Oleaceae

auctore E. MURRAY, Philadelphia, USA

Lfg. Cont. No. 52/28. 2. 19

FLORA IRANICA

FLORA DES IRANISCHEN HOCHLANDES UND DER UMRAHMENDEN GEBIRGE

PERSIEN, AFGHANISTAN, TEILE VON WEST-PAKISTAN, NORD-IRAQ, AZERBAIDJAN, TURKMENISTAN

von

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AKADEMISCHE DRUCK- u. VERLAGSANSTALT

GRAZ-AUSTRIA

Oleaceae

auctore EDWARD MURRAY, Philadelphia, USA.

Oleaceae „Oleinae", HOFFMANSSEGG & LINK, Fl. Portugal 1: 135 (1806).

Lit.: A. P. DE CANDOLLE, Prodromus 8: 273–316 (1844). E. BOISSIER, Flora Orientalis 4: 35–43 (1879). C. B. CLARKE in HOOKER f., Flora of British India 3: 590–618 (1882). E. KNOBLAUCH in ENGLER & PRANTL, Die Natürlichen Pflanzenfamilien 4 (2): 1–16 (1892). A. LINGELSHEIM in ENGLER, Das Pflanzenreich 72 (IV. 243): 1–125 (1920). B. N. BASILYEV, Oleaceae in Flora URSS. 18: 483–525 (1952).

Arbores vel frutices, raro scandentes. Folia aut opposita simplicia, aut opposita composita, aut alternantia composita. Stipulae nullae. Calyx tubulosus vel campanulatus, saepe brevissimus. Corolla aut nulla aut tubiformis aut infundibuliformis, 4–6-loba. Stamina duo, corollae inserta. Fructus aut samaroideus aut capsularis aut drupaceus aut baccatus. Flores plerumque fragrantissimi.

1a. Folia simplicia in *Syringa persica* L. autem saepe pinnatisecta. Flores petaloidei, albi vel roseo-lilacini. Fructus aut capsularis aut drupaceus 2
b. Folio composita. Flores aut apetali aut petaloidei, petalis flavis vel albis. Fructus aut samaroideus aut baccatus 4
2a. Fructus capsularis. Folia decidua, raro coriacea ..... 1. *Syringa* L.
b. Fructus drupaceus. Folia semipersistentia, plerumque coriacea 3
3a. Folia viridia subcoriacea. Inflorescentiae terminales ..... 2. *Ligustrum* L.
b. Folia cinereo-viridia coriacea. Inflorescentiae axillares ..... 3. *Olea* L.
4a. Fructus samaroideus. Flores apetali (*F. raibocarpa* REGEL exclusa). Ramuli plerumque cinerei vel cinnamomei, oppositi ..... 4. *Fraxinus* L.
b. Fructus baccatus. Flores infundibuliformes, aut flavi aut albi. Ramuli plerumque virides, saepe alternantes ..... 5. *Jasminum* L.

Subfam. *Oleoideae*

Folia semper opposita, plerumque simplicia (praeter *Fraxinum*); corollae quadrifidae, purpureae vel albae vel absentes. Fructus capsularis vel drupaceus, vel samaroideus (in *Fraxino*).

Tribus *Syringeae* G. DON, Gen. Syst. 4: 55, 51 (1837).

Fructus capsularis.

1. *Syringa*

Syringa L., Spec. Plant. 9 (1753); Gen. Plant. ed. 5: 9 (1754).

Frutices. Folia opposita, aut indivisa aut pinnatisecta, petiolata vel subsessilia, ovata vel lanceolata. Calyces tubiformes, 4-dentati, persistentes. Corollae infundibuliformes. Stamina duo, corollae parti superiori inserta. Ovarium biloculare. Fructus capsularis. Semina alata.

1a. Paniculae terminales, basi foliatae. Antherae exsertae ..... 3. *S. Emodi* WALL. ex ROYLE
b. Paniculae laterales, basi aphyllae. Antherae inclusae 2

2a. Petioli plusquam 5 mm longi. Folia nonnulla quidem pinnatisecta. Frutex erectus ..... 1. *S. persica* L.

b. Petioli 1—3 mm longi. Folia integra. Frutex humilis diffusus .....
..... 2. *S. afghanica* C. K. Schneider

Subgen. *Syringa*

Anthcrae subsessiles. Calyx quam corolla brevior.

Sect. *Syringa*

Paniculae ex gemmis lateralibus ortae; gemma terminalis plerumque deficiens.

1. ***S. persica*** L., Spec. Plant. 9 (1753).
Syn.: *S. laciniata* Miller, Gard. Dict. ed. 8 (1768). *S. capitata* S. G. Gmelin, Reise Rußland 3: 304 (1774). *Lilac persica* Lam., Encycl. Meth. Bot. 3: 513 (1789) vel (1791). *Lilac minor* Moench, Meth. 431 (1794). *Syringa angustifolia* Salisb., Prodr. 14 (1796).
Typus: „Habitat in Persia".

Frutices erecti. Folia lanceolata vel ovata, plerumque 20—60×8—15 mm, saepe 3—9-pinnatisecta. Flores coeruleo-lilacini. Capsulae subquadrangulatae, 1 cm longae. Plantam spontaneam non vidi.

Persia: W: Azerb.: Tabriz, Bornm. 1493, 1703. — S: Kerm.: Bam, in hortis, cult. Bornm. 3908! Fars.: Shiraz, in hortis, Bornm. 3903. — C: Tehr.: Tehran, Bruns.
Afghanistan: E: Kabul, in hortis, Gilli 3043!, Kerst. 48!, 101!, 420!, 420-a!, Manger 11.

Distr. gen.: Verosimiliter Sina occidentalis, ceterum culta.

Western China is its possible country of origin. It has been cultivated along the Great Silk Route through Kabul and Tehran.

2. ***S. afghanica*** C. K. Schneider, Wiener Ill. Gartenztg. 1903: 105 (1903).
Typus: Aitch. 188, 356.

Frutex humilis, ramis divaricatis brevibus. Folia 1—3×0,2—1,3 cm, subcoriacea, elliptica vel lineari-lanceolata, integra. Inflorescentia 2—4 cm longa. Corolla lilacina, tubo 1 cm longo, lobis 2,5—3 mm longis. Capsula 14 mm longa, acuminata.

Afghanistan: E: Kabul: Giri, 2400 m, Koelz 11517!
Pakistan: Kurram: In collibus prope Shalozan, 2270 m, Aitch. 188, 356. — S. Wazir.: Razmak, Blatt. & Fz.

Distr. gen.: Endem.

The only available evidently wild material (Koelz 11517) is a very poor, stunted specimen. It is not possible to solve the problem whether *S. afghanica* is, indeed, a good species. There is no evidence that Kitamura, Fl. Afgh. 302 (1960) is correct in treating the plant commonly cultivated in Kabul gardens as identical with *S. afghanica*. The characters of the above description are taken from C. K. Schneider, Ill. Handb. Laubholzk. 2: 775 (1911). (Per Wendelbo).

Sect. *Villosae* C. K. Schneider, Ill. Handb. Laubholzk. 2: 778 (1911).

Paniculae e gemmis terminalibus ortae, ad basin foliiferae.

3. ***S. Emodi*** WALL. ex ROYLE, Ill. Bot. Himal. Mount. 267 tab. 65, fig. 2 (1835). Syn.: *S. indica* ROYLE ex LINDL., Bot. Reg. 31 tab. 6 (1845) pro syn. *S. vulgaris* var. *Emodi* JAUBERT, Inv. Cult. Trianon 25 (1876). *S. villosa* var. *Emodi* REHDER in BAILEY, Cycl. Am. Hort. 1762 (1902).
Typus (Syntypi): „Kemaon versus Himalayam", ROYLE; lectotypus: WALL. 2831, K!

Frutices usque ad 5 m alti, ramis strictis. Folia lanceolata vel ovato-elliptica, subtus glauca, saepe papillosa. Inflorescentiae dense paniculatae. Corollae roseo-lilacinae vel albae. Fructus 1—1,5 cm longus, cylindricus, apice mucronatus.

Pakistan: Chitral: Ziarat, 2270 m, HARRISS. — Kurram: Safed Kuh: Karman, AFENDI 591, AITCH. 722.

Distr. gen.: In valle Kurram et ad radices montium Himalaya.

Tribus *Oleeae*.

Fructus drupaceus.

2. *Ligustrum*

Ligustrum L., Spec. Plant. 7 (1753); Gen. Plant. ed. 5: 8 (1754).

Frutex foliis integris, glabris. Flores albi, paniculati. Fructus drupaceus. Semina non alata.

1. ***L. vulgare*** L., Spec. Plant. 7 (1753).
Typus: „Habitat in Europae collibus glareosis".

Frutices. Folia ovato-lanceolata, 3—6 × 1—2 cm lata; petioli breves. Inflorescentiae thyrsoideo-paniculatae, terminales. Flores albi. Drupae virides vel nigrae.

Talish: Lenkoran, HOHEN. Inter Sallian et Lenkoran, C. A. MEY.
Persia: N: Gil.: Rasht, LIPSKY. Astara, 800 m, GAUBA & SAB. Prov. Gilan, HOHEN. — W: Azerb.: M. Qareh Dagh prope Hasan Beyglu, MIRD. in GAUBA 1203!, KNAPP. Kaleybar, MIRD. in GAUBA 1202!

Distr. gen.: Europa, Anatolia, Caucasus, Persia borco-occidentalis.

3. *Olea*

Olea L., Spec. Plant. 11 (1753); Gen. Plant. ed. 5: 8 (1754).

Frutices vel arbores. Folia opposita, coriacea, lanceolata. Calyces 4-dentati. Corollae albae, 4-partitae. Fructus drupaceus.

1a. Fructus parvus, 5—8 mm longus. Folia subtus ferrugineo-lepidota. Planta spontanea 2
b. Fructus major, c. 2 cm longus, esculentus. Folia subtus cinereo-lepidota. Planta culta. ..... 3. *O. europaea* L.
2a. Inflorescentiae paniculatae, 2—5 cm longae ..... 1. *O. ferruginea* ROYLE
b. Inflorescentiae racemosae, circiter 1 cm longae ..... 2. *O. Aucheri* (CHEV.) EHRENDF.

1. ***O. ferruginea*** ROYLE, Ill. Bot. Himal. Mount. 267 tab. 65, fig. 1 (1835).
Syn.: *O. cuspidata* WALL. ex DC., Prodr. 8: 285 (1844).
Typus: „Hab. Banks of Jumna and of Sutlej, near Turanda", ROYLE.

Arbores ad 10 m altae. Folia coriacea, lanceolata, acuminato-cuspidata, supra nitida, subtus ferruginea. Flores albi. Drupae circiter 8 mm longae, 5 mm crassae.

Persia: S: Bal.: Iranshahr: Miandar, in declivibus borealibus Kuh-e Bam Posht, 1350 m, Hotson.

Afghanistan: E: Nijrao: Kamu, in valle Badrami, 1600 m, Neub. 3321! Khost: Baq inter Khost et Yakubi silvas formans, Volk 1102! Nuristan: Wama, in valle fluvii Pech, 1400 m, Kerst. 813-a, 1259! Gusalak, 1000—1800 m, Edelb. 58!, 61!, 274! Derin, Edelb. 1738! Asmar, Kunar, Edelb. 2069! Inter Asmar et Barikot, 900 m, Edelb. 1619!, 1624!, 1630!; Gilli 3042! In valle Kunar, 900—1100 m, Neub. 4541! Inter Waigel et Nishai, Neub. 51/740! Waigel, 1500 m, Edelb. 879! In valle fluvii Bashgul (Arnawai), 1450 m, Gatacre. Chigha Sarai, Wingate. Inter Kandai et Seprigal, Kitam. — „Kabul", Honigberger s. n.! Pushut, Griff. Afghanistan, Griff. 3678!

Pakistan: Chitral: Drosh, 1350 m, Harriss. Jingeret, 1500 m, Bowes Lyon 704! — Dir.: Darora, 1500 m, Gatacre. — Swat: In valle Swat, Gatacre. — Peshawar: Inter Attock et Khushalgarh, 500 m, Rech. 30434! — Kohat: 20—30 km W Kohat versus Thal, 500—700 m, Rech. 30206! — Kurram: Inter Badishkhel et Thal, Aitch. Inter Ibrahimzai et jugum Darwazaghai, Aitch. — N. Wazir.: Razani, Stewart. Piroba, Stewart — S. Wazir.: Palosina, Stewart. Anai, Stewart. Daboi, Stewart. — Quetta: In faucibus Torkhan supra Harnai, 900 m, Rech. 29485!, 29512! 12 km N Murgha Kibzai, 1600 m Rech. 29802!, 29821! Loralai, H.-B. 19618. Sibi, Gaz. 329. Harnai, Lace. — Kalat: Rar Kaur SW Kalat, 1200 m, Hotson 159-A, 159-B. In jugo Kalgali, 1000 m, Hotson M 350. Inter Wad et Bela, 250—1100 m, Rech. 27429!, 27444! Jhalowan, H.-B. 1735, 19802. — Bela: Las Bela, H.-B. 18728. — Dera Ghazi Khan: M. Sulaiman, Fort Munro, 1600—1800 m, Rech. 29743! — Baluchistan, Stocks — Kohlu, H.-B. 19444. Kila Saifulla, H.-B. 19184.

Distr. gen.: Afghanistan, Pakistan, Kashmir.

2. ***O. Aucheri*** (Chev.) Ehrendf., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 97: 155—158 (1960).

Syn.: *O. chrysophylla* Lam. var. *Aucheri* Chev., Rev. Intern. Bot. Appl. Paris 28: 303—304: 18 (1948).

Typus: Djebel Akadar in Maskat, Arabia, Auch. 4918; holotypus P, isotypus W!

Frutices vel arbores parvae, xeromorphicae. Similis *O. ferrugineae*, sed differt inflorescentiis brevissimis racemosis, nec paniculatis.

Persia: S: Kerm.: In silva Kuh Chah inter Esfandaqeh et Sirjan, 2000—2500 m, Djazirei s. n.! Bal.: Iranshahr, Bazman, Manuch. 6598-E!

Distr. gen.: Arabia, Persia australis.

3. ***O. europaea*** L., Spec. Plant. 8 (1753).

Typus: „Habitat in Europa australi".

Frutex vel arbor. Folia lanceolata vel oblonga vel ovata, breviter petiolata, coriacea, sempervirentia, supra obscure viridia, subtus argenteo-lepidota. Flores albi. Drupa atroviolacea, ovoidea, 1—2 cm diametro.

Iraq: Kurd.: Mosul: Niniveh, Barkley 9142! Arbil: In montibus prope Rawandiz usque ad 1000 m, Bornm. 1547.

Persia: N: Gorg.: Shah Pasand, 180 m, Mooney 6522! A Behshahr orientem versus Sab. in Gauba 1206! Aliabad, Sab. in Gauba 1205! Gil.: Rudbar, 300 m, Grant 16457! Gauba 1208!, Buhse. Manjil, 350 m, Buhse, Bornm. 3898. Kaluraz, Lipsky. — S: Fars.: Kazerun prope Shapur, Bornm. 502. Fasa, 1400 m, Grant 16968! Inter Shiraz et Bushehr, Bornm. 582. Kerm.: Bam, Sab. in Gauba 1207! Shahdab, Chahar Farsakh, Behb. 6599-E!

Distr. gen.: Regio Mediterranea, praeterea etiam in regione nostra culta et verosimiliter subspontanea.

Tribus 3 *Fraxineae* (BARTLING) BENTHAM & HOOKER f., Gen. Plant. 2: 673 (1876).
Fructus samaroideus. Folia composita (in nostris).

4. *Fraxinus*

Fraxinus L., Spec. Plant. 1509 (1753); Gen. Plant. ed. 5, 477 (1754).

Lit.: A. LINGELSHEIM in ENGLER, Botanische Jahrbücher 40: 185 (1907).

Arbores vel arbusculae. Flores polygamo-monoici vel polygamo-dioici vel dioici (fide LINGELSHEIM). Calyces 4-fidi vel nulli. Corollae 4-partitae vel nullae. Samarae compressae spathulatae, uniloculares, monospermae.

1a. Petioluli distincti 5—12 mm longi. Corollae albae pulcherrimae. Samarae falcato-curvatae ..... 1. *F. raibocarpa* REGEL
b. Petioluli nulli vel 2—3 mm longi. Corollae nullae. Samarae rectae 2
2a. Foliola plerumque 7—11. Folia 20—40 cm longa ..... 3. *F. excelsior* L. subsp. *coriariifolia* (SCHEELE) E. MURRAY
b. Foliola plerumque 3—7 (raro —3). Folia 5—20 cm longa 3
3a. Ramuli decussato-oppositi. Foliola marginibus crenatis. Samarae saepe emarginatae ..... 2. *F. xanthoxyloides* (G. DON) DC.
b. Ramuli ternati aut decussato-oppositi. Foliola aut subintegra aut grosse-serrata. Samarae ellipticae ..... 4. *F. rotundifolia* MILLER

Sect. *Ornus* (NECK.) LAM. & DC., Fl. Fr. ed. 3, 3: 496 (1805).

Flores in paniculas terminales et laterales ex ramulis foliiferis ortis dispositi simul ac folia vel serius evoluti, dioici vel polygami.

Subsect. *Ornus*

Syn.: Subsect. *Euornus* REHDER (1949).
Corollae evolutae.

1. ***F. raibocarpa*** REGEL, Acta Horti Petrop. 8: 685 tab. 12 (1884).
Syn.: *F. Rehderi* HAECKEL, Feddes Rep. Beih. 108: 33, tab. 3 (1938), syn. nov.
Typus: „In valle fluvii Sarawschan, Passrut, 6000' alt."

Arbores parvae. Foliola aut subintegra aut ad apicem serrata, aut suborbiculata aut subrhomboidea aut ovata, apice aut rotundata aut emarginata aut acuta. Inflorescentiae paniculato-corymbosae, 10—15 cm longae. Flores conspicui, albi. Samarae falcato-curvatae spathulatae, distinctissimae.

Afghanistan: E: Nuristan: In jugo Ashpi, NEUB. 51/1055! Inter Kotal-e Agok et Waigel, NEUB. 51/889! Parun, 2200—2500 m, EDELB. 2025!, 2383! Inter Wama et Chetras, 1700 m, KERST. 846! (Typus *F. Rehderi* HAECKEL). Supra Chetras, KERST. 1311! Pashki, 2350 m, EDELB. 940! Inter Pashki et Kushimaikot, KITAM. Kantivo, 2100 m, EDELB. 671!

Distr. gen.: Montes Turkestaniae, Buchara, Hindukush.

Leaflet margin, emargination and shape vary widely in this species.

Sect. *Fraxinus*.

Flores in paniculas laterales aphyllas dispositi (in nostris) ante folia evoluti.

Subsect. *Sciadanthus* (Coss. & Dur.) Lingelsheim, Bot. Jahrb. 4: 219 (1907).
Flores cum calycibus. Folia rhachidibus alatis.

2. ***F. xanthoxyloides*** (G. Don) DC., Prodr. 8: 275 (1844).
Syn.: *Ornus xanthoxyloides* G. Don, Gen. Syst. 4: 57 (1837). *Fraxinus oxyacanthifolia* hort. ex Dippel, Handb. Laubh. 1: 71 (1889). *F. xanthoxyloides* var. *dimorpha* sensu Lingelsheim in Engler, Pflanzenr. 72 (IV. 243): 36 (1920) non Wenzig p. p. quoad plantas asiaticas.
Typus: Wall. 2833, K, W!

Arbusculae. Folia 1—3-juga, foliolis crenatis ellipticis vel ovatis 2—3 cm longis, subtus viridibus plerumque glabris. Rhachides saepe anguste alatae. Calyces parvi. Corollae nullae. Samarae spathulatae saepe emarginatae.

Afghanistan: E: Kabul: Tang-i Gharu, Maipar, 1600 m, Gilli 3046!, 3047! Sarobi, 1400 m, Volk 2843! In valle Salang prope Taghma, 1700 m, Gilli 3048! Ghorband, Neub. 50/81! Gardez, Volk 1163! Khost: Inter Dre Kalla et Peiwar Kotal, Karatigah, Aitch. 44. Panjshir: Prope Gulbahar, Podlech 12785! Ruka, 1700, Koelz 50/81! Nuristan: Chetras, 2200 m, Edelb. 857! Inter Doab et Chetras, 1900 m, Edelb. 536! Wama, 1400 m, Edelb. 327!, Kerst. 765! Pashki, Edelb. 584! Inter Pashki et Kushimaikot, Kitam. Kantivo, Edelb. 696! In valle fluvii Pech, 900—1200 m, Kerst. 700! Inter Gusalak et fluvium Kurder, 1200 m, Kerst. 736! — NE: Kataghan: In valle fluvii Andarab, 1100 m, Rech. 31769! In declivibus borealibus jugi Salang, 1100—2000 m, Rech. 31677! In valle fluvii Kunduz inter Pul-i Khumri et Doshi, 950 m, Rech. 16518! Hdg. & Wdb. 4072! Volk 533! — C: Doab, Volk 516!
Pakistan: Chitral: In valle Mastuj inter Buni et Mastuj, 2000 m, Kerst. 2018-b! Yarkhun inter Buni et Reshun, 1800—2000 m, Kerst. 2018-a! Koghozi, 1600 m, Kerst. 2008-a! Moroi, Kerst. 2008-b! In valle Shishi, 2000 m, Bowes Lyon 620!, 620a! Prope Ziarat, Siddiqui in R. R. Stewart 27108! Mirkhani, 1800 m, Harriss. — Swat: Inter Kalam et Paloga, Ogino 601. Kalam, 2200 m, Rech. 19449! Ushu, Rech. 19509!, 30782! Utror, 2200 m, Rech. 30806! Inter Kalam et Ushu, Stewart & Rahman 25401! In valle Jabba E Kolalai, 1600—2200 m, Rech. 30765! — S. Wazir.: Kaniguram, Stewart — Quetta: Fort Sandeman, Habsukh 18808! Shinghar, 2000 m, Rech. 29889!, 29890! Juniper Tracts, Lace. Zhob distr., Gaz. 325. Bori et Sanjawi, Loralai Gaz. 366. Shahrig et Kohlu, Sibi Gaz. 329. Inter Quetta et Pishin, Gaz. 358. Loralai, Gaz. 28. — Kalat: In collibus Harboi, H.-B. 19542. Bal.: In montibus, 1800—2900 m, Stocks.

Distr. gen.: Afghanistan, Pakistan, montes Hindukush et Himalaya.

Subsect. *Fraxinus*.

Flores sine calycibus. Folia sine rhachidibus alatis.

3. ***F. excelsior*** L. Spec. Plant. 1057 (1753).
Typus: Europa.

In regione nostra tantum occurrit:
— — subsp. ***coriariifolia*** (Scheele) E. Murray, stat. nov.
Syn.: *F. coriariaefolia* Scheele, Linnaea 17: 350 (1843). *F. excelsior* var. *coriariaefolia* Boiss., Fl. Or. 4: 40 (1879).
Typus: „In sylvis septentrionalibus M. Talysch versus desertum Muza", Hohen.; isotypus W!

A subspecie *excelsiore* differt rhachidibus saepe pubescentibus.

Talish: Grossh., C. A. Mey. Swant, Hohen.
Persia: N: Gorg.: Supra Naudeh, 900 m, Gauba & Sab. 1213! In cacumine M. Gale

Maran, GAUBA & SAB. 1214! Robat-e Qozloq, KOELZ 16210! Maz.: In valle Chalus, 2200 m, RECH. 844! Kojur: Inter Kinch et Dasht Nazir, 800—1300 m, RECH. 6609! In valle fluvii Haraz: Darli supra Panjab, 2000 m, WDB. 1606! In valle fluvii Talar, KRIESCHE in RECH. 2335! Gil.: M. Samam prope Pak Deh, BUHSE. Navrud, 1000 m, ESFAND. 6449-E! 20 km W Astara in faucibus fluvii Astara, 500 m, GRANT 16403! Prope Lahijan, MIRD. in GAUBA 1212! Persia borealis, SZOV.! — W: Azerb. Kaleybar, MIRD. 1216! M. Astara prope Asbine, MIRD. 1215! — C: Qazv.: Karaj, cult. GAUBA 759-a.

Distr. gen.: Endem.

Juvenile material with reddish rachises and ovate leaflets with serrate apices and petiolules may agree with *F. elbursensis* LINGELSHEIM in ENGLER, Pflanzenr. 72 (IV. 243): 52 (1920) which was described from sterile branches without mention of flowers or fruit. Further field study may show this to be a valid species.

4. ***F. rotundifolia*** MILLER, Gard. Dict. ed. 8, F no. 2 (1768).

1a. Folia grosse serrata viridia ..... subsp. *rotundifolia*
b. Foliola subintegra cinerea 2
2a. Rhachides et foliola pubescentes .....
..... subsp. *Bornmülleri* (LINGELSHEIM) E. MURRAY
b. Rhachides et foliola glabrescentes ..... subsp. *persica* (BOISS.) E. MURRAY

— — subsp. ***rotundifolia.***

Syn.: *F. parvifolia* LAM., Encycl. Meth. Bot. 2: 546 (1786). *F. oxycarpa* WILLD., Spec. Plant. 4: 1100 (1806). *F. oxyphylla* M. B., Fl. Taur.-Cauc. 2: 450 (1808). *F. syriaca* BOISS., Diagn. Pl. Or. Nov. Ser. 1, 11: 77 (1849).

Typus: Ignotus.

Arbusculae raro arbores. Folia foliolis 5—7, grosse serratis, plerumque viridibus, raro subtus cinereis, saepe ternatis. Inflorescentiae racemosae. Samarae oblanceolatae.

Iraq: Kurd.: Arbil: M. Qandil: Inter Shahidan et Pushtashan, 1000 m, RECH. 11730! In faucibus prope Rawandiz, FIELD & LAZAR 858! GUEST 483. In faucibus Barsarini, 750 m, GUEST 460, 461. Shaqlawa, GUEST 566. Inter Walash et Nowanda, 1040 m, GUEST 2750.

Persia: N: Maz.: Pol-e Zanguleh, 2000—2400 m, GAUBA 1620. Gil.: In silvis Gilani, AUCH. 4921. Persia borealis, AUCH., BUHSE, KY. 189. — W: Azerb.: In collibus S Tabriz, GILL.-SM. 2572. Qareh Dagh prope Hasan Beyglu, MIRD. in GAUBA 1217! Kermansh.: In valle Jamnasu, STR. Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 341! Hamadan, SAB. 1209-a!, 1209-b! Kurd.: M. Zagros prope Mazi Bon, HAUSSKN. 1867. Arak: M. Rasvand, STR. Mowdar, STR. Lur.: Khorramabad, SHAB. 89-E!, BENT & WR. 410—101 cult.! Bisheh, KOELZ 615. Safid Dasht, SAB. 332! Bagh-e Khan, SAB. 331! — S: Fars.: Kuh-e Dinar, KY. 646. Kuh-e Nil, HAUSSKN. Inter Tal-e Khosravi et Sisakht, BEHB. 952-E! Prope Eqlid, STAPF 328! Ad fontes „Abamabad", STAPF 329! Kuh Bil prope Dasht-e Arzhan, STAPF 330! Bagh-i Bagich prope Shiraz, STAPF 331! Shiraz, STAPF 332!; 1600 m, GRANT 15244!, 17015 cult.! Neyriz, KOELZ 14721! Kerm.: Prope Sirjan, 2000 m, BORNM. 3903! Rabor, 2600 m, BORNM. 3901. Prope Jupar, BORNM. 3900. Persia australis, M. „Tang Nalli", 2100 m, HAUSSKN. — E: Khor.: In montibus prope Mashhad et Torbat-e Heydariyeh, CZERN. Prov. Khorasan, BGE. — C: Tehr.: Qasr-e Qajar, Abbasabad, BRUNS. Prope Tehran, BUHSE. Darband prope Tehran, 1500—2000 m, RECH. 1082! Pas Qaleh, KY. 189! Qazv.: Qazvin, BORNM. 7628, CAVARA. Karaj, BORNM. 758. Damgh.-Semn.: Abdullahabad inter Varamin et Semnan, 1200 m, RECH. 2778 cult.! Chashmeh-i Ali, BUHSE. Shahr.-Bust.: Shahrud-Amiriyeh, SAB. in GAUBA 1210 cult.!, 1211 cult.! Qom: Rahjerd, 2000 m, KOELZ 1359. — Persia, AUCH. 2548.

Turcomania: sec. Nikitin.
Afghanistan: NW: Herat: In valle fluvii Hari Rud, Aitch. 251!, 1081! „Buzbai", Stutz 648. Herat, Amsel! Khwajachisht, 1600 m, Koelz 3688! — SW: Farah, Volk 2934! — SE: Kandahar, Koelz 13222! — E: Kabul: Dehmazang, Volk 1523 cult.! Aliabad, Neub. 3056 cult.! Darulfanun, Volk 49 cult.! Kabul, 1770 m, Gilli 3044 cult.!, 3045 cult.!, Kerst. 476-b cult.!, Koelz 11464! Sher Darwasa, 1700 m, Kerst. 476-b cult.! Afghanistan, Griff.
Pakistan: Kurram: Alizai, Khan 27, verosimiliter culta! Quetta: Kasi prope Quetta, Lace 3469! — Baluchistan, Lace.

Distr. gen.: Europa australis, Anatolia, Palaestina, Persia, Afghanistan, Pakistan occidentalis.

This taxon appears to be at least partly cultivated within the Flora Iranica region. The verticillate (ternate) characteristic provides an identification aid when it is present.

— — subsp. ***Bornmülleri*** (Lingelsheim) E. Murray, stat. nov.
Syn.: *F. Bornmülleri* Lingelsheim in Engler, Pflanzenr. 72 (IV, 243): 56 (1920).
Typus: „W. Persien, Mowdere bei Sultanabad", Str.

Arbores ramulis fertilibus ternatis flavo-brunneis. Rhachides et folia pubescentes vel pilosi. Foliola plerumque subintegra vel „grosso modo serrato-dentata" fide Lingelsheim .

Persia: W: Arak: Mowdar prope Arak, Str. — S: Fars.: Shiraz, Tal-e Khosravi, Behs. 951-E!

Distr. gen.: Endem.

The ternate leaves (three per node) place this under *F. rotundifolia*. The hairy, grey-green leaves make this a good subspecies.

— — subsp. ***persica*** (Boiss.) E. Murray, stat. nov.
Syn.: *F. persica* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 11: 78 (1849). *F. oxyphylla* M. B. var. *subintegra* Boiss., Fl. Or. 4: 41 (1879). *F. oxycarpa* Willd. var. *subintegra* (Boiss.) Wenzig in Engler, Bot. Jahrb. 4: 175 (1883). *F. excelsior* L. subsp. *oxycarpa* (Willd.) Wesmael var. *integra* Wesmael, Bull. Soc. Bot. Belg. 31: 95 (1892). *F. syriaca* Boiss. var. *persica* (Boiss.) Lingelsheim in Engler, Pflanzenr. 72 (IV, 243): 53 (1920). *F. excelsior* L. var. *integra* Parsa, Fl. de l'Iran 4: 44 (1952).
Typus: „Frutex humilis in solo schistaceo (Schieferboden) M. Kuh-Daëna", Ky. 646; holotypus W!

Frutices humiles. Folia cinereo-viridia, ad apicem irregulariter serrata, saepe subintegra; foliola plerumque 1—2 cm longa, 1 cm lata, raro longiora. A subspecie *rotundifolia* differt foliis minoribus, cinereis, subintegris.

Persia: W: Lur.: Kharon, 1800 m, Koelz 741! Papi, Sab. 333! — S: Fars.: Kalat, 35 km NW Shiraz, Grant 17692! Kuh-e Dinar, Ky 646!

Distr. gen.: Endem.

Turkish and Iraq specimens seen are on serpentine soil and Persian ones on schist. An ecotype has resulted with petite habit which has small, greyish, subentire leaves. Ternate fertile twigs occur in the holotype and in Sab. 333.

Doubtful records

F. potamophila Herd. in Regel Bull. Soc. Nat. Mosc. 41: 65 (1868).
Syn.: *F. Regelii* Dippel, Laubholzk. 1: 97 (1889).
Pakistan: S: Wazir.: Razmak, Fz. 2035.

F. sogdiana BGE., Mém. Sav. Etrang. Acad. Petersb. 7: 390 (1854).
Afghanistan: E: Kabul: Darulaman, MANGER 9.
Pakistan: N. Wazir.: Dosalli Ft., 1500 m, BLATT. & Fz.

Subfam. *Jasminoideae*

Subfam. *Jasminoideae* (JUSS.) KNOBLAUCH in ENGLER & PRANTL, Nat. Pflanzenfam. IV, 2: 5, 13 (1892).

Folia aut alternantia aut opposita, in nostris composita. Corollae 5—6-fidae infundibuliformes, luteae vel albae. Fructus baccatus.

5. *Jasminum*

Jasminum L., Spec. Plant. 7 (1753); Gen. Plant. ed. 5: 7 (1754).

Frutices scandentes vel erecti ramulis viridibus. Calyces campanulati 5—8-dentati. Corollae infundibuliformes. Baccae monospermae. Flores fragrantes.

1a. Folia opposita. Flores in vivo albi, in sicco lutescentes .. 1. *J. officinale* L.
b. Folia alternantia. Flores lutei 2
2a. Foliola 3. Calyces 5—7 mm longi ..... 2. *J. fruticans* L.
b. Foliola 5—7 (raro 3). Calyces 1—2 mm longi ..... 3. *J. humile* L.

1. ***J. officinale*** L., Spec. Plant. 7 (1753).
Typus: „Habitat in India".

Frutices subscandentes. Folia opposita 3—7-foliolata, foliolis ovato-lanceolatis acuminatis. Inflorescentiae terminales corymbosae. Dentes calycini subulati demum filiformi-elongati. Corollae albae speciosae.

Talish: Astara, HOHEN.
Persia: N: Maz.: In litore caspico inter Babol Sar et Now Shahr, RECH. 2065! In valle Chalus, TREGUBOV 163! Gil.: Rasht, LIPSKY. Kohdom prope Rasht, BORNM. obs. Lahijan, GAUBA 1204! Tunekabun, BUHSE 1015/1. — W: Ham.: Hamadan, HAUSSKN. subspont.! — S: Kerm.: Kerman, in horto cultum, BORNM. 3905. — E: Khor.: Inter Neyshabur et Mashhad, BGE. — C: Tehr.: Prope Darband, KY. 438!, 730!
Afghanistan: E: Kabul: Jalalabad, in horto cultum, VOLK 1987! In valle Nijrao: Bagrami, ad viam, 1600 m, NEUB. 51/246! Kabul, in horto cultum, GILLI 3049!
Pakistan: Chitral: Mirga, HARRISS. — Dir: Panakot, 1500 m, GATACRE. Swat: Infra jugum Laram, 1200 m, GATACRE. Inter Khwazakhiela et Shangla, 1300—1900 m, RECH. 30566! — S. Wazir.: Kaniguram, STEWART. Razmak, BLATT. & Fz. — Kurram: Shalozan, AITCH.

Distr. gen.: Regio Mediterranea, Caucasus, Persia borealis, Montes Himalaya, Sina.

Certainly wild in the Himalayas from Swat on eastwards; possibly also native in N Persia and Caucasus. Cultivated since ancient times and often subspontaneous.

2. ***J. fruticans*** L., Spec. Plant. 7 (1753).
Syn.: *J. syriacum* BOISS. & GAILL., Diagn. Pl. Or. Nov. Ser. 2, 6: 120 (1859).
Typus: „Habitat in Europa australi".

Frutices stricti. Folia alternantia, trifoliolata, raro simplicia. Foliola oblanceolata vel elliptica, 1—2 cm longa. Inflorescentiae terminales cymosae, floribus 2—5. Calyces 4—5-lobi, lobis subulatis. Corollae luteae infundibuliformes, 1—2 cm longae.

Talish: 500—900 m, C. A. Mey.

Persia: N: Gorg.: Gorgan, Shar. 289! Radkan, Buhse. Maz.: In valle fluvii Chalus, 1500 m, Stutz 1144! In valle Haraz E Emarat, 800 m, Wdb. 222! Kojur inter Kinch et Dasht Nazir, 800—1300 m, Rech. 6624! 112 km S Babol, Stutz 1259! Gil.: Rudbar, Buhse; 500 m, Bornm. 7623. Yehleh, Linds. 1422! — W: Azerb.: Hasan Beyglu, Knapp. — E: Khor.: Kotal-e yek Chenar, Koelz 16685! — C: Tehr.: Darband prope Tehran, Ky. 730!

Turcomania: Kopet Dagh, Boriss. Joldere, Baranov in Hb. Fl. As. Med. 441!

Distr. gen.: Per Regionem Mediterraneam, Caucasum et Persiam usque ad Turcomaniam.

3. ***J. humile*** L., Spec. Plant. 7 (1753).

Syn.: *J. revolutum* Sims, Bot. Mag. 1731 (1814). *J. Wallichianum* Lindl., Bot. Reg. 17: 1409 (1831).

Typus: Ignotus.

Frutices. Folia alternantia (3—)5(—7)-pinnata. Foliola ovata, apice acuta raro acuminata. Inflorescentiae cymosae, in ramulis lateralibus terminales. Calyces brevissimi, 5-dentati. Corollae luteae, 15—25 mm longae.

Persia: S: Kerm.: Kerman, in horto cultum, Bornm. 3904. — C: Tehran: Qasr-e Qajar, cultum, Bruns.

Afghanistan: NE: Herat, cult., Amsel! — SE: Kandahar, cultum Lindb. 332! — E: Kabul: Badrami in valle Nijrao, 1600 m, Neub. 253 cult.! Khost: In quercetis (*Qu. Baloot*) declivium australium jugi Narai Kotal, 1900 m, Rech. 35590! Nuristan: In valle fluvii Darin, 1900—2400 m, Neub. 51/990!, Edelb. 1995! In valle fluvii Pech, inter Gusalak et Kurder, Neub. 51/784! Inter Waigel et Nishai, Neub. 51/738! Waigel, 1500—1600 m, Edelb. 863!, 877! Wama, 1380 m, Kerst. 779! Inter Chetras et Wama, Kitam. Atershuker, 2270 m, Kerst. 1033! Kushtos, 1900 m, Neub. 4574! — NE: Kohistan: Nilkhan, 2400 m, Koelz 11699!

Pakistan: Chitral: Ziarat, in jugo Lowarai, 2100 m, Stainton 2551! — Dir.: Jambatai, 1500—1800 m, Harriss — Swat: Inter Khwazakhiela et Shangla, 1300—1900 m, Rech. 30567! Inter Madyan et Kolalai, Rech. 30682! — Kurram: Shalozan, Aitch. 289. In valle Zeran, Afendi 178! — S. Wazir.: Kaniguram, Stewart. Pre Ghal, Duthie 15621. Razmak, Blatt. & Fz. — Quetta: Juniper Tracts, Lace.

Distr. gen.: Afghanistan, Pakistan, Sina occidentalis, Montes Himalaya et Hindukush.

Doubtful records

J. grandiflorum L., Spec. Plant. ed. 2: 9 (1762).

Pakistan: N. Wazir.: Miram Shah, Fz. — S. Wazir.: Razmak, Blatt. & Fz. In collibus Sur Duor, Dundas 737-a. — Quetta: Kotra-i Kahski, H.-B. 19242.

Oleaceae 1
Subfam. *Jasminoideae* 9
(Subfam. *Jasminoideae* (Juss.) Knoblauch in Engler & Prantl) 9
Subfam. *Oleoideae* 1
Tribus *Fraxineae* (Bartling) Bentham & Hooker f. 5
Tribus *Oleeae* 3
Tribus *Syringeae* 1
Fraxinus L. 5
F. Sect. *Fraxinus* 5
F. Subsect. *Fraxinus* 6
F. Subsect. *Sciadanthus* (Coss. & Dur.) Lingelsheim. 6
F. Sect. *Ornus* (Neck.) Lam. & DC. .. 5
(*F.* Subsect. *Euornus* Rehder) 5
F. Subsect. *Ornus* 5
(*F. Bornmülleri* Lingelsheim in Engler) 8
(*F. coriariaefolia* Scheele) 6
F. elbursensis Lingelsheim in Engler 7
F. excelsior L. 6

F. excelsior L. subsp. *coriariifolia* (SCHEELE) E. MURRAY 6
(*F. excelsior* L. subsp. *oxycarpa* (WILLD.) WESMAEL var. *integra* WESMAEL) ... 8
(*F. excelsior* L. var. *coriariaefolia* BOISS.) 6
(*F. excelsior* L. var. *integra* PARSA).... 8
(*F. oxyacanthifolia* hort. ex DIPPEL)... 6
(*F. oxycarpa* WILLD.) 7
(*F. oxycarpa* WILLD. var. *subintegra* (BOISS.) WENZIG in ENGLER 8
(*F. oxyphylla* M. B.) 7
(*F. oxyphylla* M. B. var. *subintegra* BOISS.) 8
(*F. parvifolia* LAM.) 7
(*F. persica* BOISS.) 8
F. potamophila HERD. in REGEL 8
F. raibocarpa REGEL 5
(*F. Rehderi* HAECKEL) 5
(*F. Regelii* DIPPEL) 8
F. rotundifolia MILLER 7
F. rotundifolia MILLER subsp. *Bornmilleri* (LINGELSHEIM) E. MURRAY . 8
F. rotundifolia MILLER subsp. *persica* (BOISS.) E. MURRAY 8
F. rotundifolia MILLER subsp. *rotundifolia* 7
F. sogdiana BGE. 9
(*F. syriaca* BOISS.) 7
(*F. syriaca* BOISS. var. *persica* (BOISS.) LINGELSHEIM in ENGLER)..... 8
F. xanthoxyloides (G. DON) DC. 6
(*F. xanthoxyloides* (G. DON) DC. var. *dimorpha* sensu LINGELSHEIM in ENGLER) 6
Jasminum L. 9
J. fruticans L. 9
J. grandiflorum L. 10
J. humile L. 10
J. officinale L. 9
(*J. revolutum* SIMS.) 10
(*J. syriacum* BOISS. & GAILL.) 9
(*J. Wallichianum* LINDL.) 10
Ligustrum L. 3
L. vulgare L. 3
(*Lilac minor* MOENCH) 2
(*L. persica* LAM.) 2
Olea L. 3
O. Aucheri (CHEV.) EHRENDF. 4
(*O. chrysophylla* LAM. var. *Aucheri* CHEV.) 4
(*O. cuspidata* WALL. ex DC.) 3
O. europaea L. 4
O. ferruginea ROYLE 3
(*Ornus xanthoxyloides* G. DON) 6
Syringa L. 1
S. subgen. *Syringa* 2
S. Sect. *Syringa* 2
S. Sect. *Villosae* C. K. SCHNEIDER 2
S. afghanica C. K. SCHNEIDER 2
(*S. angustifolia* SALISB.) 2
(*S. capitata* S. G. GMELIN) 2
S. Emodi WALL. ex ROYLE 3
(*S. indica* ROYLE ex LINDL.) 3
(*S. laciniata* MILLER) 2
S. persica L. 2
(*S. villosa* var. *Emodi* REHDER in BAILEY) 3
(*S. vulgaris* var. *Emodi* JAUBERT) 3

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Die in Kursiv gesetzten Familien sind bereits erschienen

	Engler & Diels	Wettstein	De Candolle Bolssier	Bentham & Hooker	Hutchinson 2. ed.
PTERIDOPHYTA					
Equisetaceae	1	2	143	(2)	(2)
Lycopodiaceae	2	1	142	(1)	(1)
Marsileaceae	5	5	144	(4)	(4)
Ophioglossaceae	3	3	140	(6)	(6)
Polypodiaceae	4	4	141	(3)	(3)
Salviniaceae	6	6	145	(5)	(5)
GYMNOSPERMAE					
Cupressaceae	9	8	136	(8)	(8)
Ephedraceae	10	10	138	(10)	(10)
Pinaceae	8	9	135	(7)	(9)
Taxaceae	7	7	137	(9)	(7)
ANGIOSPERMAE					
Acanthaceae	138	110	84	86	135
Aceraceae	86	83	30a	42a	76
Aizoaceae	48	27	50	57	106
Alismataceae	16	127	115	124	146
Amaranthaceae	45	23	93	92	112
Amaryllidaceae	27	134	128	114	162
Ampelidaceae	91	91	32	41	66
Anacardiaceae	81	81	46	43	75
Apiaceae	113	94	54	58	127
Apocynaceae	125	117	82	75	82
Aquifoliaceae	82	86	70	38	58
Araceae	22	143	120	122	158
Araliaceae	112	93	55	59	19
Aristolochiaceae	40	35	103	97	96
Asclepiadaceae	126	118	74	76	84
Asparagaceae	26	133	129	116	155,7pp.
Asteraceae	146	126	61	65	131
Balanophoraceae	42	20	102	103	63
Balsaminaceae	89	85	25	33b	140
Berberidaceae	54	40	3	13	96
Betulaceae	33	11	112	108	25
Bignoniaceae	137a	108a	76a	85a	86a
Boraginaceae	129	104	80	79	142
Brassicaceae	60	46	7	16	101
Buddleiaceae	123	115	75	77	80
Burseraceae	75	78	33	36	72
Butomaceae	17	128	116	124a	145
Buxaceae	80	31	105	104a	23
Caesalpiniaceae	68b	59b	38b	45b	13
Callitrichaceae	79	32	47	50b	117
Campanulaceae	145	125	62	66	130
Cannabiaceae	37	17a	106	105	30
Capparidaceae	59	45	8	17	36
Caprifoliaceae	141	121	57	61	20
Caryophyllaceae	50	29	13	23	105
Celastraceae	83	87	35	39	60
Ceratophyllaceae	52	42	15	110	94
Chenopodiaceae	44	22	92	93	111
Cistaceae	99	49	10	19	33
Commelinaceae	24	138	132	117	154
Compositae	146	126	61	65	121
Convolvulaceae	127	102	78	80	133
Cornaceae	114	92	56	60	18
Corylaceae	33	11	112	108	27
Crassulaceae	63	56	51	48	123
Cruciferae	60	46	7	16	101
Cucurbitaceae	144	124	48	55	42
Cupuliferae	33-4	11-2	111-2	108	25-7
Cuscutaceae	128	103	79	80a	141
Cynocrambaceae	111	25	91	105c	113
Cyperaceae	20	139	134	126	169
Cytinaceae	41	36	101	96	98
Datiscaceae	101	54	49	56	43
Dioscoreaceae	28	137	131	115	164
Dipsacaceae	143	123	60	64	129
Ebenaceae	121	100	69	72	68
Ehretiaceae	129	104	80	79	87
Elaeagnaceae	103	61	97	100	64
Elatinaceae	96	52	18	26	103
Ericaceae	116	99	63	67	51
Euphorbiaceae	78	30	104	104	49
Fabaceae	68	59	38	45	13-5
Fagaceae	34	12	111	108a	26
Ficoidaceae	48	27	50	57	106
Frankeniaceae	97	51	17	22	38
Fumariaceae	58	44	6	15a	100
Gentianaceae	124	116	76	78	118
Geraniaceae	70	74	26	33	138
Globulariaceae	137	108	85	87	142
Graminae	19	140	135	127	170
Grossulariaceae	64	57	52	47	17
Guttiferae	95	55	19	27	54
Halorrhag(id)-aceae	109	67	46	50	115
Hamamelidaceae	65	33	53	49	21
Helleboraceae	53	39	1	11	90
Hippocastanaceae	87	84	30b	42b	77
Hippuridaceae	110	68	45	50a	116
Hydrangeaceae	64	57	52	47	16a
Hydrocharitaceae	18	129	114	111	146
Hypericaceae	95	55	19	27	54
Ilicineae	82	86	70	38	58
Illecebraceae	50	29	13	23	109
Iridaceae	29	135	126	113	163

	Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
Juglandaceae	32	13	109	107	28
Juncaceae	25	136	133	118	168
Juncaginaceae	14a	130	117a	125b	148
Lablatae	131	112	87	89	144
Lamiaceae	131	112	87	89	144
Lauraceae	56	37	98	98	11
Leguminosae	68	59	38	45	13-5
Lemnaceae	23	144	119	123	159
Lentibulariaceae	136	107	65	84	137
Liliaceae	26	133	128	116	155
Linaceae	71	72	23	31	47
Loganiaceae	123	115	75	77	79
Loranthaceae	39	19	100	101	61
Lythraceae	104	62	43	53	114
Malvaceae	93	69	20	28	46
Meliaceae	76	79	31	37	73
Menispermaceae	55	38	2	12	95
Menyanthaceae	124	116	76	78	119
Mimosaceae	68a	59a	38a	45a	14
Molluginaceae	48	27	50	57	105
Monotropaceae	115	98	64	67a	52
Moraceae	36	15	107	105a	31
Moringaceae	62	48	37	44	37
Myrsinaceae	117	97	67	70	67
Myriaceae	107	64	40	52	55
Najadaceae	15	132	118	125	153
Nyctaginaceae	46	26	95	91	35
Nymphaeaceae	51	41	4	14	93
Oenotheraceae	108	66	44	54	115
Oleaceae	122	119	71	73	81
Onagraceae	108	66	44	54	115
Orchidaceae	30	141	125	112	167
Orobanchaceae	135	108	83	83	136
Oxalidaceae	69	73	24	33a	139
Paeoniaceae	53	39	1	11	89
Palmae	21	142	121	119	165
Pandanaceae	12	145	122	120	166
Papaveraceae	57	43	5	15	99
Papilionaceae	68c	59c	38c	45c	15
Parnassiaceae	64	57	52	47	126
Pedaliaceae	134	109	77	85	86
Periplocaceae	126	118	74	76	83
Philadelphaceae	64	57	52	47	16
Phytolaccaceae	47	24	90	94	110
Plantaginaceae	139	114	89	90	122
Platanaceae	66	34	110	106	22
Plumbaginaceae	119	95	88	68	121
Poaceae	19	140	135	127	170
Podophyllaceae	54	40	3	13	93
Polygalaceae	77	80	12	21	41
Polygonaceae	43	21	94	95	108
Portulacaceae	49	28	14	24	107
Potamogetonaceae	14	131	117	125a	150
Primulaceae	118	96	66	69	120
Punicaceae	105	65	42	53	57
Pyrolaceae	115	98	64	67a	50
Rafflesiaceae	41	36	101	96	98
Ranunculaceae	53	39	1	11	91
Resedaceae	61	47	9	18	102
Rhamnaceae	90	90	36	40	65
Rhizophoraceae	106	63	41	51	56
Rosaceae	67	58	39	46	12
Rubiaceae	140	120	58	62	85
Ruppiaceae	14	131	117	125a	151
Ruscaceae	26	133	129	116	157
Rutaceae	73	76	28	34	70
Salicaceae	31	14	113	109	24
Salvadoraceae	84	88	72	74	59
Santalaceae	38	18	99	102	62
Sapindaceae	88	82	30	42	74
Sapotaceae	120	101	68	71	69
Saxifragaceae	64	57	52	47	124
Scheuchzeriaceae	–	130	117a	125b	148
Scrophulariaceae	133	106	82	82	134
Selaginaceae	137	108	85	87	–
Simar(o)ubaceae	74	77	29	35	71
Smila(ca)ceae	26	133	130	116	156
Solanaceae	132	105	81	81	132
Sparganiaceae	13	146	123	121a	160
Staphyleaceae	85	89	30c	42c	78
Sterculiaceae	94	71	21	29	45
Tamaricaceae	98	50	16	25	39
Theligonaceae	111	25	91	105c	113
Therebinthaceae	81	81	46	43	75
Thymelaeaceae	102	60	96	99	34
Tiliaceae	92	70	22	30	44
Typhaceae	11	147	124	121	161
Ulmaceae	35	16	108	105b	29
Umbelliferae	113	94	54	58	127
Urticaceae	37	17	106	105	32
Vacciniaceae	116	99	63	67	53
Vahliaceae	64	57	52	47	125
Valerianaceae	142	122	59	63	128
Verbenaceae	130	111	86	88	88
Violaceae	100	53	11	20	40
Vitaceae	91	91	32	41	66
Zannichelliaceae	14	131	117	125a	152
Zosteraceae	14	131	117	125a	149
Zygophyllaceae	72	75	27	32	48

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 53/28. 2. 1968

Hamamelidaceae

auctore PER WENDELBO, Göteborg

Hamamelidaceae

auctore PER WENDELBO, Göteborg

Hamamelidaceae „Hamamelideae" R. BROWN in ABEL, Narr. Journ. China App. B: 374 (1818).

Lit.: C. K. SCHNEIDER, Illustriertes Handbuch der Laubholzkunde 1: 423—434 (1906). H. HARMS in ENGLER & PRANTL, Die Natürlichen Pflanzenfamilien 18a: 303—345 (1930). A. REHDER, Manual of Cultivated Trees and Shrubs 311—319 (1960).

1a. Folia elliptica vel late obovata, in dimidio superiore repando-dentata. Antherae 5—7,4 mm longae, filamentis pendulis .... 1. *Parrotia* C. A. MEY.
b. Folia suborbicularia, dentata. Antherae ±15, c. 1 mm longae, filamentis erectis ..... 2. *Parrotiopsis* (NIEDENZU) C. K. SCHNEIDER

1. *Parrotia*

Parrotia C. A. MEY., Verz. Pfl. Cauc. 46 (1831).

Lit.: J. D. HOOKER, Botanical Magazine: tab. 5744 (1868). E. BOISSIER, Flora Orientalis 2: 818 (1872). PALIBIN in Flora URSS. 9: 272 (1939). S. JA. SOKOLOV in Derevja i kustarniki SSSR. 3: 233—235 (1954).

Genus monotypicum.

1. ***P. persica*** (DC.) C. A. MEY., Verz. Pfl. Cauc.: 46 (1831).
Syn.: *Hamamelis persica* DC., Prodr. 4: 268 (1830).
Typus: FISCHER, G.

Arbor interdum frutescens, decidua, usque ad 15(—25) m alta, omnino stellato-pubescens. Folia alternantia, 5—14×3—8,5 cm, elliptica vel ± late obovata, acuta vel subacuta, basi cuneata vel rotundata vel raro subcordata, coriacea, margine undulata et in dimidio superiore repando-dentata; nervi primarii paribus 6—8; petioli 2—6 mm longi. Inflorescentia brevi-pedunculata, capitata, 2—6-flora, bracteis involucralibus c. 1 cm longis suffulta, intra purpurascens vel virescens, extra atrobrunneo-pubescens. Calyx perigynus, in lobos 5—7 c. 5 mm longos irregulariter fissus. Antherae 5—7, 4 mm longae, apiculatae, fissuris dehiscentes, filamentis longis pendulis. Styli 2, tenues. Capsula lignosa, endocarpio corneo laevi, valvis duabus bilobis. Semina 2, oblique ovoidea, atrobrunnea, laevia, nitentia.

Talish: Prope Astara, HOHEN. Prope Lenkoran, 0—200 m, C. A. MEY. Talish, KUNTZE. Persia: N: Gorg.: In declivibus orientalis M. Elburz inter Gorgan et Ziarat, GAUBA & SAB. 2264! 6 km SE Shah Pasand, 200 m, GRANT 17335! Istenowo prope Bandar-i Gaz, SINT. 2120. Bandar-i Gaz, RECH. 5525!, SINT. 1389! Prov. Gorgan, KAREL., BGE. Maz.: Ramsar, Galand Rud, 450—500 m, ŽUMER 131!, 132! Neka, 400 m, ŽUMER 13! Abanjarmahali, KOELZ 16185! Now Shahr, 250 m, ŽUMER 86!, 87! In faucibus fluvii Chalus, 8 km S Chalus, 200 m, GRANT 16491! 32 km E Chalus, STUTZ 1212! In valle fluvii Talar inter Abbasabad et Shahi, 400 m, RECH. 2049! Inter Shahi et Pol-e Safid. KRIESCHE 2321! Mian Qaleh S Shahi, KRIESCHE 2353! In valle Haraz: Kareh~~sang~~, 100 m, ~~Wen~~ 518!, BRUNS. Gil.: Emamzadeh Hashem, PAULSEN 2188. Inter Kaluraz et Emamzadeh Hashem, BORNM. 8239. Rasht, BORNM. 8240, LIPSKY. Inter Rasht et Kohdom, BORNM.

3897. Lahijan, Starm. 252! 20 km S Hashtpar, 10 m, Grant 16435! Gilan, Linds. 779. Persia borealis, Buhse, Auch. 5924. — W: Azerb.: M. Astara prope Asbine, Mird. 2263! — C: Shahr.-Bust.: Miandasht, Shar. 48!

Distr. gen.: Endem.

Together with *Gleditschia caspia* Desf., *Parrotia persica* forms the most significant and characteristic part of the Hyrcanian element of the South-Caspian forests. Both are undoubtedly Tertiary relicts and indicate the great age of these forests which most probably have survived the ice ages of the Pleistocene in situ. Fossil evidence indicates that *Parrotia* had a much wider distribution during the Tertiary.

2. *Parrotiopsis*

Parrotiopsis (Niedenzu) C. K. Schneider, Ill. Handb. Laubholzk. 1: 429 (1909). Syn.: *Fothergilla* Murr. subgen. *Parrotiopsis* Niedenzu in Engler & Prantl, Natürl. Pflanzenfam. 3, 2a: 126 (1891).
Genus monotypicum.

1. ***P. Jacquemontiana*** (Decne.) Rehder, Journ. Arnold Arb. 1: 256 (1920). Syn.: *Parrotia Jacquemontiana* Decne. in Jacquem., Voy. Ind. 4: 73, tab. 82 (1844). *Parrotiopsis involucrata* (Falconer) C. K. Schneider, Ill. Handb. Laubholzk. 1: 429 (1909). *Fothergilla involucrata* Falconer, Proc. Linn. Soc. London 1: 18 (1839), nom. nud.
Typus: „Floret Maio, frequentissima ab Hyderabad ad Ouri, alt. 1467 metr., fructumque profert Julio monte Vestervonne circa Cachemir, a planitie usque ad 2500 metr." Jacquem.

Frutex vel arbor parva decidua usque ad 7 m alta, omnino stellato-pubescens. Folia alternantia, 2,5—6×2,5—4,5 cm, late obovata usque suborbicularia, basi rotundata vel cordata, margine a paulo supra basin apicem versus dentata, nervorum principalium paribus 5—6; petioli 6—12 mm longi. Inflorescentia brevipedunculata, capitata, multiflora, involucro e bracteis 1,5—2 cm longis inaequalibus intra albis consistente suffulta. Calyx perigynus lobis oblongis c. 2 mm longis. Antherae c. 15, 1,5 mm longae, obtusae vel emarginatae vel indistincte mucronatae, valvis dehiscentes, filamentis erectis. Styli 2, tenues. Fructus ut in *Parrotia*.

Afghanistan: E: Nuristan: In valle Darim, 1900—2400 m, Neub. 995!
Pakistan: Swat: Prope Paloga, 2600—2650 m, Ogino 22, 23. Mahodan, 2900 m, Ogino 41. Kalam, Ogino 19, 339, 741. Balin, Iwatsubo 7. Inter Paloga et Mahodan, Ogino 721. Inter Kalam et Paloga, Ogino 606, 608. In valle Jabba E Kolalai, fruticeta densa formans, 1600—2200 m, Rech. 30721! — Kurram: In collibus vallis Kurram, 2250—2500 m, Aitch. 291.

Distr. gen.: Montes Himalaya boreo-occidentales, Afghanistan orientalis.

The monotypic genus *Parrotiopsis* is most probably closely related to *Parrotia*. The two genera have in common the head-like inflorescence subtended by an involucre of bracts. Whereas *Parrotia* has 5—7 long apiculate anthers opening by slits and attached to long pendulous filaments, *Parrotiopsis* differs by the c. 15, short, obtuse anthers opening by valves and its filaments are short and erect. In anther-characters the latter genus shows similarities to the N American genus *Fothergilla* which, however, has an elongated inflorescence without an involucre at the base.

(*Fothergilla* MURR. subgen. *Parrotiopsis* NIEDENZU in ENGLER & PRANTL) .. 2
(*F. involucrata* FALCONER) 2
Gleditschia caspia DESF. 2
(*Hamamelis persica* DC.) 1
Parrotia C. A. MEY. 1
(*P. Jacquemontiana* DECNE. in JACQUEM.) 2
P. persica (DC.) C. A. MEY. 1
Parrotiopsis (NIEDENZU) C. K. SCHNEIDER 2
(*P. involucrata* (FALCONER) C. K. SCHNEIDER) 2
P. Jacquemontiana (DECNE) REHDER . 2

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 54/28. 2. 1968

Cornaceae

auctoribus A. POLATSCHEK et K. H. RECHINGER, Wien

Cornaceae

auctoribus A. POLATSCHEK et K. H. RECHINGER, Wien

Cornaceae „*Corneae*" DUM., Anal. Fam. 33, 34 (1829).

Lit.: WALTHER WANGERIN, Cornus in ENGLER, Das Pflanzenreich IV. 229: 43—92 (1910).

Frutices vel arbores (nostrae). Folia simplicia exstipulata, opposita. Flores plerumque hermaphroditi, tetrameri. Calycis tubus ovario infero adnatus. Sepala minuta vel deficientia. Stamina 4, cum petalis alternantia. Ovarium (1—)2(—4)-loculare. Stylus unicus. Ovula pendentia, anatropa, in quoque loculo solitaria. Fructus drupaceus.

1. *Cornus*

Cornus L., Spec. Plant. 117 (1753). Gen. Plant. ed. 5: 14 (1754).

Lit.: A. I. POJARKOVA, Notulae Systematicae Leningrad 12: 164—180 (1950).

1a. Inflorescentia axillaris umbellata, bracteis flavescenti-viridibus, ante folia evoluta. Petala flava. Drupa rubra ..... 4. *C. mas* L.
b. Inflorescentia terminalis corymbosa ebracteata, post folia evoluta 2
2a. Folia 10—20 cm longa manifeste discoloria, nervis parum curvatis ..... 3. *C. macrophylla* WALL.
b. Folia 6—8 cm longa fere concoloria, nervis valde curvatis 3
3a. Folia subtus praeter pilos bifidos appressos pilis simplicibus crispulis obsita; costa mediana dense pilosa ..... 1. *C. sanguinea* L.
b. Folia subtus pilis bifidis appressis tantum obsita; costa mediana laxe pilosa ..... 2. *C. australis* C. A. MEY.

1. ***C. sanguinea*** L., Spec. Plant. 117 (1753).

Syn.: *Thelycrania sanguinea* (L.) FOURR., Ann. Soc. Linn. Lyon, N. S. 16: 394 (1868).

Typus: „Habitat in Europae, Asiae, Americae borealis dumetis".

Frutex usque ad 2—4 m altus, ramis novellis atropurpureis pubescentibus, demum glabratis. Petioli 6—10 mm longi. Folia (3—)4—10 cm longa, late elliptica vel ovata, acuminata, supra viridia, subtus vix pallidiora, pilis simplicibus crispulis patulis obsita; nervorum paria 3—4(—5) valde curvata. Sepala minutissima quam 0,5 mm breviora, linearia. Petala 4—6 mm longa. Drupa 5—8 mm diametro, orbicularis.

Iraq: Kurd.: Sul.: M. Avroman, HAUSSKN. s. n.!

Persia: W: Kurd.: M. Shahu, HAUSSKN. s. n.

Distr. gen.: Europa regionibus borealibus exceptis, Anatolia, Caucasus. Iraq borealis.

Aus dem Gebiet der Flora Iranica haben wir diesen einzigen Beleg reiner *C. sanguinea* L. gesehen. Über möglicherweise hybridogene Zwischenformen zwischen *C. sanguinea* L. und *C. australis* C. A. MEY. vergleiche man die Bemerkung unter letzterer Art (A. POLATSCHEK).

2. ***C. australis*** C. A. Mey., Bull. Phys.-Math. Acad. Petersb. 3: 372 (1845). Syn.: *Thelycrania Meyeri* Pojark., Bot. Mat. Herb. Bot. Inst. Ak. Nauk. URSS. 12: 172 (1950); Fl. URSS. 17: 341 (1951).
Typus: Constantinopel.

Differt a *C. sanguinea*, cui foliorum acuminatorum forma, fructu atrocoeruleo similis, imprimis indumento paginae inferiore foliorum e pilis bifidis appressis tantum consistente, praeterea foliorum nervis utrinque semper 3—4 (numquam 5), indumento imprimis nervorum foliorum minus denso.

Iraq: Sul.: M. Avroman prope Tawilla, 1400 m, Rech. 12381! Arbil: Ad radices M. Baradost prope Handiyan, Thesiger 804! Rost, 1500 m, Haley 126! Mosul: Chalki Nasara ad rivum Khabur ditionis Wazi ad confines Turciae, Thesiger 1245!
Persia: N: Gorg.: Inter Gorgan et Ziarat, Gauba 870! Gorgan, Buhse, Shar, 279!, 800 m, Gauba 41! Gale Maran, 1600 m, Gauba 40! Bandar-i Gaz, Sint. 1526! Robat-e Qozloq, Koelz 16207! Maz.: Now Shahr, Mooney 6563!, Stutz 1188! 38 km S Babol, 500 m, Stutz 1243! In valle fluvii Talar inter Doab et Pol-e Sefid, Kriesche in Rech. 2314! Abanjarmahali, Koelz 16201! 8 km S Chalus, 200 m, Grant 16481! In valle Haraz E Emarat, 600 m, Wdb. 1548! Gil.: Rasht, Buhse 862. Kohdom prope Rasht, Bornm. 7021. — W: Azerb.: Hasan Beyglu, Knapp. Kurd.: Sanandaj, 1600 m, Jacobs 6696! Arak: M. Rasvand, Str. — E: Khor.: Kotal-e yek Chenar, Koelz 16728! — C: Tehr.: Pas Qaleh, Ky. 801! Ab-e Garm, Buhse 958. Qazv.: Alangeh prope Karaj, Gauba 869! Kuh Dashteh prope Karaj, Rech. 341! Karaj, Gauba.
Turcomania: Kizyl Arvat, Kara Kala: Joldere, Sint. 1844!

Distr. gen.: Europa orientalis (Slovacia!, Transsilvania!), Caucasus, Anatolia, Syria borealis, Tauria, Transcaucasia, Iraq, Persia borealis et occidentalis.

Die folgenden, oben unter *C. australis* aufgezählten Belege stellen (möglicherweise hybridogene) Zwischenformen zwischen *C. australis* und *C. sanguinea* dar: Jacobs 6696, Gauba 41, 870, Wdb. 1548, Thesiger 804. — Überdies finden sich Anklänge an die im Gebiet nicht rein festgestellte *C. stolonifera* Michaux (*C. alba* L.): Thesiger 1245, Stutz 1243, Sint. 1526 und zwar durch größere Zahl (5(—7)) der Blattnerven, nicht oder nicht deutlich eingefaltete Blattspitze und wesentlich hellere Blattunterseite (A. Polatschek).

3. ***C. macrophylla*** Wall. in Roxb., Fl. Ind. ed. Carey 1: 433 (1832).
Typus: „Northward of Saharunpore", Govan.

Frutex elatus vel arbor usque ad 10 m alta, ramis subquadrangulis canescenti-viridibus brunnescentibus costato-sulcatis. Petioli 1—2 cm longi. Folia 10—20 cm longa, 5—9 cm lata, basi subcordata, rotundata vel cuneata, apice longe acuminata, supra atroviridia, subtus canescentia, utrinque laxe breviter appresse pilosa; nervorum paria 6—7(—8). Sepala breviter triangularia. Petala 6—7 mm longa. Drupa ± 5 mm diametro, orbicularis.

Afghanistan: E: Nuristan: Inter Barikot et Kamdesh, 900 m, Gilli 2070 b! Inter Nishai et Ningalam, Neub. 1951/789 a! Nishai, 1300 m, Edelb. 812! Inter Gusalak et Kurder in valle fluvii Pech, Neub. 51/789 b! In valle Bashgul inter vall. Bagrona et Mandagel, 1300—1800 m, Kerst. 1464! Kushtos, 1850 m, Neub. 4582!

Distr. gen.: M. Himalaya, Afghanistan.

4. ***C. mas*** L., Spec. Plant. 117 (1753).
Typus: „In saepibus Austriae".

Frutex vel arbor usque ad 8 m alta, ramis flavescenti-viridibus. Petioli 5—10 mm longi. Folia 4—8(10) cm longa, 3—7 cm lata, suborbicularia vel ovata usque elliptica, basi rotundata, apice longe acuminata, subtus paulo pallidiora, nervorum paribus 3—5. Bracteae 6—10×3—6 mm, deciduae. Pedicelli bracteas ±

aequantes. Petala 2—2,5 mm longa, flava. Drupa pendula, usque ad 12 mm longa, oblongo-elliptica, scarlatina, nitida.

Persia: W: Azerb.: Kaleybar, 1000 m, Mird. 866! Dishgaduki, Mird. 867! M. Qareh Dagh prope Hasan Beyglu, Mird. 868!, Knapp. Ali Bolagi, Knapp — „In planitie usque ad mare Caspium" C. A. Mey.

Distr. gen.: Europa regionibus borealibus mediterraneis et atlanticis exceptis, Caucasus, Anatolia, Persia boreo-occidentalis.

Cornus L. 1
(*C. alba* L.) 2
C. australis C. A. Mey. 2
C. macrophylla Wall. 2
C. mas L. 2
C. sanguinea L. 1
C. stolonifera Michaux 2
(*Thelycrania Meyeri* Pojark.) 2
(*T. sanguinea* (L.) Fourr.) 1

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 55/28. 2. 1968

Elaeagnaceae

auctore EDWARD MURRAY, Philadelphia, U.S.A.

Elaeagnaceae

auctore EDWARD MURRAY, Philadelphia, U.S.A.

Elaeagnaceae „*Elaegni*" A. L. de JUSSIEU, Gen. Plant. 74 (1789).

Lit.: C. SERVETTAZ, Monographie, Beiheft zum Botanischen Centralblatt 25 (2): 1—420 (1909). A. REHDER, Manual of Cultivated Trees and Shrubs, ed. 2: 662—666 (1940).

Frutices vel arbores humiles argenteo- vel aureo-fulvo-lepidotae, ramis saepe spinescentibus. Folia alternantia (in nostris), integra, exstipulata. Flores bisexuales aut unisexuales, racemosi aut solitarii, apetali. Bracteae 2 vel 4, valvatae, deciduae. Calyces perigyni tubiformes. Stamina 4—8, ad calycem inserta. Fructus drupacei uniloculares, uniovulati.

1a. Folia linearia, plerumque 4—8 mm lata, subsessilia. Sepala 2. ..... 1. *Hippophaë* L.

b. Folia elliptica vel lanceolata, plerumque 8—25 mm lata, petiolata. Sepala 4. ..... 2. *Elaeagnus* L.

1. *Hippophaë*

Hippophaë L., Spec. Plant. 1023 (1753); Gen. Plant. ed. 5: 449 (1754).

Flores unisexuales, calyces 2, stamina 4 ad calycem inserta. Fructus saepe aurantiaci.

1. ***H. rhamnoides*** L., Spec. Plant. 1023 (1753).

Syn.: *Osyris rhamnoides* SCOP., Fl. Carn. ed. 2: 261 (1772). *Rhamnoides Hippophaë* MOENCH, Meth. 343 (1794). *Hippophaës rhamnoideum* ST. LAGER, Ann. Soc. Bot. Lyon 7: 127 (1880).

Typus: „Habitat in Europae maritimis arenosis".

Frutices, rarius arbusculae. Rami inermes vel spinescentes. Folia alternantia subsessilia linearia argentea. Flores masculi sessiles, feminei pedicellati solitarii. Fructus semine unico.

Talish: Swant inter Lenkoran et Astara, HOHEN. Swant, C. A. MEY.

Persia: N: Persia borealis, KY. — W: Azerb.: Qareh Dagh prope Iri, BUHSE. Binamar, BUHSE. — C: Tehr.: Lashkarak ad fl. Jaji Rud, BRUNS. Pas Qaleh, PRAVITZ 37. M. Tuchal prope Shahrestanak, BORNM. 8193. Gach Sar, 2000 m, TREGUBOV 191! Qazv.: Karaj, GAUBA 673!

Afghanistan: E: Paghman: In valle Begtut, 2380 m, GILLI 2326! Panjshir: In valle Porandeh prope Basarak E Daolana, 2350 m, GILLI 2325! Gulbahar, NEUB. 438! Mukeni, 2500 m, HDG. & WDB. 5150! Darrah-i Zuria prope Safid Jir, 3000 m, PODLECH 12523! Ghorband: In valle Ghorband, NEUB. 436! Nuristan: In valle Rangul, 2250 m, KERST. 1113! — NE: Wakhan: Qala Panja, LINDB. 1075! Munjan: Miyan Deh, 2550 m, EDELB. 1432! Kachari, 2300 m, EDELB. 1445! Badakhshan: Bahrak, BALFOUR 24! Kataghan: Farkhar: In valle Piu, 2900 m, PODLECH 12666! — C: Bamian: Panjao, 2700 m, KOELZ 2722! Darreh-i Shikar, 2200 m, WDB. 3339!

Pakistan: Chitral: Inter Mastuj et fl. Turikho, 3000 m, STAINTON 2836! Barum Gol, Shokor Shal, 3500 m, WDB. s. n.! — Kurram: In valle fluvii Hariab prope ~~Bhuri Khel~~ AITCH. 524!

Distr. gen.: Europa et Asia, in vallibus alpinis et in arenosis maritimis.

2. *Elaeagnus*

Elaeagnus L., Spec. Plant. 121 (1753); Gen. Plant. ed. 5: 57 (1754).

Flores bisexuales, saepe solitarii; sepala 4; stamina 4 ad calycem inserta.

1 a. Folia lanceolata supra cinereo-viridia subnitida, plerumque 8—15 mm lata, plerumque lepidota, margine non crispa ..... 1. *E. angustifolia* L.
b. Folia elliptica supra viridia opaca, plerumque 12—25 mm lata, saepe stellato-papillosa, margine saepe crispa ..... 2. *E. orientalis* L.

1. ***E. angustifolia*** L., Spec. Plant. 121 (1753).

Syn.: *E. spinosa* L., Syst. Nat. ed. 10, 2: 899 (1759). *E. inermis* Miller, Gard. Dict. ed. 8, No. 2 (1768). *E. incanus* Lam., Fl. Fr. ed. 1, 3: 476 (1778). *E. argenteus* Moench, Meth. 638 (1794). *E. tomentosus* Moench, l. c. (1794). *E. hortensis* M. B., Fl. Taur.-Cauc. 1: 112 (1808). *E. caspica* (Sosn.) Grossh., Obred. Rast. Kawk. 187 (1949). *E. angustifolia* L. var. *caspica* Sosn., Mat. Fl. Kawk. 3, 9: 299 (1912). Typus: „Habitat in Bohemia, Hispania, Syria, Cappadocia".

Arbores vel arbusculae deciduae. Rami nitidi saepe fusco-rubri; ramuli lepidoti cinereo-argentei. Folia lanceolata vel elliptica, lepidota, argentea, saepe quam 4 cm breviora, supra nitida cinereo-viridia, subtus argentea. Fructus plerumque permagni, edules. Frequenter culta.

Talish sec Grossh., Fl. Kawk. 6: 222 (1962).

Persia: **W**: Azerb.: Qareh Aghaj, Stapf 1997! Prope Rezaiyeh, Knapp. Khvoy, Knapp. Kaleybar, Mirdam. 671! Kurd.: Sanandaj, 1500—1600 m, Jacobs 6695! 80 km E Dezh Shahpur versus Sanandaj, Bent & Wr. 525—1001! 14 km S Sanandaj versus Kermanshah, 1350 m, Bent & Wr. 526—501! Kermansh.: Kermanshah, Cowan & Darlington. Ham.: Aq Bolagh- e Aqdaq, 100 km N Hamadan, Rioux & Golv. 254! Esf.: Esfahan, Pravitz 759, Cavara. — **S**: Fars. Shiraz, Cavara. Inter Shiraz et Firuzabad, 1600 m, Gauba & Sab. 672! Hoseynabad, 40 km W Shiraz, 1700 m, Grant 15855! Bal.: M. Taftan usque ad 2400 m, Blatt. & Hallb. — **E**: Khor.: Ozbagu, Ruttner 376! Torbat-e Heydariyeh, Koelz 16868! — **C**: Tehr.: Prope Shahrestanak, Bornm. 8194. M. Tuchal prope Vanak, Bruns. 50 km NW Tehran, Starm. 222! Qazvin: Sultanabad prope Qazvin, Linds. 320. Qom: Rahjerd, 2000 m, Koeie 1727!

Afghanistan: **NW**: Maimana: In jugo Burchao, 2700 m, Koelz 14121! Herat: Paropamisus: Chashmeh Obeh, 1800 m, Rech. 19213! Obeh, 1700 m, Koeie 3638! Ad fl. Hari Rud, 1200 m, Koeie 3755! — **E**: Kabul: Darulaman, 1700 m, Kerst. 439! Kabul, Volk 72!, Volk 1625 cult.!; Neub. 4431 cult.! Guzargah, Neub. 151!, 435! Hauz-i Mahiha, 7500 m, Koeie 2397 cult.! Gulbahar, 1500 m, Koelz 11432! Gardez: Gardez, 2400 m, Koelz 11910! Nuristan: Gusalak, 1000 m, Edelb. 2221! In valle Bashgul, 1800—2600 m, Kerst. 1473! — **C**: Doab: Eshpushta, 1500 m, Gilli 2327 cult.! Kamard, 1800 m, Koelz 13622 cult.! Doab., 1500 m, Koelz 13528! Ghorband, 1700 m. Koeie 4087! Ghorat: Inter Qala-i Ghor et Parjuman, 2000 m, Rech. 19004! Bamian: Darreh-i Shikar, 1500 m, Hdg. & Wdb. 3388! — Urmur, 1500 m, Neub. 4618! In valle Ashraf, Neub. 4382 cult.! Pakistan: Chitral: Mirkhani SW Drosh, Stainton 2314! — Kurram: Shalozan, Aitch. 1204. Alizai, Khan 52! — N. Wazir.: Razani, Fz. Miram Shah, Fz. — S. Wazir.: Wana, Fz. Razmak, Fz. — Quetta: Mach, Bolan Gaz. 124. Quetta, Lace. Inter Pishin et Toba, Gaz. 358. Mastung, H.-B. 17184. In valle superiore fluvii Zhob, Gaz. 325. Sanjawi, Loralai Gaz. 367. Bari et Barkhan, Loralai Gaz. 367. Shahriq et Kohlu, Sibi Gaz. 329. — Bal.: Kharan, H.-B. 23109.

Distr. gen.: Europa australis et Asia austro-occidentalis.

This species can vary considerably. The leaves are generally much smaller than in the following species and the bead-like upper surface of the leaves is characteristic.

2. ***E. orientalis*** L., Mantissa 41 (1767).

Syn.: *E. parvifolia* WALL., Numer. List 4026, nom. nud. *E. hortensis* M. B. var. *orientalis* (L.) LOUDON, Arbor Fruticet. Brit. 3: 1322 (1838). *E. angustifolia* L. var. *orientalis* (L.) KUNTZE, Acta Horti Petrop. 10: 235 (1887). *E. umbellata* THUNB. subsp. *parvifolia* SERVETTAZ, Beih. Bot. Centrbl. 35: 55 (1909).

Typus: „Habitat in ..... ?" Holotypus in herbario Linneano!

Arbuscula decidua. Rami plerumque cinerei; ramuli cinereo-argentei vel aureo-flavi. Folia 3—8 cm longa, elliptico-ovata, apice obtusa, margine saepe crispa, supra viridia, opaca, saepe stellato-papillosa, subtus argentea. Fructus 5—7 mm longi.

Afghanistan: N: Akcha, NEUB. 113 cult.! — E: Nuristan: Inter Kamu et vallem Bagrami, 1450—2025 m, NEUB. 3337! Inter jugum Ashpi et jugum Kushtos, 2500 m, NEUB. 698! Kamdesh, NEUB. 3254! Inter Kamdesh et Barikot, 1000 m, EDELB. 1790! Bashgul inter Barikot et Kamdesh, 1000 m, GILLI 2328! In valle fluvii Bashgul, 1250—1500 m, KERST. 1403! Derin, EDELB. 1762! — Urmur, 1400 m, NEUB. 4611!

Pakistan: Swat: In valle Jabba E Kolalai, 1600—2200 m, RECH. 30726! — Kurram: Shalozan, AITCH. 288. — N. Wazir.: Boya, BLATT. & Fz. — S. Wazir.: Wana, BLATT. & Fz.

Distr. gen.: Afghanistan, Pakistan, Hindukush, Himalaya.

Leaves are dull green above and often noticeably veined beneath and upper surfaces are sometimes sparingly dotted with stellate hairs. Older twigs may become brownish mottled with grey, not shiny maroon. Both the Linnean holotype and the WALLICH 4026 have been seen. The Linnean type has stellate hairs on the opaque upper leaf surface. The WALLICH 4026 has small leaves and is somewhat dubiously placed here.

The name of *E. orientalis* will receive criticism! I take up the old, mis-used at times, name of LINNAEUS of 1767 on the basis of the holotype in the Linnaean Herbarium in London. The stellate indumentum indicates to me its placement with this taxon of the Himalaya which logically is related to Asiatic taxa such as *E. umbellata* THUNB. However, this feature of stellate hairs is not constant and is observed only on some specimens. The opaque upper surface of the holotype appears to be a better criterion for recognizing this species.

Elaeagnus L. 2
E. angustifolia L. 2
(*E. angustifolia* L. var. *caspica* SOSN.) . 2
(*E. angustifolia* L. var. *orientalis* (L.) KUNTZE) 3
(*E. argenteus* MOENCH) 2
(*E. caspica* (SOSN.) GROSSH.) 2
(*E. hortensis* M. B.) 2
(*E. hortensis* M. B. var. *orientalis* (L.) LOUDON 3
(*E. incanus* LAM.) 2
(*E. inermis* MILLER) 2
E. orientalis L. 3
(*E. parvifolia* WALL.) 3
(*E. spinosa* L.) 2
(*E. tomentosus* MOENCH) 2
(*E. umbellata* THUNB. subsp. *parvifolia* SERVETTAZ) 3
Hippophaë L. 1
H. rhamnoides L. 1
(*Hippophaës rhamnoidcum* ST. LAGER). 1
(*Osyris rhamnoides* SCOP.) 1
(*Rhamnoides Hippophaë* MOENCH) 1

Polygonaceae

auctoribus K. H. RECHINGER et H. SCHIMAN-CZEIKA, Wien

Lfg. Cont. No. 56/28. 2. 19

FLORA DES IRANISCHEN HOCHLANDES UND DER UMRAHMENDEN GEBIRGE

PERSIEN, AFGHANISTAN, TEILE VON WEST-PAKISTAN, NORD-IRAQ, AZERBAIDJAN, TURKMENISTAN

von

Univ.-Prof. Dr.
KARL HEINZ RECHINGER
Erster Direktor des Naturhistorischen Museums in Wien

AKADEMISCHE DRUCK- u. VERLAGSANSTALT
GRAZ-AUSTRIA

Polygonaceae

auctoribus K. H. Rechinger et Helene Schiman-Czeika, Wien [1])

Polygonaceae A. L. de Jussieu, Gen. Plant. 82 (1789), „*Polygoneae*".

Lit.: H. Gross, Beiträge zur Kenntnis der Polygonaceen in Englers Botanische Jahrbücher 49: 234—348 (1913). Fl. URSS. 5: 442—704 (1936). V. P. Drobov et G. P. Sumnevitsch in Flora Uzbekistan 2: 98—207 (1953). N. V. Pavlov, Flora Kazakhstan 3: 90—179 (1960).

Herbae, frutices vel plantae scandentes latice nullo. Nodi caulis saepe ± incrassati. Folia semper fere alterna. Stipulae saepe in vaginam membranaceam coalitae (ochrea). Flores hermaphroditi vel unisexuales. Perianthium 3- usque ad 6-merum, herbaceum, sub fructu saepe accrescens membranaceum. Stamina plerumque (4—) 6—9 (—16); ovarium superum, uniloculare; styli 2—4; ovulum solitarium, basilare. Fructus nux trigona vel lenticularis.

1a. Frutices erecti valde ramosi 2
b. Frutices humiles, herbae erectae vel rarius scandentes 4
2a. Fructus non alatus, perianthii segmentis interioribus accrescentibus involucratus ..... 5. *Atraphaxis* L.
b. Fructus alatus vel setosus 3
3a. Fructus trialatus, alis bipartitis ..... 6. *Pteropyrum* Jaub. & Spach
b. Fructus quadrialatus vel (et) setosus, setis plerumque ramosis ..... 7. *Calligonum* L.
4a. Perianthii segmenta 4. Stamina 6 ..... 3. *Oxyria* Hill
b. Perianthii sementa 5—6 5
5a. Perianthii segmenta exteriora spinis tribus validis armata ... 1. *Emex* Neck.
b. Perianthii segmenta exteriora inermia 6
6a. Folia palmati-nervosa. Stamina 9 ..... 4. *Rheum* L.
b. Folia non palmati-nervosa. Stamina minus numerosa 7
7a. Perianthii segmenta 6, interiora sub fructu saepe multo magis accrescentia quam exteriora, interdum dentata vel spinosa ..... 2. *Rumex* L.
b. Perianthii segmenta 5, sub fructu subaequalia, interdum exteriora quam interiora majora 8
8a. Nux perianthio ad minimum duplo longior ..... 9. *Fagopyrum* Miller
b. Nux perianthio inclusa vel eo paulo tantum longior ..... 8. *Polygonum* L.

1. *Emex*

Emex Neck., Elem. 2: 214 (1790).

Herba annua, monoica. Ochreae non ciliatae, mox dilaceratae. Flores feminei ad basin inflorescentiae sitae. Perianthii segmenta 6, in floribus masculis libera, in floribus femineis connata, exteriora tria in statu fructifero indurata spinescentia. Stamina 4—6. Stigmata 3. Nux triquetra, perianthio inclusa.

[1]) Subsidiis National Science Foundation Grant GB-4691.

1. ***E. spinosus*** (L.) Campd., Monogr. Rumex 58 (1819).
Syn.: *Rumex spinosus* L., Spec. Plant. 337 (1753).
Typus: Creta.

Herba glabra, erecta vel ascendens, 5—30 cm alta. Folia usque ad 6×3 cm, ovata, basi truncata vel subcordata, petiolata. Flores masculi in glomerulis terminalibus et axillaribus pedunculatis. Flores feminei axillares, sessiles. Nux perianthio inclusa. Segmenta exteriora in spinas patentes excurrentia, segmenta interiora erecta, tuberculata.

Persia: W: Esfahan, Deicke. — S: Fars.: Bushehr, Koelz 14815!, Koelz 120!, Bornm. 621-b. Kerm.: Tomagoa, Koelz 14304! Lar.: Hajjiabad prope Tarom, 900 m, Rech. 3345! Bandar Abbas, Bornm. 521. Bal.: Iranshahr, Bazman, Shar. 7459-E! Biaban: Sirik, Behb. 461-E! Makran, Palmer.

Distr. gen.: Regio Mediterranea, Iraq, Persia australis.

2. *Rumex*

auctore K. H. Rechinger, Wien

Rumex L., Spec. Plant. 333 (1753); Gen. Plant. ed. 5: 156 (1754).

Lit.: K. H. Rechinger, Vorarbeiten zu einer Monographie der Gattung Rumex, Beihefte zum Botanischen Centralblatt 49, 2: 1—132 (1932). K. H. Rechinger, Rumex Subsect. Patientiae, Feddes Repertorium 31: 225—283 (1933). K. H. Rechinger, Rumices Asiatici, Candollea 12: 9—132 (1949).

Herbae annuae vel perennes, raro suffrutices vel frutices. Folia plerumque basalia et caulina, ochreis membranaceis saepius integris. Flores hermaphroditi vel polygami, interdum dioici. Inflorescentiae partiales cymosae glomeruli appelantur in axillis ochrearum vel foliorum plerumque in paniculas dispositae. Pedicelli articulati. Perianthium 6-phyllum, dicyclicum, segmentis interioribus (valvis) fructificatione saepe accrescentibus interdum calliferis vel dentatis. Stamina 6. Stylus brevis stigmatibus penicillatis. Nux triquetra, non alata, valvis inclusa, cum eis decidua.

1a. Flores dioici vel polygami. Basis foliorum hastata vel sagittata 2
b. Flores hermaphroditi raro exceptione polygami. Basis foliorum cordata, rotundata vel attenuata 9
2a. Valvae nuce matura non majores ..... 1. *R. Acetosella* L.
b. Valvae nuce matura evidenter majores 3
3a. Plantae fruticosae suffruticosae vel herbaceae perennes. Valvae 3—5 (—6) mm diametro 4
b. Plantae annuae. Valvae ad minimum 10 mm diametro 8
4a. Plantae fruticosae 5
b. Plantae herbaceae vel suffrutescentes 6
5a. Frutex aphyllus (incomplete notus) ..... 3. *R. ephedroides* Bornm.
b. Frutex foliatus, foliis hastatis ..... 2. *R. hastatus* D. Don
6a. Radicis fibrae partim quidem tuberoso-incrassatae .... 6. *R. tuberosus* L.
b. Radicis fibrae numquam tuberoso-incrassatae 7
7a. Flores plerumque polygami. Perigonii foliola exteriora basibus valvarum appressa. Rhizoma lignescens surculosum ..... 4. *R. scutatus* L.
b. Flores dioici. Perigonii fructiferi foliola exteriora reflexa. Radix nec lignescens nec surculosa ..... 5. *R. Acetosa* L.

8a. Valvae nervo continuo marginatae, margine minutissime spinulosae vel denticulatae ..... 7. *R. cyprius* Murb.
b. Valvae nec nervo continuo marginatae nec spinulosae .. 8. *R. vesicarius* L.
9a. Valvae fructiferae omnes ecallosae, raro callo rudimentario vel nervo mediano indistincte longitudinaliter incrassato preditae 10
b. Valvae fructiferae omnes vel unica quidem callifera 12
10a. Valvae fructiferae longitudine saepe evidenter latiores, minute denticulatae, nervo mediano interdum longitudinaliter subincrassato .... 11. *R. Paulsenianus* Rech. f.
b. Valvae fructiferae longitudine non vel vix latiores, integrae vel obsolete crenulatae, nervo mediano ceteris vix crassiore 11
11a. Planta elata. Valvae 4—5×3—3,5 mm, acutiusculae .... 10. *R. kandavanicus* Rech. f.
b. Planta humilis. Inflorescentia breviter pauciramosa. Valvae 5×5 mm, ovato-cordatae ..... 9. *R. angulatus* Rech. f.
12a. Valvae integrae vel subintegrae vel minutissime denticulatae vel crenulatae, denticulis vix 0,5 mm longis* 13
b. Valvae manifeste dentatae, dentibus ad minimum 1 mm longis 21
13a. Caulis humilis, subsimplex vel pauciramosus. Pedicelli fructiferi crassi, in medio circiter articulati, quam valvae semper breviores. Valvae 10—25 mm diametro ..... 18. *R. angustifolius* Campd.
b. Caulis plerumque elatus ramosus. Pedicelli fructiferi tenues, semper infra medium articulati, valvas longitudine ad minimum aequantes 14
14a. Valvae majusculae late rotundato-cordatae callo valvae latitudine multo angustiore. Florum glomeruli plurimi approximati 15
b. Valvae 2,5—3,8 mm longae, lingulatae, callo maximam partem vel totam valvae latitudinem occupante. Florum glomeruli omnes remoti .. 20
15a. Folia basalia et caulina inferiora proportione angusta, latitudine plusquam triplo longiora ± undulato-crispata, in vivo saturate viridia, petiolo supra canaliculato. Valvae saepius omnes calliferae ..... 17. *R. crispus* L.
b. Folia basalia et caulina inferiora latitudine ad summum triplo longiora, saepe magna et lata, in vivo pallide viridia, petiolo supra plano, margine tantum ± crispata. Valva anterior saepius tantum callifera 16
16a. Valvae permagnae, ultra 12 mm latae, in uno eodemque perigonio magnitudine saepe diversae 17
b. Valvae minores, ad summum 8 (—10) mm latae 18
17a. Valva anterior 12—15 mm lata, callo globoso-ovato .... 15. *R. ponticus* E. H. L. Krause emend. Rech. f.
b. Valva anterior 15—22 mm lata, callo elongato-fusiformi .... 16. *R. elbursensis* Boiss.
18a. Inflorescentia ampla aperta laxiuscula, ramis arcuatis. Folia basalia basi cordata. Valvae 5×6—7 mm, interdum transverse latiores, basin versus saepe eroso-denticulatae ..... 12. *R. thjanschanicus* Los.
b. Inflorescentia compacta, ramis erectis. Folia basalia basi subcordata vel truncata 19
19a. Callus valvae anterioris ovatus vel ellipsoideus ..... 13. *R. Patientia* L.
b. Callus valvae anterioris elongato-fusiformis .. 14. *R. caucasicus* Rech. f.

* Si rami divaricato-arcuati, pedicelli breves crassi confer *R. pulchrum* subsp. *anodontum* et subsp. *divaricatum*!

20a. Valvae omnes calliferae. Pedicelli fructiferi perigonio ± aequilongi. Florum glomeruli omnes foliati ..... 19. *R. conglomeratus* Murr.
b. Valva unica tantum callifera. Pedicelli fructiferi perigonio omnes evidenter longiores. Florum glomeruli superiores aphylli ..... 20. *R. sanguineus* L.
21a. Planta annua ..... 26. *R. dentatus* L.
b. Plantae perennes 22
22a. Pedicelli fructiferi ± crassi, perigonium ± aequantes, in medio vel paulo infra articulati. Valvae crassae, crasse nervosae 23
b. Pedicelli fructiferi tenues, perigonio ad minimum duplo longiores, prope basin articulati. Valvae membranaceae, tenuiter nervosae 24
23a. Folia parva. Valvae valde variabiles (vide subspecies!) ad summum 4,5—6×2,5—4,5 mm (dentibus exclusis), dentibus utrinque 4—6 (—8), rarius valvae integrae vel subintegrae ..... 22. *R. pulcher* L.
b. Folia magna. Valvae usque ad 8×7 mm (dentibus exclusis), cordato- vel triangulato-rotundatae, dentibus utrinque 8—14 ... 23. *R. alveolatus* Los.
24a. Valvarum dentes apice manifeste hamati..... 25. *R. nepalensis* Spreng.
b. Valvarum dentes apice recti 25
25a. Valvae late cordato-triangulares vel cordato-rotundatae; nervatura valvarum aequaliter reticulata; dentes utrinque 4—9. Pedicelli ad basin perigonii nodoso-incrassati ..... 24. *R. chalepensis* Mill.
b. Valvae anguste triangulares vel ovato-lingulatae, dentibus utrinque ad summum 4; nervatura valvarum apicem valvae versus evanescens. Pedicelli in basin perigonii sensim dilatati ..... 21. *R. obtusifolius* L.

Subgen. ***Acetosella*** (Meisn.) Rech. f., Field Mus. Bot. 17: 6 (1937).

Syn.: *Rumex* Sect. *Acetosella* Meisn. apud DC., Prodr. 14: 63 (1856).

Dioici (rarissime polygami). Plantae perennes, graciles. Valvae nuce non vel vix majores, integrae, non calliferae. Folia hastata vel sagittata, acerba.

1. ***R. Acetosella*** L., Spec. Plant. 338 (1753).
Syn.: *R. acetoselloides* Bal., Bull. Soc. Bot. Fr. 1: 282 (1854).
Typus: Europa.

Perennis. Caules saepe plures 10—40 cm alti, tenues, erecti, foliati, a medio ramosi; inflorescentia laxe paniculata, aphylla. Folia 10—60×1—5 mm, linearivel lanceolato-sagittata, forma variabilia; lobus medianus lanceolatus, utrinque attenuatus; lobi basales triangulares, patuli vel sursum curvati, ± acuti, interdum fissi, raro deficientes; petiolus foliorum basaliam laminam ± aequans, superiorum sensim brevior. Pedicelli flores ± aequantes. Flores dioici, raro polygami. Valvae nuce non vel vix majores, ecallosae, integrae, interdum indistincte nervosae. Nux 1,3—1,5 mm longa, latitudine longior, a valvis libera.

Persia: W: Azerb.: M. Sahand: Maragheh, Shar. 7475-E! Shah Jardi, Buhse. Kuh-e Mishu Dagh, Gill.-Sm. 1796. Isperechan versus Senjanab, Knapp.

Distr. gen.: Europa et Asia borealis et temperata, ceterum passim inquilinus.

Auf das Vorkommen von zwei nah verwandten Arten ist zu achten:

a) *R. tenuifolius* (Wallr.) Löve, Bot. Not. 1941: 99 (1941). Syn.: *R. Acetosella* L. var. *tenuifolius* Wallr., Sched. Crit. 186 (1822). Stengel aufsteigend, oft schon unter der Mitte verzweigt. Blätter schmal lineal, Grundblätter bis zu zehnmal so lang wie breit, Rand oft umgerollt. Nuß nur 0,9—1,3 mm lang, mit den Valven nicht verwachsen. — Eurasien, auch Kaukasus und Nord-Anatolien.

b) *R. angiocarpus* Murb., Lunds Univ. Årsskr. 27: 46 (1891). Habitus und Blattform wie *R. Acetosella* L. jedoch Nuß mit den Valven verwachsen. — Mittel- und Westeuropa, westliches Mittelmeergebiet. In alle Erdteile verschleppt und meist eingebürgert.

Subgen. ***Acetosa*** (Meisn.) Rech. f., Field Mus. Bot. 17: 6 (1937).

Syn.: *Rumex* Sect. *Acetosa* Meisn. apud DC., Prodr. 14: 64 (1856).

Dioici vel polygami, raro monoici. Herbae annuae vel perennes. Valvae nuce evidenter majores, integrae, calliferae vel ecallosae. Folia hastata vel sagittata, plerumque acerba.

2. ***R. hastatus*** D. Don, Prodr. Fl. Nepal. 74 (1825).

Typus: „Hab. in Gosaingsthan Nepalensium, Wallich".

Suffrutex multicaulis 40—80 cm altus crebre ramosus, ramis axillaribus sterilibus. Petioli laminam aequantes vel ± superantes. Folia hastata, magnitudine et forma valde variabilia, ± glauca. Paniculae terminales laxiusculae, ramis erecto-divergentibus simplicibus vel inferioribus ramosis. Pedicelli tenuissimi, prope basin articulati. Perigonii foliola ovato-elliptica obtusa, basi vix connata. Valvae fructiferae ± 4 mm longae et latae, orbiculato-cordatae, tenuiter membranaceae subpellucidae, tenuissime reticulato-nervosae, saepe roseo-suffusae. Nux 2 mm longa, brunnea.

Afghanistan: E: Kabul: In valle Bagram, Neub. 3304! Nuristan: Kamdesh, Edelb. 1146! Gusalak, Edelb. 1146!, 1514! Inter Ningalam et Darim 1300—1900 m, Neub. 1951/979! Inter Nishai et Ningalam, Neub. 1951/797! In valle fluvii Pech, Neub. 1951/864!, 1380 m, Kerst. 797! Waigel, Edelb. 885! Kandai, Rech. 32464!, Kitam. Inter Chigha Sarai et Kandai, Rech. 32415! Chigha Sarai, 820 m, Gilli 2223!, Kerst. 689! Inter Seprigal et Wama, Kitam. Laghman: Najil, 1500 m, Koelz 11630! — Afghanistan, Griff. 9208!, 4134.

Pakistan: Chitral: Rumbur, 1800 m, Kerst. K-141! In pago Chitral, 1500 m, Stainton 2201! — Swat: Inter Madyan et Kalam, 1700 m, Rech. 19382! Inter Khawazakhiela et Shangla, 1300—1900 m, Rech. 30601! Malakand, in saxosis granit., 800 m, Rech. 30452! — Kohat: Cherat SE Peshawar, 700—900 m, Rech. 30259!

Distr. gen.: Montes Hindukush et Himalaya ab Afghania orientali usque ad Sinam.

Die Art variiert erheblich in der Größe, Form und Breite der Blätter. Sie erreicht in Afghanistan ihre Westgrenze. Im westlichen Arealteil überwiegen schmalblättrige Formen.

3. ***R. ephedroides*** Bornm., Journ. Russe Bot. 6: 92 (1909).

Typus: Alexeenko 882, B, LE.

Fruticosus, ramosissimus, aphyllus, ramis inferne valde lignosis erectis, superne dichotome scopario-ramulosis, glauco-virentibus. Pedicelli singuli vel bini rarius terni tenuissimi, 1—1,5 mm longi, in medio articulati. Perigonii floris masculi phylla exteriora late ovata vel rotundata purpurea, interiora pallidiora duplo majora. Flores feminei et fructus ignoti.

Persia: S: Fars.: „In ditione Schulistan, in declivibus petrosis inter Ardakun et Pul-i Murt in convalle fluvii Schul-i Rud", Alexeenko 882.

Distr. gen.: Endem.

Die Art ist seit ihrer Entdeckung nicht mehr gesammelt worden und nur unvollständig bekannt.

4. ***R. scutatus*** L., Spec. Plant. 337 (1753).
Syn.: *R. hastaefolius* M. B., Fl. Taur.-Cauc. 1: 290 (1808).
Typus: „Hab. in Helvetia, Galloprovincia".

Rhizoma lignescens, surculos subterraneos emittens. Caules 20—40 cm alti saepe a basi ramosi. Petioli lamina saepe pluries longiores. Folia magnitudine et forma variabilia, glauca vel viridia, hastata, supra lobos basales ± contracta, lobo mediano plerumque lato, lobis basalibus ± angustis, acutis. Inflorescentia laxissima vix paniculata; rami pauci erecto-patentes, remote floriferi. Flores hermaphroditi vel polygami. Pedicelli filiformes, quam valvae plerumque breviores, infra medium articulati. Perigonii folia exteriora vix 2 mm longa, elliptica subcymbiformia, libera. Valvae fructiferae 4,5—6×5 mm, late ellipticae, pallescentes, subpellucidae, tenuissime reticulatae. Nux 3—3,5 mm longa, griseo-flavescens.

Iraq: Kurd.: Arbil: M. Algurd Dagh supra Nowanda, 2000 m, Rech. 11853! In declivibus orientalibus M. Algurd Dagh, 2100 m, Gillett 9511! Rost, 2600 m, Haley 190!
Talish: C. A. Mey. Swant, Hohen.
Persia: N: Maz.: Pol-e Zanguleh in valle fluvii Chalus, 2200—2600 m, Rech. 6391! 64 km S Chalus, 1050 m, Furse 2522! In valle Haraz inter Zardman et Panjab, 1000 m, Wdb. 290! Gil.: Kelishom inter Langarud et Qazvin, Alexeenko 354. Persia borealis, Ky. 110. — W: Azerb.: Meshg Anbar Mianeh prope Tabriz, 1400 m, Mird. Inter Shahpur et Rezaiyeh, Shar. 6493-E! Kaleybar, Mird. 1050! M. Gelosa, Knapp. Kuh-e Mishu Dagh, Gill.-Sm. 2379. M. Sahand, 5 km E Kandujan, 33 km E Khosrow Shah, 2900 m, Grant 16278! Qareh Dagh: Inter Ali Yar et Chasin, Buhse. Binamar, Buhse. Kurd.: Sanandaj, 1800 m, Jacobs 6920! Esf.: Esfahan, Auch. 2573! — C: Tehr.: Pas Qaleh prope Darband, 1500—2000 m, Rech. 1094!; Ky. 110!, 671!, 672! M. Tuchal, 2200—2400 m, Bornm. 8117; 3150 m, Linds. 530! Supra Darband, 1800 m, Bruns 453!, Taghilou 1094-E, 1096-E! 38 km NNE Tehran, 2000 m, Furse 3156! Qazv.: Prope Fashand, Gauba 1090. Inter Karaj et Gach Sar, Schmid 5720! Shahr.-Bust.: M. Shahvar prope Nokarman, in saxosis serpentin., 2400 m, Rech. 5896! Damgh.-Semn.: Inter Orim et Taru, Kuh-i Nizwa, Wdb. 1119!

Distr. gen.: Europa media et australis, Asia austro-occidentalis usque ad Persiam borealem et occidentalem.

5. ***R. Acetosa*** L., Spec. Plant. 337 (1753).
Typus: „Hab. in Europae pascuis".

Perennis. Radicis fibrae non incrassatae. Caulis herbaceus ± stricte erectus 30—60 cm altus. Folia basalia 5—7×2—3 cm, latitudine 2—4 (—6)-plo longiora, lobis basalibus acutis deorsum directis. Ochreae laciniatae. Inflorescentia angusta ± elongata saepe laxiuscula, ramis plerumque simplicibus. Valvae fructiferae 3—3,5 mm diametro, suborbiculares, membranaceae reticulato-nervosae. Nux 1,8—2,2 mm longa atrobrunnea nitida.

Talish, C. A. Mey.
Persia: N: Gil.: Manjil, Buhse 391.
Afghanistan: E: Nuristan: Pashki, Edelb. 1201! Inter Pashki et Kushitaki, Kitamura. Eshtaway, Kitamura.
Pakistan: Swat: Utror, 2500 m, Rech. 19564!

Distr. gen.: Asia subarctica et temperata, in regionibus australioribus monticola, Europa praesertim borealis et media, America borealis; praeterea passim introductus.

6. ***R. tuberosus*** L., Spec. Plant. ed. 2: 481 (1762).
Typus: Italia.

Perennis. Radicis fibrae pro parte quidem tuberoso-incrassatae. Caulis usque ad 60 cm altus. Folia 3—6 × 2—4 cm, forma et magnitudine variabilia, latitudine usque ad 3—4-plo longiora, hastata. Valvae fructiferae orbiculato-cordatae, in subspeciebus vario modo evolutae.
Distr. gen. speciei: Regio Mediterranea, Asia austro-occidentalis.

1a. Valvae 4—5 mm latae. Inflorescentiae rami ramosi .....
..... subsp. *horizontalis* (C. Koch) Rech. f.
b. Valvae 3—4 mm latae. Inflorescentiae rami iterum iterumque ramosi ...
..... subsp. *turcomanicus* (Rech. f.) Rech. f.

— — subsp. ***horizontalis*** (C. Koch) Rech. f., Candollea 12: 31 (1949).
Syn.: *R. horizontalis* C. Koch, Linnaea 22: 211 (1849) sensu Boiss., Fl. Or. 4: 1016 (1879).
Typus: In regione subalpina Ponti Lazici supra Djimil, C. Koch, B †.
Iraq: Kurd.: Arbil: Handiyan ad radices M. Baradost, Thesiger 683!
Diana prope Rawandiz, Field & Lazar 895!
Talish: Lenkoran, Hohen. Swant, Hohen.
Persia: N: Maz.: Haraz, E Emarat, 600 m, Wdb. 505! Gil.: Supra Manjil, Gauba 2039! Rudbar, Buhse. Inter Ardabil et Astara, 1500 m, Furse 2464! — W: Azerb.: M. Karnaru, Knapp. Kuh-e Sahand, Knapp. Ham.: In valle Ganjnameh, Pichler. Kermansh.: Kuh-e Galajeh, Behb. 296!
Distr. gen. subspeciei: Anatolia borealis, Armenia, Iraq, Persia.

— — subsp. ***turcomanicus*** (Rech. f.) Rech. f., Candollea 12: 31 (1949).
Syn.: *R. tuberosus* L. var. *turcomanicus* Rech. f., Feddes Repert. 49: 1 (1940).
Typus: Rech. 1733, W!
Iraq: Kurd.: Arbil: M. Algurd supra Nowanda, 2000 m, Rech. 11382! M. Qandil, Rech. 11724! Mosul: In quercetis saxosis supra Sirsang, 1200 m, Rech. 11907!
Persia: E: Khor.: In jugo Allah Akbar, 1800 m, Rech. 1733! Kuh-i Neyshabur: Darreh Abshar supra Akhlamad, 1800 m, Rech. 4631! Kuh-e Hazar Masjed: Inter Ardak et Talqur, 1600 m, Rech. 5024! 62 km E Loveh versus Dasht, 1200 m, Rech. 33136!
Turcomania: Kopet Dagh: In faucibus Chuli prope Ashkhabad, Lipsky 1755!, Litw. 1966! Sundsodagh prope Kara Kala, Sint. 1789!
Distr. gen. subspeciei: Transcaucasia, Iraq, Persia borealis, Turcomania.

7. ***R. cyprius*** Murb., Lunds Univ. Årsskr. N. F. 2, 14: 20 (1907).
Syn.: *R. roseus* L., Syst. Veg. ed. 10, 2: 990 (1759) et auctorum subsequentium omnium, non L. (1753), nomen ambiguum. *R. cyprius* Murb. subsp. *disciformis* Samuels., Bot. Not. 1939: 512 (1939), nom. illeg. *R. disciformis* Samuels., Bot. Not. 1939: 512 (1939), nom. illeg.
Typus: Cyprus.

Planta annua saepe a basi ramosa, fragilis, 5—30 cm alta pallide virens. Folia inferiora 2—4 × 1—3 cm, petiolata, hastata vel triangulari-ovata acuminata. Pedicelli in ochreis singuli, plerumque flores 2 (vel 3) ferentes. Agglomerationes florum in statu fructifero applanatae disciformes. Valvae valde inaequales, maxima 10—21 mm longa, 10—23 mm lata, copiose reticulato-venosa, nervo continuo rubro marginatae, margine minute spinulosae vel denticulatae, basi profunde cordatae. Nux ± 5 mm longa.
Iraq: Kurd.: Kirkuk: Darbandikhan, Barkley 5148! Diyala: Khanaqin, Rech. 14125! Inter Baquba et Khanaqin, 150 m, Rawi & Gillett 7342! Jabal Hamrin, Graham 689!;

Inter Shahraban et Jalula, Rech. 14240! N Mansuriya, Barkley 6817! 16 resp. 30 km S Badrah, Rech. 9151!, 13947! Amarah: Shatt at-Tib, 70 km N Amarah, 50—200 m, Rech. 8900!, 8952! — Kurdistan, Smith 6210!

Persia: W: Kermansh.: Qasr Shirin, Shar. 5764-E! Bakht.: Gatvand, Mart.-Escal. Lur.: Ilam, 400 m, Jacobs 6259! Mirabad inter Khorramabad et Andimeshk, Bent & Wr. 416—209! Tang Panj inter Khorramabad et Andimeshk, Bent & Wr. 419—301! Posht Kuh, Halat-e Mehran, Behb. 295! Prope Dehloran, Nab. 1001, Khuz.: 60 km NE Dezful, 500 m, Koelz 342! Ahvaz, Koelz 14876! 80 kmE et S Gach Saran, 350 m, Stutz 958! — S: Lar.: Hajjiabad prope Tarom, 900 m, Rech. 3257! Hormud, Gauba 2048! Fars.: Jahrom, Koelz 14594! Kotal-i Malu, 600 m, Koelz 14811! Kazerun, Gauba 2042!, Haussкn.! Inter Dalaki et Kazerun, Koelz 1235!, 300—1200 m, Haussкn.! Dalaki, Stapf 2054 p. p.! Gere inter Bushehr et Shiraz, Ky. 33!

Distr. gen.: Aegyptus, Sinai, Arabia Petraea, Cyprus, Palaestina, Syria, Kurdistan, Iraq, Persia australis.

Ältere Angaben aus der Literatur: Persia orientalis, Bge., Afghanistan, Bge. Baluchistan, Stocks, S Bampur, Hotson haben sich nicht bestätigt.

Da ich mir über den systematischen Wert der auf Zypern vorkommenden Sippe des *R. cyprius* nicht im klaren bin, sehe ich vorläufig davon ab, für die in Südwestasien weit verbreitete, bisher als *disciformis* bezeichnete Sippe einen neuen Namen einzuführen.

8. ***R. vesicarius*** L., Spec. Plant. 336 (1753).

Typus: „Hab. in Africa".

Planta annua saepe a basi ramosa, fragilis, 5—40 cm alta, pallide virens. Folia inferiora 1—3×1—2 cm, petiolata, obtusa vel obtusiuscula, late ovata, basi truncata vel subcordata, superiora ovato-oblonga vel subdeltoidea basi rotundata-cuneata, apice ± acuta. Pedicelli in quaque ochrearum axilla semper singuli, articulati. Flores in pedicellis semper bini rarius terni. Valvae fructiferae floris primarii 12—18 (—23) mm longae et latae, subaequales suborbiculares, sine nervo marginali, lobis basalibus parallelis omnes extrorsum longitudinaliter complicatae, florem secundarium omnino occultantes. Nux floris primarii 3,5—4,7 mm, floris secundarii 2,8—4 mm longa, griseo-brunnea.

Persia: S: Fars.: Gere inter Bushehr et Shiraz, Ky. 33! Dalaki, Stapf 2054 p. p.! Kazerun, 1000 m, Haussкn.! Firuzabad, coll. ig. 5766-E! Shapur prope Kazerun, Cavara. Kerm.: Kuh Seidin, 2000 m, Bornm. 4248! M. Jebal Barez versus Sabzvaran, 900 m, Rech. 3797! Shahdab, 1300 m, Bobek 147! Jiroft, Haman-e Jaz Murian, 400 m, Starm. 114! Lar.: Bandar Abbas, Shervinovsky in Gauba 2046! Kotal Bastak, 550 m, Behb. in Gauba 2045! Nimeh inter Bandar Abbas et Lar, 900 m, Gauba 2044! Gahkom inter Bandar Abbas et Saidabad, 640 m, Mird. in Gauba 2047! Hajjiabad prope Tarom, 900 m, Rech. 3385! Qotbabad, 100 km N Bandar Abbas, 800 m, Zumer 360! Bal.: Khash, Karevandar, Mirzayan 457-E! M. Karevandar inter Khash et Iranshahr, 1500 m, Rech. 4026! Iranshar, Damin, Shar. 458-E! Tis prope Chah Bahar, Gauba 2041! Saravan, Salavatian 5765-E! Makran: Hudiyan: Deh Zigh, 750 m, Gabr. 43 — E: Khor.: Ozbagu, Ruttner 94! — C: Lut: Kuh-e Chah Rui, 1000 m, Gabr. 134.

Afghanistan: E: Kabul: Sarobi, Kitam. In faucibus fluvii Kabul E Sarobi, 900 m, Rech. 3472! 50 km NW Tor Khama versus Jalalabad, 600 m, Rech. 31013, 5 km W jugi Khyber, Podlech 10178! — NE: Kataghan: Doshi, 850 m, Rech. 16536!, Wdb. 3495! — C: Doab, Volk 2700! Inter Doab et Eshpushta, 1500 m, Gilli 2224! — Panjvai, Lindb. 313!

Pakistan: Peshawar: Tor Khama, 700 m, Rech. 30357! Kohat: Inter Kohat et Kalabagh, Schlagintweit! In jugo Kohat, 700—900 m, Rech. 30188! — S. Waziristan, Stewart — Quetta: Infra Mach, 600—800 m, Rech. 28478!, Rech. 28753! — Bal.: Kalat: Inter Kolpur et Mach, 900—1600 m, Rech. 28471! Makran: In planitie Balgathar inter Hoshab et Panjgur, 600 m, Rech. 28038! Ispikan NE Mand, 300 m, Hotson M 81.

In valle Kulban ENE Mand, 400 m, Hotson M-105. Nushki, H.-B. 19216. Kharan, H.-B. 23217. Chagai, Gaz. Inter Avaran et Turbat, 100—200 m, Rech. 27764! 10—30 km SW Turbat, 100—200 m, Rech. 27790! 20—30 km S Panjgur, Rech. 30119! — Baluchistan, Stocks 815!

Distr. gen.: Africa borealis, Graecia (?), Arabia, Iraq, Persia australis, Baluchistan, Afghanistan, Panjab.

Subgen. ***Rumex***

Syn.: Subgen. *Lapathum* Rech. f., Field Mus. Bot. 17, 1: 6 (1937).
Sect. *Lapathum* Campd., Monogr. Rumex 63 (1819); Meisner apud DC., Prodr. 14: 42 (1856).

Basis foliorum basalium et caulinorum inferiorum cuneata vel rotundata vel cordata, numquam hastata vel sagittata. Flores omnes vel plurimi androgyni. Perigonii foliola interiora (valvae) fructificationis tempore nuce evidenter semper pluries maiora, ecallosa vel callifera, integra vel vario modo dentata.

9. ***R. angulatus*** Rech. f., Candollea 12: 51 (1949).
Syn.: *R. orientalis* Hook., Fl. Brit. Ind. 5: 58 (1890) p. p., non Bernh. (1830).
Typus: Lamayuru, Koelz 6219, BM.!

Perennis. Caulis 10—40 cm altus, erectus, crassiusculus breviarticulatus, purpureo-suffusus. Folia basalia 10—15×3—6 cm, basi cordata vel truncata, caulina inferiora breviter petiolata, usque ad 15×4 cm, apicem versus longius basin versus brevius attenuata, omnia plana, extremo margine tantum crispata. Inflorescentia breviramosa, ramis abbreviatis interdum subsimplex. Pedicelli perigonio maturo ad summum sesquilongiores. Valvae fructiferae ± 5 mm longae et latae, orbiculato-cordatae, membranaceae, tenuiter reticulatae, saepe purpureo-suffusae, subintegrae, ecallosae. Nux ± 2,5 mm longa, latitudine circiter duplo longior.

Afghanistan: NE: Wakhan: Ab Gaj, 3200 m, Roemer 389! Badakhshan: Zebak, Lindb. 752!

Distr. gen.: Afghanistan orientalis, Kashmir, Tibet occidentalis.

10. ***R. kandavanicus*** (Rech. f.) Rech. f., stat. nov.
Syn.: *R. crispus* L. var. *kandavanicus* Rech. f., Ann. Nat. Mus. Wien 53, 1: 355 (1942).
Typus: Rech. 2099, W!

Perennis. Caulis erectus, ultra 60 cm altus, pallidus, sulcato-striatus pubescens. Folia basalia et caulina inferiora ignota; caulina superiora e basi attenuata oblonga 8—10×3—4 cm, acuta, margine crispata. Inflorescentia in statu fructifero elongata breviramosa, ramis axi appressis sat compacta, aphylla; rami fasciculati. Pedicelli fructiferi tenuiter filiformes, 5—10 mm longi, prope basin articulati. Valvae fructiferae 4—5×2—3,5 mm, basi truncatae, ambitu ovato-triangulares, acutiusculae, rufo-brunneae, tenuissime reticulato-nervosae, ecallosae, integrae. Nux 2—2,2 mm longa, in medio circiter latissima, atro-brunnea.

Persia: N: Maz.: In declivibus borealibus jugi Kandavan, secus rivulos, 2800 m, Rech. 2099!

Distr. gen.: Endem.

R. kandavanicus gehört entgegen meiner ursprünglichen Auffassung nicht als aberrante schwielenlose Form in den Formenkreis des *R. crispus* L. sondern in die Ver-

wandtschaft von *R. longifolius* DC. und *R. angulatus* Rech. f., ist also als isolierter Vertreter eines arktisch-subarktischen Formenkreises aufzufassen, dessen südlichere Repräsentanten Hochgebirgsbewohner sind. Von den genannten Arten unterscheidet sich *R. kandavanicus* durch die kleinen spitzlichen Valven, die immer deutlich länger als breit sind und durch die kleinen Nüsse.

11. ***R. Paulsenianus*** Rech. f., Feddes Repert. 29: 246 (1931). — Tab. 8, fig. 14.
Typus: Pamir: Goran, Kuh-i Lal, 2600 m, Paulsen, C!

Perennis. Caulis ad 2 m altus, robustus, saepe pallescens, paniculam amplam semper laxam arcuato-ramosam ferens. Folia basalia usque ad 30×18 cm, late cordata, latitudine circiter 2½-plo longiora, prope medium latissima, apice acuta; petiolus laminam subaequans. Folia superiora sensim angustiora, acutiora, brevius petiolata. Pedicelli fructiferi tenuissimi, longitudine variabiles, perigonio 2½—3½ (—4½)-plo longiores. Valvae fructiferae ±5 mm longae, 7—8 mm latae, ecallosae, e basi profunde cordata late reniformes, apice acuminatae, pallide brunneae, membranaceae, tenuiter reticulato-nervosae, maculis nervaturae marginalibus transversaliter valde elongatis. Nux 3—3,5 mm longa, ±2 mm lata.

Turcomania: sec. Nikitin.
Afghanistan: NW: Herat: Badghiz: Qala Ao Safed, Artch. 538. — E: Kabul: In declivibus australibus jugi Salang, 2600 m, Rech. 31382! Panjshir: Mukeni, 2500 m, Wdb. 5153! Ghazni: Inter jugum Kechru et Miradina, 2700—3200 m, Rech. 17556! Unai, 2800 m, Volk 2107! Nuristan: Ptili, Edelb. 1298! Nuristan, Edelb. 1209! Jaji: In jugo Shutargardan, 3300 m, Rech. 32370! — NE: Badakhshan: Jurm, 2100 m, Koelz 12898! Kataghan: In jugo Salang prope Olang, 2500 m, Podlech 11561! — C: Doab: In jugo Sabz, 3000 m, Koelz 13826! Bamian: Mandigak inter jugum Deraz Kol et Panjao, 2800—3200 m, Rech. 18707! In latere austro-orientali jugi Hajigak, 3000 m, Rech. 18534!, 18662! Parwan: In declivibus orientalibus jugi Shibar, 2200 m, Volk 2802!, 2600 m, Rech. 16872! Deh Kundi: Inter juga Waras et Khonak, 2600 m, Rech. 36631! — Chardeh-Ghorband, Codrington s. n.!

Distr. gen.: Afghanistan, Turcomania, Tadjikistan, Uzbekistan, Pamir, Tibet.

12. ***R. thjanschanicus*** (*tianschanicus*) Los., Fl. URSS. 5: 716 (1936).
Typus: Tian-Schan: Alexandrowski-Gebirge, Titov 1506, LE!

R. Paulseniano Rech. f. valde similis, differt ab eo (an specifice?) valva anteriore callum majusculum subglobosum vel ovatum ferente, valvis ceteris quoque interdum callo rudimentario praeditis vel ecallosis, inflorescentia ut videtur quam in *R. Paulseniano* saepe densiore, foliis angustioribus, valvis interdum proportione angustioribus.

Persia: E: Khor.: Darreh Abshar prope Akhlamad, 1700 m, Gauba in Rech. 1765!, Rech. 4636! Kuh-e Bezg, 1900 m, Rech. 1452! Kuh-e Hazar Masjed inter Ardak et Talqur, 1600 m, Rech. 4939!
Afghanistan: SW: Ghorat: Kotal Nayak inter Sar-i Naorak et Qala-i Ghor, 2600 m, Rech. 18972! — E: Kabul: Paghman, 2250 m, Koelz 12066!, Gilli 2225!, 1800 m, Kitam.

Distr. gen.: Persia boreali-orientalis, Afghanistan, Turcomania, M. Tien Shan.

13. ***R. Patientia*** L., Spec. Plant. 3333 (1753).
Typus: „Hab. in Italia".

Perennis, pallide viridis. Caulis erectus, 0,5—1(—2 m altus. Inflorescentia densa, ramis inferioribus fasciculatis. Folia basalia (15—)20—30(—40) cm longa, (4—)7—9(—12) cm lata, basi truncata vel cuneata rarius subcordata, oblongo-

lanceolata, acuta; petiolus lamina tertia parte brevior, supra applanatus; folia caulina sensim decrescentia brevius petiolata. Pedicelli fructiferi tenuiter filiformes, perigonio circiter duplo longiores. Valvae 4—8×4—10 mm, in subspeciebus diversis forma et magnitudine valde variabiles, unica vel rarius omnes (subsp. *orientalis*) callum subsphaericum vel ovoideum ferens. Nux 3—4 mm longa, brunnea.

Persia: N: Gorg.: M. Shahvar prope Hajjilang, 2600 m, Rech. 6177! Maz.: Kojur inter Nemasieh et Zanus, 1800—2200 m, Rech. 6545! Gil.: M. Samam inter Pak Deh et Kelishom, Buhse. — W: Azerb.: Kuh-e Sahand prope Liqvan, 2100 m, Knapp. Distr. Afshar: Gishavan, Knapp. Lur.: Oshtoran Kuh, Str. — C: Tehr.: In jugo Damavand, 2700 m, Buhse. Shahr.-Bust.: M. Shahvar supra Nokarman, 2500 m, Rech. 5895!, 5946-b!
Afghanistan: E: Kabul: Paghman, 2900 m, Wdb. 5070! Podlech 11594! Ghazni: Ad lacum Sabzab, 2800 m, Rech. 17964! — C: Bamian: Behzud, 2800 m, Rech. 18621! Bulola, 2200 m, Rech. 16750! Band-i Amir, 2800 m, Rech. 18308! Ghorat: SW Sar-i Naorak, 2480 m, Rech. 18931! Qala Qansi, 2200 m, Rech. 18840!
Pakistan: Chitral: Shogot Lutko, 2000 m, Bowes Lyon 765!

Distr. gen.: Europa austro-orientalis, Asia temperata, ceterum passim introductus.

1a. Valvae fructiferae 6—8 mm longae, 8—10 mm latae, unica vel omnes calliferae. Planta validissima usque ad 2 m alta caule saepe pallescente. Folia basalia basi interdum subcordata ..... subsp. *orientalis*
b. Valvae fructiferae minores praecipue angustiores 2
2a. Valvae fructiferae 6—8 mm longae, 4,5—7 mm latae ..... subsp. *Patientia*
b. Valvae fructiferae 4—5(—6) mm longae, 4—6 mm latae 3
3a. Valvae fructiferae 4,5—6 mm longae, 4—5 mm latae, basi vix emarginatae vel truncatae, apice ± acutae ..... subsp. *tibeticus*
b. Valvae fructiferae longitudini aequilatae vel latiores, basi manifeste emarginatae, apice ± distincte rotundatae ..... subsp. *pamiricus*

— — subsp. ***Patientia.***

Syn. *R. Patientia* subsp. *eu-Patientia* Rech. f., Feddes Repert. 31: 246 (1933).

Ein Teil der unter *R. Patientia* schlechtweg angeführten Belege kommt der typischen Unterart sehr nahe.

Distr. gen. subspeciei: Europa austro-orientalis, Asia austro-occidentalis.

— — subsp. ***orientalis*** (Bernh.) Danser, Nederl. Kruidk. Arch. 1923: 11 (1924).

Syn.: *R. orientalis* Bernh. apud Schultes fil., Syst. 7: 1433 (1830).

Typus: Non indicatus.

Afghanistan: E: Nuristan: Chetras, Kitam. C: Doab, Kitam. — Afghanistan, Griff. 1700!
Pakistan: Kurram: Sergal, Aitch. 1202!

Distr. gen. subspeciei: Europa austro-orientalis, Asia austro-occidentalis.

Beide von mir geschenen Belege sind nicht typisch; bei Griff. 1700 sind die Valven kaum größer als bei subsp. *Patientia*, jedoch alle mit Schwielen versehen wie bei subsp. *orientalis*. Bei Aitch. 1202 sind die Valven etwas langgestreckt und leicht zugespitzt; sie erinnern dadurch an subsp. *tibeticus*.

— — subsp. ***pamiricus*** (Rech. f.) Rech. f., Candollea 12: 73 (1949). — Tab. 8, fig. 11.

Syn.: *R. pamiricus* Rech. f., Feddes Repert. 31: 260 (1933). *R. Rechingerianus* Los., Fl. URSS 5: 715 (1936).

Typus: Pamir, Paulsen 1523, C!

Persia: C: Tehr.: Ab-e Garm, 2200 m, Aell. 644! Shahr. Bust.: M. Shahvar, Nokarman, 2500 m, Rech. 5946-a!
Afghanistan: E: Nuristan: Ptili, Edelb. 1296! Ghazni: Ad lacum Sabzab, 2800 m, Rech. 17963! — NE: Badakhshan: Iskatul, 3300 m, Koelz 12601! Wakhan: Langar Kisht, 3000 m, Paulsen! — C: Bamian: Band-i Amir, 2500 m, Volk 2838!

Distr. gen. subspeciei: Persia, Afghanistan, Asia centralis.

— — subsp. ***tibeticus*** (Rech. f.) Rech. f., Candollea 12: 74 (1949). — Tab. 8, fig. 13.
Syn.: *R. tibeticus* Rech. f., Feddes Repert. 31: 262 (1933).
Typus (Lectotypus): „Tibet occid., 9—11000 ft." Hook. f. et Thoms. C!

Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2800 m, Rech. 6751!
Afghanistan: E: Nuristan: Chetras, Kitam. — NE: Kataghan: In jugo Salang prope Olang, 2600 m, Podlech 12240! — C: Doab: Ao Khorak-i Bala, 2700 m, Koelz 13783!

Distr. gen. subspeciei: Persia, Afghanistan, Asia centralis.

14. ***R. caucasicus*** Rech. f., Feddes Repert. 31: 258 (1933).
Syn.: *R. aschabadensis* Los., Fl. URSS. 5: 715 (1936).
Typus: Caucasus: Angida, Akuada, Hollos, BP!

Differt a *R. Patientia* L. valva anteriore callum 3—4 mm majorem prominentem elongato-fusiformem dimidium valvae longitudinis attingentem vel superantem ferente.

Turcomania: Kopet Dagh, in faucibus M. Saan Dagh, Litw.!

Distr. gen.: Anatolia boreo-orientalis, Caucasus, Turcomania.

15. ***R. ponticus*** E. H. L. Krause emend. Rech. f., Feddes Repert. 31: 235 (1933).
R. ponticus E. H. L. Krause, Beih. Bot. Centrbl. 24/2: 15 (1909), nomen seminudum, excl. pl. e M. Algird Dagh. *R. Patientia* L. var. *kurdicus* Boiss., Fl. Or. 4: 1009 (1879).
Typus: Sintenis, Iter orientale 1894, No. 7072, LD!

Differt ab affini *R. elbursensi* Boiss. valvis fructiferis minoribus 9—11 mm longis, 12—15 mm latis, valva maxima callum ovatum 3 mm longum, 2—2,5 mm crassum ferente.

Iraq: Kurd.: Arbil: Rost, 2400 m, Thesiger 955! Algurd Dagh supra Nowanda, 2000—2600 m, Rech. 11394! Kirkuk: Darband-i Bazian, Haussкn. Sul.: M. Avroman, Haussкn. M. Shahu, Haussкn.
Persia: W: Bakht.: Kuh Rang, 2250 m, Wdb. 1716! Lur.: Dow Rud, 2100 m, Koelz 17878!

Distr. gen.: Anatolia orientalis, Iraq, Persia occidentalis.

16. ***R. elbursensis*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 12: 100 (1853). — Tab. 8, fig. 12.
Syn.: *R. elbrusensis* Boiss., Fl. Or. 4: 1008 (1879). *R. elbursensis* Boiss. var. *kurdicus* Bornm., Bull. Herb. Boiss. Ser. 2, 8: 549 (1879).
Typus: Ky. 294, G!

Perennis. Caulis 80—120 cm altus, gracilescens. Rami inflorescentiae singuli nec fasciculati, arcuato-patentes, paniculam fructiferam ± laxam apertam formantes. Folia basalia 18—25 × 6—12 cm, oblongo-lanceolata, basi cuneata,

truncata vel rarius subcordata, latitudine 3—4-plo longiora; petiolus lamina circiter dimidio brevior. Folia caulina pauca, breviter petiolata, lanceolata, acuta. Pedicelli perigonio fructifero 1—½-plo longiores. Valvae fructiferae inaequales, anterior maxima 12—14×15—22 mm, basi cordata, ambitu late rotundato-cordata, apice late acuminata, callifera; callus fusiformis 5—7 mm longus. Nux 5—7 mm longa, 4 mm lata, brunnea.

Persia: N: Maz.: Pol-e Zanguleh in valle fluvii Chalus, 2600 m, Rech. 6382! In latere boreali jugi Kandavan, 2800 m, Rech. 516!, 2098! Gilli s. n.! — W: Azerb.: M. Sahand, 2500 m, Buhse. — In planitie „Gilache", 2500 m, Cowan & Darlington 2458! — Kermansh.: Kuh-i Parrow, Nojubaran, Str.! Ham.: M. Alvand prope Hamadan, Auch. 2981! Lur.: Dow Rud, 1500 m, Koelz 15606! Najiu, 25 km E Khorramabad, 1900 m, Koelz 498! — C: Tehr.: M. Tuchal prope Shahrestanak, Bornm. 8160! M. Damavand, 2500 m, Bornm. 8158! Pas Qaleh prope Tehran, Ky. 294! Qazv.: Fashand inter Qazvin et Karaj, Gauba 2052!

Distr. gen.: Endem.

17. ***R. crispus*** L., Spec. Plant. 335 (1753).
Typus: „Hab. in Europae succulentis".

Perennis. Caulis erectus (0,3—)0,6—1(—1,5) m altus, brunnescens; planta habitu variabilis. Folia basalia usque ad 30(—35) cm longa, 6—8 cm lata, ± anguste lanceolata, basi saepius cuneata, margine ± undulato-crispa; petiolus quam lamina plerumque multo brevior, superne ± angustato-carinatus. Pedicelli fructiferi longitudine variabiles, perigonio (1,5—)2—2,5-plo longiores. Valvae fructiferae 3,4—5(—6,5) mm longae et circiter aequilatae, magnitudine et ambitu variabiles, anterior tantum vel omnes calliferae, saepius rotundato- vel oblongo-cordatae, margine integrae. Nux 2—3(—3,5) mm longa, infra medium latissima, castanea.

Iraq: Kurd.: Arbil: Kholan, 1500 m, Rawi 13703! Walash, Thesiger 307!
Talish: Lenkoran, Hohen. Sallian, C. A. Mey.
Persia: N: Gorg.: Bandar-i Gaz, Sint. 1515. Zarrin Gol versus Abr, 1300 m, Gauba & Sab. Maz.: In jugo Kandavan, 2900 m, Gauba 1087, 1092. Kojur: Inter Zanus et Kinj, 1300—1600 m, Rech. 6573-b! Gil.: E Ardabil, 1700 m, Cowan & Darlington 1658! — W: Azerb.: Khosrava, Knapp. Mianeh, Rech. 32601! Lur.: Dow Rud, Koelz 17633! 50 km E Khorramabad, Kharon, 1300 m, Koelz 1233! — S: Kerman: Kuh-e Laleh Zar, 3000 m, Bornm. 4247! — C: Tehr.: Damavand, Ab-i Garm, Behb. 163-E! Kandavan, 2900 m, Gauba 1087, 1092. Pas Qaleh, Taghilou 1382-E! Qazv.: Karaj, Gauba & Sab. Alangeh, Gauba & Sab.
Afghanistan: E: Kabul: Sharenau, 1770 m, Gilli 2226! Dehmazang, 1770 m, Gilli 2227! Gusargah, 1770 m, Gilli 2228! Darulfanun, Manger 77. Paghman, 2400—2500 m, Gilli 2229!, 2230! Nuristan: Kulam, 2150 m, Kerst. 1070! Jaji: In jugo Peiwar Kotal, Aitch. 611!
Pakistan: Kurram: Shalozan, Aitch. 302!

Distr. gen. speciei: Nunc in toto fere orbi terrarum inquilinus; in Europa et Asia temperata certe indigenus.

1a. Valvae omnes calliferae 2
b. Valva anterior tantum callifera. Rami arcuato-divergentes ..... var. *unicallosus* Peterm.
2a. Valvae 5—7 mm diametro. Rami arcuato-divergentes ..... var. *robustus* Rech. pat.
b. Valvae minores 3

3a. Valvae 4—5 mm latae, rotundato-cordatae, inaequaliter calliferae. Rami arcuato-divergentes ..... var. *crispus*

b. Valvae 3—4 mm latae, ovato-triangulares, subaequaliter calliferae. Rami stricte erecti, axi appressi ..... var. *strictissimus* Rech. pat.

— — var. ***crispus***.

Bisher habe ich keine der typischen Varietät entsprechenden Belege aus dem Gebiet der Flora Iranica gesehen.

— — var. ***unicallosus*** Peterm., Fl. Lips. 266 (1838).

Persia: N: Maz.: In jugo Kandavan, 2700—3000 m, Rech. 2111! — C: Qazv.: Gach Sar, Gauba.

— — var. ***strictissimus*** Rech. pat., Ann. Nat. Mus. Wien 36: 153 (1923).

Iraq: Kurd.: Arbil: M. Qandil prope Pushtashan, 1500 m, Rech. 11820! M. Algurd Dagh supra Nowanda, 2000 m, Rech. 11387! Hajji Omran, 1700 m, Rech. 11306! Sul.: Penjwin, 1400 m, Rech. 10544!

Persia: N: Maz.: Pol-e Zanguleh in valle fluvii Chalus, 2200—2600 m, Rech. 6309! Sorkhabad in valle fluvii Talar, 1400 m, Rech. 5612! M. Tuchal prope Pas Qaleh, 2000 m, Rech. 1137! — W: Ham.: Hamadan, 1900 m, Mird. 2038! Arak: Arak, Ste. — E: Khor.: Inter Mashhad et Chanaran, 1100 m, Rech. 4680! Inter Mashhad et Quchan, 1000—1300 m, Rech. 1606! Inter Shirvan et Bojnurd, Rech. 1785! — C: Qazv.: Karaj, in alveo fluvii, 1400 m, Rech. 737! Tehr.: Polur, Gilli s. n.!

Afghanistan: E: Kabul: Band-e Kargha, 2000 m, Rech. 31275! Wdb. 1370! Kabul, 1800 m, Wdb. 3229! N Kabul, 1800 m, Rech. 17034! Paghman, Volk 2182! Wardak, Volk 821! Ghazni: 10 km N Ghazni, 2200 m, Rech. 17307!

— — var. ***robustus*** Rech. pat., Österr. Bot. Zeitschr. 42: 17 (1892).

Bisher habe ich keine dieser Varietät entsprechenden Belege aus dem Gebiet der Flora Iranica gesehen.

R. crispus ist besonders in jugendlichem Zustand dem *R. Patientia* L. habituell ähnlich, von ihm jedoch durch meist schmälere, stärker gewellt-gekrauste Blätter von freudig-grüner (nicht blaßgrüner) Farbe und oberseits schmal gekieltem, nicht breit abgeflachtem Blattstiel zu unterscheiden. Im übrigen kommen die Schwielen der Valven bei *R. crispus* früher zur Entwicklung resp. Verhärtung als bei *R. Patientia* und sie nehmen im Vergleich zur Valvenfläche einen größeren Raum ein.

18. ***R. angustifolius*** Campd., Monogr. Rumex 63 et 73, tab. 1, fig. 2 (1819). Typus: In herb. Tournefort.

Rhizoma crassum, pluriceps, caules plerumque plures, humiles, 25—40 cm altos, simplices tenues erectos emittens. Folia basalia 2—3 × 8—12 cm, ± anguste lanceolata, utrinque subaequaliter attenuata, plana, petiolata; petiolus laminam ± aequans. Glomeruli fructiferi inferiores remoti. Pedicelli 5—8 mm longi, crassi, quam valvae semper evidenter breviores. Valvae fructiferae 10—12 × 8—14 mm, cordato-reniformes, longitudine aequilatae vel latiores, crasse reticulato-nervosae. Nux 6—7 × 4 mm, brunnea, basi breviter, apice longius acuminata.

Iraq: Kurd.: Arbil: Algurd Dagh supra Nowanda, 2000—2600 m, Rech. 11835! Sul.: Penjwin, 1400 m, Rech. 10537!

Persia: W: In montibus Zagros, Haussk.

Distr. gen.: Anatolia, Armenia, Transcaucasia, Iraq, Persia boreo-occidentalis.

Die Art steht isoliert. Sie ist durch die Korrelation von niedrigem Wuchs, kurzen Fruchtstielen und großem Fruchtperigon eindeutig gekennzeichnet. Im Gebiet der Flora Iranica findet sich nur die subsp. *angustifolius*, der die obige Beschreibung entspricht. Die subsp. *libanoticus* Rech. f. mit herzförmig-dreieckigen Valven, deren Länge immer deren Breite übertrifft, ist im Libanon endemisch, die subsp. *macranthus* (Boiss.) Rech. f. mit größeren Valven und Nüßchen als subsp. *angustifolius* ist im Taurus endemisch.

19. ***R. conglomeratus*** Murr., Prodr. Stirp. Gotting. 52 (1770).
Typus: Germania: Göttingen.

Perennis. Caulis (20—)30—80(—120) cm altus, ramosus, ramis arcuato-divaricatis saepe elongatis. Folia basalia usque ad 16×5 cm, basi truncata vel leviter cordata, oblongo-ovata, plana, acutiuscula; petiolus laminam ± aequans. Folia caulina minora, ovato-lanceolata acutiuscula, breviter petiolata. Florum glomeruli omnes remoti, omnes foliis suffulti. Pedicelli fructiferi perigonium ± aequantes. Valvae fructiferae 2,5—3,2×1—1,7 mm, oblongo-ovatae, integrae, omnes calliferae, saepe totam fere faciem valvae occupantes. Nux 1,3—1,7 mm, atrobrunnea.

Iraq: Kurd.: Arbil: Hajji Omran, 1700 m, Rech. 11307! M. Qandil, Pushtashan, 1100 m, Rech. 11060! Ser-i Rost, 2000 m, Haley 96! Shaqlawa, 1000 m, Gillett 11576! Kirkuk: Qara Anjir, 27 km E Kirkuk, 700 m, Rech. 10011! Sul.: Penjwin, 1400 m, Rech. 12257! M. Avroman, Tawilla, Susakan, 1200 m, Rech. 10152! Mosul: Sharanish N Zakho, Basingera, 1200 m, Rech. 11984!
Persia: N: Gorg.: Chehel Chai, 200 m, Gauba 2035! Maz.: Sorkhabad, in valle fluvii Talar, 1400 m, Rech. 5624! Gil.: Rasht, Lipsky. — W: Azerb.: Rezaiyeh, Knapp. Lur.: Dow Rud, 1600 m, Koelz 15808! Bisheh, 50 km E Khorramabad, 1200 m, Rech. 5703!, Koeie 1229! Ham.: Borujerd, Koelz 18413! Hamadan, Mird. — E: Khor.: Kuh-e Neyshabur, Darreh Abshar prope Akhlamad, 1500 m, Gauba in Rech. 1777! Inter Mashhad et Chanaran, 1100 m, Rech. 4678-a! — C: Tehr.: In valle Hafthauz NW Tehran, 1500 m, Aell. 1648! Kashan: Qamsar, Manuch. s. n.! Tehr.: Damavand: Ab-e Garm, Behb. 162-E! In valle fluvii Hableh Rud inter Simin Dasht et Kabutar Darreh, 1150 m, Aell. 601!, Manuch. 5771-E! — 10 km a jugo Askna, 1350 m, Cowan & Darlington 1637.
Turcomania: Ashkhabad sec. Nikitin.
Afghanistan: NW: Herat: Khwajachisht, Rech. 19200! — SW: Kandahar: Arghandab, Kitam. — E: Kabul, 1800 m, Rech. 17060!, Wdb. 4322! Istalif, 1900 m, Rech. 31204! — NE: Kataghan: Kunduz, Bala Hissar, 400 m, Rech. 16075! — N: Mazar-i Sharif: Balkh, 400 m, Rech. 16156!

Distr. gen.: Europa media et australis, Asia centralis et austro-occidentalis, ceterum in terras multas introductus.

20. ***R. sanguineus*** L., Spec. Plant. 334 (1753).
Syn.: *R. condylodes* M.-B., Fl. Taur.-Cauc. 1: 288 (1808). *R. nemorosus* Schrad. ex Willd., Enum. Pl. Hort. Berol. 397 (1809).
Typus: „Hab. in Virginia" (evidenter erronee).

Perennis. Caulis 0,5—1(—1,2) m altus, erectus, gracilescens, in parte superiore tenuiter arcuato-ramosus. Folia basalia usque ad 14×6 cm, basi truncata vel rotundata, rarius subcordata, oblongo-ovata; petiolus laminam ± aequans. Folia caulina paulo minora acutiora brevius petiolata. Florum glomeruli laxiusculi, omnes valde remoti, infimi tantum foliis suffulti. Pedicelli fructiferi quam perigonium semper evidenter longiores. Valvae fructiferae 3—3,8×0,8—1,5 mm, lingulatae, integrae, anterior tantum callifera. Nux 1,6—2 mm, atrobrunnea.

Talish: Lenkoran, Hohen., C. A. Mey. Sallian, C. A. Mey.
Persia: N: Gorg.: Bandar-i Gaz, Rech. 554! Maz.: Inter Abbasabad et Shahi, 400 m, Rech. 2041! Robat-e Qozloq, Koelz 16244! Kojur: Inter Nemasieh et Zanus, 1800 m, Rech. 6549! In valle Haraz, Karehsang, 100 m, Wdb. 1520! Kalarabad, Sab. 246! Gil.: In valle Safid Rud, Buhse. Inter Rasht et Lahijan, Rech. 45!, Rech. 56! Navrud, 200—1200 m, Esfand. 6450-E!

Distr. gen.: Europa media et australis, Anatolia, Caucasus, Persia borealis.

R. sanguineus L. ist mit *R. conglomeratus* Murb. nah verwandt, unterscheidet sich jedoch von diesem konstant durch den nur im untersten Teil beblätterten Blütenstand, durch die Fruchtstiele, die immer deutlich länger sind als das Fruchtperigon, sowie dadurch, daß nur eine Valve eine deutliche Schwiele trägt.

21. ***R. obtusifolius*** L., Spec. Plant. 335 (1753).
Syn.: *Lapathum obtusifolium* Moench, Meth. 356 (1794).
Typus: „Hab. in Germania, Helvetia, Gallia, Anglia".

Perennis. Caulis 0,6—1,2 m altus, a medio arcuato-ramosus. Folia basalia usque ad 20×12 cm, e basi cordata late oblongo-ovata, latitudine ad summum duplo longiora, plana; petiolus lamina plerumque longior. Folia caulina brevius petiolata, sensim acutiora, inferiora basi cordata, superiora rotundata. Florum glomeruli plurimi remoti, infimi tantum foliis suffulti. Pedicelli fructiferi perigonio usque ad 2½-plo longiores. Valvae fructiferae forma et magnitudine in subspeciebus variis valde variabiles.

Distr. gen.: Europa regione boreali et Mediterranea exclusis, Asia occidentalis.

In regione Florae Iranicae tantum occurrit:
— — subsp. ***subalpinus*** (Schur) Čelak., Prodr. Fl. Böhm. 159 (1873). — Tab. 8, fig. 10.
Syn.: *R. daghestanicus* C. Koch, Linneae 22: 209 (1849). *R. obtusifolius* L. var. *subalpinus* Schur, Enum. Pl. Transs. 579 (1866). R. *silvester* Wallr. subsp. *subalpinus* (Schur) Simonkai, Enum. Fl. Transs. 472 (1886).
Typus: Transsilvania: Montes Arpas, Bulla, Kereszthegy, Schur.

Valvae fructiferae anguste triangulares vel triangulari-lingulatae, ± breviter paucidentatae, anterior tantum callifera.

Talish: C. A. Mey.
Persia: N: Gorg.: Inter Zarrin Gol et Abr, 1300 m, Gauba 2036! Maz.: In declivibus borealibus jugi Kandavan, 2700 m, Rech. 2115! Kojur: Inter Zanus et Kinj, 1300—1600 m, Rech. 6569! Pol-e Zanguleh, in valle fluvii Chalus, 2200 — 2600 m, Rech. 6306! — C: Tehr.: M. Tuchal, Pas Qaleh, 1300—1600 m, Aell. 604! In jugo Kandavan, 2850 m, Gilli s. n. Qazv.: Gach Sar in valle Loura, Bornm. 8118!

Distr. gen. subspeciei: Europa austro-orientalis, Asia austro-occidentalis.

22. ***R. pulcher*** L., Spec. Plant. 336 (1753).
Typus: „Hab. in Gallia, Italia, Veronae".

Perennis. Habitu variabilis. Caulis 0,2—0,6 m altus, saepe jam infra medium ramosus. Folia basalia usque ad 10×3,5 cm basi cordata, ovato-oblonga, crassiuscula; petiolus lamina brevior vel eam aequans. Folia caulina inferiora basi cordata, superiora rotundato-attenuata, brevius petiolata, acuta, in folia florum glomerulos fulcrantia transientia. Florum glomeruli omnes remoti, omnes foliis suffulti. Pedicelli fructiferi crassi, perigonio plerumque breviores, raro ± aequilongi. Valvae 4,5—6×2,5—4,5 mm, forma ac magnitudine in subspeciebus diversis valde

variabiles, subintegrae vel vario modo dentatae, plerumque omnes ± inaequaliter calliferae. Nux 3—4 mm longa, infra medium latissima.
Distr. gen. speciei: Regio Mediterranea, Europa occidentalis, Asia austro-occidentalis.

1a. Valvae integrae vel prope basin breviter denticulatae, dentibus ad summum 0,5 mm longis. Rami arcuato-divaricati. Folia basalia plerumque non panduriformia ..... subsp. *anodontus* (Haussk.) Rech. f.
b. Valvae utrinque pluridentatae, dentibus plusquam 0,5 mm longis 2
2a. Valvae suborbiculares vel ovato-triangulares, apice late acuminatae; dentes breves, utrinque usque ad 8; maculae nervaturae in utroque latere calli plerumque 3. Rami arcuato-divaricati. Folia basalia plerumque non panduriformia ..... subsp. *divaricatus* (L.) Murb.
b. Valvae anguste ovatae vel oblongae, apice lingulatae; dentes longiusculi, utrinque plerumque 4, maculae nervaturae in utroque latere calli 1—2. Rami angulato-flexuosi, saepe intricati. Folia basalia plerumque panduriformia ..... subsp. *pulcher*

— — subsp. ***pulcher***. — Tab. 8, fig. 5.
Syn.: *R. pulcher* L. subsp. *eu-pulcher* Rech. f., Beih. Bot. Centrbl. 49/2: 26 (1932); Rech. f., Candollea 12: 105 (1949).

Persia: N: Gil.: Rasht, Lipsky, Mir Kamali 6646-E! Inter Rasht et Lahijan, Rech. 58! Lahijan, Gauba 2053!, Linds. 953 p. p.! Rudbar, Buhse. In valle Shafarud, Buhse. — W: Lur.: Bisheh, Koeie 636. — C: Qazv.: Prope Karaj, 1500 m, Gauba 1085.
Turcomania: Ashkhabad, Makrowa, Sint. s. n.!

Distr. gen. subspeciei: Regio Mediterranea, Europa meridionalis et occidentalis, Asia austro-occidentalis. In multas terras alias introductus.

— — subsp. ***divaricatus*** (L.) Murb., Fysiogr. Sällsk. Handl. 2: 45 (1891); Rech. f., Beih. Bot. Centrbl. 49/2: 35 (1932); Rech. f., Candollea 12: 105 (1949). — Tab. 8, fig. 7.
Syn.: *R. divaricatus* L., Spec. Plant. ed. 2: 478 (1762).
Typus: Italia.

Iraq: Kurd.: Sul.: M. Avroman, Tawilla, 1300 m, Rech. 10231!
Persia: N: Maz.: In valle fluvii Chalus, 500 m, Rech. 1985! In valle fluvii Talar, Sorkhabad, 1400 m, Rech. 5613! — W: Lur.: Bisheh, 1200 m, Rech. 5728! Kharon, 1300 m, Koeie 1230! Bakht.: Keshvar, 800 m, Koeie 1228. — C: Tehr.: Pas Qaleh prope Tehran, 1500 m, Rech. 1121! M. Tuchal, in valle Hafthauz, 1300 m, Aell. 606!, 608!, 616! Qazv.: Kuh Dashteh prope Karaj, Vardeh, 1600 m, Rech. 748! Aliabad prope Karaj, Gauba 2054!

Distr. gen. subspeciei: Asia austro-occidentalis. Regio Mediterranea praecipue meridionalis. In terras nonnullas alias introductus.

— — subsp. ***anodontus*** (Haussk.) Rech. f., Beih. Bot. Centrbl. 49/2: 34 (1932); Rech. f., Candollea 12: 106 (1949). — Tab. 8, fig. 6.
Syn. *R. pulcher* L. var. *anodonta* Haussk., Mitt. Thür. Bot. Ver. N. F. 1: 34 (1891).
Typus (Syntypi): Graecia: Volos, Haussk., Iraq: Darband-i Bazian, Haussk., JE!

Iraq: Kurd.: Arbil: Inter Dukan et Mirza Rostam, 1200 m, Rech. 11934! Kuh Safin prope Shaqlawa, 1200 m, Bornm.! Mosul: 86 km N Mosul, Rech. 10631! Kirkuk: Dar-

band-i Bazian, Hausskn.! Sul.: W Sulaymaniyah, 700 m, Rech. 10068! W Penjwin, Rech. 12331!

Persia: N: Maz.: In valle Haraz, Panjab, 1000 m, Wdb. 1633-b! Gorg.: Inter Naudeh et Gorgan, Rech. 5513! — W: Bakht.: Chashmehghirin, Koelz 15297! — S: Fars.: Shiraz, 1600 m, Koelz 17557! Ad fluvium Safid Rud prope Shapur, Stapf 2058! — C: Qazv.: Kuh Dashteh prope Karaj, Vardeh, 1600 m, Rech. 771!

Distr. gen. subspeciei: Asia austro-occidentalis, Africa borealis, raro in parte europaea Regionis Mediterraneae.

23. ***R. alveolatus*** Los., Fl. Turkmen. 2: 44 (1937).

Syn.: *R. foveolatus* Los., Fl. URSS. 5: 717 (1936) non Hochst. (1845). *R. Losinskajae* Rech. f., Feddes Repert. 48: 164 (1940).

Typus: Kopet Dagh, Ali Dere, Bobrov, LE!

Perennis. Caulis usque ad 1 m altus, validus, a medio circiter ramosus. Folia basalia 15—20×8—10 cm, plana, e basi cordata oblongo-ovata; petiolus lamina brevior vel eam subaequans. Folia caulina inferiora basalibus similia sed brevius petiolata, superiora sensim longiora acutiora. Florum glomeruli omnes plerumque remoti, inferiores et medii foliis suffulti. Pedicelli fructiferi crassi, perigonia ± aequantes. Valvae fructiferae dentibus exclusis 8×7 mm, e basi truncata vel subcordata rotundato-triangularia vel late ovata, utrinque irregulariter multi-(8—14)-dentatae, facie crasse reticulato-nervosae, inaequaliter calliferae. Nux ±5 mm longa, infra medium latissima, atrobrunnea.

Persia: N: Gorg.: Inter Zarrin Gol et Abr, Gauba 2037! Maz.: E Gaduk, 2300 m, Aell. 643! Inter Gaduk et Abbasabad, 1800 m, Rech. 1979! Gaduk, 2150 m, Behb. 5767-E! In declivibus borealibus jugi Kandavan, 2600 m, Rech. 6756! In valle fluvii Talar: Sorkhabad, 1400 m, Rech. 5605! Pol-e Zanguleh, 2200—2600 m, Rech. 6349! Gil.: Gilan, Linds. 953! — E: Khor.: Inter Bojnurd et Tappeh-ye Moraveh, Rech. 1918! — C: Tehr.: M. Tuchal in valle Hafthauz, 1500 m, Aell. 607! Inter Reneh et Damavand, 2640 m, Gilli s. n.

Turcomania: M. Kopet Dagh centr., Fedtsch. 578! Ajdere, Bobrov.

Afghanistan: N: Mazar-i Sharif: In faucibus 21 km SE Tashkurghan versus Haibak, 600 m, Rech. 34031! — NE: Kataghan: Kunduz, Rech. 16022! Baghlan, Volk 788! Doshi, 850 m, Rech. 16533! Badakhshan: Takhar: Ishkamish, 1100 m, Podlech 10685! — C: Deh Kundi: In declivibus australibus jugi Waras, 2400 m, Rech. 36716!

Pakistan: Swat: Ad ripas fluvii Swat prope Mingora, 900 m, Rech. 30669! — Peshawar: Inter Pabbi et Peshawar, 300 m, Rech. 30269!

Distr. gen.: Endem.

R. alveolatus schließt sich durch die relativ kurzen, dicken Fruchtstiele zunächst dem polymorphen Formenkreis des *R. pulcher* und zwar subsp. *divaricatus* an, ist aber durch die folgenden Merkmale spezifisch verschieden: große, breite, fast an *R. obtusifolius* erinnernde Grundblätter, fast doppelt so große Fruchtperigone mit viel reicher gezähnten Valven und größeren Nüßchen. Durch die derben, kurzen Fruchtstiele und die dicken, derbnetzig-grubigen Valven ist *R. alveolatus* von *R. chalepensis* leicht zu unterscheiden.

24. ***R. chalepensis*** Miller, Gard. Dict. ed. 8 no. 11 (1768). — Tab. 8, fig. 9.

Syn.: *R. denticulatus* C. Koch, Linnaea 22: 208 (1849) non Campd. (1891). *R. syriacus* Meisn. apud DC., Prodr. 14: 53 (1856); Rech. f., Feddes Repert. 38: 52 (1935). *R. dictyocarpus* Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 192 (1860); Rech. f., Feddes Repert. 27: 385 (1930); Rech. f., Beih. Bot. Centrbl. 49/2: 65 (1932). *R. obtusifolius* Boiss., Fl. Or. 4: 1011 (1879) p. p. non L. (1753)

R. turkestanicus O. Paulsen, Bot. Tidskr. 29: 154 (1909); *R. Drobovi* E. Korov., Opred. Rast Okr. Taschkent 154 (1924) fide Losinskaja, Fl. URSS. 5: 477 (1936). Typus: Aleppo, BM!

Perennis. Caulis (20)40—120 cm altus, in dimidio superiore arcuato-ramosus. Folia basalia usque ad 20×8 cm, e basi cordata oblonga vel oblongo-ovata, plana; petiolus lamina tertia circiter parte brevior. Folia caulina inferiora basalibus similia sed brevius petiolata, superiora basi truncata vel cuneata, sensim decrescentia, angustiora acutiora et brevius petiolata. Florum glomeruli omnes remoti, inferiores foliis suffulti. Pedicelli fructiferi tenues, perigonio usque ad duplo longiores. Valvae fructiferae 5 (—7)×5—6 mm, rotundato-cordatae, apice obtusae vel acutiusculae, margine utrinque ± breviter inaequaliter 4—9-dentatae, facie tenuiter subaequaliter reticulato-nervosae, plerumque inaequaliter calliferae. Nux 3 mm longa, paulo infra medium latissima, brunnea.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1315! Maz.: Sorkhabad in valle fluvii Talar, 1400 m, Rech. 5620! In valle Haraz, Panjab, 1000 m, Wdb. 1633-a! Inter Pol-e Zanguleh et Kamarband, Rech. 6424! Gil.: Lahijan, Linds. 953 p. p.! — W: Azerb.: Qareh Dagh prope Iri, Buhse! Tabriz, Gill. Sm. 1661!, 2170! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 101! Lur.: Dow Rud, 1600 m, Koelz 15735! — S: Kerm.: Kerman, 1700 m, Rech. 2947!, 1900 m, Bornm.! Bam, in palmetis, 900 m, Rech. 3628! M. Jebal Barez, Deh Bakri, 2100 m, Rech. 3700! M. Laleh Zar, Shirinak, 2900 m, Bornm.! Kuh-e Jupar, 3000 m, Bornm.! Fars.: Kuh Bamu prope Shiraz, Stapf 1056! Aspas, Stapf 2057! Shiraz, 1600 m, Grant 17564!, 17706! Sivand, 1400 m, Pravitz 718! Bal.: M. Taftan, prope Sangan, 1600 m, Rech. 4053! — E: Khor.: Inter Birjand et Torbat-e Heydariyeh Manuch. 5770-E! Inter Robat-i Safid et Torbat-e Heydariyeh, Rech. 1573! M. Hazar Masjed: Ardak, 1200 m, Rech. 5229! Talqur, 1600 m, Rech. 5200! Inter Mashhad et Chanaran, 1100 m, Rech. 4677! Mashhad, 1000 m, Rech. 4848! Inter Mashhad et Fariman, 1300 m, Rech. 1362! Inter Neyshabur et Mashhad, Sharifabad, 1300 m, Rech. 1351! N Dasht-e Kavir: Hizomeh, 1200 m, Gabr. 45! — C: Tehr.: Shimran prope Tehran, 1200 m, Pravitz 162!, 263! Inter Tehran et Firuzkuh prope Jaban, 2200 m, Rech. 1149! Tehran, Bruns! Shahr Rey, Bruns. Damavand, 2640 m, Gilli. Ferosad, 1800 m, Bornm.! Varamin, Manuch. 5769-E! Inter Tehran et Karaj, Rech. 2180! Qazv.: Gach Sar, 2200 m, Bornm.! Karaj, 1400 m, Rech. 815!, Gauba 2049! Vessieh, 1600 m, Rech. 412! Qom, Cowan & Darlington 827! Damgh.-Semn.: Qomrud Pain, 60 km E Firuzkuh, Aell. 605! Shahr.-Bust.: Shahrud, Bge! M. Shahvar, Dihi, 2500 m, Rech. 5919!
Turcomania: Ashkhabad, Kuntze, Sint.! Kizyl-Arvat: Kara Kala, M. Sundsodagh, Sint.!
Afghanistan: N: Mazar-i Sharif: Balkh, 400 m, Rech. 16157! Inter Chashmeh-i Shafal et Akupruk, 800 m, Rech. 16261! — NW: In valle Hari Rud, Aitch. 438! Herat, Amsel s. n.! — SE: Kandahar, Linds. 813! Tshilsina, Kerst. 334! — E: Kabul: 20 im E Gulbahar, 1700 m, Rech. 35971! Pul-i Charkhi, 1800 m, Rech. 36830! Guzar Gah, Neub. 51/150! Inter Dehmazang et Guzar Gah, 1770 m, Gilli 2233! Charasiah, 1740 m, Gilli 2232! Karte Char, 1780 m, Gilli 2236! Kabul, 1800 m, Volk 58!, Akhtar s. n.! Gilli 2234!, 2235!, Rech. 16889!, Wdb. 2956!, Honigberger! Khotshe Mullah, Neub. 50/303! Band-e Kargha, 2000 m, Rech. 31232! In valle Nijrao, Bagram, 2900 m, Neub. 51/244! In valle Logar, Johnston! Khudi Khel, 2100 m, Koelz 11543-b. Ghazni: Sang-i Masha, 2500 m, Rech. 17459! Ghazni, 2200 m, Rech. 17308! Jaji: Inter Dre Kalla et Qasim Khel, Rech. 32291! — C: Ghorat: Sar-i Naorak, 2480 m, Rech. 18938! — Afghanistan, Griff.! Rashid, 650 m, Oldrich s. n.!
Pakistan: Chitral: Toppin 327! — Kurram: Shalozan, Aitch. 302! Parachinar, 1800 m, Afendi 215! — Bal.: Stocks 396! In valle Hanna, Lace 3790!

Distr. gen.: Syria, Armenia, Transcaucasia, Persia, Afghanistan, Pakistan, Turcomania, Chitral, Kashmir, Sina, Manchuria.

25. ***R. nepalensis*** Spreng., Syst. Veg. 2: 159 (1825). — Tab. 8, fig. 8.
Syn.: *R. hamatus* Trevir., Nov. Act. Nat. Cur. 13: 1402 (1830) p. p. *R. peregrinus* Boiss., Diagn. Pl. Or. Nov. Ser. 1,5: 46 (1844).
Typus: Nepal.

Perennis. Caulis 0,6—1,7 m altus, in dimidio superiore arcuato-ramosus. Folia basalia usque ad 18×10 cm, e basi cordata raro truncata oblongo-ovata, plana; petiolus laminam subaequans. Folia caulina inferiora basalibus similia sed brevius petiolata, superiora e basi truncata vel rotundata lanceolata acuta, breviter petiolata. Florum glomeruli omnes remoti, inferiores tantum foliis suffulti. Valvae fructiferae 5—7×2,5—4 mm, ovato-triangulares, apice linguiformi-productae, plerumque anterior tantum callifera, utrinque 6—8-dentatae; dentes jam paulo post florendum evoluti, fructificationis tempore 3—4 mm longi, apice hamato-incurvi. Nux ±4 mm longa, infra medium latissima, atrofusca.

Persia: N: Gorg.: Bandar-i Gaz, Sint.! Maz.: Lajim, Tregubov 189!
Afghanistan: E: Paghman, Begtut, 2900 m, Gilli 2238! Paghman, 2500 m, Koelz 12064!, Volk 2128!, Rech. 17124; 2900 m, Wdb. 5064!; 3100 m, Wdb. 4412! Panjshir: In valle Porandeh, 2800 m, Gilli 2237! Mukeni, 2500 m, Wdb. 5152! Nuristan: Gusalak, Edelb. 1504!, 1541!, 1542! Nishai, Edelb. 796! Chetras inter Seprigal et Wama, Kitam. — Khelenmargh, 3500 m, Neub. s. n.!
Pakistan: Chitral: Ziarat, in jugo Lowarai, 2100 m, Stainton 2545! Shishi, 2850 m, Bowes Lyon 154! Moiga, Gatrace, Chitral Rel. Exp.! Swat: Inter Khwazakhiela et Shangla, 1900 m, Rech. 30628! Kalam, 2200 m, Rech. 19456! — Kurram: Kaiwas, Aitch. 705!

Distr. gen.: Sina austro-occidentalis, montes Himalaya, Pakistan, Afghanistan, Persia borealis, Anatolia et in locis disjunctis montium Nilghiri, insulae Java et Europae peninsularum Balcanicae et Apenninicae.

R. nepalensis ist von allen übrigen im Bereich der Flora Iranica vorkommenden Arten durch die an der Spitze hakig gekrümmten Zähne der Valven leicht zu unterscheiden.

26. ***R. dentatus*** L., Mantissa Alt. 226 (1771).
Typus: Aegyptus.

Annuus. Caulis 0,2—0,7 m altus, simplex vel ramosus; rami erecto- vel arcuato-patentes. Folia basalia 8—10×4—5 cm, e basi truncata rarius subcordata oblonga vel ovato-oblonga, infra medium interdum panduriformi-contracta; petiolus lamina brevior vel eam aequans. Folia caulina sensim decrescentia, brevius petiolata, angustiora, acutiora. Florum glomeruli omnes remoti vel summi contigui, omnes foliis lanceolatis acutis suffulti sed folia summa glomerulos haud superantia. Pedicelli fructiferi rigiduli, perigonio plerumque longiores. Valvae fructiferae forma ac magnitudine in subspeciebus variis valde variabiles. Nux 2—2,75 mm longa, infra medium latissima.

Persia: S: Bal.: Gasht, Blatt. & Hallb. SW Sib, Blatt. & Hallb.
Afghanistan: SW: Herat: Tirphul, Aitch. 438.
Pakistan: N. Wazir.: Miram Shah, Blatt. & Fz. — S. Wazir.: Kaniguram, Duthie 15767. Tank, Williams 7203. — Bal.: Makran: Nag W Kola NE Turbat, 700 m, Hotson M 243. Khudabadan N Panjgur, Hotson M-196. — Baluchistan, Lace.

Distr. gen. speciei: Asia tropica et subtropica, Africa borealis, Europa austro-orientalis.

1a. Dentes latitudinem valvarum aequantes vel superantes; valvae (4—) 5 mm longae 2

b. Dentes latitudine valvarum breviores vel eam ad summum aequantes; valvae 3—4 mm longae 3
2a. Valvae omnes calliferae, nervatura valvarum valida subfoveolata; dentes valvarum validi divaricati, basi non dilatati .. subsp. *mesopotamicus* Rech. f.
b. Valva unica tantum callifera; nervatura valvarum tenuis; dentes valvarum tenues, basi dilatati ..... subsp. *reticulatus* (Bess.) Rech. f.
3a. Valvae ±3 mm latae, ambitu triangulares, dentibus ad summum 3 mm longis validis, nervatura valida ..... subsp. *Halácsyi* (Rech.) Rech. f.
b. Valvae ± 2,5 mm latae, ambitu rotundato-triangulares, dentibus ad summum 2 mm longis tenuioribus; nervatura tenuior ..... subsp. *Klotzschianus* (Meisner) Rech. f.

— — subsp. ***Klotzschianus*** (Meisner) Rech. f., Beih. Bot. Centrbl. 49/2: 19 (1932). — Tab. 8, fig. 1.
Syn.: *R. Klotzschianus* Meisner in DC., Prodr. 14: 57 (1856).
Typus: „E Nepalia: In horto botanico berolinensi Chamissonis tempore cultus" B, †!

Persia: S: Kerm.: Tomagoa, Koelz 14336!
Afghanistan: N: Mazar-i Sharif: Balkh, 400 m, Rech. 16155! — SE: Kandahar, Kitam. In alveo fluvii Helmand prope Qala Bist, 800 m, Rech. 34722! Ad. fl. Helmand inter Mianpushta et Safer, 800 m, Rech. 34586! — E: Kabul, 1800 m, Volk 1935!, Honigberger! Nuristan: Chigha Sarai, 820 m, Gilli 2240! Barikot, 850 m, Gilli 2241! Papruk, Edelb. 1592! — NE: Kataghan: Kunduz. 400 m, Rech. 16050!, 16071! — C: Bamian: Doab, Volk 2701!, 2726! Inter Bulola et Doab, Kitam. — Afghanistan, Griff. 1699!
Pakistan: Swat: Ad ripas fluvii Swat prope Mingora, Rech. 30674! Peshawar: Inter Attock et Kushalgarh, 500 m, Rech. 30430! Landi Kotal, 1000 m, Rech. 30304! Peshawar, Kerst. 2175! Kohat: Inter Kohat et Thal, Rech. 30234! — Quetta: „Guilistan", Kitam. Dera Ismail Khan ad Indus fluvium, Rech. 30016! — Sind: 20 NW Sukkur versus Shikarpur, Rech. 28487! In inundatis inter Amri et Laki, Rech. 28686!

Distr. gen. subspeciei: Sina, India, Pakistan, Afghanistan, Persia australis.

— — subsp. ***Halácsyi*** (Rech.) Rech. f., Beih. Bot. Centrbl. 49/2: 16 (1932). — Tab. 8, fig. 3.
Syn.: *R. Halácsyi* (*limosus* × *pulcher*) Rech., Verh. Zool. Bot. Ges. Wien 49: 105 (1899). *R. pulcher* L. var. *macrodon* Haussk., Mitt. Thür. Bot. Ver. N. F. 1: 34 (1891) p. p.
Typus: Thessalia: Trikkala, Formanek, W!

Talish: Sallian, Prilipko! Lenkoran, Koenig!
Persia: N: Maz.: In litore caspico inter Babol Sar et Now Shahr, Rech. 2094! Sorkhabad in valle fluvii Talar, Rech. 5623! Gil.: Astara, Cowan & Darlington 1712! Bandar-e Pahlavi, Pravitz 863! — S: Kerm.: Jiroft, Sabzvaran, 700 m, Rech. 3846-a! Bal.: Khash, Sohrabad, Mirzayan 456-E! Makran: Biaban: Sirik, Behb. 462-E! — E: Sistan: Zabol, 700 m, Rech. 7292! Neyzak, Shar. 5778-E! Khor.: Bojnurd, Rech. 1786! Inter Shirvan et Bojnurd, Rech. 1846! — C: Shahr.-Bust.: Khash Aylan, 70 km E Shahrud, Rech. 5470!
Turcomania: Ashkhabad, Kuntze!, Alm!, Sint.!, Bornm.!, Litw.! Kizyl Arvat, Kara Kala, ad ripas fluvii Sumbar, Sint.!

Distr. gen. subspeciei: Asia centralis et occidentalis, Europa austro-orientalis.

— — subsp. ***reticulatus*** (Bess.) Rech. f., Beih. Bot. Centrbl. 49/2: 18 (1932). — Tab. 8, fig. 4.

Syn.: *R. reticulatus* Bess., Ind. Sem. Hort. Kremen. 1820. *R. dentatus* L. var. *pleiodon* Boiss., Fl. Or. 4: 1013 (1879) p. p. *R. strictus* Link, Enum. Hort. Berol. 350 (1821) p. p.

Typus: Planta quaedam culta.

Iraq: Mosul, Noë! Mosul versus Baghdad, Olivier!

Talish: Kisilagach, Hohen. Lenkoran, Hohen. Astara, Hohen.

Persia: C: Yazd, Buhse.

Distr. gen. subspeciei: Asia centralis et occidentalis, Europa orientalis. Raro in Europam occidentalem introductus.

— — subsp. ***mesopotamicus*** Rech. f., Beih. Bot. Centrbl. 49/2: 15 (1932). — Tab. 8, fig. 2.

Syn.: *R. dentatus* L. var. *pleiodon* Boiss., Fl. Or. 4: 1013 (1879) p. p. *R. dentatus* Haussk., Mitt. Thür. Bot. Ver. N. F. 1: 34 (1891) p. p. *R. pulcher* L. var. *macrodon* Haussk. p. p., l. c.

Typus: Baghdad, Haussk., W †.

Iraq: Kurd.: Mosul: Ain Kebrit, 250 m, Hand.-Mzt. 1183! Niniveh, 250 m, Bornm. — Diyala: Inter Baghdad et Khanaqin, Rech. 2153! — „Tigris Plain", 240 m, Low 337. Persia: W: Bakht.: Gatvand, Mart.-Escal. Khuz.: Khorramshahr, Koelz 1231! Ahvaz, Koelz 14971! Abadan, Gauba s. n.! In planitie fluvii Dez 7 km E Haft Tappeh, Bent & Wr. 427—104! — S: Lar.: Bandar Abbas, Berentin, Sarkiman 5772-E!

Distr. gen. subspeciei: Persia australis, Mesopotamia, Syria, Palaestina, insula Cyprus, Aegyptus. Raro introductus in Europam borealem et occidentalem.

Rumex -Hybriden

1. ***R. alveolatus*** × ***chalepensis; R. promiscuus*** Rech. f., Österr. Bot. Zeitschr. 97: 124 (1950).

Syn.: *R. chalepensis* × *Losinskajae* Rech. f., l. c.

Persia: N: Maz.: Sorkhabad in valle fluvii Talar, inter parentes, 1400 m, Rech. 5622-a!

2. ***R. alveolatus*** × ***crispus; R. sorkhabadensis*** Rech. f., Österr. Bot. Zeitschr. 97: 126 (1950).

Persia: N: Maz.: Sorkhabad in valle fluvii Talar, 1400 m, inter parentes, Rech. 5621! Pol-e Zanguleh in valle fluvii Chalus, 2200 m, Rech. 6307-a! Gil.: Ispili, Yelah, Linds. 1330!

Afghanistan: NE: Kataghan: Kunduz, Bala Hissar, 400 m, inter parentes, Rech. 16076!

3. ***R. alveolatus*** × ***dentatus*** subsp. ***Klotzschianus; R. pakistanicus*** Rech. f., nov. hybr.

Typus: Rech. 30673, W!

Habitu valido et ramis longis arcuato-divaricatis et nervatura valvarum *R. alveolato* similis a quo autem differt: Pedicellis partim quidem longioribus tenuioribus, valvis angustioribus acutioribus partim quidem longioribus. A *R. dentato* subsp. *Klotschiano* differt habitu validiore, ramis magis arcuatis, valvis majoribus imprimis latioribus et distinctius reticulatis; ceterum inter parentes intermedius.

Pakistan: Swat: Ad ripas fluvii prope Mingora, inter parentes, 3. VI. 1965, Rech. 30673! — Peshawar: In paludosis inter Pabbi et Peshawar, 300 m, Rech. 3268!

4. ***R. alveolatus*** × ***pulcher*** subsp. ***divaricatus; R. subdubius*** Rech. f., Österr. Bot. Zeitschr. 97: 126 (1950).

Persia: N: Maz.: Sorkhabad in valle fluvii Talar, 1400 m, inter parentes, Rech. 5622-b!

5. ***R. chalepensis*** × ***crispus; R. Griffithii*** Rech. f., Candollea 12: 143 (1949). Syn.: *R. crispus* × *dictyocarpus* Rech. f., Beih. Bot. Centrbl. 49/2: 112 (1932).

Persia: N: Maz.: Sorkhabad in valle fluvii Talar, inter parentes, 1400 m, Rech. 5606! — E: Khor.: Inter Mashhad et Chanaran, 1100 m, inter parentes, Rech. 4679!
Afghanistan: E: Kabul: 20 km E Kabul versus Tang-e Gharu, 1800 m, Wdb. 4256! Ghazni: In fossis 10 km N Ghazni, inter parentes, 2200 m, Rech. 17309!

6. ***R. chalepensis*** × ***dentatus*** subsp. ***Halácsyi; R. talaricus*** Rech. f., Österr. Bot. Zeitschr. 97: 124 (1950).

Persia: N: Maz.: Sorkhabad in valle fluvii Talar, inter parentes, 1400 m, Rech. 5611!

7. ***R. chalepensis*** × ***Patientia; R. exspectatus*** Rech. f., Österr. Bot. Zeitschr. 97: 125 (1950).

Persia: C: Shahr.-Bust.: Dihi in declivibus australibus M. Shahvar supra Nokarman, inter parentes, 2500 m, Rech. 5920!

8. ***R. chalepensis*** × ***thjanschanicus; R. khorasanicus*** Rech. f., Österr. Bot. Zeitschr. 97: 125 (1950).

Persia: E: Khor.: M. Hazar Masjed, Talqur, 1600 m, inter parentes, Rech. 5218! Kuh-e Neyshabur infra Akhlamad, 1200—1600 m, Rech. 4580!

9. ***R. conglomeratus*** × ***crispus; R. Schulzei*** Haussk., Mitt. Geogr. Ges. Thüring. 3: 68 (1885).

Iraq: Arbil: Hajji Omran, 1700 m, Rech. 15882!

10. ***R. conglomeratus*** × ***dentatus*** subsp. ***Klotzschianus; R. oryzetorum*** Rech. f., nov. hybr.
Typus: Rech. 16072, W!

Differt a *R. conglomerato* valvis dentatis, plurimis majoribus imprimis latioribus; differt a *R. dentato* subsp. *Klotzschiano* valvis minoribus, brevius et magis irregulariter dentatis, ab ambobus parentibus valvis valde irregulariter evolutis, pedicellis longitudine valde inaequalibus, nucibus plurimis sterilibus. — Planta inter parentes exacte intermedia.

Afghanistan: NE: Kataghan: Kunduz, ad fossas oryzetorum, inter parentes, V. 1962, 400 m, Rech. 16072!

11. ***R. crispus*** × ***dentatus; R. accessorius*** Rech. f., Candollea 12: 144 (1949).

Persia: E: Khor.: Inter Mashhad et Chanaran, 1100 m, Rech. 4678-b!
Afghanistan: C: Doab, Volk 2148!

An der persichen Pflanze ist *R. dentatus* subsp. *Halácsyi*, an der afghanischen *R. dentatus* subsp. *Klotschianus* als Elternart beteiligt.

12. ***R. crispus*** × ***nepalensis; R. remotiflorus*** Samuelsson in Hand.-Mzt., Symb. Sin. 7: 167 (1929).
Afghanistan: E: Kabul: Paghman, Volk 2183!, Gilli 2239!

13. ***R. crispus*** × ***obtusifolius*** subsp. ***subalpinus.***
Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2700 m, Rech. 2108!, 6757! Pol-e Zanguleh in valle fluvii Chalus, Rech. 6307-b!

14. ***R. crispus*** × ***Patientia; R. confusus*** Simonkai, Termesz. Füz. 1: 238 (1877) p. p.
Persia: N: Maz.: Kojur, inter Zanus et Kinj, 1300—1600 m, Rech. 6573-a!

15. ***R. crispus*** × ***pulcher; R. pseudopulcher*** Haussk., Mitt. Thür. Bot. Ver. N. F. 11: 60 (1897).
Persia: W: Lur.: Bisheh, 1100 m, Koelz 1232!

16. ***R. obtusifolius*** subsp. ***subalpinus*** × ***sanguineus.***
Persia: N: Maz.: Kojur, inter Zanus et Kinj, 1600 m, Rech. 6568!

3. *Oxyria*

Oxyria Hill, Veg. Syst. 10: 24 (1765).

Herba perennis. Folia plurima basalia reniformia. Perianthii segmenta quattuor dicyclica, interiora sub fructificatione accrescentia, non tuberculata. Stamina 6. Stigmata 2. Fructus lenticularis, late alatus.

1. ***O. digyna*** (L.) Hill, Hort. Kew. 15 (1768).
Syn.: *Rumex digynus* L., Spec. Plant. 337 (1753).
Typus: „Hab. in alpibus Lapponicis, Helveticis, Wallicis".

Planta glabra usque ad 25—40 cm alta. Folia 1—3 cm longa, plurima basalia, reniformia, longe petiolata. Inflorescentia pauciramosa, aphylla. Pedicelli filiformes, in medio circiter articulati, basin perigonii versus incrassati. Perigonii segmenta exteriora patentia vel reflexa, interiora appressa.

Iraq: Arbil: Algurd Dagh, 3000—3800 m, Rech. 11867! M. Qandil, 3500 m, Rech. 11824!
Persia: N: Maz.: Shahzadeh Kuh, 2900 m, Gauba 2040! M. Alamut, Auch. 5279. Hazarchal 4000—4100 m, Bornm. 8112. Persia borealis Ky. 495. — W: Azerb.: M. Sahand prope Isperechan, Knapp. — C: Tehr.: M. Damavand, 3000—3300 m, Buhse 564. Prope Reneh, 3800—400 m, Gilli s. n.! Qazv.: Junesar in valle Loura, 2600—2700 m, Bornm. 8113.
Afghanistan: E: Kabul: In valle Bagram, 2000 m, Neub. 4509! In valle Nijrao, 3000 m, Neub. 1951/303! Paghman: Hauz-e Chas, 4200 m, Thesiger 221! Inter Hauz-e Chas et Shakar Darreh, 2800—3800 m, Gilli 2219!, 2220! Paghman, 2700 m, Koelz 12112!; 3500—4000 m, Volk 923!, Neub. 730! Paghman versus lacum, 4000 m, Wdb. 5071! E Kotal-i Kotandar, 3980 m, Gilli 2221! In jugo Unai: Kuh-i Qhalandaran, 3400 m, Wdb. 4517!, 2900 m, Volk 1633! Panjshir: In valle Porandeh, 2800 m, Gilli 2218! Darreh Rastagal, 3800 m, Wdb. 5214! Nuristan: Munui in valle Kulam, 2150 m, Kerst. 1050! Pashki, Edelb. 996!, 998!, 1336!, Kitam. Eshtaway, Kitam. Trokikorl, Kitam. — NE: Wakhan: In valle Futur, 4300 m, Roemer 67! Badakhshan: Ad lacum Shiva, Lindb. 726! In parte superiore vallis Anjuman, 3400 m, Podlech 12388! Kataghan: Takhar:

Khost-o Fereng, in valle Echani, 3800 m, Podlech 11824! — C.: Bamian: Kuh-i Baba 4050 m, Gilli 2222! In jugo Lorinj, 3000 m, Koelz 13755!
Pakistan: Chitral: Sora Lasht, Bowes Lyon 1102! Ojor Gol S Tirich Mir, 2850 m, Stainton 2737! Madaklasht, 2100 m, Bowes Lyon 628! Barum Gol, Och Anzog, 3600 m, Wdb. s. n.! Zapotili, 3600 m, Wdb. s. n.! — Swat: In valle Jabba E Kolalai, 2200 m, Rech. 30739! Inter Paloga et Mahodan, 2450 m, Honda 79. Inter Diwan Gol et Pichar, 4100 m, Ogino 147. — Kurram: Shend Toi versus Seratigah, 3000—3900 m, Aitch.!

Distr. gen.: In regionibus arcticis et subarcticis Europae, Asiae et Americae, in regionibus australioribus monticola.

4. *Rheum*

Rheum L., Spec. Plant. 371 (1753).

Lit.: A. S. Losina-Losinskaya, Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 3: 67 (1936).

Herbae validae pingues rhizomate crasso. Folia magna, palmato-costata. Ochreae laxae, persistentes, non ciliatae. Flores hermaphroditi, paniculati. Perianthii segmenta 6, libera, aequalia, maturitate non accrescentia. Stamina 9. Stigmata 3, subsessilia. Fructus membranaceo-trialatus.

Unsere Bearbeitung stützt sich vorwiegend auf die Bearbeitung von Losina-Losinskaya, l. c. Da uns nur spärliches Material zur Verfügung stand, ist vorliegende Arbeit bis zu einem gewissen Grad als provisorisch zu betrachten.

1a. Inflorescentia spiciformis, indivisa ..... 8. *R. spiciforme* Royle
b. Inflorescentia ramosa 2
2a. Caulis foliatus, elatus, ad summum 150 cm altus .....
..... 1. *R. Wittrockii* Lundstr.
b. Caulis scapiformis, aphyllus, rarius 1—2-foliatus, ad summum 100 cm altus 3
3a. Folia lobata. Indumentum in parte inferiore villosum .....
..... 9. *R. platylobum* Rech. f.
b. Folia non lobata. Indumentum numquam villosum 4
4a. Caules floriferi nani, ad summum 30 cm alti. Folia stellato-papillosa ....
..... 6. *R. persicum* Los.
b. Caules floriferi plerumque quam 30 cm multo elatiores. Folia papillosa vel verrucosa vel glabra sed numquam stellato-papillosa 5
5a. Fructus ad summum 17 mm longus 6
b. Fructus ultra 17 mm longus 7
6a. Pedicelli ultra 5 mm longi. Fructus cordato-ovoideus; nervus marginalis a margine paulo remotus. Folia papilloso-scabra ..... 5. *R. Ribes* L.
b. Pedicelli 3—4 mm longi. Fructus ± orbicularis, basi et apice emarginatus; nervus marginalis a margine laterali 2 mm remotus. Folia ± velutina ...
..... 2. *R. tibeticum* Maxim. ex Hook.
7a. Fructus latitudini aequilongus. Phylla perigonii 4 mm longi .....
..... 4. *R. rupestre* Litw. ex Los.
b. Fructus longior quam latus. Phylla perigonii 3 mm longi 8
8a. Pedicelli prope basin articulati, fructiferi ±15 mm longi. Fructus nervo marginali obsoleto, a margine vix 1 mm remoto... 7. *R. Maximowiczii* Los.
b. Pedicelli paulo infra medium articulati, fructiferi ad summum 7 mm longi. Fructus nervo marginali manifesto, a margine ±2 mm remoto .....
..... 3. *R. turkestanicum* Janisch

1. ***R. Wittrockii*** Lundstr., Acta Horti Berg. 5: 23 (1914).
Icon.: Acta Horti Berg., fig. 4 et 5 (1914).
Typus: Turkestan, Taschkent.

Planta glabra. Caulis elatus, ad summum 150 cm altus, foliatus. Ochreae magnae, usque ad 60 mm longae. Folia inferiora petiolata, petiolus lamina semper multo longior, lamina 40×30 cm; folia caulina multo minora; omnia ovata, acuta, basi cordata, margine obsolete undulata, in vivo nitida, nervis principalibus 5 prominentibus. Inflorescentia paniculata, densiflora. Phylla perigonii ±2 mm longa; pedicellus 3—6 mm longus, in quarta circiter parte inferiore articulatus. Fructus longitudine latior 13×15 mm; alae latae, basi cordatae; pedicellus fructu subaequilongus.

Pakistan: Chitral: Drosh, 3500 m, Bowes Lyon 194!

Distr. gen.: Chitral, Pamir-Alaj, Tien Shan, Altai.

Zum Unterschied von der Originalbeschreibung von Lundström sind die Blätter am Rand nicht mit roten Papillen besetzt und die Ochreen sind kürzer als angegeben.

2. ***R. tibeticum*** Maxim. ex Hook., Fl. Brit. Ind. 5: 56 (1890).
Typus: Zanskar, Thoms., K.

Caudex crassus, ochreis emarcidis dense obsitus. Planta ad summum 60 cm alta. Scapi 1—5, erecti, glabri vel laxe papillosi, inflorescentiam ± conicam formantes. Folia plerumque 1—3, breviter petiolata; petiolus 5—15 cm longus, lamina 8—35×11—30 cm, obtuse cordata rarius longitudine paulo latior, consistentia crasse coriacea, nervis 3—5 primariis valde prominentibus, margine integra vel subcrenata, undulata, supra glabra vel interdum sparse papillosa, subtus imprimis secus nervos dense reticulatos valde prominentes dense papillosa. Phylla perigonii 2—3 mm longa; pedicelli 3—4 mm longi, infra medium saepe basin versus articulati, fructiferi vix elongati rarius usque ad 7 mm longi. Fructus 10—16 mm diam., ± orbicularis, basi et apice emarginatus, alae latitudine seminis subduplo latiores; nervus marginalis manifestus, a margine 2 mm remotus, apice in marginem excurrens.

Afghanistan: E: Panjshir: Basarak, Neub. 1950/302! Nuristan: Papruk, in pratis paludosis, 3000—3400 m, Kerst. 1420! Pashki, 3150 m, Edelb. 973! Nuristan, Edelb. 1680! — NE: Wakhan: Qazi Deh, 3200 m, Roemer 172! Badakhshan: Mian Kuh, Lindb. 1959/721!
Pakistan: Chitral: Tirich Mir, Bomosto, Kerst. F-210! Shokor Shal, 3500 m, Wdb. s. n.! Barum, 3600 m, Stainton 2778!

Distr. gen.: Afghanistan, Wakhan, Chitral, Kashmir, Tibet occidentalis.

3. ***R. turkestanicum*** Janisch in Sched. Herb. Fl. Ross. 8: 92 Nr. 2570 (1922).
Syn.: *R. tataricum* Aitch. & Hemsl., Trans. Linn. Soc. 3: 106 (1888—94), non L. (1781).
Icon.: Sched. Herb. Fl. Ross. 8 tab. 6 (1922). Act. Inst. Bot. Acad. Sci. URSS. Ser. 1, 3: fig. 3, 1 (1936). Trans. Linn. Soc. 3: Tab. 45 (1888—94).
Typus: Prov. Transkaspia, distr. Merw., in arenosis prope stationem viae ferreae Repetek, Androssov, LE.

Planta validior, glabra vel sparse papillosa. Caulis ±75 cm altus, crassus, subaphyllus, jam infra medium in paniculam ± globosam abiens, ramis iteratim ramosis. Folia saepe 8, 25—30×35—50 mm, longitudine semper latiora, cordato-reniformia, rugosa, integra, margine ± scabra, tri- vel subquinque-nervia. Phylla

perigonii ±3 mm longa; pedicelli 3—7 mm longi, infra medium articulati. Fructus 20—25×15—20 mm, ellipticus, basi profunde cordatus; alae latitudinem seminis aequantes vel eo paulo latiores; nervus marginalis ± manifestus, a margine plerumque 2 mm remotus.

Persia: E: Khor.: N Tuman Aqa, Aitch. 319. Torbat-e Heydariyeh, 1300 m, Rech. 4377!

Distr. gen.: Persia, Kara Kum.

4. ***R. rupestre*** Litw. ex Los., Acta Inst. Bot. Acad. Sci. URSS. ser. 1, 3: 108 (1936).
Icon.: Fl. URSS. 5 tab. 28, 12 (1936).
Typus: Kopet Dagh, Firyuza, Korsh.

Caulis erectus, ad summum 100 cm altus, a medio ramosus, glaber. Folia late ovata, ad summum 50 cm lata, semper longitudine latiora. Phylla perigonii late ovalia, 4 mm longa. Fructus ad summum 20 mm longus et latus, late ovoideus; alae membranaceae, undulatae, latae, basi profunde cordatae, apice attenuatae et emarginatae; nervus marginalis a margine 1—2 mm remotus.

Turcomania: Firyuza, Aktepe, Litw. 138. Prope Firyuza, Korsh. 4357, Antonow, Lipsky. Kopet Dagh prope Kizyl Arvat, Sint. 1704. Inter Ashkhabad et Gaudan, Korsh. 4358. Gaudan, in faucibus Kurd Ssu, Czern. 1312, Fedtsch. 417.

Distr. gen.: Transcaucasia australis, Turcomania.

5. ***R. Ribes*** L., Spec. Plant. 1: 372 (1753).
Icon.: Jaub. & Spach, Ill. Pl. Or. 5: 470 (1856).
Typus: „In Persia, Libano, Carmelo".

Caulis ad summum 100 cm altus, erectus ± flexuosus, aphyllus, dense verrucosus vel sparse papillosus, superne in inflorescentiam laxe et ± divaricate ramosam abiens; rami inferiores saepe fasciculati. Folia breviter petiolata; petiolus semper quam laminae longitudo multo brevior; lamina plerumque 30—50× 25—40 cm, suborbicularis, semper longitudine latior, margine ± undulata, supra glabra vel sparse verrucosa, subtus ± verrucosa, nervis tribus principalibus prominentibus, ad nervos dense ± acute verrucosa. Phylla perigonii 3 mm longi. Pedicelli ad summum 10 mm longi, infra medium articulati. Fructus cordato-ovoideus, 13—17×10—14 mm; alae ad summum latitudinem seminis aequantes; nervus marginalis ± obsoletus, a margine paulo remotus.

Iraq: Kurd.: Sul.: Pira Magrun, Haussk. Arbil: Kuh Safin prope Shaqlawa, 1600 m, Bornm. 1773. Rubar-i Sideka, 1200 m, Haley 205! Rost, 1800 m, Thesiger 912!
Persia: W: Azerb.: Ser prope Rezaiyeh, Knapp. Kuh-i Bilqis, Knapp. Kuh-e Mishab Dagh prope Zanjireh, Knapp. Azerbaijan, Auch. 5284. Kurd.: 21 km W Sanandaj, Bent & Wr. 520—202! Dezh Shahpur, 1300—1600 m, Jacobs 6462! Kermansh.: Kuh-i Parrow, Str. In faucibus prope Nojubaran, Str. Ham.: Ganjnameh, Haydere, Stapf. Kuh Alvand, 13 km SW Hamadan, 2400 m, Furse 1990!, Pichler. Bakhtiari: Gahar, 2400 m, Koelz 17975! Arak: Yekab, Str. Girdu prope Arak, Str. p. p.! Arak, Str. M. Rasvand, Str. Lur.: Kharon, 50 km E Khorramabad, 2300 m, Koelz 754! Prope Qaleh Rostam, Str. Oshtoran Kuh, Str. — S: Kerm.: Inter Saadatabad et Chah-e Chaghak, 1900 m, Rech. 3223! Inter Baghin et Khaneh Sorkh, 2200 m, Rech. 2999! Inter Mashiz et Khaneh Sorkh, 2000—2500 m, Rech. 3041! Fars.: Kalat, 35 km NW Shiraz, 2300 m, Grant 17702! Sisakht, Kuh-e Dinar, Behb. 1147-E! Kuh-e Dinar, Ky. 586. Persepolis, Ky. 252. Lar.: Lar, 1000 m, Gauba 2060! Bal.: S Khash, 1300 m, Gauba 2061! 120 km W Zahedan, 15 km W Nosratabad Sipi, 1300 m, Grant 15373! —

E: Khor.: Tabas, Shir Geshk, Ruttner 557! 20 km S Mashhad, Rech. 1500! Inter Robat-e Safid et Heydariyeh, Rech. 1577! Khorasan, Gabr. 84. — C: Tehr.: Pas Qaleh, Taghilou 1095-E! Dosdarreh prope Shahrestanak, 2300—2600 m, Bornm. 8116. Qazv.: Inter Karaj et Gach Sar, 1400—2500 m, Schmid 5719! Hazarband, 2800 m, Bornm. 1084; 3000 m, Gauba 2059! Yazd: In montibus prope Deh Bala, Buhse. Qom: Rahjerd, Koelz. Afghanistan: NW: Herat: M. Paropamisus versus Gulran, 1500 m, Aitch. 397. — E: Kabul: Nijrao, Badrami, 2800—3000 m, Neub. 51/326! Paghman, 3000 m, Chaw.-Must. s. n.! Tang-i Gharu, 1700 m, Gilli 2216! Dahan-e Abdila, 35 km E Sar-i Chashma, 2800 m, Rech. 17798! Jaji: In valle fluvii Hazar Darakht, 2600—3300 m, Aitch. 539. Ghazni: Inter Miradina et jugum Ghoutch Kol, 3300 m, Rech. 17636! Nuristan: In jugo Atsui, 3000 m, Edelb. 679! In jugo Farajghan Kotal, 3300 m, Koelz 11741! Kantivo, 2200 m, Kerst. 915! — C: Bamian: Inter Bamian et Siah Sang, 2900 m, Hdg. & Wdb. 4605! Kuh-i Baba, in declivibus australibus, Thesiger 40!
Pakistan: Chitral: Inter Shoghot et Lutko, 1800 m, Bowes Lyon 764! Inter Chitral et Mastuj, 2000 m, Stainton 2464! — Bal.: Kacha, 900 m, Maynard. — Baluchistan, Stocks.

Distr. gen.: Nachitschewan, Anatolia orientalis, Persia, Afghanistan, Pakistan.

Bei dem uns vorliegenden Material fallen Exemplare auf, die stärkere Büschelung der Blütenzweige aufweisen und zugleich weniger rauhes Indument besitzen. Es sind dies die folgenden: Gauba 2060, 2061, Koelz 17975, Rech. 1500, 2999, 3041, 3223 und Ruttner 557. Eine zweite Gruppe von Belegen, nämlich Chaw.-Must., Hdg. & Wdb. 4605, Jacobs 6462, Koelz 11741, Neub. 326. Rech. 17636, Stainton 2464 und Edelb. 679a und b besitzt an den Nerven auf der Blattunterseite Papillen, die nahezu dornig sind. Jedoch zeigen sich keine weiteren korrellierten Merkmale, die eine Abtrennung rechtfertigen würden.

6. ***R. persicum*** Los., Acta Inst. Bot. Acad. Sci. URSS. ser. 1, 3: 123 (1936).
Typus: In faucibus Kuh-e Dinar, Ky.

Planta nana. Caules florendi tempore 25—30 cm alti, erecti, glabri vel subverrucosi, aphylli. Folia 2, lamina 15—30 × 15—25 mm, late rotundata, majora longitudine latiora, basi truncata, integra, nervis tribus principalibus prominentibus aut utrinque stellato-papillosa, aut supra dense simpliciter papillosa subtus stellato-papillosa. Inflorescentia anguste paniculata. Phylla perigonii 1—2 mm longa. Pedicelli 6—8 mm longi, prope medium articulati. Fructus maturus ignotus, juvenilis ovoideus, alis angustis rubris.

Persia: W: Arak, Str.! Lur.: Dow Rud, 1650 m, Koelz 15763-a! Bakht.: In montibus Bakhtiaricis, Bode. — S: Fars.: Kuh Bungi prope Dasht-e Arzhan, Stapf 2053! In faucibus Kuh-e Dinar, Ky.

Distr. gen.: Endem.

7. ***R. Maximowiczii*** Los., Bull. Jard. Bot. Princ. 30: 382 (1931).
Icon.: Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 3: 127, fig. 4, 2 (1936).
Typus (Lectotypus): Czingan, Minkevitsch 1187.

Planta glabra, caulis et lamina subtus ± verrucosus vel laevis. Caulis ad summum 100 cm altus, solitarius, aphyllus, ramosus, superne inflorescentiam pyramidalem formans. Foliorum lamina 20—50 × 30—60 cm, late rotundato-reniformia, basi late cordata, margine subundalata, nervis principalibus tribus valde prominentibus; petiolus 10—25 cm longus, supra plerumque verrucosus. Phylla perigonii ±3 mm longa; pedicelli 10 mm longi, prope basin articulati. Fructus ±20 × 15 mm, alae latitudinem seminis aequantes; nervus marginalis obsoletus, a margine vix 1 mm remotus; pedicellus ±15 mm longus.

Afghanistan: NE: Badakhshan: Khash distr., 3000 m, Koelz 12999!

Distr. gen.: Afghanistan, Pamir-Alaj, Syr Darya, Tien Shan.

8. ***R. spiciforme*** Royle, Ill. Bot. Himal. Mount. 318 (1839).
Syn.: *R. Moorcroftianum* Royle, Ill. Bot. Himal. Mount. 315 (1839) sec. Los.
Icon.: Royle, Ill. Bot. Himal. Mount. tab. 78 (1839).
Typus: Kherang Pass, Inglis.

Planta subacaulis. Folia radicalia 15—25 × 12—16 cm, late ovata vel obtuse cordata, coriacea, utrinque stellato-pubescentia, petiolis ±5 cm longis, crassis. Scapi 1—3, simplices, 10—30 cm longi, dense multiflori, glabri. Flores 2—3 mm lati. Fructus 6—15 × 5—7 mm, late obovatus, alae semine latiores.

Pakistan: Kurram: Shend Toi versus Seratigah, 3000—4200 m, Aitch. 952, 971.

Distr. gen.: Pakistan, Tibet occidentalis, Himalaya occidentalis.

9. ***R. platylobum*** Rech. f., sp. nov.
Typus: Rech. 33877, W!

Partes subterraneae ignotae. Caulis florifer 20—30 cm altus, prope basin in statu compresso 7—10 mm crassus, fistulosus, sulcatus, 0—2-foliatus, in dimidio vel in tertia parte superiore inflorescentiam breviter erecte pauciramosam aphyllam proferens, omnino pilis crispulis albis dense obsitus, in regione inflorescentiae insuper verrucis crassis purpureis obsitus. Ochreae amplae brunneae papillosae caducae. Folia basalia 18—20 × 23 cm, basi cordata, ambitu late cordato-reniformia, longitudine latiora obtuse late (3—)5(—7) lobata, in vivo carnosa, in sicco coriacea, leviter grosse undulato-plicata, nervis primariis palmatis 3 crebre furcato- et reticulato-anastomosantibus, pallide viridia, supra sparse papillosa glabrescentia, subtus imprimis secus nervos principales albo-villosa et purpureo-verrucosa, margine subcrenata et cartilagineo-papillosa; petiolus 7—10 mm crassus, vix dimidiam laminam aequans, dense villosus et verrucosus. Folia caulina si evoluta usque ad 5 × 3 cm, breviter crasse petiolata, profunde cordata, undulato-crispata, apice obtusa. Pedicelli floriferi filiformes, inaequales, 3—6 mm longi, in tertia circiter parte inferiore articulati. Perigonii folia herbacea, viridia saepe purpureo-marginata, ± 3,5 mm longa. Fructus ignotus.

Afghanistan: NE: Kataghan: In jugo Paigah Kotal inter Pul-i Khumri et Haibak, in declivibus argillosis, 1500 m, 5. V. 1967, Rech. 33877!

Distr. gen. Endem.

Die neue Art ist von allen übrigen im Gebiet der Flora Iranica vorkommenden Arten durch die gelappten Blätter und das im unteren Teil der Pflanze vorwiegend zottige Indument verschieden. Sie dürfte den beiden im Tien Shan endemischen, mit nur aus der Beschreibung bekannten Arten *R. macrocarpum* A. Los., Bull. Jard. Bot. Petersbg. 30: 379 (1931) und *R. lobatum* Litw. ex A. Los., Acta Inst. Bot. Acad. Sci. URSS. ser. 1: 3 (1936) zunächst stehen, scheint von diesen jedoch durch Wuchs und Indument deutlich verschieden zu sein.

Irrtümliche Angaben.

Die Angabe von *R. tataricum* L. fil. von Aitchison aus dem Gebiet des Hari Rud bezieht sich auf *R. turkestanicum* Janisch, diejenige von Sintenis aus dem Kopet Dagh auf *R. rupestre* Litw. ex Los.

5. *Atraphaxis*

Atraphaxis L., Spec. Plant. 333 (1753).

Fructices erecti. Folia parva, persistentia. Ochreae basi brunneae, apicem versus hyalinae, bifidae, bivenosae. Flores hermaphroditi, breviter racemosi. Perianthii segmenta 4 vel 5, interiora 2 vel 3 accrescentia fructum involucrantia. Stamina 6 vel 8, basi in annulum coalita. Stigmata 2 vel 3. Nux non alata.

1a. Perigonium tetramerum. Nux lenticularis compressa..... 1. *A. spinosa* L.
b. Perigonium pentamerum. Nux triquetra 2
2a. Folia latitudine 3—4-plo, rarius sexplo longiora, manifeste penninervia [si obsolete penninervia cf. *A. frutescentem* (L.) Ewersm.] 3
b. Folia latitudine ultra 10-plo longiora, obsolete nervosa, plerumque uninervia 7
3a. Folia manifeste petiolata, petiolus ±5 mm longus, lamina obovato-rhomboidea, basi semper manifeste cuneata ..... 3. *A. pyrifolia* Bge.
b. Folia brevissime petiolata vel subsessilia, lamina ± ovata vel ovato-lanceolata, basi rotundata vel leviter cuneata 4
4a. Folia latitudine ultra 4-plo longiora, obsolete penninervia. Ochreae cuspidatae ..... 6. *A. frutescens* (L.) Ewersm.
b. Folia latitudine ad summum triplo longiora, manifeste penninervia. Ochreae bifidae 5
5a. Lobi perigonii interiores fructificationis tempore ultra 10 mm lati ..... 5. *A. macrocarpa* Rech. f. & Schiman-Czeika
b. Lobi perigonii interiores fructificationis tempore ad summum 8 mm lati .. 6
6a. Folia infra medium latissima, basi ± cordata... 4. *A. seravschanica* Pavlov
b. Folia in medio vel supra medium latissima, basi leviter cuneata ..... 2. *A. Tournefortii* Jaub. & Spach
7a. Ramuli spinescentes. Folia obsolete uninervia ..... 8. *A. suaedifolia* Jaub. & Spach
b. Ramuli inermes. Folia semper nervo mediano prominentes 8
8a. Pedicelli ad summum 3 mm longi, paulo infra apicem articulati ..... 10. *A. Aucheri* Jaub. & Spach
b. Pedicelli ultra 5 mm longi, infra medium articulati 9
9a. Suffruticosa, basi praecipue ramosa, inflorescentiis strictis. Plantae ad summum 25 cm altae..... 9. *A. angustifolia* Jaub. & Spach
b. Fruticosa, tota longitudine ramosa, inflorescentiis flexuosis. Plantae ultra 30 cm altae ..... 7. *A. Badghysi* Kult.

Sect. *Atraphaxis*

Syn.: *Euatraphaxis* Jaub. & Spach, Ill. Pl. Or. 2: 12 (1844).

Perigonium tetramerum. Stamina 6. Stigmata 2. Nux ± lenticularis, compressa.

1. ***A. spinosa*** L., Spec. Plant. 1: 333 (1753).

Syn.: *A. replicata* Lam., Encycl. Meth. Bot. 1: 329 (1783). *A. spinosa* L. β *rotundifolia*, γ *sinaica*, δ *glauca* Boiss., Fl. Or. 4: 1021 (1879). *A. candida* Boiss. & Hausskn. in Boiss., Fl. Or. 4: 1021 (1879). *A. afghanica* Meisner in DC., Prodr. 14: 76 (1856).

Icon.: Lam., Rec. planches bot. de l'Encyclop. 2: tab. 265 (1823). Bot. Mag. tab. 1065 (1808).

Typus: „Habitat in Media ad urbem Hansen locis glareosis juxta fluvios."

Frutex squarroso-ramosus plerumque spinescens. Rami ± laxe subdistiche ramosi, ramulis patentibus, ± aequilongis vel irregulariter ramosis, saepe valde abbreviatis; internodia longitudine valde variabilia, cortice fuscescente vel cinereo vel candido, ± rimoso. Ochreae brevissimae. Folia forma et magnitudine valde variabilia, minuta, 2—11(—14)×7(—11), elliptica, lanceolata vel obovata acuta, vel subrotundata, interdum apice emarginata, subsessilia vel brevissime petiolata, plana vel margine paulo revoluta, saepe obsolete nervosa. Pedicelli infra medium articulati. Lobi perigonii interiores tempore fructificationis ovato-orbiculares, plerumque longitudine latiores, (4—)5(—8)×(4—)6—7(—11) mm. Nux 3—4× 4—5 mm, ± triangulato-cordata, fusco-brunnea.

Talish: Swant, 1500 m, Hohen.

Persia: N: Gorg.: Aliabad, Gauba 2030! Ramian, Sab. 337! Maz.: Inter Amol et Zardman, Schmid 5822! In valle Haraz supra Panjab, 1200 m, Wdb. 636! Kuh-i Nizwa, in cacumine occidentali, 2900 m, Wdb. 1262! Gil.: Inter Kelishom et Pul-i Ambu, Alexeenko 364. — W: Azerb.: Qareh Dagh, Buhse, Szov. In montibus N Tabriz, Gill.-Sm. 2382. Prope Yam, Gill.-Sm. 2478. Meshg Anbar Mianeh, Mird. in Gauba 2027! 34 km W Marand versus Khvoy, Rech. 14922! Prope Shahpur, Knapp! Zanjireh, Knapp! Shahin Dezh, Knapp! Ad lacum Kushchi, Knapp! Kermansh.: 94 km NNW Taq-e Bostan, Rech. 14688! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 96! Kuh-e Garri, Str. Esf.: M. Shahkuh, Deicke 383. Arak: Kuh Kohrud, Str. Latetar, Str. Bakht.: In valle fluvii Khersan, Haussk. — S: Fars.: Inter Deh-e Girdu et Yazd-e Khvast, Stapf 2052! Kuh Bungi prope Dasht-e Arzhan, Stapf 2051! Hoseynabad 40 km W Shiraz, 1700 m, Grant 16795! — E: Khor.: Inter Qareh Tekan et Mashhad, Czern. Kopet Dagh supra Quchan, Rech. 1651! Inter Mashhad et Herat, Bge. Golestan, Bge. Inter jugum Alam Ali et Allah Akbar, 1500 m, Rech. 2029! Kuh-e Neyshabur: Darreh Abshar prope Akhlamad, 1600—1800 m, Rech. 4668! Bardu Forest, Koelz 16758! Geredu, 70 km S Ozbagu, Ruttner 39! Kheyrabad, Aitch. 708! — C: Tehr.: Damavand, Ab-e Garm, Behb. 134-E! Pul-i Jaji Rud, Bruns. Inter Polur et Reneh, 2100 m, Gilli! Inter Simin Dasht et Istgah-e Kabutar Darreh in valle fluvii Hableh Rud, 1150 m, Aell. 1646! Qazv.: Karaj, 1400 m, Schmid 6467! Gauba 6. Alangeh, Gauba 5. Vardeh, 1600 m, Rech. 804! Pich Kuh, Rech. 574! Kuh Safid, Rech. 622! In collibus Halkedar, 1200 m, Rech. 6837! Mardabad, Gauba 2031! Vessieh, Rech. 6856! Pachenar, Paulsen 2192-a. In valle Loura, Ky. 541! Shahr.-Bust.: Shahvar, Dihi supra Nokarman, 2500 m, Rech. 5953! Shahrud, Bge. Yazd, 1500 m, Bornm. 4166! Inter Jandaq et Anarak, Buhse 648. Qom: Rahjerd, 2000 m, Kotie 1224!

Turcomania: Prope Firyusa, Sint. 544! Kopet Dagh, Czern. Ashkhabad, Lipsky, Sint. 995!

Afghanistan: N: Mazar-i Sharif: Chashmeh-i Shafal in faucibus fluvii Balkh, 500—800 m, Rech. 16181!, Hdh. & Wdb. 3955! — SE: Kalat-i Ghilzai: Wasikha, Neub. 49/25! — E: Kabul: Wardak, Volk 868-a! Aliabad, Volk 1558! Ghazni: Dasht-e Nawar, Okak, 3000 m, Rech. 17716! In valle Ashraf, Neub. 4375! — NE: Wakhan: Sar-i Skhaur, 2700 m, Roemer 38! Kataghan: Inter Haibak et Pul-i Khumri, 1500 m, Rech. 16466! Paigah Kotal SE Haibak, 1350 m, Hdg. & Wdb. 4033! Takhar: Khost-o Fereng, 1450 m, Podlech 11969! — C: Doab: Binimang, Koelz 13884! Kamard, 1800 m, Koelz 13628! Doab, 1500—1800 m, Volk 1751! Eshpushta, 1500 m, Gilli 2242! Bamian: In valle Ajar W Doab, 1400 m, Rech. 16625!, Hdg. & Wdb. 4119! In valle Saighan inter Doab et Bulola, 1800 m, Gilli 2243! Bamian, 2300—3150 m, Neub. 4193!, Lindb. 1947/92! Gilli 2244!, 2245!, Koelz 13926! Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18195! In jugo Shibar, 2600—3000 m, Rech. 16849!, Hdg. & Wdb. 4228!, Volk 470!, 4696! Mandigak, inter Deraz Kol et Panjao, 2800—3200 m, Rech. 18666! Naiak, in

declivibus borealibus Kuh-i Baba, 2400 m, Thesiger 70! — „In regno Cabulico", Griff. Pakistan: Chitral: Inter Chitral et Mastuj, 2000 m, Stainton 2461! In valle Yarkhun prope Mastuj, 2000 m, Kerst. 2030! — Quetta: Kirani prope Quetta, H.-B. 18892. Tabai, Zhob Gaz. 15. — Kalat, Stocks — Baluchistan, Lace.

Distr. gen.: Peninsula Balcanica, Anatolia, Kurdistania turcica, Persia, Afghanistan, Rossia australis.

Wie sich schon aus der reichen Synonymie entnehmen läßt, ist *A. spinosa* sehr polymorph. Die Variabilität betrifft die Wuchsform, Färbung, Blattgröße und Form, Blattfärbung, Größe der Perigonblätter im Fruchtzustand. Im gedrungenen Wuchs erinnern manche Exemplare an *A. compacta* Ledeb., Fl. Alt. 2: 55 (1830), die in typischer Form nicht in unserem Gebiet auftritt; besonders auffällig sind durch Blätter von geringerem Durchmesser als die Perigonblätter im Fruchtzustand die folgenden Exemplare: Lindb. 92, Rech. 574, 16849 und 17716, Wdb. 1262. Der Beschreibung der *A. candida* Boiss. & Hausskn. entsprechen durch weiße Rinde, graugrüne Blätter die folgenden Exemplare: Aell. 1646, Aitch. 708, Behb. 134-E, Gauba 2030, 2031, Gilli 2244, Koelz 13628, 13884, 16758, Neub. 732, Rech. 6837, 6856, 14688, 14922, Stapf 2052, Thesiger 70.

Unabhängig von den übrigen Merkmalen unterliegen die beiden inneren Perigonblätter im Fruchtzustand großen Schwankungen. Sie erreichen durchschnittlich 5 × 6 mm, die größten 7—8 mm bei Hdg. & Wdb. 4228, Rech. 804, Rioux & Golv. 96 und 10—11 mm bei Gauba 2030, während die Frucht selbst nicht variiert. Da die Korrelation der die einzelnen angenommenen systematischen Einheiten charakterisierenden Merkmale sehr unvollständig ist, da überdies jegliche geographische Bindung der Merkmale fehlt und Übergangsformen häufiger auftreten als die Extreme, konnten wir uns nicht zu einer systematischen Gliederung des Formenkreises entschließen. Dieser Entschluß stützt sich u. a. auf eine statistische Analyse sämtlicher gesehener Belege.

Sect. *Tragopyrum* (M. B.) Jaub. & Spach, Ill. Pl. Or. 2: 13 (1844).

Syn.: *Tragopyrum* M. B., Fl. Taur.-Cauc. 3: 284 (1819).
Perigonium pentamerum. Stamina 8. Stigmata 3. Nux triquetra.

2. ***A. Tournefortii*** Jaub. & Spach, Ill. Pl. Or. 2: 14 (1844).
Icon.: Jaub. & Spach, l. c.: tab. 112.
Typus: „In Armenia", Tournef., P.

Fruticosa, ad summum 80 cm alta, dense intricate ramosa. Rami et ramuli ± divaricati, flexuosi, inermes; internodia usque ad 5—10 mm longa, rarissime usque ad 20 mm longa; ramuli papilloso-velutini. Cortex ± cinereus. Ochreae longe cuspidato-bifidae, 3—4(—5) mm longae. Folia (12—)14—17(—22) × 5—8 mm, elliptico-oblonga vel ovata, cuspidata, basi ± cuneata, in petiolum ± indistinctum abrupte attenuata, margine ± undulata, plerumque papillosa, reticulato-nervosa, nervatura utrinque prominente, laete viridia. Flores racemos breves 20—30 mm longos ± densos formantes. Pedicelli 2—5 mm longi, infra medium articulati. Lobi perigonii fructificationis tempore 6—8 mm diam., suborbiculares. Nux 4—5 mm longa, triquetra, nigrescens.

Iraq: Kurd.: Sul.: Penjwin, 1600 m, Rech. 10437!
Persia: W: Kermansh.: Kuh-i Parrow, Str. Nojubaran, Str. Ham.: Kuh-e Garri, Str. Arak: M. Rasvand, Str.

Distr. gen.: Armenia, Iraq, Persia occidentalis.

Bornmüller, Beih. Bot. Centrbl. 28,2: 498 (1911) gibt *A. Billardieri* für Kuh-e Garri und Kuh-i Parrow (Strauss) an. Da er l. c. 24: 88 (1908) die Artberechtigung der

A. Tournefortii gegenüber der *A. Billiardieri* bezweifelt, dürften sich die Angaben auf *A. Tournefortii* beziehen.

3. ***A. pyrifolia*** Bge., Mém. Sav. Etrang. Acad. Petersb. 7: 483 (1851).
Icon.: Flora Kazakhstan 3, tab. 11, 2 (1960).
Typus: Seravschan, LE.

Frutex 80—150 cm altus. Rami flexuosi, saepe elongati, internodiis 10—20 mm longis, cortice griseo, ± rimoso. Ramuli divaricati, plerumque abbreviati, ± rigidi, spinescentes. Ochreae ramulorum ±5 mm longae, infundibuliformes, dentatae, saepe bifidae, demum fimbriatae. Folia petiolata, petiolus ±5 mm longus; lamina 10—20(—23)×7—12(—15) mm, obovato-subrhomboidea, interdum suborbicularis, basi semper cuneata in petiolum attenuata, apice rotundata vel paulo emarginata sed semper mucronulata, glabra, manifeste penninervia, in sicco flavo- vel griseo-viridis. Flores 2—4-ni fasciculati, racemum 25—30 mm longum formantes. Pedicelli ad summum 10 mm longi, infra medium articulati. Lobi perigonii interiores fructificationis tempore 6—7×7—8 mm, suborbiculares. Nux ±3 mm longa, triquetra, acuta, brunnea.

Afghanistan: NW: Herat: Paropamisus: Chashmeh Obeh, 1800 m, Rech. 19227! — E: Kabul: Wardak, Volk 868! Chakewardak, 2600 m, Gilli 2247! Botkhah, Neub. 51/372! Panjshir: 22 km supra Gulbahar, 1750 m, Hdg. & Wdb. 3002! Till Pain, Lindb. 1025! — NE: Munjan: Skarzar, 2600 m, Koelz 12808! Wakhan: Sar-i Skhaur, 2650 m, Roemer 22! Kataghan: In declivibus borealibus jugi Shibar, Volk 716! Godarrah in valle fluvii Andarab, 1850 m, Podlech 11020! Khaf Darrah 6 km S Farkhar, 1300 m, Podlech 10503! — C: Bamian: In valle Saighan inter Doab et Bulola, 1800 m, Gilli 2246! Darreh-i Shikar, 15 km S Doab, 1500 m, Hdg. & Wdb. 3390! Ghorat: Tang-i Chorsar inter Qala Shahrak et Khwajachisht, 1800 m, Rech. 19194!
Pakistan: Chitral: Mastuj, 2250 m, Stainton 2478! Inter Chitral et Mastuj, 1800 m, Stainton 2444! Lutko, 2400 m, Bowes Lyon 782!

Distr. gen.: Asia Media, Pamir-Alaj, Afghanistan, Pakistan.

4. ***A. seravschanica*** Pavlov, Animadvers. Syst. Herb. Tomsk 5—6: 3 (1933).
Icon.: Fl. Uzbekistan 2: tab. 8, fig. 2 (1953).
Typus: Seravschan, LE.

Frutex 40—80 cm altus, ± divaricato-ramosus. Rami ± flexuosi; internodii longitudine variabiles, ad summum 40 mm longi. Ramuli rigidi, ± flexuosi, ± dense foliati, inermes. Ochreae ramulorum 2—3 mm longae, plerumque bifidae. Folia brevissime petiolata, petiolus 1 mm longus; lamina 5—7(17)×4—6(—10) mm, ovato-lanceolata, basi rotundata, rarius subcordata, apice acuminata ± mucronulata, glabra, penninervia, glauca; nervi utrinque prominentes. Flores racemos laxos 20—40 mm longos formantes. Pedicelli ad summum 8 mm longi, infra medium articulati. Lobi perigonii interiores fructificationis tempore suborbiculares, 6—7×7—8 mm. Nux 3—4 mm longa, triquetra, acuta, brunnea.

Turcomania: Sec. Fl. URSS.

Distr. gen.: Asia centralis, Pamir-Alaj, Turcomania.

5. ***A. macrocarpa*** Rech. f. & Schiman-Czeika, sp. nov.
Typus: Aitch. 1105, G!, BM!

Fruticosa, ± divaricato-ramosa, subspinescens. Rami erecti, leviter flexuosi, subaphylli, internodiis medianis 20—35 mm longis, cortice pallide grisea, rimulosa,

partim fibroso-decorticante. Ramuli elongati, virgati vel abbreviati, foliati, glabri. Ochreae 5—10 mm longae, parte inferiore ± tubulosae, apicem versus ± linguiformes, binervosae, plerumque bifidae et dentatae vel rarius ± profunde fimbriatae; florales 2—3 mm longae infundibuliformes. Folia (10—)15—25(—30) mm elliptica, in medio latissima, in petiolum brevissimum attenuata, vel ovato-lanceolata, prope basin latissima abrupte attenuata, apice obtusa vel acuta interdum obsolete apiculata, margine ± undulata, glabra vel papillosa, prominenter penninervia. Flores 1—3-ni racemosi, racemos 20—30 mm longos, ± densos formantes. Pedicelli ±4 mm longi, in medio vel paulo infra articulati. Perigonium in statu florifero ignotum. Lobi perigonii interiores in statu fructifero 7—10 × 10—12 mm, late ovato-cordati, tenuiter membranacei, duo exteriores patentes 5—6 × 7—8 mm. Nux ±5 mm longa, ±4 mm lata, triquetra, basi late ovata, acuta, atrofusca. — *A. seravschanicae* Pavlov similis sed ab ea distincte differt ochreis manifeste longioribus et lobis perigonii statu fructifero multo majoribus.

Afghanistan: NW: Herat: Tirphul, in valle fluvii Hari Rud, Aitch. 1105!

Distr. gen.: Endem.

Bei der vorliegenden Aufsammlung fallen die zum Teil sehr kurzen Seitenzweige auf, die besonders bei dem Exemplar aus dem British Museum meist gebüschelt sind.

6. ***A. frutescens*** (L.) Ewersm., Reise von Orenbg. nach Buchara 115 (1823).

Syn.: *Polygonum frutescens* L., Spec. Plant. 1: 359 (1753). *Tragopyrum lanceolatum* M. B., Fl. Taur.-Cauc. 3: 285 (1819). *Atraphaxis lanceolata* (M. B.) Meisner in DC., Prodr. 14: 78 (1856).

Icon.: J. G. Gmelin, Flor. Sibir. 3, tab. 12, fig. 2 (1768). C. K. Schneider, Ill. Handb. Laubholzk. 1, fig. 167 e, f (1906).

Typus: „In Sibiria, Dauria".

Frutex 20—70 cm altus. Rami elongati, tenues, flexuosi, ± virgati, teretes, internodiis medianis 15—20 mm longis, foliati, cortice griseo, ± rimoso, inermes, glabri vel parce papillosi. Ochreae ad summum 6 mm longae, ± tubulosae, cuspidatae. Folia (8—)15—20(—25) × (2—)3—6(—8) mm, oblongo-lanceolata vel lanceolata, in petiolum brevissime attenuata, acuta vel mucronulata, plerumque margine revoluta, ± obsolete penninervia, nervo mediano tantum prominente, plerumque glabra. Flores racemos laxos ad summum 60 mm longos terminales formantes. Pedicelli ±5 mm longi, infra medium articulati. Perigonium 2—3 mm longum; lobi perigonii interiores fructificationis tempore 4—5 × 4—6 mm.

Turcomania: Sec. Fl. URSS. 5: 521 (1936).

Distr. gen.: Tauria, Caucasus, Turcomania, Aralo-Caspia, Altai, Sibiria, Soongaria, Mongolia.

7. ***A. Badghysi*** Kult., Trans. Scienc. Soc. Turk. 1: 118 (1923).

Icon.: Kult., l. c. tab. s. n.

Typus: Transcaspia, LE.

Frutex 30—80 cm altus, a basi usque ad apicem copiose ramosus. Rami et ramuli saepe elongati, internodiis 10—15(—25) mm longis, cortice grisea, ± profunde rimosa; ramuli numerosi tenues, flexuosi, inermes, papilloso-velutini, abunde floriferi. Ochreae usque ad 15 mm longae, florales multo breviores. Folia (15—)20—30(—40) × 1,5—3 mm, anguste lineari-lanceolata, plana vel margine revoluta, nervo mediano subtus tantum prominente, plerumque utrinque ± dense

papilloso-velutina. Flores bini rarius singuli, racemos laxos usque ad 60 mm longos formantes. Pedicelli demum 5—8 mm longi, paulo supra basin articulati. Perigonium ±4 mm longum; lobi perigonii interiores in statu fructifero 6—8×5—6 mm longi.

Turcomania: Badghiz, Botschantzew 177!
Afghanistan: NW: In valle fluvii Hari Rud: Tirphul, Aitch. 274!

Distr. gen.: Kara Kum, Turcomania, Afghanistan.

8. ***A. suaedifolia*** Jaub. & Spach, Ill. Pl. Or. 2: 15 (1844).
Typus: „In Media prope hodiernam urbem Tauris", Auch. 5272, P.

Glaberrima. Ramuli steriles spinescentes. Folia angusta, acuta, plerumque revoluta, glauca, evenia, nervo mediano obsoleto. Ochreae breves, bidentatae. Pedicelli in medio circiter articulati. Lobi perigonii externi demum reflexi subbreviores, interni ovato-orbiculares, subdimidio latiores. Nux perigonio subduplo brevior ovato-triquetra.

Persia: W: Azerb.: Prope Tabriz, Auch. 5272.

Distr. gen.: Endem.

9. ***A. angustifolia*** Jaub. & Spach., Ill. Pl. Or. 2: 15 (1844).
Icon.: Jaub. & Spach, l. c. tab. 115.
Typus: „In Armenia", Auch. 2564, P, G!

Suffruticosa usque ad 25 cm alta, basi praecipue ramosissima. Rami ± abbreviati, internodiis usque ad 10 mm longis; ramuli virgati vel ± stricti pseudoterminales floriferi, inermes, scabro-papillosi. Ochreae plerumque lateraliter bicuspidatae, apice ± profunde dentatae vel laceratae, internodia ramulorum saepe imbricato-obtegentes. Folia 15—40×1—3 mm, superiora minora, linearia, plerumque margine revoluta, uninervia, supra glabra, subtus ad nervos et margine scabro-papillosa. Flores 2—3-ni racemos terminales multifloros formantes. Pedicelli ad summum 8 mm longi, paulo infra medium articulati. Perigonium ±4 mm longum; lobi interiores fructificationis tempore suborbiculares, 6—8 mm diam. Nux ±4 mm longa, triquetra, atro-fusca.

Transcaucasia meridionalis, sec. Fl. URSS. 5: 525 (1936).

Distr. gen.: Transcaucasia, Armenia.

10. ***A. Aucheri*** Jaub. & Spach, Ill. Pl. Or. 2: 15 (1844).
Icon.: Jaub. & Spach, l. c.: tab. 114.
Typus: Auch. 5271, P, G!

Fruticosa vel suffruticosa, irregulariter tenuiter ramosa. Rami flexuosi, foliati, teretes. Ramuli tenues, virgati, inermes. Ochreae albidae, plerumque bifidae, cuspidatae vel ± fimbriatae, inferiores internodiis subaequilongae, superiores plerumque multo breviores. Folia ramorum 20—50×2—4 mm, ramulorum minora, superiora ±5 mm longa, omnia anguste lanceolato-linearia, plana vel margine revoluta, obsolete penninervia, nervo mediano manifesto, glabra vel margine ± scabro-puberula. Flores 2—3-ni in axillis superioribus foliorum ramulorum racemum laxum, saepe interruptum formantes. Pedicelli usque ad 2—3 mm longi, paulo infra apicem articulati. Perigonium 2—3 mm longum, lobi oblongo-ovati. Nux ±4 mm longa, triquetra, acuta, atro-fusca.

Persia: N: Gil.: Pak Deh, Buhse 1104/1! Inter Rudbar et Manjil, 300—600 m, Bornm. 8114, 8115. Manjil, 600 m, Gauba 1714. — Persia, in aridis, Auch. 5271!

Distr. gen.: Endem.

6. *Pteropyrum*

Pteropyrum Jaub. & Spach, Ill. Pl. Or. 2: 7 (1844).

Frutices divaricato-ramosissimi. Folia minuta. Ochreae brevissimae. Flores glomerati, hermaphroditi. Perianthii segmenta 5, petaloidea, duo exteriora demum reflexa, interiora nuci appressa. Stamina 8, tria ceteris longiora. Styli 3, breves. Stigmata capitata. Nux rostrata, trialata, alis membranaceis, supra medium bipartitis, sinu rotundato.

1a. Folia ± sublinearia revoluta, saepe fere teretiuscula, semper latitudine plus quam 6-plo longiora. Pedicelli plerumque paulo supra basin articulati ..... 1. *P. Aucheri* Jaub. & Spach
b. Folia ± oblongo-spathulata ± plana, ad summum margine revoluta, latitudine ad summum 6-plo longiora 2
2a. Fructus latitudini aequilongus; alae nuci subaequilatae. Pedicelli plerumque paulo infra medium articulati ..... 2. *P. Olivieri* Jaub. & Spach
b. Fructus latitudine longior; alae nuce angustiores. Pedicelli plerumque paulo supra basin articulati ..... 3. *P. Noëanum* Boiss.

1. ***P. Aucheri*** Jaub. & Spach, Ill. Pl. Or. 2: 8, tab. 107 (1844).
Syn.: *P. ericoides* Boiss., Fl. Or. 4: 1002 (1879), syn. nov.
Icon.: Jaub. & Spach, l. c.: tab. 107.
Typus: „In collibus aridis Persiae septentrionalis, ad amnem Kizil Ouzein", Auch. 5269, G!

Frutex cortice cinerascente vel fusco, ± rimuloso. Rami erecti vel divaricati. Ramuli patentes, subflexuosi vel virgati. Folia fasciculata, dimensione valde variantia (5—)8—15(—17)×(1—)2(— rarissime 3) mm, sublinearia, plerumque acuta et margine revoluta, saepe teretiuscula, interdum lineari-spathulata, viridia vel juvenilia glauca, glabra vel velutino-papillosa. Pedicelli ad summum 6 mm longi, plerumque paulo supra basin articulati. Perigonium ad summum 2 mm longum. Fructus 5—7 mm longus, plerumque subaequilatus. Nux alata, ad sinum alarum in plicam transversalem hippocrepidoideam distorta, alarum lobi terminales loborum inferiorum quasi alterni, lobi terminales ab inferioribus ± remoti.

Iraq: Kurd.: Kirkuk: Inter Jalula et Darbandikhan, Barkley 9268! Inter Arbil et Kirkuk, 250 m, Nab. 462. Amarah: Jabal Ruhaila, 70 km N Amarah, Rech. 14150!
Persia: N: Gil.: In valle fluvii Safid Rud, Buhse! Ad amnem Qezel Owzan, Auch. 5269! Kaluraz, Lipsky. Inter Kelishom et Pul-i Ambu, Alexeenko 418. — W: Lur.: Kuh-e Saverz, Haussk. Bakht.: In valle fluvii Khersan, Haussk.! Keshvar, 800 m, Koeie 530! Esf.: M. Shahkuh, 2600 m, Deicke 360. Esfahan, Deicke 49. „Kuh-e Pinar" E Esfahan, Stapf 2049! — S: Kerm.: Khabis, Koelz 14259! Mirjaveh, Manuch. 5775-E! Madanu, Koelz 14240! Kuh-e Nasr, 2300—2900 m, Bornm. 4170! Kuh-e Jupar, 2800 m, Bornm. 4172! Kuh Seidin, 2000 m, Bornm. 4169! Fars.: Yazd-e Khvast, Stapf 2050! Tang-i Buchara prope Golmakan, Stapf 2048! Saadatabad, 1800 m, Grant 15838! Bal.: Inter Zahedan et Khash, Rech. 4221! Makran: Nikshahr, Shab. 468-E!, Shervinovsky 5777-E! Sarbaz, Salavatian 455-E!, 5776-E! — E: Sistan: Sistan, Furon S-24! Khor.: Bezg, Aitch. 693. Inter Shahrud et Neyshabur, Bge.! Robat-e Khan in planitie Taq, Koelz 16805! Inter Mashhad et Herat, Bge.! Inter Awiz et Mozhnabad, Czern. E Mashhad, Diez! Inter Shush et Khunik, Czern. — G: Tehr.: Prope Tehran, Protiva. Inter Firuzkuh et Semnan, Gauba & Sab. In valle fluvii Hableh Rud inter Simin Dasht et Kabutar Darreh, Manuch. 5774-E! Supra Bonehkuh, Manuch. 5773-E! Qazv.: Inter Qazvin et Rasht, 500—1200 m, Schmid 6589! Prope Bibersin, Buhse! Prope Karaj, 1400 m, Gauba 1083. Damgh.-Semn.: Inter Semnan et Damghan, Rech.

1277! Shahr.-Bust.: Inter Sabzevar et Miandasht, Gauba & Mird. Shahrud, 1400 m, Bge. s. n.!, Rech. 5387! Yazd.: In montibus prope Taft, Buhse. Prope Anarak, Buhse! Qom: Inter Qom et Arak, Cavara.
Afghanistan: SE: Kandahar: Boghra SW Girishk, Volk 1324! Safia, Aitch.
Pakistan: Kalat: 25—50 km E Jhal Jhao, 400 m, Rech. 27660!, 27661! Kalat, Stocks! Inter Wad et Bela, 250—1100 m, Rech. 27440!, 27441! — Makran: 8—25 km W Awaran versus Turbat, Rech. 27739! Panjgur, 900 m, Popov 150!

Distr. gen.: Endem.

Über die Variabilität der Art und ihr Verhältnis zu *P. Olivieri* vergleiche man unter der letzteren.

2. ***P. Olivieri*** Jaub. & Spach, Ill. Pl. Or. 2: 9, tab. 108 (1844).
Syn.: *P. gracile* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 12: 102 (1853). *P. Olivieri* Jaub. & Spach β *gracile* Boiss., Fl. Or. 4: 1002 (1879), syn. nov. *P. Griffithii* Meisner in DC., Prodr. 14: 31 (1856). *P. Olivieri* Jaub. & Spach var. *scabrida* Gilli, Feddes Repert. 68: 242 (1963).
Icon.: Jaub. & Spach, l. c.: tab. 108.
Typus: „In Persia septentrionali, circa urbem Teheran", Olivier & Bruguière, P.

Frutex cortice albido, rimuloso. Rami iteratim ramosi, erecto-patentes. Ramuli ± patentes, virgati. Folia forma et dimensione valde variabilia, (2—)3—10 (—15, rarissime 17)×(rarissime vix 2—)3—5(—8) mm, plerumque oblongo-spathulata, obtusa, rarius lanceolato-oblonga vel sublinearia, plana vel margine paulo revoluta, ± glaucescentia, glabra vel velutino-papillosa. Pedicelli 3—6 mm longi, plerumque paulo infra medium articulati. Perigonium ±2 mm longum. Fructus 6—8(—10) mm longus, subaequilatus. Nux alata, ad alarum sinum in plicam transversalem hippocrepidoideam distorta, lobi terminales lobis inferioribus subcontigui.

Iraq: Sutherland 425!, 426!
Persia: N: Gil.: Rudbar, Gauba 2025! — W: Arak: Latetar, Str.! Inter Arak et Qom, Str.! Kuh Kohrud, Str. Kermannsh.: Sar-i Pul 7—20 km E Qasr Shirin, Rech. 14587! Esf.: Kuh Siah ad lacum Gav Khuni, Bobek 51! — S: Kerm.: Prope Rabor, 2800 m, Bornm. 4162! Lar.: 60 km SE Bastak, 400 m, Grant 16976! Fars.: Dalaki, Stapf 2044! Chenar Rah Dar, Stapf 2047! Dasht-e Arzhan, Stapf 2045! Kotal Kumaraj, Stapf 2046! Bal.: Sib, Blatt. & Hallb. Chah-i Khuda Baksh, Blatt. & Hallb. Ziarat S Nikshahr, 150 m, Blatt. & Hallb. — E: Sistan, Thomas. — C: Tehr.: Prope Sonak, Ky. 664! Prope Shurab, Haussкn.! Tehran, Koelz 16061!, 18403!, Olivier & Bruguière. Qazv.: Karaj, in alveo fluvii, 1400 m, Rech. 6854! Kuh Safid S Karaj, Rech. 614! Pachenar, Paulsen 2192-b. Qazvin, 1500 m, Linds. 381!, Schmid 6442! Qom: Rahjerd, 1700 m, Koelz 1225! Kashan: Shurab, Bge.!
Afghanistan: SW: Farah: Khurmalik inter Farah et Dilaram, 800 m, Rech. 19273! — E: Kabul: Tang-i Gharu, 1500 m, Rech. 2215! Lataband, Regel s. n.! — „In collibus circa Sharhabad, Affghanistan, „Lower Kalos", Griff. (Typus *P. Griffithii* Meisner).
Pakistan: Quetta: 12 km N Murgha Kibzai, 1600 m, Rech. 29804! Inter Mekhtar et Murgha Kibzai, 1500 m, Rech. 29789! In jugo Bolan, Griff. Supra Mach, Gaz. 120. — Kalat: Benn Chah inter Surab et Kalat, 1850 m, Hotson M 7 B. Chuttak S Kalat, 1350 m, Hotson 160. Korok SW Kalat, 550 m, Hotson M 160 A. Saruna, H.-B. 1717. Wahir SW Khuzdar, H.-B. 18356. — Bal.: Chagai, Gaz. 324. Makran: Turbat, 250 m, Popov 97! Tump W Turbat, 180 m, Hotson M 7. Rod Khan N Kolwa, 550 m, Hotson M 34 B. Sor (Kilkaur) S Panjgur, 700 m, Hotson M 7 A — Bela: Inter Bela et Uthal, Rech. 27464! Las Bela, H.-B. 18766. Diwana, H.-B. 18478. Kotiro, H.-B. 18445. — Karachi: Khadeji, Rech. 28557! — Sind, Stocks!

Distr. gen.: Endem.

P. Aucheri Jaub. & Spach und *P. Olivieri* Jaub. & Spach sind offenbar äußerst nahe verwandt. Die Art der Verzweigung, die Berindung, die Gestalt der Blüte beider Arten gleichen einander. Die Artikulation des Blütenstiels liegt bei *P. Aucheri* meist unter dem unteren Viertel der Gesamtlänge des Stielchens, bei *P. Olivieri* dagegen meist etwas unter der Mitte; die Längenverhältnisse variieren jedoch so stark, daß sie nur als Hilfsmerkmal herangezogen werden können. Die Gestalt der Frucht ist grundlegend gleich; *P. Olivieri* hat jedoch die breiteren Flügel, sodaß sich die oberen und unteren Abschnitte meist überlappen; bei *P. Aucheri* sind sie meist etwas voneinander entfernt. Aber auch hier überschneiden sich oft die Extreme beider Arten. Eine halbwegs günstige Unterscheidungsmöglichkeit bieten die Blätter. Während sie bei *P. Aucheri* schmallineal und durch ihren stark zurückgerollten Rand nahezu drehrund erscheinen, besitzt *P. Olivieri* breitere Blätter, die nie lineal sind, sondern ihre breiteste Stelle meist im oberen Drittel haben; allerdings darf man zur Unterscheidung nur das Verhältnis von Länge zu Breite verwenden; die absolute Breite allein wäre irreführend. Die schmalsten Blätter unter den als *P. Olivieri* bestimmten Belegen haben: Bobek 51: 10 × 1,75 mm; Grant 16976: 7 × 2 mm; Popov 97: 10 × 2 mm; Rech. 14587: 10 × 2 und Rech. 27464: 7 × 2 mm. Die breitesten Blätter unter *P. Aucheri* fanden sich bei: Barkley 9268: 17 × 2,5 mm; Manuch. 5773-E: 15 × 2 mm und Schmid 6589: 17 × 2 mm. Das Exemplar Grant 15838 verhält sich hinsichtlich der Blattform intermediär, es besitzt Blätter, die 15 mm lang und 2—3 mm breit sind, die meisten sind jedoch 12 × ±2 mm; die Früchte sind noch nicht reif, aber die Artikulation des Blütenstiels ist sehr tief — dies würde ebenso wie die spitzen Blätter für *P. Aucheri* sprechen. Ebenfalls hinsichtlich der Blattgröße intermediär ist Rech. 27660, die breitesten Blätter sind 13 × 2 mm groß.

Beide Arten können auch dicht papillös behaarte Blätter haben; die von Boissier aufgestellte Art *P. ericoides*, die sich von *P. Aucheri* nur durch dieses Merkmal unterscheidet, läßt sich somit nicht aufrecht erhalten. Bei *P. Aucheri* haben folgende Aufsammlungen behaarte Blätter: Manuch 5775-E und Salavatian 5776-E, Kokie 530, Popov 150, Rech. 4221, 14150 und 27739; bei dem als *P. Olivieri* bestimmten Material: Gilli 2215, Grant 16976, Rech. 29789 und 29804, Stapf 2044, 2045, 2046, 2047. Pflanzen mit kahlen Blättern können neben solchen mit behaarten Blättern vorkommen, wie die Aufsammlung Rech. 4221 beweist; diese Eigenschaft geht daher nicht mit einer geographischen Trennung Hand in Hand.

Die ebenfalls von Boissier aufgestellte Art *Pteropyrum gracile*, die er in der Fl. Or. 4: 1002 als Varietät zu *P. Olivieri* stellt, läßt sich auch nicht aufrecht erhalten. Das Typusmaterial fällt noch in die Variationsbreite von *P. Olivieri*.

Aus den obigen Ausführungen ergibt sich, daß *P. Olivieri* und *P. Aucheri* in den meisten Fällen unterschieden werden können, daß jedoch *P. ericoides* Boiss. in die Variationsbreite des *P. Aucheri*, *P. gracile* in die Variationsbreite des *P. Olivieri* fällt.

3. ***P. Noëanum*** Boiss. ex Meisner in DC., Prodr. 14: 31 (1856).

Typus: „Ad ripam Dialae et Tigridis prope Mossul", Noë 1002, G!

Frutex cortice fuscescente, ± rimuloso, ramosissimus. Ramuli graciles, patentes. Folia (3—)5—8(—12) × (1—)2—3(—5) mm, oblongo-lanceolata, margine subrevoluta, viridia, glabra. Pedicelli ad summum 5 mm longi, supra basin articulati. Perigonium ad summum 2 mm longum. Fructus ±6 × ±8 mm, praecedentibus conformis, sed alae nuce latiores.

Iraq: Diyala: 10 km E Mandali, Rech. 9640!

Distr. gen.: Endem.

Nach dem vorliegenden dürftigen Vergleichsmaterial erscheint es zweifelhaft, ob die spezifische Unterscheidung zwischen *P. Noëanum* und *P. Olivieri* gerechtfertigt ist.

7. *Calligonum*

Calligonum L., Spec. Plant. 530 (1753).

Lit.: El. Borszczow, Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg, Série 7, 3: 1: 1 (1860).

Frutices erecti, ramis saepe duris, angulato-flexuosis, cortice pallida. Folia minuta, inconspicua, valde caduca. Ochreae breves, non venosae. Perianthii segmenta 5 vel 6, ± petaloidea, libera, sub fructu persistentia, deflexa. Stamina c. 15. Stigmata 4. Fructus alatus vel setosus, setis saepe ramosis.

1a. Nux setis apice in membranam contiguam expansis obtecta ..... 18. *C. junceum* (Fisch. & C. A. Mey.) Litw.
b. Nux alata vel setis apice liberis obsita 2
2a. Nux alata 3
b. Nux setis omnino liberis vel basi dilatatis ± connatis obsita 9
3a. Nux 8-alata .... 1. *C. leucocladum* (Schrenk) Bge. var. *serratum* Litw.
b. Nux 3—4-alata 4
4a. Alae quam nux manifeste angustiores 5
b. Alae quam nux aequilatae vel latiores 6
5a. Spinulae alarum 2—3-furcatae, firmae .. 7. *C. tetrapterum* Jaub. & Spach
b. Spinulae alarum simplices, quam in *C. tetraptero* tenuiores ..... 6. *C. stenopterum* Bge. ex Boiss.
6a. Nux 3- rarius 4- alata. Alae margine obsolete repandae vel denticulatae ..... 3. *C. Bungei* Boiss.
b. Nux semper 4-alata 7
7a. Alae nervo marginali continuo carentes, ± profunde dentato-laceratae et interdum usque ad basin incisae vel fissae ..... 5. *C. schizopterum* Rech. f. & Schiman-Czeika
b. Alae nervo marginali continuo praeditae, denticulatae, numquam fissae vel incisae 8
8a. Alae nuce subduplo latiores, simplices, margine denticulato-laceratae ... 4. *C. denticulatum* Bge. ex Boiss.
b. Alae nuci ± aequilatae duplices, margine acute denticulatae ..... 2. *C. persicum* (Boiss. & Buhse) Boiss.
9a. Fructus minutus, ad summum 10 mm diametro. Nux in medio abrupte valde dilatata, 180° torta ..... 17. *C. microcarpum* Borszcz.
b. Fructus major. Nux plerumque sensim dilatata, 90° torta vel recta 10
10a. Setae subsimplices vel bifurcatae, rarissime plurifurcatae 11
b. Setae semper iteratim divaricato-ramosae 13
11a. Setae basi dilatata subconnata numquam autem in alam manifestam confluentes. Nux ad summum 8×5 mm..... 13. *C. crinitum* Boiss.
b. Setae basi in alam manifestam confluentes 12
12a. Nux ultra 15×8 mm ..... 8. *C. setosum* Litw.
b. Nux ad summum 9×4 mm ..... 9. *C. laristanicum* Rech. f. & Schiman-Czeika
13a. Setae subliberae 14
b. Setae basi in alam connatae 16
14a. Fructus ultra 20 mm diametro..... 14. *C. Caput-Medusae* Schrenk
b. Fructus ad summum 13 mm diametro 15
15a. Fructus subglobosus, ultra 11 mm diametro. Nux leviter torta ..... 15. *C. turkestanicum* (Korov.) Pavlov

b. Fructus ovatus, ad summum 11 × 10 mm. Nux manifeste torta ..... 16. *C. amoenum* Rech. f. & Schiman-Czeika

16a. Fructus semper longior quam latus. Ramificationes ultimae ordinis setarum ad summum 10 ..... 10. *C. polygonoides* L.

b. Fructus subglobosus. Ramificationes ultimae ordinis setarum ultra 10 ... 17

17a. Setae a basi usque ad apicem iteratim subrectangulariter divaricato-ramosae, intertextae. Nux ±90° torta ..... 11. *C. intertextum* Rech. f. & Schiman-Czeika

b. Setae basi iteratim divaricato-ramosae, apicem versus angulo acuto furcatae, non intertextae. Nux leviter torta ..... 12. *C. comosum* L'Hér.

Sect. *Pterococcus* (Pall.) Endl., Gen. Plant. 308 (1837).

Syn.: *Pterococcus* Pall., Reise 2, 1: 332, 738 (1773).

Nux angulis in alam membranaceam expansis.

1. ***C. leucocladum*** (Schrenk) Bge., Mém. Sav. Etrang. Acad. Petersbg. 7: 485 (1851).

Syn.: *Pterococcus leucocladus* Schrenk, Bull. Phys.-Math. Acad. Petersbg. 3: 211 (1845).

Icon.: Fl. URSS. 5: tab. 31, fig. 5 et 6 (1936).

Typus: Pribalchash.

In ditione tantum occurrit:

— — var. ***serratum*** Litw. ex Pavlov, Fl. URSS. 5: 545 (1936).

Frutex usque ad 200 cm altus. Rami crassi, angulato-flexuosi, cortice albido-griseo, opaco, nodis incrassatis. Ramuli pauci fasciculati, pallide cinereo-virescentes, angulato-flexuosi, internodiis brevibus divaricate ramosi, fragillimi. Fructus 11—15 × 10—13 mm, ambitu ovato-orbiculatus, basi leviter cordato-emarginatus, quadriangulatus, angulis bialatis, alis binis ex angulis diversis ortis adeo convergentibus ut una occultetur. Alae 3—6 mm latae, membranaceae, fuscescentes, nervis transversalibus parallelis extremo margine nervo continuo cinctae, crebre subsinuato-denticulatae. Nux ± 10 × 3—4 mm.

Persia: E: Khor.: Robat-e Khan, in planitie Taq, Koelz 16810! — C: Qazv.: In collibus Halkedar prope Mardabad, 1200 m, Rech. 6822!

Distr. gen. speciei: Aralo-Caspia, Pribalchasch, Syr Darya, Kizil-Kum, Kara Kum, Dsungaro-Tarbagatai, Persia.

Der Typus der Art unterscheidet sich lediglich durch ganzrandige Fruchtflügel. Die allgemeine Verbreitung der Varietät ist uns nicht bekannt.

2. ***C. persicum*** (Boiss. & Buhse) Boiss., Fl. Or. 4: 999 (1879).

Syn.: *Pterococcus persicus* Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 191 (1860).

Typus (Syntypi): „Am Sefidrudfluß unweit Mendschil (fruct.); Sandwüste bei Enarek (flor. et deflor.), Buhse.

Rami flexuosi, albidi, ramuli tenues. Folia subulata, decidua. Fructus alis membranaceis planis elevatim multinerviis in statu immaturo paulo supra medium bicristatis; cristae acute denticulatae.

Persia: N: Gil.: Ad fl. Safid Rud prope Manjil, Buhse 985. — C: Yazd: In desertis Anarak, Buhse 1281!, 1281-a.

Distr. gen.: Endem.

Der Syntypus im Herbar Genf (Anarak) zeigt nicht ausgereifte Früchte. Die Fruchtflügel verdoppeln sich etwas oberhalb der Mitte, wodurch die Art gut gekennzeichnet erscheint.

3. ***C. Bungei*** Boiss., Fl. Or. 4: 999 (1879).

Typus: In arena mobili Persiae orientalis inter Kerman et Yazd, Bge., G!

Rami valde angulato-infracti cinerei; ramuli tenues, glaucescentes, divaricati. Fructus 12—17×11—20 mm, alis basi profunde emarginatis ternis vel quaternis, membranaceis, planiusculis, margine obsolete repandis vel denticulatis, quam nux vix 10—12×5—6 mm longa usque ad summum duplo latioribus, apice rotundatis.

Persia: S: Kerm.: 140 km W Zahedan, 27—30 km NE Kahurak, 1300 m, Grant 15308!, 15380! Bal.: Makran: Iranshahr, Manuch. 5781-E! — C: Yazd: Inter Kerman et Yazd, Bge.! Yazd, Bornm. 4153. Inter Anar et Rafsanjan, Rech. 2930!

Distr. gen.: Endem.

Grant 15380 unterscheidet sich vom Typus durch breitere, deutlicher gezähnelte Fruchtflügel von zarterer Beschaffenheit. Die Zahl der Fruchtflügel beträgt vorwiegend 3, daher kommt keine der anderen, durchwegs vierflügeligen Arten in Betracht.

4. ***C. denticulatum*** Bge. ex Boiss., Fl. Or. 4: 999 (1879).

Typus: „In Persia orientali inter Kerman et Yazd", Bge., G!

Rami valde angulato-tortuosi, cinerei; ramuli valde flexuosi et divaricati, glaucescentes. Fructus 15—18 mm diam. Nux 3—4×10 mm, alis ±6 mm latis membranaceis, planis vel undulatis nuce subduplo latioribus, tenuiter elevate radiato-nervosis, margine grosse irregulariter denticulato-laceratis, apice obtusis.

Persia: S: Kerman: Inter Kerman et Yazd, Bge.!

Distr. gen.: Endem.

5. ***C. schizopterum*** Rech. f. & Schiman-Czeika, sp. nov.

Typus: Rech. 3918, W!

Frutex humilis, crebre divaricate ramosus, ramis crassis angulato-flexuosis, cortice pallide griseo opaco, nodis leviter incrassatis. Ramuli pauci fasciculati divaricate ramosi, opaci, sordide virides. Folia subulata, ±2 mm longa, caduca. Fructus longitudine latius, 10—11×13—15 mm, ambitu late cordatus, sinu basali late aperto, quadriangulatus, angulis simpliciter alatis. Alae 3—6 mm latae, membranaceae, fuscescentes, nervis transversalibus parallelis, nervo marginali continuo nullo, margine irregulariter fere dupliciter dentato-laceratae, irregulariter profunde interdum usque ad basin fissae. Nux ±10×3—4 mm.

Persia: S: Kerm.: Ad limites austro-orientalis deserti Lut prope Nosratabad Sipi, 1400 m, 11. V. 1948, Rech. 3918!

Distr. gen.: Endem.

Die Art ist durch die im Umriß breit herzförmigen Fruchtflügel mit weit offener Basalbucht und durch den Mangel eines durchlaufenden Randnerven gut gekennzeichnet, wodurch die Flügel unregelmäßig oft bis zum Grund einreißen. Nach den Abbildungen in Fl. URSS. 5, tab. 31, fig. 7 und 8 (1936) besteht eine gewisse Ähnlichkeit mit *C. dissectum* T. Popova, bei welcher Art die Früchte jedoch deutlich länger als breit sind.

6. ***C. stenopterum*** Bge. ex Boiss., Fl. Or. 4: 999 (1879).

Typus: „In Persia orientali et Afghania occidentali, Kuh-i Bochtan, prope Robat inter Herat et Tabbas", Bge., G!

Rami flexuosi et tortuosi, albidi, ramuli tenues. Folia subulata, brevissima. Fructus $\pm 13 \times \pm 8$ mm, oblongus. Nux $10 \times 5-6$ mm, alis membranaceis planis quam nux multo angustioribus, margine in spinulas subdistichas simplices abeuntibus.

Persia: E: Kuh-i Bochtan prope Robat inter Herat et Tabas, Bge.! — Persia orientalis, Bge.

Distr. gen.: Endem.

7. ***C. tetrapterum*** Jaub. & Spach, Ill. Pl. Or. 5: tab. 471 (1856).
Syn.: *Pterococcus tetrapterus* Meisner ex DC., Prodr. 14: 29 (1856).
Icon.: Jaub. & Spach, l. c.
Typus: Syria vel Mesopotamia, „inter Bagdad et Halep", Olivier & Bruguière, P

Frutex ad summum 2 m altus. Rami flexuosi; cortex cinereus. Ramuli fasciculati, dichotome ramosi vel subsimplices, $\pm$ flexuosi, glaucescentes. Folia minuta. Flores 2—5-ni fasciculati. Fructus $10-17 \times 8-15$ mm, alae 4, margine cristatae, dentibus brevibus, inaequalibus, subdistichis, interdum 2—3-furcatis.

Iraq: Kut al-Imara: 28 km NE Zurbatiyah versus Tek Tek, Grant 7659!

Distr. gen.: Mesopotamia, Anatolia, Persia, Aralo-Caspia, Pribalchash.

Sect. *Calligonum*

Syn.: Sect. *Eucalligonum* Bge. ex Boiss., Fl. Or. 4: 1000 (1879) et Borszcz., Mem. Acad. Sci. Petersb. ser. 7, 3: 39 (1860). Sect. *Pterygobasis* Borszcz. l. c. 34.

Nux setis apice liberis $\pm$ dense obsita.

Borszczow, Mem. Acad. Sci. Petersb. 39 (1860) unterteilte die Sektion *Calligonum* in *Pterygobasis* mit 8 am Grunde zu schmalen Flügeln vereinigten Borstenreihen und *Eucalligonum* mit gänzlich freien Borsten in 8—12—16 Reihen. Auf Grund der vorliegenden Exemplare erscheint diese Abgrenzung wesentlich weniger klar als die der anderen Sektionen. So fanden sich bei *C. comosum* L'Hér aber auch bei *C. polygonoides* L. Früchte, die Übergänge zwischen den obengenannten Merkmalen zeigen. Wir greifen daher auf die ursprüngliche Einteilung zurück. Nach den Nomenklaturregeln hätte außerdem für die Namen Sect. *Pterygobasis* der Name Sect. *Calligonum* einzutreten, da Borszczow *P. polygonoides* L., die Typusart der Gattung, in seine neue Sektion stellte.

8. ***C. setosum*** Litw., Trav. Mus. Bot. Acad. Sci. Petersbg. 11: 57 (1913).
Syn.: *C. acanthopterum* Borszcz. var. *setosum* Litw., Sched. Herb. Fl. Ross. 2: 28 (1900).
Icon.: Litw. l. c.: tab. 8, fig. 18. Fl. URSS. 5: tab. 35, fig. 4 (1936).
Typus: Transcaspia, in deserto arenoso inter Meru et Amu Darya prope Repetek, Litw., LE; Isotypus W!

Frutex mediocris. Rami flexuosi, ramuli tenues. Fructus subglobosus, 25—36 mm diam. Nux $15-20 \times 8-15$ mm, recta vel leviter torta, acute costata. Setae plerumque bifurcatae $8-10(-13)$ mm longae, $\pm$ rigidae, basi in alam confluentes. Facies alarum setis $(1-2(-3)$-seriatis armata.

Turcomania: Inter Annaju et Gyaurs, Sint. 2979! Repetek, Litw.
Afghanistan: E: Kabul: Jalalabad, in arenosis, Volk 1958!

Distr. gen.: Turcomania, Kara Kum, Kizil Kum, Amu Darya, Afghanistan.

9. ***C. laristanicum*** Rech. f. & Schiman-Czeika sp. nov.
Typus: Rech. 3423, W!

Frutex elatus, ramis tenuibus divaricatis leviter tantum angulato-flexuosis,

nodis valde incrassatis, cortice grisea. Ramuli crebre fasciculati, griseo-virides, opaci, modice ramosi, valde fragiles. Pedicelli ±4 mm longi, infra medium articulati. Fructus 13—15×11—15 mm, fuscescens, ambitu late ovatus vel suborbiculatus, quadriangulatus, angulis anguste bialatis, alis ±1 mm latis, setis semper fere biseriatis obsitus; setae usque ad 6 mm longae, plerumque semel rarius bis furcatae, rectae strictae regulariter paralleliter patentes. Nux 8—9×4 mm.

Persia: S: Lar.: Inter Ginau et Sarzeh in arenosis, 250 m, 29. IV. 1948, Rech. 3423!

Distr. gen.: Endem.

Die neue Art erinnert in den dünnen, nur mäßig winkelig-flexuosen Zweigen, besonders aber im Fruchtbau an *C. setosum* Litw. Die Fruchtborsten des *C. setosum* sind jedoch fast doppelt so lang.

10. ***C. polygonoides*** L., Spec. Plant. 530 (1753).

Icon.: Fl. URSS. 5: tab. 34, fig. 4 (1936).

Typus: „In monte Ararat".

Frutex usque ad 150 cm altus. Rami albidi, validi; ramuli tenues. Folia 7—15 mm longa, subulata, mox decidua. Fructus 12—17×10—14 mm. Nux ±10×5 mm, oblonga, ± aequaliter torta. Setae 3—6 mm longae, ramosae, ± rigidae, basi dilatatae, in alas quattuor manifestas ± latas conjunctae.

Iraq: Diyala: Jabal Hamrin, Sutherland 422! Inter Shahraban et As Sadiyah, Rech. 8074!

Persia: W: Azerb.: Inter Seyyed Hajjin et Chorbula, Szov. Inter Habashi et Tasuj, Knapp. — S: Kerm.: Mirjaveh, Manuch. 5780-E! Bal.: Chah-i Khuda Bakhsh, Blatt. & Hallb. — E: Sistan, Thomas, Khor.: Hizomeh, 1200 m, Gabr. 56. — C: Damgh.-Semn.: Torud, Gabr. Malheh, Gabr. Yazd: Rig-e Jin, Gabr.

Turcomania: Inter Annaju et Gyaurs, Brotherus 327.

Pakistan: S. Wazir.: Tank, Williams 7204. — Quetta: Sibi, Lace. In valle Pishin, Lace. — Bela: Ad fl. Hab, H.-B. 18432. Uthal, H.-B. 19592. — Kharan: Mianeh Rodak, H.-B. 23154.

Distr. gen.: Anatolia, Kurdistania turcica, Persia, Turcomania, Iraq, Pakistan.

Die Zugehörigkeit mancher der aus der Literatur übernommenen Verbreitungsangaben zu dieser Art ist zweifelhaft.

11. ***C. intertextum*** Rech. f. & Schiman-Czeika, sp. nov.

Typus: Sab. 5778-E, W!

Fruticosa. Ramuli flexuosi, striati, simplices vel pauciramosi, glaucescentes. Ochreae vix 1 mm longae, tubulosae, membranaceae, glaucescentes vel fuscescentes. Folia 1—4 mm longa, subulata, mox decidua. Flores 2—4-ni fasciculati vel solitarii. Lobi perigonii 2—2,5 mm longi. Stamina 12 basi dilatata connata. Styli 4 brevissimi. Pedicelli fructificationis tempore ±4 mm longi, prope medium articulati. Fructus 13—20×12—17 mm, late ovatus vel subrotundatus. Nux 10—12×5—7 mm, 4-costata. Costae ±90° tortae, omnes setis biseriatis obsitae; setae 4—5 mm longae quater usque sexies furcatae, patule vel subrectangulariter divaricato-ramosae, basi dilatatae in alas ±1 mm latas confluentes, ramificationibus ultimae ordinis tenuiter 10—20 subulatis intertextis. — Differt a *C. comoso* L'Hér. ramificationibus setarum ultimae ordinis intertextis.

Persia: W: Khuz.: Inter Ahvaz et fl. Karkheh, IV. 1964, Sab. 5778-E!

Afghanistan: SE: Kandahar: In deserto Dasht-i Margo 20 km NW Darweshan, Rech. 34713!

Distr. gen.: Endem.

Der afghanische Beleg unterscheidet sich vom Typus durch etwas geringeren Durchmesser der Früchte.

12. ***C. comosum*** L'Hér., Trans. Linn. Soc. 1: 180 (1791).
Typus (Syntypi): „In Aegypto, Lippi; Barbaria, Desf."

Arborescens, usque ad 175 cm altum, ramosissimum. Rami albidi, tortuosi. Ramuli fasciculati, tenues, simplices vel ramosi, glaucescentes, mox aphylli. Folia 1—5 mm longa, subulata. Fructus 12—13 mm diam. Nux 7—8 × ±3 mm, fusiformis, leviter torta, quadricostata; costae setis 2—4-seriatis obsitae; setae ter usque quinquies ramosi, basi dilatatae ± connatae, molles vel paulo fragiles.

Persia: W: Esf.: Prope Esfahan, Bge. — S: Kerm.: Prope Kerman, Bge. Lar.: Bandar Abbas, Rezvan, Esfand. & Behb. 469-E! Bal.: Makran: „Hajji Khademi", coll. ign. 1099-E! Biaban: Inter Jask et Bahmadi, Behb. 465-E! Ad viam versus Chah Bahar, Shar. 1093-E! Inter Chah Bahar et Tang-e Sorkh, Shar. 1097-E! — E: Khor.: Inter Mozhnabad et Awiz, in arenosis, Czern. — C: Yazd: Prope Yazd, Bge. Inter Anar et Rafsanjan, Rech. 2927! In desertis prope Rafsanjan, Bornm. 4149. Prope Anar, 1700 m, Bornm. 4148.
Afghanistan: SE: Kandahar: In arenosis mobilibus deserti Registan, 25—30 km S Kandahar, 1000 m, Rech. 35341! In arenosis deserti Registan prope Bhagat, 600 m, Rech. 34679! In deserto Dasht-i Margo, 30 km NNW Darweshan, Rech. 34714!
Pakistan: Makran: Inter Kappar et Gwadar, Rech. 27900! 8—25 km W Awaran versus Turbat, Rech. 27723! Bal.: Chagai: In arenosis, 100—150 km E Nok Kundi, Rech. 27265!, 27267! Inter Padag et Nushki, Rech. 27302!

Distr. gen.: Aegyptus, Arabia, Syria, Persia, Afghanistan, Baluchistan.

C. comosum L'Hér. wurde hier provisorisch weit gefaßt. Das eine Extrem bildet Rech. 27723 mit Früchten, deren Borsten pinselartig sind und am Grund zu schmalen Leisten zusammenfließen. Das andere Extrem bildet Behb. 465-E und Esfand. & Behb. 469-E, Shar. 1093-E, 1097-E und Herb. Min. Iran. Agr. 1099-E (ohne Sammler) mit weniger starren Fruchtborsten, deren Verzweigungen meist stärker divergieren und die am Grunde schwimmhautartig zusammenhängen.

13. ***C. crinitum*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 4: 77 (1859).
Typus: „In ditione Beloutschistan", Stocks, G!

Frutex elatus. Rami elongati, tenuissimi, valde flexuosi, striati; ramuli tenuissimi, elongati. Fructus 20—27 mm diam. Nux 6—8 × 3—5 mm, elliptica, dextrorsum torta, apice attenuata. Setae plerumque octoseriatae, 9—12 mm longae, tenuissimae, molles, basi dilatatae, subconnatae, supra medium bis vel ter dichotome ramosae, fuscae vel pallescentes.

Afghanistan: SE: Kandahar: In arenosis deserti Registan prope Bhagat, 600 m, Rech. 34680!
Pakistan: Bal.: Makran: Dokap E Mand, 200 m, Hotson M 60-A. Tump W Turbat, 180 m, Hotson M 60. Garmkan NE Panjgur, 940 m, Hotson M 60-A. — Bela: Inter Uthal et Naka Kharai, Rech. 27478! — Baluchistan, Stocks!

Distr. gen.: Endem.

14. ***C. Caput-Medusae*** Schrenk in Fisch. & C. A. Mey., Enum. Pl. Nov. 9 (1841).
Icon.: Fl. Uzbekistan 2: tab. 13 fig. 8; tab. 15 fig. 2 (1953).
Typus: Ad lacum Balchasch, Schrenk, LE.

Fruticosum, 100—200 cm altum. Rami ascendentes, cortice griseo vel albido, rimoso. Ramuli fasciculati vel solitarii, simplices vel pauciramosi. Folia 2—3 mm

longa, subulata. Fructus 20—25 mm diam., subglobosus vel ± ovatus. Nux 8—13×4—7 mm, elliptica, dextrorsum 90° torta, apice angustata, 4-costata. Setae 6—12 mm longae, 8-seriatae, subliberae, a basi patule multiramosae, rigidae.

Iraq: Diyala: Jabal Hamrin, Sutherland 423!

Turcomania: Ashkhabad, Kuntze. Kizyl-Arvat, Becker. Prope Jabal, Litw. 251.

Distr. gen.: Iraq, Turcomania, Kizil-Kum, Kara-Kum, Soongaria, Amu Darya.

15. ***C. turkestanicum*** (Korov.) Pavlov, Feddes Repert. 33: 155 (1933).

Syn.: *C. comosum* L. var. *turkestanicum* Eug. Kor., Sched. Herb. Fl. As. Med. 10: 3 no. 226-a, b. (1926). *C. comosum* auct. Fl. Turkest., non L'Hér. (1791).

Icon.: Fl. URSS. 5: tab. 37, fig. 4 (1936).

Typus: „Turkestania ross., prov. Transcaspia, distr. Merv, in arenis immobilibus prope Palvart", Herb. Fl. As. Med. no. 226-a, b.

Frutex ad summum 100 cm altus. Rami albidi. Ramuli tenues, herbacei. Fructus subglobosus vel ovatus, 12—13 mm diam. Nux 7—8×3—4 mm, ± anguste elliptica, leviter sinistrorsum rarius dextrorsum torta, costis rotundatis. Setae 12—16-seriatae, 3—5 mm longae, basin versus non vel rarius paulo dilatatae, omnino liberae, fere a basi iteratim divaricato-ramosae.

Turcomania: Ashkhabad, in deserto arenoso, Litw. in Herb. Fl. Ross. 484! Inter Annaju et Gyaurs, Sint. 48-a et b.

Distr. gen.: Turcomania, Persia, sec. Fl. URSS. 5: 586 (1936).

16. ***C. amoenum*** Rech. f. & Schiman-Czeika, sp. nov.

Typus: Safavi & Dezfoulian 6423-E, W!

Fruticosum. Rami flexuosi, cortice albida, striata. Ramuli semper fere fasciculati, plerumque simplices vel pauciramosi, tenues, longitudine internodiis valde variabilibus, usque ad 35 mm longis, glaucescentibus, striatis. Ochreae vix 1 mm longae, ± tubulosae, membranaceae, glaucescentes vel fuscescentes. Folia 1—5 mm longa, subulata, fructificationis tempore persistentia. Flores 2—4-ni fasciculati vel solitarii. Lobi perigonii 5—6, ad summum 2 mm longi, filamentis interdum in perianthii phylla dilatatis. Stamina 8—12, basi dilatata, connata. Styli 4, brevissimi. Pedicelli longitudine florum breviores, prope medium articulati, fructificationis tempore ad summum 4 mm longi. Fructus 9—11×7—10 mm, ovatus. Nux 6—8×2—4 mm, anguste elliptica vel fusiformis, acute 4-costata, costis dextrorsum manifeste tortis omnibus setis biseriatis obsitae. Setae 2—4 mm longae ter usque quater subrectangulariter divaricato-ramosae, rigidae, basi paulo dilatatae, ramificationibus ultimae ordinis 6—12 tenuiter subulatis. — Fructu parvo cum *C. microcarpo* Borszcz. et *C. turkestanico* (Korov.) Pavlov comparandum; a priore differt nuce minus torta utrinque sensim attenuata, ab altero fructu minore manifestius torto.

Persia: S: Lar.: Inter Minab et Jiroft, Safavi & Dezfoulian 6423-E! Bandar Abbas „Guahkom", Alexandrov 5779-E! Kerm.: 27 km N Kahurak, 140 km W Zahedan, 1300 m, Grant 15377! Bal.: Makran: Iranshahr, Salavatian 454-E!

Afghanistan: SE: Kandahar: In arenosis deserti Registan prope Bhagat, 600 m, Rech. 34678! Ad marginem deserti Registan inter Darweshan et Safer, in arenosis, 700 m, Rech. 34577!, 34578! Ad marginem deserti Dasht-i Margo SW Qala Bist, 820 m, Rech. 34491! In deserto Dasht-i Margo 20 km NNW Darweshan, Rech. 34517!

Distr. gen.: Endem.

17. ***C. microcarpum*** Borszcz., Mém. Acad. Scienc. Petersbg. ser. 7, 3: 41 (1860).
Syn.: *C. minimum* Lipsky, Verh. Kiewer Ges. Naturf. 11: 2 (1891).
Icon.: Borszcz., l. c., tab. 3, fig. 14-14-c.
Typus: „Ex oriente maris Aral, inter puteos Bil-Kuduk et Kulambai-Kuduk, hinc, inde", Borszcz., LE.

Fruticosum, usque ad 100 cm altum. Rami ± flexuosi, cortice grisea. Ramuli erecto-patentes saepe fasciculati, simplices vel pauciramosi, striati, glaucescentes. Folia minuta mox decidua. Fructus 5—10 mm diam., subglobosus vel late ovatus. Nux 5—7×4—6 mm, elliptica, in medio valde dilatata, 180° torta, 4-costata. Setae 3—4 mm longae, patenter multiramosae, basi paulo dilatatae, liberae.

Turcomania: Prope Ashkhabad, Litw. 44, 485. In collibus prope Meterowa, Sint. 2202! Kizyl Arvat, Lipsky.

Distr. gen.: Asia centralis, Kizil-Kum, Kara-Kum, Turcomania.

Sect. *Calliphysa* (Fisch. & C. A. Mey.) Endl., Gen. Plant. 308 (1837).
Syn.: *Calliphysa* Fisch. & C. A. Mey., Ind. Sem. Horti Petrop. 1: 24 (1835).

Nux setis apice in membranam eam includentum expansis dense obtecta.

18. ***C. junceum*** (Fisch. & C. A. Mey.) Litw., Sched. Herb. Fl. Ross. 8: 9 (1922).
Syn.: *Calliphysa juncea* Fisch. & C. A. Mey., Ind. Sem. Horti Petrop. 1: 24 (1835). *Calligonum Calliphysa* Bge. Del. Sem. Horti Dorpat. 8 (1839).
Icon.: Fl. URSS. 5: tab. 37, fig. 11 (1936).
Typus: „In litore orientali maris Caspii", Kar., LE.

Frutex ramis albidis tortuosis, ramulis flexuosis. Folia intertextis decidua. Fructus notis supra indicatis a ceteris speciebus generis *Calligoni* distincte differt.

Persia: W: Azerb.: Inter „Bedesht" et Mianeh, Bge. — C: Yazd: Inter Kerman et Yazd, Bge. Shar.-Bust.: Inter Mayamey et Shahrud, Rech. 5309!

Distr. gen.: Persia, Turcomania, Aralo-Caspia, Pribalchasch, Tien Shan, Kizil Kum, Kara-Kum, Mongolia.

8. *Polygonum*

Polygonum L., Spec. Plant. 359 (1753).

Lit.: C. F. Meisner, Monographiae Generis Polygoni Prodromus (1826). C. F. Meisner, Polygonaceae in Annales Musei Botanici Lugduno-Batavi 2: 55—65 (1865—1866). B. H. Danser, die Polygonaceen Niederländisch Ostindiens, in Bulletin du Jardin Botanique sér. 3, 8: 117—261 (1927). G. Samuelsson, Polygonaceae in H. Handel-Mazzetti, Symbolae Sinicae 6: 171—188 (1929). A. N. Steward, The Polygoneae of Eastern Asia in Contributions from the Gray Herbarium of Harvard University, 5, 88: 3—129 (1930).

Herbae annuae vel perennes, suffrutices vel frutices humiles. Folia forma ac magnitudine valde variabilia. Perianthii segmenta plerumque ± aequalia, libera vel basi connata, partim quidem petaloidea, nec alata nec carinata. Stamina 8, raro pauciora. Stigmata 2 vel 3. Nux lenticularis vel trigona, non alata, in perianthio persistente inclusa vel ex eo ad summum dimidio emergens.

Die Gattung wird hier im Gegensatz zu vielen neueren Autoren im ursprünglichen, weiten Sinn gefaßt, da sie seit mehr als 100 Jahren niemals in ihrem Gesamtumfang monographisch behandelt worden ist und da die Korrelation der zur Aufteilung herangezogenen Merkmale in vielen Fällen nicht deutlich erscheint.

1a. Flores ± approximati, inflorescentias aphyllas formantes. Folia plerumque ultra 30 mm longa, si breviora petiolata, ± orbicularia. Plantae ± erectae, rarius procumbentes 2
b. Flores remoti, plerumque axillares, rarius inflorescentias spiciformes aphyllas valde laxas formantes, si flores approximati, inflorescentiae crebre foliatae. Folia semper fere ad summum 30 mm longa, numquam orbicularia. Plantae plerumque procumbentes vel ascendentes 23
2a. Caulis volubilis vel flexuosus. Folia cordata vel sagittata. Flores in paniculas vel spicas spurias laxas dispositi 3
b. Caulis erectus vel procumbens, non volubilis. Folia ovata vel lanceolata, si folia sagittata, flores conferti 5
3a. Perennes. Flores paniculam laxam formantes .. *1. P. baldschuanicum* Regel
b. Annuae. Flores racemosi vel spicam spuriam laxam formantes 4
4a. Perigonii segmenta exteriora late membranaceo-alata. Pedicelli plerumque ultra 2 mm longi ..... 3. *P. dumetorum* L.
b. Perigonii segmenta exteriora obtuse angulata, numquam manifeste alata. Pedicelli breves ..... 2. *P. Convolvulus* L.
5a. Flores plerumque subsessiles capitulum parvum formantes 6
b. Flores pedicellati vel sessiles, inflorescentiam paniculatam vel spiciformem formantes 7
6a. Planta perennis basi indurata. Folia inferiora ad summum 15 mm longa, cordato-rotundata. Petiolus nec alatus nec auriculatus . 8. *P. Gilesii* Hemsl.
b. Planta annua. Folia inferiora ultra 15 mm longa, ± rhomboidea. Petiolus alatus, basi auriculatus ..... 9. *P. nepalense* Meisn.
7a. Styli liberi, breves, ad summum quartam partem ovarii aequantes. Inflorescentia paniculata 8
b. Styli inferne connati, si liberi, quarta parte ovarii longiores 11
8a. Planta humilis caespitosa 5(—10) cm alta. Folia linearia ....7. *P. sibiricum* Laxm. subsp. *Thomsonii* (Meisn. ex Steward) Rech. f. & ..... Schiman-Czeika
b. Plantae elatae, ultra 25 cm altae. Folia lanceolata vel ovata vel suborbicularia 9
9a. Caulis a basi divaricato-ramosus. Folia latitudine vix longiora .... 6. *P. tortuosum* D. Don
b. Caulis simplex vel pauciramosus, ramis non divaricatis. Folia latitudine evidenter longiora 10
10a. Caulis ramosus. Ochreae demum evanescentes ..... 4. *P. bucharicum* Grig.
b. Caulis ± simplex. Ochreae persistentes 5. *P. rumicifolium* Royle ex Bab.
11a. (7) Caules plerumque simplices. Styli 3, liberi 12
b. Caules ramosi. Styli 2—3, basi connati 15
12a. Folia basi late cordata, superiora quidem amplexicaulia .... 22. *P. amplexicaule* D. Don
b. Folia basi angustata, petiolata vel sessilia 13
13a. Inflorescentia basi bulbillifera, usque ad 9 mm crassa. Perigonium album ..... 19. *P. viviparum* L.
b. Inflorescentia numquam bulbillifera, crassior. Perigonium roseum vel purpureum 14
14a. Folia in sicco membranacea nervis non prominentibus. Rhizoma non surculosum ..... 21. *P. Bistorta* L.

b. Folia in sicco coriacea, nervis utrinque prominentibus. Rhizoma surculosum ..... 20. *P. affine* D. Don

15a. (11) Ochreae longe fimbriatae, fimbriae ± 20 mm longae ..... 10. *P. barbatum* L.

b. Ochreae breviter ciliatae vel nudae, ciliae ad summum 3 mm longae 16

16a. Inflorescentiae laxae, filiformes, basi interruptae 17

b. Inflorescentiae densae, spiciformes, ultra 7 mm crassae 19

17a. Perigonium dense manifeste glanduloso-punctatum ... 16 *P. Hydropiper* L.

b. Perigonium eglandulosum 18

18a. Folia lanceolato-linearia, ad summum 5 mm lata. Perigonium usque ad 2,5 mm longum ..... 18. *P. minus* Hudson

b. Folia lanceolata, ultra 7 mm lata. Perigonium ultra 3 mm longum ..... 17. *P. mite* Schrank

19a. Folia ovata ve lovato-cordata, acuminata, caulina media ultra 40 mm lata, ± longe petiolata. Planta valida semper ultra 1 m alta ..... 12. *P. orientale* L.

b. Folia late vel anguste lanceolata, ad summum 40 mm lata, brevissime petiolata vel subsessilia. Plantae graciliores, humiliores 20

20a. Plantae perennes. Folia basi truncata vel cordata. Styli perianthium aequantes vel paulo superantes ..... 11. *P. amphibium* L.

b. Plantae annuae. Folia basi attenuata. Styli quam perianthium semper breviores 21

21a. Caulis crassus, nodis incrassatis. Ochreae non ciliatae ..... 13. *P. glabrum* Willd.

b. Caulis gracilior, nodis non incrassatis. Ochreae ciliatae 22

22a. Ochreae tubulosae, longe ciliatae; ciliae ultra 1 mm longae ..... 15. *P. Persicaria* L.

b. Ochreae ± patentes, ciliatae; ciliae brevissimae, rarius ad summum 1 mm longae ..... 14. *P. lapathifolium* L.

23a. (1) Plantae perennes 24

b. Plantae annuae 43

24a. Plantae caulibus elongatis, virgatis, ultra 20 cm altis, basi lignosae; si suffrutex multiramosus ramis tenuissimis conf. *P. sarobiense* Rech. f. (E Afghanistan, Chitral) 25

b. Plantae caulibus nanis, procumbentibus, si erectis rami post anthesin persistentes, plerumque ad summum 15 cm alti 28

25a. Inflorescentiae aphyllae. Perigonium ultra 5 mm longum. Nuces maturae paulo longiores quam latae, latitudine ad summum sesquilongiores ..... 23. *P. arianum* Grig.

b. Inflorescentiae foliatae. Perigonium ad summum 3,5 mm longum 26

26a. Nux matura paulo longior quam lata ..... 24. *P. hyrcanicum* Rech. f.

b. Nux matura multo longior quam lata, plerumque latitudine duplo longior 27

27a. Folia anguste lineari-lanceolata, inferiora plerumque usque ad 30×2 mm. Pedicelli brevissimi ..... 25. *P. setosum* Jacq.

b. Folia lineari-lanceolata, inferiora 30(−50)×3 mm. Pedicelli perigonium aequantes ..... 26. *P. luzuloides* Jaub. & Spach

28a. (24) Rami floriferi prostrati, rarius ascendentes, herbacei, basi tantum lignosi 29

b. Rami floriferi erecti vel prostrati, lignosi 35

29a. Styli 2. Nux applanata .. 28. *P. chitralicum* Rech. f. & Schiman-Czeika
b. Styli 3. Nux triquetra 30
30a. Ochreae integrae vel subintegrae. Perigonium numquam ultra medium lobatum 31
b. Ochreae ± laciniatae. Perigonium plerumque profundius incisum 33
31a. Folia minuta, ad summum 10 mm longa. Nervi ochreae obsoleti ..... 29. *P. serpyllaceum* Jaub. & Spach
b. Folia media ultra 10 mm longa. Nervi submarginales ochreae manifesti.. 32
32a. Folia ultra 15 mm longa, margine revoluta. Caules et rami crassi ..... 27. *P. alpestre* C. A. Mey.
b. Folia ad summum 15 mm longa, plana. Caules et rami tenues ..... 30. *P. pamiroalaicum* Komar.
33a. Folia latitudine plusquam 4-plo longiora. Flores semper plures quam terni fasciculati..... 42. *P. corrigioloides* Jaub. & Spach
b. Folia ovata latitudine ± duplo longiora. Flores 1—3-ni fasciculati 34
34a. Planta erecta regionis glacialis. Folia ultra 10 mm longa. Perigonium usque ad basin fere incisum ..... 31. *P. myrtillifolium* Komar.
b. Planta prostrata regionum humiliorum. Folia ad summum 9 mm longa. Perigonium paulo infra medium lobatum..... 33. *P. Podlechii* Rech. f. & Schiman-Czeika
35a. Rami floriferi, ± erecti, rigidi, rami post anthesin indurati persistentes, fruticulum hemisphaericum formantes. Ochreae truncatae 36
b. Rami floriferi plerumque prostrati, flexuosi, caespitoso-suffruticosi. Ochreae ovato-lanceolatae 39
36a. Rami omnes longe spinescentes ..... 41. *P. spinosum* H. Gross
b. Rami omnes inermes 37
37a. Ochreae juniores truncatae, ± campanulatae. Internodia saepe valde abbreviata, plerumque ± 5 mm, ad summum 10 mm longa ..... 40. *P. salicornioides* Jaub. & Spach
b. Ochreae juniores ± acutae et ± tubulosae. Internodia saepe elongata, plerumque ultra 10 mm longa 38
38a. Plantae perigonio excepto glabrae vel papilloso-scabriusculae. Folia mox decidua, inferiora ultra 10 mm longa . 39. *P. aridum* Boiss. & Haussk.
b. Plantae ochreis exceptis tomentosae vel papilloso-puberulae. Folia persistentia, inferiora usque ad 7 mm longa ..... 38. *P. dumosum* Boiss.
39a. Folia ovata. Ochreae biaristatae .... 32. *P. biaristatum* Aitch. & Hemsl.
b. Folia lanceolata vel linearia. Ochreae integrae vel ± laciniatae, numquam biaristatae 40
40a. Nux ± regularis, recta, saepe acute trigona. Ochreae breves ..... 34. *P. thymifolium* Jaub. & Spach
b. Nux assymetrica, leviter sed distincte curvata, in parte superiore tantum acutangula. Ochreae longiores 41
41a. Plantae basi tantum lignosae, ramis floriferis crassis fragilibus prostratis vel ascendentibus, fasciculis axillaribus crassis confertis plurifloris facile deciduis. Folia latiuscula 42
b. Planta altius lignescens, ramis floriferis tenuissimis elongatis, fasciculis axillaribus tenuibus remotis uni- vel paucifloris persistentibus. Folia angustissima ..... 36. *P. sarobiense* Rech. f.
42a. Folia semper quam ochreae longiora, plana; folia ramorum principalium

quam ea ramulorum manifeste longiora. Planta plerumque papilloso-puberula ..... 35. *P. afghanicum* Meisn.

b. Folia quam ochreae breviora vel inferiora sublongiora, margine revoluta; folia ramorum et ramulorum longitudine vix diversa. Planta glabra .... 37. *P. paronychioides* C. A. Mey.

43a. (23) Rami in regione inflorescentiae aphylli vel folia abrupte decrescentia 44

b. Rami usque ad apicem foliati 47

44a. Nux quam 4 mm longior ..... 52. *P. Kitaibelianum* Sadl.

b. Nux ad summum 3 mm longa 45

45a. Flores approximati. Folia saepe mox decidua .. 53. *P. argyrocoleon* Steud.

b. Flores remoti. Folia semper fere post florendum persistentia 46

46a. Caules rigidi apice numquam nutantes. Planta laete vel flavescenti-viridis, serotina. Ochreae regionis floriferae usque ad medium induratae, nervosae, brunnescentes ..... 51. *P. patulum* M. B.

b. Caules tenues flaccidi apice nutantes. Planta olivascens vel sordide viridis, praecox. Ochreae regionis floriferae hyalinae, interdum ima basi obsolete nervosae, virescentes .... 50. *P. olivascens* Rech. f. & Schiman-Czeika

47a. Nux compressa ovata. Flores quam ochreae breviores .... 46. *P. molliaeforme* Boiss.

b. Nux triquetra. Flores quam ochreae longiores 48

48a. Ochreae medianae quidem bipartitae 49

b. Ochreae non bipartitae 52

49a. Planta heterophylla 50

b. Planta isophylla 51

50a. Nux plerumque rugulosa. Caules et rami ± stricti ... 49. *P. aviculare* L.

b. Nux laevis. Caules et rami apice nutantes .... 50. *P. olivascens* Rech. f. & Schiman-Czeika

51a. Nux plerumque rugulosa vel punctulata ..... 48. *P. arenastrum* Boreau

b. Nux semper laevis ..... 51. *P. patulum* M. B.

52a. Flores manifeste pedicellati, ad extremos ramos aggregati, semper plures quam terni fasciculati ..... 42. *P. corrigioloides* Jaub. & Spach

b. Flores subsessiles, per totos ramos subaequaliter dispersi, ad summum terni fasciculati 53

53a. Folia latitudine ad summum triplo longiora .. 47. *P. lenkoranicum* Komar.

b. Folia angustiora, multo longiora quam lata 54

54a. Perigonium subcampanulatum, usque ad medium lobatum. Nux cum perigonio non concreta ..... 43. *P. polycnemoides* Jaub. & Spach

b. Perigonium tubulosum, usque ad tertiam circiter partem lobatum. Nux cum perigonio concreta 55

55a. Ochreae inciso-dentatae. Rami tenues sed tenaces ± teretes; internodia inferiora quidem elongata; folia, ochreae, flores ad extremos ramos interdum ± approximati, numquam autem clavato-congesti. Perigonii tubus non costato-rugosus, lobis ovato-lanceolatis .... 44. *P. rottboellioides* Jaub. & Spach

b. Ochrae integrae. Rami crassi sed fragiles ± angulato-costati; internodia omnia valde abbreviata; folia, ochreae, flores imprimis ad extremos ramos claviformi-congesti. Perigonii tubus costato-rugosus, lobi spathulati late albo-marginati ..... 45. *P. breviarticulatum* Rech. f.

Sect. *Pleuropterus* (Turcz.) Bentham & Hooker, Genera Plant. 3: 99 (1883).
Syn.: *Pleuropterus* Turcz., Bull. Soc. Nat. Mosc. 21, 2: 586 (1848).

Plantae perennes longe volubiles scandentes vel elatae flexuosae. Flores numerosi, paniculas laxas formantes.

1. ***P. baldschuanicum*** Regel, Acta Hort. Petrop. 8: 684 (1883).
Typus: „In Bucharae orientalis chanato Baldschuan ad fluvium Wachsch ad pedem orientalem montium Sevistan 4—5000' alt.", A. Regel, LE!
Icon.: Acta Hort. Petrop. 8, tab. 10 (1883).

Planta glabra. Caulis usque ad plura metra longus, volubilis, basi lignosus. Ochreae breves, saepe mox fissae, in bracteas hyalino-membranaceas transientes. Folia longe petiolata; petiolus 20—40 mm longus; lamina 20—50 × 15—45 mm, sagittato-cordata, acuta vel acuminata, margine indistincte crenulato-scabra; folia superiora angustiora, in petiolum attenuata. Inflorescentia 50(—100) mm longa, terminalis vel axillaris, ramis flexuosis. Flores 5—8 mm longi; pedicelli usque ad 10 mm longi. Perigonium 5-partitum, hyalino-albidum; lobi ovati, dorso naviculari-alati. Nux triquetra, nigra, nitida.

Afghanistan: E: Kabul: Giri, 2400 m, Koelz 11513!
Pakistan: S. Wazir.: Razmak, Blatt. & Fz.

Distr. gen.: Afghanistan, Pamir-Alaj, Pakistan.

Sect. *Tiniaria* Meisn., Monogr. Gen. Polyg. Prodr. 43 et 63 (1826).

Plantae annuae, volubiles vel caules tenues flexuosi. Flores racemosi vel spicam spuriam formans.

2. ***P. Convolvulus*** L., Spec. Plant. 364 (1753).
Syn.: *Fagopyrum carinatum* Moench, Meth. 290 (1794). *F. Convolvulus* (L.) H. Gross, Bull. Géogr. Bot. 23: 21 (1913). *Bilderdykia Convolvulus* (L.) Dumort., Fl. Belg. 28 (1827).
Typus: „In Europa agris".

Planta glabra. Caulis a basi ramosus, tenuis usque ad 100 cm longus, striatus. Ochreae breves, ± fissae, brunnescentes. Folia sagittata vel cordata, petiolata; lamina usque ad 50 × 30 cm, integra; petioli plerumque 10—20 mm longi. Flores usque ad 6-ni fasciculati axillares, spicam spuriam laxam formantes, breviter pedicellati. Perigonium 2—2,5 mm longum, 5-partitum, viride, margine album; segmenta tria exteriora dorso obtuse angulata, numquam manifeste alata. Nux triquetra, nigra, granulata.

Talish: Lenkoran, Hohen. Swant, Hohen.
Persia: N: Gorg.: Shahkuh, Koelz 16319! Maz.: Abbasabad versus Shahi, 400 m, Rech. 2026! Kuh-i Nizwa, Orim, 1900 m, Wdb. 1179-b! 48 km S Shahi, 1200 m, Furse 2914! Inter Kinch et Dasht Nazir, 800 m, Rech. 6619! Gil.: Lahijan, Lindsay 1047! — W: Azerb.: Kaleybar, Mird. 2056! Rezaiyeh, Hasan Beyglu, Knapp. Ham.: Kuh Gerru, Str. Borujerd, Str. Lur.: Bisheh, 50 km E Khorramabad, 1200—1400 m, Rech. 5688!, Koelz 1234! Oshtoran Kuh, Str. Persia occidentalis, Haussk. — C: Qazv.: Karaj, Gauba 1074. Gach Sar, Bornm. 8180. Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, Dihi, 2500 m, Rech. 5931! Tehr.: Darband, Shar. 5749-E!
Turcomania: sec. Nikitin.
Afghanistan: E: Kabul: Gulbahar, Neub. 50/315! Panjshir: Darrah-i Zuria prope Safed Gir, 3200 m, Podlech 12540! Nuristan: Pashki, 2300 m, Edelb. 1322! — C: Bamian: Lorinj, 2400 m, Koelz 13679! Doab, Kitam. — NE: Kataghan: In declivibus borealibus

jugi Salang, 2200 m, Rech. 31622! In valle Andarab, Darrah-i Kosan NE Deh Saleh, 1800 m, Podlech 1678! — Afghanistan, Griff.
Pakistan: Kurram: In valle Zeran, 2000 m, Afendi 77! Parachinar, 1800 m, Afendi 214! Shalozan, Aitch. 657.

Distr. gen.: Europa regionibus arcticis exceptis, Africa borealis et australis, Asia temperata.

3. ***P. dumetorum*** L., Spec. Plant. ed. 2: 522 (1762)
Syn.: *Fagopyrum membranaceum* Moench, Meth. 290 (1794). *Bilderdykia dumetorum* (L.) Dumort., Fl. Belg. Prodr. 28 (1827).
Typus: „In Europa australioris sylvis umbrosis".

Habitu *P. Convolvulo* L. simile, sed caulis usque ad 150 (300) cm longus. Flores 2—5-ni fasciculati axillares vel spicam spuriam laxam ± longam formantes, pedicellati; pedicelli 2—4 mm longi. Perigonii segmenta exteriora dorso late membranaceo-alata.

Talish: Lenkoran, Hohen. Astara, Hohen.
Persia: N: Gorg.: Minudasht, Shar. 335! Gil.: Gilan, Lindsay 1019! Rasht, Buhse 864.
Afghanistan: E: Nuristan, Edelb. 1229! Wama, 1400 m, Kerst. 1288! Kushtos, 2000 m, Neub. 3295! Gusalak, Neub. 51/823! Inter Wama et Chetras, Kitam. Inter Wama et Trokikorl, Kitam. Afghanistan, Griff. ex Meisn.
Pakistan: Swat: Utror, 2500 m, Rech. 19560! — Kurram: Shalozan, Aitch.

Distr. gen.: Europa et Asia temperata.

Sect. *Acontogonum „Aconogonon"* Meisn., Monogr. Gen. Polyg. Prodr. 43 et 55 (1826); Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 840 (1913).

Plantae perennes. Inflorescentia paniculata. Nux triangulata.

4. ***P. bucharicum*** Grig., Act. Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 102 (1933). — Tab. 1.
Syn.: *P. nuristanicum* Kitam., Acta Phytotax. Geobot. 17: 141 (1958); Kitam., Fl. Afgh. 92, fig. 48 (1960), syn. nov. e descr. et icone.
Typus: In valle fluminis Jagnob (syst. flum. Zeravschan), A. Regel, LE!

Caules usque ad 150 cm alti, erecti, herbacei, ramosi, plerumque glabri. Folia 50—100 × 20—50 mm, ovata vel ovato-lanceolata, acuta, basi late cuneata vel rotundata, subtus plerumque breviter ± appresse pilosa, rarius glabra, margine semper fere setuloso-ciliata, breviter petiolata; petioli 3—4 mm longi. Ochreae ± brunneae, superiores pallidiores, demum evanescentes, glabrae, rarius ± pilosae. Flores in paniculas multiramosas dispositi, pedicellati; pedicelli usque ad 5 mm longi. Perigonium 3,5—5,5 (7) mm longum, usque ad basin fere partitum. Nux usque ad 5 mm longa, triquetra, saepe in tertia parte superiore latissima, plerumque perianthio brevior, laevis, brunnea.

Afghanistan: E: In declivibus australibus jugi Salang, 2300—2600 m, Rech. 31375! Kabul: In jugo Unai, 2800 m, Volk 2118!, 2900 m, Gilli 2260!, 3000 m, Hdg. & Wdb. 4523! Paghman, 2400—2700 m, Chaw.-Must., Koelz 11118!, 12141!, 12148! Panjshir: In valle Porandeh prope Basarak, 2800 m, Gilli 2258! Mukeni, 2500 m, Hdg. & Wdb. 5148! Ghazni: Sang-i Masha, Neub. 1949/55! Nuristan: Pashki, Edelb. 934! Inter Pashki et Kushitaki, Kitam. Inter Pronz et Eshtaway, Kitam. Kushtos, 2000 m, Neub. 3308! In valle Kantivo prope Brubruts, 2460 m, Kerst. 939! In jugo Atsui, 3000 m, Edelb. 674! In jugo Mum, 2200—3000 m, Kerst, 881! — NE: Wakhan: In valle Qazi Deh, 3200 m, Roemer 151! Munjan: Darreh-i Parshui, 4050 m, Frey 401! Badakhshan:

Distr. Khash, 3000 m, Koelz 12977!, 13017! Ad lacum Shiva, Lindb. 855! Harkh, Lindb. 879! Dad Ali, Lindb. 704! Daraim, 2600 m, Koelz 13052! Kataghan: In valle Salang prope Olang, 2500 m, Podlech 11550! — C: Parwan: In declivibus orientalibus jugi Shibar, 2800 m, Hdg. & Wdb. 4242! Bamian: Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16852! In jugo Lorinj, 3000 m, Koelz 13747! In declivibus australibus Koh-i Baba, 3000 m, Thesiger 41! Deh Kundi: Inter juga Waras et Khonak, 65 km SW Panjao, 2600 m, substr. granit., Rech. 36628!
Pakistan: Chitral: Chitral Gol, 3000 m, Stainton 2264!

Distr. gen.: Afghanistan, Pamir-Alaj, Chitral, Tien Shan.

Gilli 2258 besitzt Nüßchen, die in seitlicher Betrachtung teils dreieckig, teils nahezu kreisrund oder sogar queroval sind. Stainton 2264 unterscheidet sich vom Typus durch breitlanzettliche Blätter von etwas derberer Konsistenz und mit größter Breite in der Nähe der Mitte, keilig verschmälerter Basis und oft ± stumpflicher Spitze, anscheinend auch durch länger erhalten bleibende Ochreen.

5. ***P. rumicifolium*** Royle ex Bab., Trans. Linn. Soc. 18: 112 (1841). — Tab. 2, fig. 1.
Syn.: *P. glaberrimum* Kitam., Acta Phytotax. Geobot. 77: 141 (1958), Fl. Afgh. 91, fig. 47 (1960); syn. nov. e descr. et icone.
Typus: Kunawar, Royle.

Caulis usque ad 75 cm altus, erectus, herbaceus, crassus, striatus, plerumque simplex, glaber vel pilosus. Ochreae usque ad 30 (—35) mm longae, truncatae, brunneae, superiores pallidiores, glabrae vel pilosae. Folia 50—110×25—55 mm, ovata, acuta, basi rotundata vel cuneata, in petiolum ± 15 mm longum attenuata, glabra vel pilis brevibus ± rigidis obsita, margine ± undulata semper fere setuloso-ciliata. Flores in paniculas axillares parvas et in paniculas terminales multifloras dispositi. Pedicelli usque ad 5 mm longi. Perigonium 3—4 mm longum, usque ad basin fere partitum. Nux usque ad 4 (—5) mm longa, triquetra, laevis, brunnea, saepe in tertia parte superiore latissima, plerumque perianthium ± aequans.
Afghanistan: NE: Munjan: Weran, 3800 m, Edelb. 1277!
Pakistan: Chitral: Golen, 4000 m, Bowes Lyon 124! Ishporili Gol S Mastuj, 3750 m, Stainton 3107! — Swat: Inter Diwan Gol et Pichar, 3600 m, Ogino 128. Inter Mahodan et Dishei, 2920 m, Honda 107. — Kurram: Shend Toi, 3000—3600 m, Aitch. 794.
Distr. gen.: Afghanistan, Chitral, Kashmir, Nepal.

Beschreibung und Abbildung von *P. glaberrimum* Kitam. stimmen weitgehend mit *P. rumicifolium* Royle überein. *P. glaberrimum* soll allerdings mit Ausnahme der Blattränder kahl sein. Die offenbar authentische Aufsammlung von Royle aus NW-Indien (Herb. Kew) besteht aus 3 Individuen, von denen eines stark, eines nur schwach und das dritte gar nicht behaart ist. Auch Hooker, Fl. Brit. Ind. 5: 51 (1890) schreibt „glabrous or sparsely puberulous". Dies spricht für eine Identität von *P. rumicifolium* mit *P. glaberrimum*. Auch die übrigen uns vorliegenden Belege sind kahl oder nur schwach behaart.

6. ***P. tortuosum*** D. Don, Prodr. Fl. Nepal. 71 (1825). — Tab. 3.
Typus: In alpibus Nepaliae, Wallich; isotypus W!

Rhizoma elongatum lignosum. Planta perigonio excepto ± dense pubescens, pilis saepe vel folia margine ± ciliata vel tota planta glabra. Caulis usque ad 50 cm altus, a basi iteratim divaricate ramosus, ramis intricatis, internodiis mediis 20—40 mm longis. Ochreae fuscescentes, inferiores usque ad 20 mm longae, paucilaceratae ± evanescentes, superiores minores saepe laceratae. Folia (10—) 15—

30(−50)×(8−)10−15(−25) mm, in regione inflorescentiae minora, ovata vel elliptica, obtusa vel acuta, sessilia vel basi ± cordata subamplexicaulia. Flores breviter pedicellati, partim in paniculas parvas terminales, partim in glomerulos vel spicas spurias axillares dispositi. Perigonium ± 3 mm longum, usque ad basin fere partitum. Nux triquetra, perigonio inclusa, brunnea.

Afghanistan: E: Ghazni: In jugo Ghoutch Kol NNE Sang-i Masha, 3300 m, Rech. 17643! — NE: Badakhshan: Chakmak, Lindb. 952!
Pakistan: Chitral: Supra Bomosto, 3100−3500 m, Kerst. 1565! Supra Shokor Shal, 3600 m, Wdb. s. n.! Agram, Arkari Gol W Tirich Mir, 2700 m, Stainton 2620! Tirich Gol, 3000 m, Bowes Lyon 1077!

Distr. gen.: Afghanistan, Chitral, Kashmir, Tibet.

Eine deutliche Abnahme der Intensität der Behaarung ist vom Osten des Verbreitungsgebietes gegen Westen zu beobachten.

7. ***P. sibiricum*** Laxm., Novi Comment. Acad. Sci. Petrop. 18: 531 (1773).

Caules floriferi erecti vel decumbentes, 4−50 cm alti, ramosi, ± dense foliati, glabri. Folia 20−60(−80)×2−7(−12) mm, anguste lineari-lanceolata vel anguste hastata, breviter petiolata. Ochreae usque ad 10 mm longae, ciliatae vel fimbriatae, plerumque oblique truncatae, ± hyalinae, brunnescentes. Flores in inflorescentias terminales pauciramosas laxas vel spiciformes vel subcapitatas compactas dispositi. Perigonium ± 2 mm longum. Nux 2−3 mm longa, triquetra, perigonium aequans, nigra.

— — subsp. ***sibiricum***.
Typus: Altai.

Rhizoma elongatum, ramos 10−40 cm longos flexuosos e basi decumbente ascendentes emittens. Folia oblongo- vel lineari-lanceolata, usque ad 7 cm longa, 0,5−1,2 cm lata, crassiuscula. Inflorescentia paniculata ramis tenuibus flexuosis, florum glomerulis ± remotis.
Distr. gen. subspeciei: Sibiria, Montes Asiae centralis.

— — subsp. ***Thomsonii*** (Meisn. ex Steward) Rech. f. & Schiman-Czeika, stat. nov. — Tab. 7, fig. 4.
Syn.: *P. sibiricum* Laxm. var. *Thomsonii* Meisn. ex Steward, Contr. Gray Herbar. 88: 112 (1930).
Typus: Tibet, Thomson, W!
Icon.: Steward, l. c. tab. 4 b.

Rhizoma multiceps surculos numerosos squamis brunneis membranaceis obsitos tenues sed tenaces flexuosos emittens; planta dense caespitosa. Caules floriferi plerumque ±5 cm alti, rarius usque ad 10 cm, erecti vel ascendentes, a basi ramosi, dense foliati. Folia 15−50×2−5 mm, lineari-lanceolata, margine revoluta, basi angustata subsessilia vel partim breviter hastata, breviter petiolata. Inflorescentia terminalis densa ovoidea, usque ad 15 mm longa, folia non superans.

Afghanistan: E: Ghazni: Okak NE Dasht-i Nawar, 3000 m, Rech. 17762! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17927! — NE: Wakhan: Qala Panja, 2800 m, Roemer 311! — C: Bamian: Band-i Amir, 2900 m, Volk 2846-a!

Distr. gen. subspeciei: Afghanistan, montes Himalaya boreo-occidentales, Tibet.

Sämtliche uns vorliegenden Belege aus Afghanistan haben durch gedrungenen Wuchs, gestauchte Infloreszens und schmale Blätter ein sehr einheitliches Gepräge. Sie entsprechen laut Abbildung und Beschreibung der var. *Thomsonii* Meisn. ex Steward,

Contr. Gray Herbar. 88: 112, tab. 4b (1930) und stellen offenbar eine geographische Rasse dar, die als solche den Rang einer Subspecies verdient. Der Typus stellt eine besonders zarte, extrem schmalblättrige Pflanze dar.

Sect. *Cephalophilon* Meisn. in Wall., Pl. Asiat. Rar. 3: 59 (1832).

Plantae annuae vel perennes. Flores subsessiles, capitula formantes. Nux biconvexa vel triquetra.

8. ***P. Gilesii*** Hemsl. in Hook., Icon. Pl. tab. 1756 (1887—1888). — Tab. 2, fig. 2.
Typus: "Shoghot, 6000 to 7000 feet; South of Hindu Koosh, Dr. Giles", K!
Icon.: Hook., l. c.

Planta perennis suffruticosa, glabra, glaucescens, pluricaulis. Caules usque ad 100 cm alti, virgati, ± rigidi, subsimplices vel pauci-ramosi, internodiis valde elongatis, plerumque 50—130 mm longis, subaphylli. Folia inferiora 10—15 mm longa et lata, superiora valde diminuta, cordata vel cordato-rotundata vel interdum sagittata, obtusa vel subacuta, margine ± crenulata, manifeste petiolata; petioli ad summum 30 mm longi. Ochreae minutae squamaeformes, obliquae. Flores subsessiles vel pedicellis usque ad 3 mm longis, in capitula parva terminalia vel rarius in fasciculos paucifloros axillares dispositi, quam bracteae maiores. Perigonium 2—2,5 mm longum, usque ad basin fere partitum. Nux paulo exserta, triquetra, glabra, nuda, brunnea. Styli 3.

Pakistan: Chitral: Shoghot, 2100 m, Bowes Lyon 822! Shishi Gol NE Drosh, 1500 m, Stainton 3162! Bashgalian Deh, 2100 m, Stainton 3225! In valle Ojor prope Hasanabad, 1900 m, Kerstan 1594! In valle Rumbur, Kerstan 2124! — Swat: Utror, 2500 m, Rech. 19565!, Rech. 30830!

Distr. gen.: Chitral, Swat, Yunnan boreo-occidentalis.

Hemsley, Journ. Linn. Soc. Bot. 26: 340 (1891) stellt fest, daß sein *P. Gilesii* genau intermediär zwischen *Fagopyrum* und *Polygonum* sei. Samuelsson in Hand.-Mzt., Symb. Sin. 7, 1: 187 (1929) findet die Einreihung des *P. Gilesii* in die Sektion *Cephalophilon* Meisn. unrichtig; er reiht die Art wegen des Habitus und der kleinen, schief abgeschnittenen Ochreen in die Sektion *Fagopyrum* Meisn. ein. Uns erscheint es richtiger, die Art bei der Sektion *Cephalophilon* zu belassen.

9. ***P. nepalense*** Meisn., Monogr. Gen. Polyg. Prodr. 84 (1826). — Tab. 4.
Syn.: *P. punctatum* D. Don, Prodr. Fl. Nepal. 72 (1825), non Elliott (1821—1824). *P. alatum* Hamilton ex D. Don, l. c. in Syn. *P. alatum* Hamilton ex Spreng., Syst. Veg. 4, 2: 154 curae posteriores (1827). *P. perforatum* Meisn., Monogr. Gen. Polyg. Prodr. 83 (1826).
Typus: „In Nepalia", K!, G!

Planta annua. Caulis usque ad 50 cm altus, tenuis, ascendens vel interdum procumbens, a basi ramosus vel rarius subsimplex, glaber sed ad nodos superiores et infra capitula pilis glanduliferis ± longis obsitus; internodia (15—)30—70 (—100) mm longa. Folia 15—50×5—25 (—30) mm, inferiora ± rhomboidea, basi late rotundata, pars inferior in petiolum alato-decurrens, supra plerumque glabra, subtus ad nervos semper fere pilis ± crispatis, partim glanduliferis obsita, superiora cordato-amplexicaulia; petiolus basi auriculatus. Ochreae ± cylindraceae, oblique truncatae, saepe demum laceratae. Flores bracteis minores, capitula sphaerica formantes. Nux perigonii tubo inclusa, 2 mm longa, plerumque biconvexa, rarius triquetra, ± longitudinaliter scrobiculato-reticulata, brunnea vel subnigra. Stylus ± elongatus, plerumque bifurcatus.

Afghanistan: E: Nuristan: Kushtos, 1800—2000 m, Neub. 3282!, Edelb. 1099! In jugo Ashpi, Neub. 1951/1039! Kurder, 1600—1700 m, Neub. 1951/761!, Neub. 1951/772! Inter Trokikorl et Chetras, Kitam. Inter Chetras et Kushimaikot, Kitam. Inter Wama et Trokikorl, Kitam. In valle Darim, 1900—2400 m, Neub. 1951/983! In valle Rangul prope Pushol, 2300 m, Kerst. 1110! In valle Parun, Edelb. 1292! Nuristan, Edelb. 1233! Panjshir: Mukeni, Hdg. & Wdb. 5277! Paghman, 2500 m, Volk 2171! — NE: Badakhshan: Ribat, 2600 m, Koelz 12838!
Pakistan: Chitral: Golen Gol, 2000 m, Bowes Lyon 18! Chitral, Hassan Din 244! — Swat: Utror, 2500 m, Rech. 19557! Kalam, 2200 m, Rech. 19434! — Kurram: Shalozan, Aitch. 986. M. Sikaram, 3600 m, Aitch.

Distr. gen.: Afghanistan, Pakistan, India, Sina, Japan.

Unsere Untersuchungen führten zu demselben Resultat, zu dem bereits Danser in Bull. Jard. Bot. Buitenzorg, Ser. 3, 8: 204 (1927) gekommen ist. *P. nepalense* Meisn. ist mit *P. perforatum* Meisn. identisch. Dies hat auch bereits Hooker in Fl. Brit. Ind. 5: 42 (1890) festgestellt; er wählte aber den anscheinend älteren Namen „*P. alatum* Ham. mss." Da dieser Name aber nur als Synonym veröffentlicht wurde, ist er ungültig. Weiterhin ließe sich zwischen den gleich alten Meisner'schen Namen *P. nepalense* und *P. perforatum* wählen. Wir folgten hier Danser, da die Beschreibung von *P. nepalense* passender ist.

Sect. *Persicaria* Meisner, Monogr. Gen. Polyg. Prodr. 66 (1826) excl. § 2.

Herbae annuae vel perennes. Caules ramosi. Inflorescentiae spiciformes, saepe ramosi. Styli 2—3 ± connati.

10. ***P. barbatum*** L., Spec. Plant. 362 (1753).
Typus: „Habitat in China".

Rhizoma elongatum. Tota planta appresse strigillosa. Caulis 100 cm vel longior, nodis inferioribus incrassatis, ascendens, validus, ± ramosus. Ochreae tubulosae cauli accumbentes, perlongae, longitudine saepe internodia aequantes, in parte superiore longe fimbriato-dissolutae. Folia 100—200×10—25 mm, ± anguste lanceolata, acuta, basi attenuata, rarius obtusa. Spicae spuriae ad apicem caulis confertae, dense cylindraceae, ± 7 mm latae. Bracteae anguste infundibuliformes, ± longe ciliatae, pilosae vel glabrae. Perigonium ad summum 2,5 mm longum, eglandulosum. Nux ± 2 mm longa, triquetra, nitida, sublaevis, atrobrunnea. Styli 3.

Persia: S: Bal.: Gasht, 1400 m, Hotson.
Pakistan: Kurram: Hangu, Sadiq Masih 34! — N. Wazir.: Razani, Stewart. — Bal.: Zidi ESE Khozdar, 1080 m, Hotson 356.

Distr. gen.: Asia tropica et subtropica, Pakistan, Africa tropica, Australia.

11. ***P. amphibium*** L., Spec. Plant. 361 (1753).
Syn.: *P. amphibium* var. *aquaticum* et var. *terrestre* Leyss., Fl. Hal. 391 (1761). *P. amphibium* var. *decumbens* Klett & Richter, Fl. Phan. Gew. Umg. Leipzig 351 (1830).
Typus: „Europa".
Icon.: Reichenb. Icon. Fl. Germ. 24: 77, tab. 218 (1909). Komar., Fl. URSS., tab. 45, fig. 1, 2 (1936).

Planta perennis, usque ad 100 cm longa, ± ramosa, amphibia, valde variabilis. Status natans: Caulis fluitans, inferne radicans. Folia (30—)50—150(—180)× 10—40 mm, fluitantia, glabra, longe ovoidea, acuta, basi truncata vel interdum

cordata, longe petiolata, petiolus usque ad 60 mm longus. Ochreae glabrae. Status terrestris: Caulis ± stricte erectus, basi tantum radicans. Folia 50—120 (150)× 5—25 mm, longe lanceolata, acuta, basi attenuata sessilia vel breviter petiolata, appresse scabrida. Ochreae ± hirsutae. Inflorescentia spiciformis, terminalis plerumque solitaria, 20—30(—50)×7—11 mm. Flores pedicellati, plerumque pentandri, saepe dioici vel polygami. Perigonium ± 4 mm longum, roseum. Bracteae ovatae, acutae, pedicellos subaequantes, interdum laxe pilosae, ciliatae. Nux compressa, biconvexa, subrotunda. Styli 2.

Persia: W: Azerb.: Gol, Knapp. Prope Maragheh, Knapp. Arak: Kuh Kohrud, Str. Lur.: Darband, 100 km NE Khorramabad, 1800 m, Koeie 1227! — S: Fars.: Lacus Dasht-e Arzhan, Stapf 1042!

Turcomania: sec. Nikitin.

Afghanistan: NW: Maimana: Zehnadis, 2400 m, Koelz 14023! — E: Kabul: Inter Karte Char et Guzar Gah, 1780 m, Gilli 2250! Guzar Gah, Neub. 1950/6! Khotshe Mullah, Neub. 1950/304! Gulbagh, Gilli 2251! Dehmazáng, Gilli 2249! Kabul, Volk 2643!, S. A. Akhtar 490! Nuristan: Kantivo, 2200 m, Edelb. 726!

Pakistan: Chitral: In jugo Baroghil, 3900 m, Stainton 2989!

Distr. gen.: Europa, Asia et America borealis et temperata.

12. ***P. orientale*** L., Spec. Plant. 362 (1753).

Syn.: *P. altissimum* Moench, Meth. 630 (1794).

Typus: „India".

Icon.: Bot. Mag. tab. 213 (1793).

Planta annua 150 (—260) cm alta, laxe ramosa, floribus exceptis pubescens vel glabrescens. Ochreae patulae, interdum ± recurvatae. Folia (30) 50—200 (—350)×(10—)20—80 (—180) mm, ovata vel ovato-cordata, superiora angustiora brevius petiolata, acuminata, margine integra. Inflorescentia spiciformis, erecta vel nutans, usque ad 120 mm longa. Flores ±3 mm longi, pedicellati. Bracteae ovatae, acutae, ciliatae. Nux lateraliter compressa, biconvexa, obtusa. Styli 2.

Distr. gen.: Caucasus, Persia, Turcomania [sec. Fl. URSS 5: 648 (1936)], Pamir-Alaj, Asia centralis et austro-orientalis.

Wir haben keine Belege aus dem Gebiet der Flora Iranica gesehen.

13. ***P. glabrum*** Willd., Spec. Plant. 2: 447 (1799).

Typus: „Hab. in India orientali".

Planta *P. Persicariae* L. et *P. lapathifolio* L. habitu similis sed validior. Caulis usque ad 130 cm altus, basi ± 15 mm crassus, pauciramosus, glaber vel interdum pilis rigidis laxe obsitus, nodis ± incrassatis. Ochreae tubulosae, demum ± fissae, paulo patentes, non ciliatae. Folia 40—150(—200)×10—25(45) mm, elongato-lanceolata, acuminata, basi in petiolum attenuata, glabra vel ad nervos et ad marginem pilis rigidis brevibus ciliata. Spicae spuriae anguste cylindricae, ad apicem caulis confertae. Bracteae ± infundibuliformes, margine nudae vel brevissime ciliatae. Perigonium ad summum 2,5 mm longum. Nux ±3 mm longa, compressa, biconvexa, nitida. Styli 2.

Pakistan: Kurram: Parachinar, 1800 m, Afendi 79! Shalozan, Aitch. 866.

Distr. gen.: America (?), Africa, Asia australior, Pakistan.

14. ***P. lapathifolium*** L., Spec. Plant. 360 (1753).

Lit.: A. Kerner, Österreichische Botanische Zeitschrift 25: 255 (1875). J. Schuster, Mitteilungen der Bayrischen Botanischen Gesellschaft 2: 50, 74 (1907) B. H. Danser,

Nederlandsch Kruidkundig Archief 1931: 100 (1932). K. H. Rechinger in Hegi, Illustrierte Flora von Mittel-Europa ed. 2, 3: 415 (1958).

Planta annua. Caulis erectus vel prostratus, ± ramosus. Ochreae semper fere patentes, minute ciliatae, rarius glabrae. Folia (15—)25—150×8—40 mm, linearilanceolata vel ovato-lanceolata vel breviter elliptica, acuta vel ± obtusa, in petiolum brevem attenuata, glabra vel laxe pilosa vel subtus dense tomentosa. Inflorescentia late vel anguste cylindrica. Bracteae obtusiusculae vel acutae, non vel brevissime ciliatae. Perigonium ±3 mm longum, album vel roseum. Nux 2—3 mm longa, compressa, biconvexa. Styli 2.

Distr. gen. speciei: Europa, Asia, America temperata.

1a. Folia glabra vel laxe pilosa. Nux ±2 mm longa ..... subsp. *lapathifolium*
b. Folia subtus semper dense lanuginosa vel tomentosa. Nux quam 2 mm longior 2
2a. Folia superiora latitudine plusquam 4-plo longiora, omnia acuta, plerumque canescenti- vel flavescenti-viridia .... subsp. *pallidum* (With.) Fries
b. Folia superiora latitudine ad summum 4-plo longiora, plerumque omnia apice obtusiuscula vel rotundata, laete viridia ..... subsp. *Brittingeri* (Opiz) Rech. f.

— — subsp. ***lapathifolium.***

Syn.: *P. nodosum* Pers., Synops. 1: 440 (1805). *P. lapathifolium* L. f. *nodosum* (Pers.) Beck in Reichenb., Icon. Fl. Germ. 24: 75 (1909). *P. lapathifolium* L. subsp. *nodosum* Danser, Ned. Kruidk. Arch. 1931, 107 (1932) p. p.

Typus: „In Gallia".

Caulis plerumque erectus usque ad 100 (120) cm altus, rarius procumbens, copiose ramosus. Folia 30—150×8—40 mm, anguste lanceolata vel ovato-lanceolata vel interdum ovata, ± acuta, dilute vel obscure viridia, glabra vel laxe pilosa. Flores pedicellati, inflorescentiam spiciformem formantes. Nux ± 2 mm longa et lata vel paulo angustior.

Iraq: Mosul: Sirsang, Barkley 9064! Msoul: Wadi Aloka, Barkley 9019! Arbil, Walash, Thesiger 314!

Talish: Swant, Hohen.

Persia: N: Maz.: In valle Haraz, Zardman, 700 m, Wdb. 1486! — W: Azerb.: Hasan Beyglu, Knapp. Kurd.: 8 km E Sanandaj, 1500 m, Furse 3370! Arak: M. Chahar Khatun, Str. Khuz.: Shush, Graham 502! — C: Tehr.: In valle fluvii Hableh Rud, Simin Dasht, Manuch. 5755-E! Boneh Kuh, Manuch. 5747-E! Qazvin: Purkan N Karaj, 1500 m, Žumer 1122!

Afghanistan: N: Akcha, Neub. 1950/132! — E: Kabul: 30 km NW Jalalabad, Lindb. 128/1962! Kabul, 1800 m, Lindb. 1362! Nuristan: Inter Kandai et Seprigal, Kitam. — NE: Badakhshan: Hazratsaid, 2400 m, Koelz 12861! Shuturjangal, 1500 m, Koelz 12175! Kataghan: Takhar, 5 km N Farkhar, 1200 m, Podlech 12706! 12707! Khost-o Fereng, in valle Kala prope Daanah, 1600 m, Podlech 11981! — C: Bamian: Qala Sarkari, 1500 m, Koelz 13909! Doab: Kamard, 1800 m, Koelz 13562!, Koelz 13595!

Distr. gen.: Europa, Asia, Persia, Afghanistan.

Die Angabe aus Turkmenien von Nikitin, Illustrierte Bestimmungsschlüssel für die Pflanzen der Umgebung von Ashkhabad 104 (1965) bezieht sich wohl auf subsp. *lapathifolium*. Wdb. 1486 fällt durch seine, dem *P. Persicaria* L. entsprechend gestalteten Ochreen auf. Sie sind anliegend röhrig und mit bis zu 2 mm langen Wimpern besetzt.

— — subsp. ***Brittingeri*** (Opiz) Rech. f. in Hegi, Ill. Fl. Mitteleur. ed. 2, 3: 416 (1958).

Syn. *P. Brittingeri* Opiz, Naturalientausch 8, 74 (1824), *P. lapathifolium* L. var. *Brittingeri* (Opiz) Beck in Reichenb., Icon. Fl. Germ. 24: 76 (1909). *P. lapathifolium* L. subsp. *nodosum* Danser, Ned. Kruidk. Arch. 1931: 107 (1931) p. p. *P. nodosum* Pers. var. *Brittingeri* (Opiz) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 819 (1913). *P. danubiale* Kerner, Österr. Bot. Zeitschr. 25: 255 (1875).

Icon.: Reichenb., Icon. Fl. Germ. 24 tab. 217, fig. 4—6 (1909).

Typus: „Prope Linz in Austria", Brittinger.

Differt a subsp. *lapathifolio* notis sequentibus: Caulis plerumque prostratus, rarius suberectus, basi semper fere procumbens. Folia breviter elliptica, saepe subrotundata, inferiora plerumque ± obtusa, superiora acuta, lamina plerumque in petiolum abrupte attenuata, subtus dense albo- vel incano-tomentosa. Inflorescentiae saepe breves. Nux 2—3 mm longa, quam in ceteris subspeciebus latior.

Persia: N: Gil.: Ispili, Linds. 1113! — W: Lur.: 50 km E Khorramabad, 1300 m, Koelz 1226! Dow Rud, 1500 m, Koelz 15700! — C: Tehr.: M. Elburz 50 km NE Tehran, Starm. 191! Prope Simin Dasht, 1150 m, Aell. 573! Manuch. 5753-E! Qazv.: Karaj, 1330 m, Aell 572!

Afghanistan: E: Kabul: In valle Logar E Charasiah, 1780 m, Gilli 2256! Panjshir: Inter Tang-i Saidan et Lalandar, 1810 m, Gilli 2257! — NE: Kataghan: Prope Doshi, 850 m, Rech. 16535!

Distr. gen.: Europa media et orientalis, Asia occidentalis.

— — subsp. ***pallidum*** (With.) Fries, Mant. 2: 24 (1839).

Syn.: *P. pallidum* With., Arr. Br. Pl. ed. 3, 2: 381 (1796). *P. lapathifolium* L. var. *incanum* Boiss., Fl. Or. 4: 1030 (1879). *P. lapathifolium* L. subsp. *tomentosum* (Schrank) Danser, Ned. Kruidk. Arch. 1931: 111 (1931). *P. tomentosum* Schrank, Bayer. Fl. 1: 669 (1789). *P. scabrum* Moench, Meth. 629 (1794).

Icon.: Reichenb. Icon. Fl. Germ. 24 tab. 217, fig. 1—3 (1909).

Typus: Britannia.

Differt a subspecie praecedente notis sequentibus: Caulis erectus vel procumbens, internodia saepius elongata. Folia anguste vel rarius lineari-lanceolata, vel interdum rotundato-elliptica, ± obtusa vel rarius acuta, subtus, locis aridis interdum etiam supra dense appresse albo-tomentosa, inflorescentia densa, late cylindrica. Nux quam 2 mm longior.

Persia: W: Lur.: Kharon, 1300 m, Koelz 1226.

Distr. gen.: Europa, Asia occidentalis.

Bei der von Kitamura, Fl. Afgh. 91 (1960) für Afghanistan angegebenen var. *salicifolium* Sibth. dürfte es sich um subsp. *pallidum* (With.) Fries handeln.

15. ***P. Persicaria*** L., Spec. Plant. 360 (1753).

Typus: „Europa".

P. lapathifolio L. habitu simile, a quo differt notis sequentibus: Ciliae ochrearum superiorum oculo nudo manifestae plusquam 1 mm longae, ochreis cauli arcte appressis demum tantum ramis lateralibus accrescentibus ruptis.

Iraq: Kurd.: Arbil: Pushtashan, 1100 m, Rech. 11030!

Talish: Swant, Hohen.

Persia: N: Maz.: Tamishan, Zumer 106! Now Shahr, 40 m, Zumer 1[illegible] inter Abbasabad et Shahi, Rech. 2029! Mazandaran, Bogomolov 5741-E! Gil.: Rasht, Buhse, Lahijan,

Linds. 776! Talebabad, Mir Kamali 4667-E! Tazehabad inter Rudarkhaneh et Pulardichan, Alexeenko 155. — W: Azerb.: Rezaiyeh, Knapp. Kurd.: Sanandaj, 2100 m, Haussкn.! Kermansh.: 102 km NNW Taq-i Bostan, Rech. 14697! Lur.: Borujerd, Koelz 18418!, 18422! Esf.: Esfahan, Deicke 66. Seghahan, Koelz 15001. Khuz.: Ab-e Shur, prope Shush, Nab. 984. — E: Khor.: Inter Shirvan et Bojnurd, Rech. 1807! — C: Qazv.: Karaj, Rech. 6697! Shahr.-Bust.: Shahrud, Koelz 16961!

Turcomania: sec. Nikitin.

Afghanistan: SE: Kandahar: Arghandab, Kitam. — E: Kabul: Gulbahar, Volk 1160 p. p.! Kabul, 1770 m, Gilli 2255! Sarobi, Kitam. — NE: Badakhshan: Jurm, Koelz 12901! Kataghan: Kunduz, 400 m, Rech. 16053! Kunduz versus Khanabad, 480 m, Podlech 11338! Pul-i Khumri, Kitam. Baghlan, Volk 539! — C: Bamian: Volk 2235!

Pakistan: Chitral: Brep N Mastuj, 2400 m, Stainton 3074! — Kohat: 20—30 km W Kohat versus Thal, Rech. 30227! — Quetta, Blatt., Hallb., McCann — Baluchistan, Lace.

Distr. gen.: Europa centralis et australis, Asia temperata, Persia, Afghanistan, Chitral.

16. ***P. Hydropiper*** L., Spec. Plant. 361 (1753).

Syn.: *P. flaccidum* Roxb., Fl. Ind. 2: 291 (1832). *P. flaccidum* Meisn. in DC., Prodr. 14: 106 (1856).

Lit.: B. H. Danser, Bulletin du Jardin Botanique Buitenzorg ser. 3,8: 187 (1927).

Planta annua. Caulis erectus vel ascendens, tenuis, flaccidus, 30—60 cm altus, basi interdum radicans, parce ramosus. Ochreae longe cylindricae, postea ramis lateralibus ruptae, ciliatae. Folia 20—60(80) × 5—10(15) mm, lanceolata, acuta vel obtusiuscula, basi in petiolum attenuata, plerumque glabra sed margine ciliata. Inflorescentiae laxae, ± filiformes, basi interruptae in ramos abeuntes. Bracteae infundibuliformes, superiores plerumque non ciliatae. Perigonium ±3 mm longum, semper fere dense glanduloso-punctatum, virescens. Nux ±3 mm longa, triquetra vel compressa, granulato-striata. Styli plerumque 3.

Distr. gen.: Europa, Asia, America borealis et temperata, Africa borealis, Australia.

— — subsp. ***Hydropiper.***

Syn.: *P. Hydropiper* L. subsp. *megalocarpum* Danser, Bull. Jard. Bot. Buitenzorg ser. 3, 8: 188 (1827). *P. Hydropiper* auct. europ.

Typus: „In Europae cultis".

Caulis elatior, non glanduloso-punctatus. Ochreae breviter ciliatae, bracteae superiores non ciliatae, plerumque leviter glanduloso-punctatae. Costa mediana foliorum subtus glabra vel appresse pilosa. Perigonium fructiferum laxe glandulosum. Nux ±3 mm longa, plerumque applanata.

Talish, sec. Fl. URSS.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1341. Gorgan, coll. ign. 6225-E! Maz.: Tamishan, Zumer 106! Gil.: Lahijan, Linds. 770! Rasht, Paulsen 2160. Gilan, Haussкn. — W: Azerb.: Qareh Dagh, Buhse 707. Khuz.: Shush, Haussкn.

Afghanistan: E: Nuristan: In valle Bashgul, 1300—1800 m, Kerst. 1461! Gusalak, in valle Kurder, Neub. 1951/827! Barikot, 850 m, Gilli 2252! Kabul: Paghman, 2480 m, Gilli 2254! Gulbahar, Volk 1160 p. p.! Nijrao, 1600 m, Volk 2377! Kabul, 1770 m, Gilli 2253! — NE: Kataghan: Takhar, 5 km N Farkhar, 1200 m, Podlech 12708! Badakhshan: Jurm, 2100 m, Koelz 12902! — In regno Cabulico, Griff.

Pakistan: Kohat: 20—30 km W Kohat versus Thal, Rech. 30224! — Kurram, Aitch. 433. — S. Wazir., Stewart.

Distr. gen. subspeciei: Europa, Asia occidentalis.

— — subsp. ***microcarpum*** Danser l. c.

Typus: Non indicatus.

Caulis humilior, interdum glanduloso-punctatus. Ochreae omnes, superiores quoque longe ciliatae, bracteae et perigonium plerumque dense glanduloso-punctatae. Costa mediana foliorum subtus semper dense appresse pilosa. Perigonium fructiferum dense glandulosum. Nux ± 2 mm longa, in var. *lenticulari* Danser applanata, in var. *triquetro* Danser triquetra.

Pakistan: Swat: Kalam, 2200 m, Rech. 19418! Madyan, 1350 m, Stewart 24424! Bahrain, 1350 m, Stewart & Rahman 25409!

Distr. gen. subspeciei: Asia praecipue orientalis.

Durchsicht der Belege aus dem gesamten Verbreitungsgebiet der Art im Herbar W bestätigt im Allgemeinen Danser's Charakteristik der beiden Unterarten. Weitere Unterschiede ließen sich nicht feststellen. Die Belege aus dem iranischen Florengebiet erweisen sich jedoch als intermediär und zwar entsprechen diejenigen aus Persien und Afghanistan weitgehend der subsp. *Hydropiper*, jedoch ist die Bewimperung der Brakteen durchschnittlich stärker und dreikantige Früchte herrschen vor. Neubauer 827 aus Nuristan ist stärker drüsig punktiert und auch die obersten Brakteen sind bewimpert. Die Belege aus Swat nähern sich vor allem durch kleinere Früchte von nur 2,5—3 mm Länge stärker der subsp. *microcarpum*, die drüsige Punktierung auch des Stengels ist durchwegs stärker, die Brakteen, auch die obersten, sind länger bewimpert; die Blattrippen sind jedoch unterseits kahl.

Steward, Contr. Gray Herbar. 5, 88: 58 (1930) faßt die typische Varietät des *P. Hydropiper* weiter als Danser; nach seiner Auffassung würden sämtliche Belege aus dem iranischen Florengebiet noch *P. Hydropiper* s. str. entsprechen. Seine übrigen Varietäten sind auf östlichere Gebiete beschränkt.

17. ***P. mite*** Schrank, Baier. Fl. 1: 668 (1789).

Typus: „Torfgründe (Bavaria)".

Planta annua, habitu *P. Hydropiperi* L. similis. Caulis erectus vel basi decumbens, usque ad 60(—70) cm altus, subsimplex vel parce ramosus, plerumque glaber. Ochreae tubulosae, longe ciliatae, ± appresse hirsutae. Folia 30—80 (100) × 7—20 mm, longe lanceolata, acuminata vel obtusa, in petiolum brevem attenuata, subtus secus nervos et margine setulis appressis scabra. Spicae spuriae ad caulem vel ad ramos terminales graciles, laxiflorae, basi interruptae. Bracteae infundibuliformes, ciliatae, glabrae. Perigonium 3—3,5 mm longum, eglandulosum, albidum vel roseum. Nux 2,5—3(3,5) mm longa, ± symmetrice vel assymetrice compressa vel interdum triquetra, laevis vel indistincte punctata, atrobrunnea vel nigra. Styli 3 vel 2.

Talish: Prope Astara, Hohen. Talish, Hohen., Buhse.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 2255. Maz.: Now Shahr, Sab. 244! — C: Qazv.: Karaj, Gauba 1081.

Afghanistan: NW: Bala Murghab, Jakeš s. n.! — E: Kabul: Nijrao, Volk 2378! Lataband, Volk 1176! In valle Panjshir, Fairservis Jr.! — NE: Kataghan: Khanabad, 600 m, Koelz 12205!

Distr. gen. Europa media et australis, Asia occidentalis.

18. ***P. minus*** Hudson, Fl. Angl. 1: 148 (1762).

Typus: „Tothilfields, Westminster".

Planta annua. Caulis ascendens vel decumbens, plerumque usque ad 30 cm

longus, tenuis, flaccidus, prope basin ramosus, glaber. Ochreae tubulosae ciliatae, interdum appresse pilosae. Folia (20—)50—60(—70)×2—5 mm, anguste lanceolato-linearia, acuminata, basi attenuata subsessilia, subtus secus nervos tantum vel in tota lamina hirsuta. Spicae spuriae 1—3, laxae, graciles, basi interruptae, plerumque usque ad 40 mm longae. Bracteae infundibuliformes, glabrae, ± longe ciliatae. Perigonium usque ad 2,5 mm longum, eglandulosum, albidum vel roseum. Nux 2—2,4 mm longa, plerumque compressa, biconvexa vel interdum triquetra, laevis, nitida. Styli 3 vel 2.

Talish: Prope Lenkoran et Astara, Hohen.
Persia: N: Gil.: Lahijan, Linds. 938! Tazehabad inter Rudarkhaneh et Pulardichan, Alexeenko 157.

Distr. gen.: Europa, Asia, America borealis et temperata.

Sect. *Bistorta* (Adans.) D. Don, Prodr. Fl. Nepal. 69 (1825).

Syn.: *Bistorta* Adans., Fam. 2: 277 (1763).

Herbae perennes. Caules plerumque simplices, ± erecti. Flores terminales conferti.

19. ***P. viviparum*** L., Spec. Plant. 1: 360 (1753).
Icon.: Fl. URSS. 5: 674, tab. 47 (1936).
Typus: „In Europae subalpinis pascuis duris".

Caulis (3—)5—30(—40) cm altus, glaber, simplex. Ochreae usque ad 30 mm longae, tubulosae, fuscae. Folia inferiora longe petiolata, lamina 15—80 mm longa, anguste ovata; caulina minora, sessilia, lanceolata; folia margine revoluta, glabra, interdum subtus laxe pilosa, manifeste reticulato-venosa. Flores terminales et bulbilli spicam spuriam formantes. Flores pedicellati, hermaphroditi vel unisexuales, monoici vel dioici; perigonium ±3 mm longum, 5-partitum, plerumque albidum. Bulbilli sessiles. Bracteae membranaceae apiculatae. Nux raro evoluta, triquetra, brunnea, 3 mm longa. Styli 3.

Afghanistan: E: Panjshir: Darreh Shalzur, 3800 m, Hdg. & Wdb. 5400! Till Pain, Lindb. 1000! Nuristan: Pashki, Edelb. 899!, 909!; 2200 m, Kerst 1365! Inter Pashki et Kushitaki, Kitam. — NE: In jugo Munjan, 4000 m, Koelz 12744! Wakhan: In valle Qazi Deh, 3200 m, Roemer 184!
Pakistan: Chitral: Yarkhun, 3000 m, Bowes Lyon 1051! Khot An N Mastuj, 3300 m, Stainton 2863! Tirich Gol, 3300 m, Bowes Lyon 1069! — Swat: Inter Mahodan et Dishei, 2880 m, Honda 106. Diwan Gol, 3200 m, Ogino 100. Inter Diwan Gol et Pichar, 3200 m, Ogino 512.

Distr. gen.: Europa, Asia, America borealis et temperata.

Bei Lindberg 1000, Koelz 12744, Bowes Lyon 1051 und Stainton 2863 fällt die lockere, krause Behaarung der Blattunterseite auf. Bowes Lyon 1069 ist auffallend hochwüchsig, 34—42 cm.

20. ***P. affine*** D. Don, Prodr. Fl. Nepal. 70 (1825). — Tab. 5, fig. 2.
Syn.: *P. Brunosis* Wall. in Royle, Ill. Bot. Himal. Mount. 317, tab. 80 (1839).
Icon.: Royle, Ill. Bot. Himal. Mount. tab. 80, fig. 3 sub *P. Brunosis* Wall.
Typus: In Nepaliae alpibus, Wallich, K.

Planta glabra, surculis induratis epigaeis dense caespitosa. Caulis ± florifer 6—30 cm longus foliosus, simplex. Ochreae usque ad 20 mm longae, tubulosae, fuscae. Folia 15—90 mm longa, lanceolata, coriacea, reticulato-venosa; inferiora

in petiolum 10—25 mm longum attenuata; superiora sessilia; nervi imprimis ad marginem revolutam prominentes, folia itaque quasi undulato-crispata. Inflorescentia terminalis, spiciformis, compacta. Flores pedicellati. Perigonium 5-partitum, lobi 3—4 mm longi, ovati, rosei. Bracteae quam pedicelli breviores, apiculatae. Nux triquetra, brunnea. Styli 3.

Afghanistan: E: Nuristan: In jugo Urura supra Kushtos, 3000 m, Neub. 1951, 613! In jugo Donda, 3280 m, Kerst. 1245! Pashki, Edelb. 1009! Shabul Gol, Kitam.
Pakistan: Chitral: Ishporili Gol S Mastuj, 3750 m, Stainton 3108! Golen, 3750 m, Bowes Lyon 129! Gangalwat Gol SW Chitral, 2700 m, Stainton 2711! — Swat: Inter Mahodan et Dishei, 2800 m, Honda 97.

Distr. gen.: Montes Himalaya et Hindukush.

21. ***P. Bistorta*** L., Spec. Plant. 360 (1753) s. l.
Typus: „In montibus Helvetiae, Austriae, Galliae".

Rhizoma crassum. Caulis usque ad 30 cm altus, simplex. Ochreae usque ad 30 mm longae, oblique truncatae, non fimbriatae. Folia inferiora approximata 40—80×10—15 mm, longe lanceolata, basi angustata petiolata; superiora remota minora et angustiora, sessilia; omnia margine undulata revoluta, glabra vel interdum subtus puberula. Inflorescentia 15—20×10 mm, terminalis, breviter spiciformis, densa. Flores pedicellati. Perigonium plerumque 5-partitum, ± 3 mm longum, roseum. Bracteae obtusae vel acutae, superiores longe abrupte apiculatae. Nux triquetra, brunnea, nitida. Styli 3.

Iraq: Kurd.: Arbil: Algurd Dagh, 3500 m, Haley 131!
Persia: W: Azerb.: M. Sahand, Knapp. Ham.: M. Alvand, Hausskn., Pichler 105!, Str. Takht-i Suleiman, Str. Hamadan versus Tabriz, Str. In valle Haydere, 2240 m, Stapf. Lur.: Oshtoran Kuh, Str.
Pakistan: Kurram: In jugo Nangvar, 3500 m, Aitch.

Distr. gen.: Europa et Asia temperata et subarctica, in regionibus australioribus monticolum; Alaska.

Die uns vorliegenden Belege unterscheiden sich vom Durchschnitt des europäischen *P. Bistorta* L. durch schmälere Blätter und die kopfige Infloreszenz. Soweit wir feststellen konnten, läßt sich unsere Pflanze mit keiner der aus dem Formenkreis des *P. Bistorta* unterschiedenen Arten identifizieren. Wegen der Spärlichkeit des vorliegenden Materials sehen wir von einer Neubeschreibung ab. Der gesamte Formenkreis bedarf weiterer Untersuchungen. Wahrscheinlich ist eine Gliederung in geographische Rassen möglich. Selbstverständlich bezieht sich unsere Beschreibung auf die aus dem Gebiet der Flora Iranica zitierten Belege.

22. ***P. amplexicaule*** D. Don, Prodr. Fl. Nepal. 70 (1825). — Tab. 5, fig. 1.
Syn. *P. speciosum* Meisn., Monogr. Gen. Polyg. Prodr. 66 (1826) fide Steward.
Typus: „Sirinagur", Kamrop.

Caules ascendentes vel ± erecti, simplices vel pauciramosi, laxe foliati, glabri vel apicem versus puberuli. Ochreae usque ad 50 mm longae, laceratae, fuscescentes, truncatae. Folia glabra vel parce puberula et ciliata, inferiora petiolata, (20—)30—100(—170)×(15—)20—50(—70) mm, ovata, basi cordata, acuminata; superiora sessilia, lanceolata, basi cordata amplexicaulia, omnia margine nervis incrassatis crenulata. Spica multiflora, cylindrica. Flores pedicellati vel interdum sessiles. Perigonium 5-partitum, atro-purpureum, 4—5 mm longum; lobi ovati. Bracteae late ovatae, obsolete acutae vel ± longe acuminatae, plerumque pedicellos subaequantes. Nux triquetra. Styli 3.

Afghanistan: E: Nuristan: Elasoon, 3200 m, Edelb. 1724! In valle Darim supra pagum Darim, 1900—2400 m, Neub. 1951/1015! Edelb. 1761! In jugo Ashpi, Neub. 1951/1041! Kushtos, 2000 m, Neub. 3257! Inter jugum Ashpi, 3500 m, et Kushtos, 2500 m, Neub. 1951/681! In valle Waigel, 1800 m, Edelb. 2395! In jugo Donda, 2500—3200 m, Kerst. 1251-c! — Khelenmargh, 3500 m, Neub. s. n.!
Pakistan: Chitral: Drosh Gol, 2100 m, Stainton 3187!; 2600 m, Bowes Lyon 156! Chitral, Hassan Din 237! — Swat: Kalam, 2200 m, Rech. 19426! — Kurram: Shend Toi, 3000 m, Aitch. 767.

Distr. gen.: Montes Himalaya et Hindukush.

Sect. *Polygonum*

Syn.: Sect. *Avicularia* Meisn., Monogr. Gen. Polyg. Prodr. 43 et 85 (1826); Meisn. in DC., Prodr. 14: 85 (1856).

Plantae annuae vel perennes. Ochreae in parte superiore quidem hyalinae, plerumque laciniatae. Flores in axillas foliorum vel in fasciculos axillares dispositi. Styli plerumque 3.

23. ***P. arianum*** Grig., Act. Inst. Bot. Acad. Sci. URSS. ser. 1, 1: 104 (1933).
Typus: „Schur-Sufi, non procul a castello Kuschka", Volkov, LE!
Icon.: Fl. URSS. 5, tab. 38 (1936).

Planta basi lignosa, 20—40 cm alta, inferne iteratim ramosa. Caules stricte erecti, in dimidio inferiore internodiis elongatis laxe foliati, in dimidio superiore floriferi foliosi, papilloso-pilosi. Ochreae anguste infundibuliformes, ± oblique truncatae, laciniatae, nervis obsoletis, glabrae. Folia 10—35×2—5 mm, lanceolata, acuta, basi attenuata subsessilia, glabra vel imprimis ad marginem et ad nervos breviter pilosa. Flores pedicellis 1—2 mm longis, solitarii vel bini, valde remoti, inflorescentiam laxe ramosam ± aphyllam formantes. Ochreae florales infundibuliformes, oblique truncatae, leviter incisae, nervis obsoletis. Perigonium 5—6(7) mm longum, in sicco albidum, segmentis nervo brunneo percursis. Nux 2,5—3 mm longa, triquetra, laevis, fere nigra. Styli 3.

Distr. gen.: Turcomania, sec. Fl. URSS., l. c.

24. ***P. hyrcanicum*** Rech. f., Ann. Nat. Mus. Wien 53, 1: 352 (1942). — Tab. 6.
Syn.: *P. equisetiforme* auct. fl. Persiae, nec Sibth. & Sm. (1809).
Typus: Rech. 1892, W!

Planta multicaulis, glabra, canescenti-viridis. Caules basi indurati 30—100 cm longi, arcuato-ascendentes, superne ramosi, striati. Ochreae juniores ± tubulosae, in parte inferiore coriaceae brunneae opaceae, manifeste nervosae, postea profunde multilaceratae; ochreae florales inferioribus similes sed breviores. Folia (10—)20—25(—30)×4—7 mm, lanceolata, acuta, in petiolum attenuata; folia floralia inconspicua. Flores axillares singuli vel bini, inferiores remoti, superiores ± approximati; manifeste pedicellati. Pedicelli 1—2(—3) mm longi. Perigonium 1,5—2(—2,5) mm longum, roseum. Nux ±2 mm longa, triquetra, laevis, fere nigra. Styli 3.

Persia: N: Gorg.: Prope Behshar, 10 m, Aell. 910!, Mirmahaleh, 60 m, Schmid 6037! 5 km N Gorgan, Stutz 613! Gorgan, Koelz 16158!, 16600! Golestan, 160 km W Bojnurd, 800 m, Rech. 37633! Maz.: Prope Shahi, 1200 m, Furse 2925! Inter Abbasabad et Shahi, 400 m, Rech. 2023! Lajim, 800 m, Zumer 61! In valle fluvii Chalus, 400 m, Rech. 2093! In valle fluvii Talar: Sorkhabad, 1400 m, Rech. 5587! Inter jugum Gaduk et

Abbasabad, Rech. 1976! Distr. Kojur: Inter Kinch et Dasht Nazir, 800—1300 m, Rech. 6613! Gil.: Prope Manjil, Buhse. — Persia borealis, Buhse. — W: Azerb.: Dasht-e Moghan, 160—500 m, Schmid 6572! — E: Khor.: Inter Tappeh-ye Moraveh et Bojnurd, Rech. 1892! Kotal-e yek Chenar, Koelz 16697! Inter Quchan et Bojnurd, 950—1100 m, Schmid 6355! — C: Qazv.: Soltanabad prope Qazvin, 1500 m, Linds. 304! Pachenar, Buhse. Inter Tehran et Qazvin prope Hasara, Buhse. Damgh.-Senn.: Qomrud, Behb. 5776-E!

Distr. gen.: Endem.

25. ***P. setosum*** Jacq., Obs. Bot. 3: 8 tab. 57 (1768), non Willd. (1799).
Typus: Ex Oriente, Tournef.
Icon.: Jaub. & Spach, Ill. Pl. Or. 2 tab. 125 (1845). Fl. URSS. tab. 38 (1936).

Planta multicaulis, glabra. Caules basi indurati 20—45 cm alti, ± stricte erecti, graciles, virgati, pauciramosi, striati. Ochreae juniores ± tubulosae, manifeste nervosae, postea profunde laceratae. Ochreae florales inferioribus similes sed minores, subinfundibuliformes. Folia (15—)20—30(—40)×1—3 mm, anguste linearia, mucronata, in petiolum brevem attenuata; superiora minora. Flores axillares, solitarii vel terni, inferiores remoti, breviter pedicellati. Pedicelli 0,5—2 mm longi. Perigonium 2—3 mm longum. Nux 2,5—3 mm longa, triquetra, laevis, subnigra. Styli 3.

Persia: W: Azerb.: Distr. Afshar: Qotursu, Knapp. Lur.: Oshtoran Kuh, Str.

Distr. gen.: Anatolia, Persia.

26. ***P. luzuloides*** Jaub. & Spach, Ill. Pl. Or. 2: 37 (1845).
Icon.: Jaub. & Spach, l. c. tab. 126.

Planta *P. setoso* Jacq. similis sed ab eo differt notis sequentibus: Folia caulina latiora, (25—)35—60(—70)×(2,5—)3—5 mm, aristulato-mucronata. Flores plerumque 2—4-ni fasciculati, sub anthesi ochreas superantes. Pedicelli 2—3(—4) mm longi. Perigonium 3 mm longum. Nux 3—3,5 mm longa.

Iraq: Kurd.: Arbil: M. Qandil: Supra lacum Goam-e Kirmosoran, 3000—3200 m, Rech. 11139! Algurd Dagh: Supra Nowanda, 2000—2600 m, Rech. 11369! Sul.: M. Avroman et M. Shahu, 2700 m, Haussk.!
Persia: W: Azerb.: Yam, Gill.-Sm. 2022. Kurd.: Dalakhanai, Haussk. Ham.: M. Alvand, Auch. 2589. Kermansh.: Karand, Noë 1115. Lur.: Dow Rud, 2400 m, Koelz 18373! Kuh-e Pariz, 2400 m, Koelz 18502!

Distr. gen.: Anatolia, Persia.

27. ***P. alpestre*** C. A. Mey., Verz. Pfl. Cauc. 157 (1831).
Syn.: *P. ammanioides* Jaub. & Spach, Ill. Pl. Or. 2: 28, tab. 119 (1844). *P. alpestre* C. A. Mey. var. *ammanioides* (Meisn.) Boiss., Fl. Or. 4: 1038 (1879). *P. cognatum* Meisn. var. *alpestre* (C. A. Mey.) et var. *ammanioides* (Jaub. & Spach) Meisn. in DC., Prodr. 14: 96 (1856).
Icon.: Jaub. & Spach, Ill. Pl. Or. 2, tab. 118, 119 (1844).
Typus (Syntypi): In alpinis M. Kasbek, in ripa torrentis Terek; Wladikawkas; in locis lapidosis M. Talüsch.

Planta glabra. Caules ima basi indurati, usque ad 15 cm longi, ± prostrati, ramosi. Ochreae albidae, subpellucidae, subintegrae, binerviae, nervis submarginalibus. Folia (10—)15—25(—30) mm longa, ovato-lanceolata vel elliptica, caulina plerumque manifeste petiolata, ramealia saepius angustiora, subsessilia. Flores 5—8-ni fascucilati, subsessiles, erecti. Perigonium florendi tempore ±3 mm lon-

gum, infundibuliforme, usque ad medium 5-lobatum. Nux perigonio brevior, ±3 mm longa, triquetra, laevis nitida, angulis apicem versus plerumque subconcavis. Styli 3.

Iraq: Kurd.: Mosul: N Zakho supra Basingera, 1200 m, Rech. 11530! Zawita, 1800 m, Rech. 10937! In valle inter Marsis et Zawita, 1000—1400 m, Rech. 12018! Arbil: M. Qandil: Supra lacum Goam-e Kirmosaran, 3200 m, Rech. 11781! M: Helgurd: Supra Nowanda, 2000—2600 m, Rech. 11406! Ser-i Rost, 1800 m, Haley 99!

Talish: Hohen, C. A. Mey. Swant, Hohen.

Persia: N: Gorg.: Inter Naudeh et Shahrud, 1000—2000 m, Schmid 6055! Maz.: Kuh-i Nizwa in declivibus borealibus, 2800 m, Wdb. 1220! In jugo Gaduk, 2400—2700 m, Behb. 5734-E! In valle fluvii Chalus, 2400 m, Rech. s. n.! In declivibus borealibus jugi Kandavan, 2400 m, Gauba 1076, 1077. Prope Nur, Buhse. — W: Azerb.: 22 km SE Mahabad, 1500 m, Furse 2166! Maragheh, Shab. 6498-E! Var prope Khvoy, Knapp. Tabriz, Gill.-Sm. 2617, 2618. Yam, Gill.-Sm. 2380. Azerbaijan, Auch. 5273. Kermansh.: 40 km W Kermanshah inter Kermanshah et Shahabad, Bent & Wr. 514—117! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 99! Hamadan, Pichler! Arak: M. Latetar, Str. Bakht.: Gahar, 2250 m, Koelz 17906! Lur.: 25 km E Khorramabad, 1900 m, Koeie 524! Dow Rud, 1500 m, Koelz 15733! Borj, 2100 m, Koeie 1223! — S: Fars.: Kuh Dishg, Stapf 2043! — E: Khor.: Kuh-e Hazar Masjed, 2000—2800 m, Rech. 5069! — C: Tehr.: In jugo inter Tehran et Jaji Rud, 1590 m, Aell. 884! S Damavand: Emamzadeh Hashem, 2900 m, Wdb. 1409! Damavand prope Reneh, 2200 m, Bornm. 8166-b. Damavand, 3300 m, Buhse. M. Tuchal, Bornm. obs. Qazv.: Soltanabad prope Qazvin, 1500 m, Linds. 244! Aliabad prope Karaj, Gauba 2033!

Distr. gen.: Caucasus, Anatolia, Kurdistan, Persia.

Die von mehreren Autoren angenommene Identität mit *P. cognatum* Meisn., Monogr. Gen. Polyg. Prodr. 91 (1826) erscheint mir nach Herkunft „Sibiria" und der Beschreibung „floribus axillaribus; ochreis laxis, membranaceis, laceris, mucronatis; caule erecto, ramoso, basi suffruticoso" sehr unwahrscheinlich. Wir haben den Typus nicht gesehen.

28. ***P. chitralicum*** Rech. f. & Schiman-Czeika, sp. nov. — Tab. 7, fig. 1.

Typus: Bowes Lyon 78, BM!

Caudex crassus, multiceps. Planta glabra. Rami floriferi 5—10(—20) cm longi, prostrati, simplices vel rarius prope basin pauciramosi, regulariter foliati; internodia inferiora ad summum 15 mm longa. Ochreae membranaceae, hyalinae, basales ± fuscae, plerumque integrae, superiores paucidentatae, omnes indistincte nervosae vel interdum nervi submarginales in parte inferiore ochrearum submanifesti. Folia 7—15×4—7 mm, ovata, margine revoluta, acuta vel acuminata, omnia petiolata; nervus medianus subtus in parte inferiore laminae prominens. Flores plerumque 3—4-ni fasciculati, pedicellati. Pedicellus usque ad 4 mm longus. Perigonium florendi tempore 2,5—3 mm longum, infundibuliforme, usque ad medium 5-lobatum. Nux ±3 mm longa, perigonio paulo brevior, semper fere compressa, rarissime assymmetrice compressa itaque subtriquetra, laevis, nitida, nigra. Styli 2. — Species nova *P. alpestri* C. A. Mey. et *P. serpyllaceo* Jaub. & Spach similis est sed ambae species a *P. chitralico* nuce semper triquetra manifeste diversae sunt. *P. alpestre* C. A. Mey. praeterea differt a *P. chitralico* floribus subsessilibus, foliis plerumque maioribus, ochreis albidis subpellucidis, nervis submarginalibus semper manifestis. *P. serpyllaceum* Jaub. & Spach praeterea differt a *P. chitralico* habitu minore magis compacte caespitoso.

Afghanistan: E: Nuristan: Pashki, 2650 m, Edelb. 997!

Pakistan: Chitral: Golen Gol, 3750 m, Bowes Lyon 78! Siru Gol S jugi Shah Jinali, 4200 m, Stainton 3059! Och Anzog, 3600 m, Wdb. s. n.!

Distr. gen.: Endem.

29. ***P. serpyllaceum*** Jaub. & Spach, Ill. Pl. Or. 2: 24 (1844).
Syn.: *P. radicosum* Boiss., Fl. Or. 4: 1039 (1879).
Typus: „In Persiae borealis alpibus Elamouth-Dagh", Auch. 5274, K!
Icon.: Jaub. & Spach, l. c. tab. 117.

Caudex crassus lignosus multiceps, planta dense pulvinato-caespitosa, glabra. Rami floriferi usque ad 8 cm longi, tenues, flexuosi, prostrati vel ascendentes, simplices vel interdum pauciramosi. Ochreae membranaceae, inferiores ± fuscae, integrae vel apice dentatae vel bifidae, nervis obsoletis, superiores albidae. Folia parva, (2—)4—10(—15) mm longa, ± ovata, superiora saepe anguste spathulata, semper fere in petiolum angustata. Flores 2—4-ni fasciculati erecti, breviter pedicellati. Perigonium florendi tempore ±2 mm longum, infundibuliformi-campanulatum, usque ad medium 5-lobatum. Nux perigonio brevior, ±2,5 mm longa, triquetra, laevis, nitida. Styli 3.

Persia: N: Gorg.: M. Shahvar: Hajjilang, Ostamaidan, 3200 m, Rech. 6061! Maz.: Alamut Dagh, Auch. 5274! — W: Lur.: Kuh-e Nil, 3900 m, Hausskn. — S: Fars.: Kuh-e Dinar, Ky. 779! — C: Tehr.: M. Tuchal, 3600—3800 m, Bornm. 8166! M. Damavand, 3200—4000 m, Bornm. 8163, Gilli! 8 km SW Reneh, 4220 m, Grant 16526! Prope Reneh, 2100 m, Bornm. 8164. Hazarchal, Ky. 499; 4000—4100 m, Bornm. 8165. Damgh.-Semn.: Kuh-i Nizwa, 2900 m, Behb. & Aell. 872! Shahr.-Bust.: M. Shahvar supra Raheh, 3300 m, Rech. 5960!
Afghanistan: E: Kabul, Paghman, 4000—4500 m, Neub. 1950/318! Ghazni: In M. Saperlebuli, 4200 m, W. Rech. in Rech. 37369! — NE: Kataghan: Sar-i Hauz in declivibus borealibus jugi Salang, 3300—3800 m, Rech. 37519! — C: Bamian: In jugo Hajigak, 3000—3600 m, Griff. 4104!, 1723!

Distr. gen.: Endem.

30. ***P. pamiroalaicum*** Komar., Fl. URSS. 5, Addenda 4: 719 (1936), e descriptione et icone.
Typus: „In valle Kumar ad fl. Seravschan alt. 3300 m supra mare et in locis numerosis aliis", Komar., TBI.
Icon.: Fl. URSS. 5, tab. 39, fig. 1 (1936).

Planta glabra, caepitoso-multicaulis. Caules usque ad 15 (—20) cm longi, basi dense congesti, e caudice multicipite ascendentes vel prostrati, pauciramosi. Ochreae pellucidae, acuminatae, paucilaceratae, inferiores ± truncatae. Folia 7—12×2—6 mm, ovata, apice plerumque rotundata, plana, uninervia, semper fere petiolata. Flores 2—3-ni fasciculati, breviter pedicellati. Pedicelli perigonio semper breviores. Perigonium 2—3 mm longum, rubrum vel viride, ad summum ad medium lobatum. Nux ±3 mm longa, anguste triquetra, nitida, nigra. Styli 3.
Afghanistan: NE: Badakshan: Ad lacum Sapak, Lindb. 846!
Pakistan: Kurram: Hariab, M. Sikaram, 3600 m, Aitch. 367!

Distr. gen.: Afghanistan, Pakistan, Pamir-Alaj.

31. ***P. myrtillifolium*** Komar., Fl. URSS. 5, Addenda 4: 718 (1936).
Typus: „In valle Langlif in decursu superiore fl. Seravschan influentis", Komar., LE!
Icon.: Fl. URSS. 5, tab. 39 fig. 3 (1936).

Caudex usque ad 5 mm crassus, multiceps. Planta glabra. Caules usque ad 15 cm longi, procumbentes vel ascendentes, pauciramosi. Ochreae albidae pellucidae, acuminatae, dentatae vel bifidae vel ± laceratae. Folia 10—15×4—7 mm, elliptica, apice obtusa, saepe apiculata, nervus medianus subtus ± prominens, petiolata. Flores 1—3-ni fasciculati. Pedicelli perigonio aequilongi, ad summum

3 mm longi. Perigonium ±2 mm longum, profunde 5-partitum, ± campanulatum, rubrum vel albidum. Nux ± 2 mm longa, triquetra, nitida. Styli 3.

Afghanistan: NE: Nuristan: In jugo Munjan, 3600 m, Koelz 12695! Wakhan: In regione Noshaq, 4000 m, Roemer 216!

Distr. gen.: Afghanistan, Pamir-Alaj.

32. ***P. biaristatum*** Aitch. & Hemsl., Journ. Linn. Soc. Bot. 18: 90 (1881). Typus: Seratigah, 12000', Aitch. 816, G, K!

Planta glabra, fruticoso-caespitosa, rami plerumque 7—10 cm longi, prostrati, ramosi, floriferi crassi lignescentes, internodiis abbreviatis confertis plerumque 2—5 mm longis, breviarticulati, ochreis ± persistentibus fibroso-squarrosis. Ochreae ovato-lanceolatae, apice ± laceratae, nervis submarginalibus in setas longas excurrentibus biaristatae. Folia 6—8(—10)×(2—)3—4(—5) mm, elliptica vel obovata, sessilia vel in petiolum brevem attenuata, acuta vel acuminata, ad apicem ramorum conferta. Flores solitarii vel bini, sessiles vel breviter pedicellati. Perigonium 2—3 mm longum, rubrum. Nux 2,5—3 mm, longa, triquetra, laevis, subnigra. Styli 3.

Afghanistan: E: Kabul: Paghman, 4000—4500 m, Neub. 317!, 318-a! In valle Panjshir: Darreh Rastagal, 4100 m, Hdg. & Wdb. 5190! In declivibus australibus jugi Salang, 3300 m, Rech. 37466!, 37471! — NE: Badakhshan: Khash, 3000 m, Koelz 13011! Pakistan: Chitral: Och Anzog, 3600 m, Wdb.! Zapotili, 3500 m, Wdb.! Kurram: Seratigah, 3600 m, Aitch. 816!

Distr. gen.: Afghanistan, Tien Shan, Pamir-Alaj, Chitral, Himalaya.

33. ***P. Podlechii*** Rech. f. & Schiman-Czeika, sp. nov. Typus: Podlech 12686, M!

Caudex crassus lignosus. Planta dense caespitosa, glabra, cinerascenti-virens. Caules 7—13 cm longi, prostrati vel ascendentes, striati, basi 1—1,5 mm crassi, internodiis usque ad 8 mm longis, apice vix 1 mm crassi, internodiis valde abbreviatis, irregulariter iteratim laxe ramosi, apicem versus ut rami dense foliati. Ochreae ± 3 mm longae, infundibuliformes, albidae, subpellucidae, basin versus ± fuscescentes, semper fere profunde plurilaceratae. Folia caulina ±8×3 mm, mox decidua, folia superiora et ramealia 4×3 mm et minora, omnia ovata, acuta vel interdum obtusa; nervus medianus tenuis, ceteri obsoleti. Flores 1—3-ni in axillis foliorum dispositi. Perigonium vix 2 mm longum, tubuloso-campanulatum, paulo infra medium quinquelobatum, purpureum vel albidum. Pedicellus perigonio subaequilongus. Nux ±2 mm longa, triquetra, paulo longior quam lata, leviter punctata, atrobrunnea. Styli 3 brevissimi.

Afghanistan: NW: Bala Murghab ad ripam fluvii Darya-i Murghab, 470 m, 31. X. 1964, Jakeš s. n.! — E: Kabul: Pul-i Charkhi, in hortis derelictis, 1800 m, Rech. 36849! — NE: Kataghan: Takhar: In valle superiore Farkhar, Warsaj, in declivibus aridis, 1800 m, 20. IX. 1965, Podlech 12686! — C: Ghorat: In faucibus calc. infra Parjuman, E, 1850 m, Rech. 19014!

Distr. gen.: Endem.

Das im übrigen völlig übereinstimmende Exemplar Jakeš s. n. ist älter und wesentlich größer; die Stengellänge beträgt im Durchschnitt 15 cm, die längsten sind 40 cm, auch die Blätter sind etwas größer, aber die Blüten- und Fruchtmasse sind gleich.

Die Art fällt unter den ausdauernden *Avicularia* vor allem durch die tief zerschlitzten Ochreen und die gleichmäßig kurzgliedrigen Seitenzweige auf. Sie kommt offenbar spät im Jahr zur Blüte bzw. Fruchtreife. Sie ist heterophyll, dies fällt jedoch an den vor-

liegenden Belegen nicht auf, da die größeren Blätter der Hauptsprosse bis auf wenige bereits abgefallen sind. Die Blätter sind stumpf graugrün und fast nervenlos, die Perigone purpurn, die dreikantigen Früchte sind bei starker Vergrößerung fein punktiert. Die angedeutete Merkmalkombination charakterisiert die Art eindeutig; es fällt schwer, sie mit einer der bekannten zu vergleichen.

Ein unvollständiges Exemplar, Neub. 3375 aus Kabul, gehört möglicherweise auch zu dieser neuen Art.

34. ***P. thymifolium*** Jaub. & Spach, Ill. Pl. Or. 2: 22 (1844).
Syn.: *P. Kotschyanum* Boiss., Fl. Or. 4: 1040 (1879).
Icon.: Jaub. & Spach, l. c. tab. 116.
Typus: Auch. 5276, P.

Planta ± dense papilloso-puberula vel glabra. Caules usque ad 15(−20) cm alti, basi lignosi, ascendentes, ramosi. Rami ± graciles, rigidi, internodiis inferioribus elongatis, ±10 mm longis, superioribus abbreviatis. Ochreae ovato-lanceolatae, margine laceratae semper glabrae, obsolete binerviae, inferiores usque ad 8 mm longae, superiores multo breviores, florales 2—5 mm longae, ± tubulosae, valde fimbriatae. Folia (3—)5—13×3—4(5) mm, ovato-lanceolata, margine manifeste revoluta, basi attenuata sessilia, acuminata vel cuspidata, flavo-viridia. Flores plerumque terni fasciculati, sessiles vel brevissime pedicellati; fasciculi superiores approximati. Perigonium ±2,5 mm longum. Nux 2,5—3 mm longa, laevis, triquetra nigra. Styli 3.

Persia: N: Maz.: Kuh-i Nizwa, 2900 m, Wdb. 1233! — W: Azerb.: Kuh-i Bilqis, Knapp. Khvoy, Knapp. M. Sahand prope Isperechan, Knapp. Ham.: In collibus prope Hamadan, Stapf. Prope Yalfan, Stapf. Lur.: Dow Rud, 1400 m, Koelz 18347! — S: Kerm.: Kuh-e Jupar, 3000—3700 m, Bornm. 5081! Fars.: Kuh-e Dinar, Ky. 719! Inter Fasa et Shiraz, Auch. 5276. — E: Khor.: Kuh-e Hazar Masjed, 2000 m, Rech. 5141-a! Inter Chanaran et Quchan, 1200—1300 m, Rech. 4697! — C: Qazv.: Kuh Dashteh prope Karaj, 2300 m, Gauba 2032! Damgh.-Semn.: Kuh-i Nizwa, 2900 m, Aell. 871! Shahr.- Bust.: In jugo Khash Aylan, 2000—2200 m, Rech, 5423! Kuh-i Kakashan, 3000 m, Koelz 16377! M. Shahvar, 3300 m, Rech. 5997!
Turcomania: sec. Nikitin.
Afghanistan: NW: Badghiz: M. Paropamisus, 1050 m, Aitch. 561! Herat: Obeh versus Khwajachisht, Koeie 1471!, 1492! — E: Ghazni: Ad marginem orientalem altoplanitiei Dasht-i Nawar, 3000 m, Rech. 37293! Sar-i Ab, 52 km W Ghazni, 2700 m, Rech. 37196! Okak NE Dasht-i Nawar, 3000 m, Rech. 17717!, Rech. 17739! Panjshir: Darrah-i Zuria prope Safed Jir, 3300 m, Podlech 12545! Dasht-i Rewat, Lindb. 1008! — NE: Wakhan: Prope Qazi Deh, 3200 m, Roemer 123! Munjan: In jugo Munjan, 3600 m, Koelz 12658!, 12687! Kataghan: Khost-o Fereng in valle Echani, 3200 m, Podlech 11816! — C: Bamian: Inter jugum Deraz Kol et Panjao prope Mandigak, 2800—3280 m, Rech. 18722! Band-i Amir: Ad lacum Band-i Panir, 2800 m, Rech. 18350! Band-i Amir, 2900 m, Hdg. & Wdb. 4799!, Rech. 18220!; 3300 m, Volk 2725!, Podlech 12149! Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18156! In declivibus borealibus jugi Shahtu, 3000 m, Rech. 36373! Ghorat: Dolaini, Darreh Garmak, 2540 m, Rech. 18917-b!
Pakistan: Chitral: Sora Lasht, 3300 m, Bowes Lyon 1097!

Distr. gen.: Endem.

Durch die besonders stark verholzte Grundachse, die bis mehrere Zentimeter Dicke erreichen kann, gedrungenen Wuchs, graugrüne, nicht gelblichgrüne Blattfarbe und verkürzte Blütensprosse weichen die folgenden Belege auffällig vom Typus ab: Rech. 17717, 18156, 18917-b und Volk 2725.

35. ***P. afghanicum*** Meisn. in DC., Prodr. 14: 90 (1856).
Typus: Afghanistan, Griff. 1724, K!

Planta dense caespitosa, ± suffruticosa, ochreis excepta plerumque papilloso-puberula. Rami floriferi ± ascendentes vel prostrati, usque ad 15 (20) cm longi, lignosi ± elongati, internodiis mediis 10—15 mm longis, ramulis superioribus abbreviatis, dense foliosis. Ochreae semper quam folia breviores, lanceolatae, laceratae. Folia (3—)5—17(—20)×1—2(—3) mm, linearia plana vel margine obsolete revoluta, glaucescentia, apice plerumque setaceo-mucronata. Flores semper fere solitarii. Nux ±3 mm longa, leviter curvata, obsolete triquetra, laevis, nigra. Styli 3.

Persia: S: Bal.: Inter Zahedan et Khash, 1300—1600 m, Rech. 4255! M. Taftan prope Sangan, 1600 m, Rech. 4079! — E: Khor.: In collibus ad Torbat-e Heydariyeh, 1300 m, Rech. 4353! Robat-e Safid, 1700 m, Rech. 1530! Kuh-e Bezg, Rech. 1491-b!, Aitch. Kuh-i Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4596! M. Hazar Masjed, 2000 m, Rech. 5141-b! Inter Mashhad et Shahrud E Sabzevar, Rech. 5283! Khorasan, Aitch.

Afghanistan: N: Mazar-i Sharif: Chashmeh-i Shafal, SW Mazar-i Sharif, 500—800 m, Rech. 16172! — NW: Herat: M. Paropamisus, Chashmeh Obeh, 1800 m, Rech. 19241! Badghiz, Kharez Ilias, Aitch. 470! — SW: Inter Kandahar et Kushk-i Nahod, 1000 m, Kerst. 308! — SE: Kandahar: 80 km N Kandahar versus Girishk, 1100 m, Rech. 34799! 34 km N Kandahar versus lacum artific. „Arghandab Reservoir", 1200 m, Rech. 34886! Tirin: 20—25 km S Tirin, 1800 m, Rech. 35120! — E: Kabul: Sher Darwasa, 1800—2000 m, Rech. 16983!, Gilli 2285!, 2293-a!, 2294-a! Hdg. & Wdb. 4316!, Kerst. 469! Aliabad, Neub. 1950/310! Kabul, 1800 m, Rech. 17046!, Podlech 16628-a! S. A. Akhtar!, NNW Khord Kabul, 2280 m, Gilli 2297! Inter Kabul et Tang-i Gharu, 1700 m, Gilli 2292! Kuh-e Chelsotun, 2210 m, Gilli 2296! Panjao, 2700 m, Hdg. & Wdb. 4990! In jugo Salang N Charikar, 1900—2200 m, Rech. 31334!, 2700—3300 m, Rech. 31429! Bagram prope Charikar, 1500 m, Codr. 18! Gulbahar, Neub. 1950/314! Amsel! Kuh-i Qorogh, 2800 m, Gilli 2300! Inter Kabul et Ghazni, Shaikhabad, 2300 m, Rech. 17259 p. p.! Wardak, Volk 797!, 849!, 872! Chakewardak 2600 m, Gilli 2298, 2303! Gardez: 10—20 km SE Gardez versus Khost 2400—2700 m, Rech. 32082! Jaji: In jugo Peiwar Kotal, 2650—2800 m, Rech. 32222! Inter Ahmad Khel, 2200 m et Ali Khel, 2400 m, Rech. 32197! Khost: In valle Tangai inter Domandao et Urgun, 1500 m, Rech. 35799! Paghman: Supra Begtut, 2900 m, Gilli 2301! In valle Paghman, 2300—2800 m, Rech. 17172!, Gilli 2287!, 2299!, Neub. 1950/311!, Neub. 1950/731!, Chaw.-Must.! In jugo Unai, 3150 m, Gilli 2304! Dahan-i Abdila, 25 km E Sar-i Chashma, 2800 m, Rech. 18580! Nuristan: Inter Asmar et Barikot, 840 m, Gilli 2280! Logar: Shakh-e Barantai, 2800 m, Volk 1731! — NE: Kataghan: Inter Doshi et Doab, 1800—1300 m, Rech. 16564! Inter Haibak et Pul-i Khumri, in jugo Paigah Kotal, 1500 m, Rech. 16428! Hdg. & Wdb. 4015! In valle Andarab, 1100 m, Rech. 31789! In declivibus borealibus jugi Salang, 3300—2700 m, Rech. 31607! — C: Bamian: In jugo Aoband Kotal inter Farakulum et Behzud, 3000 m, Rech. 18616! Inter Kotal Deraz Kol et Panjao prope Mandigak, 2800—3280 m, Rech. 18678! In declivibus australibus Koh-i Baba, 2700 m, Thesiger 112! Parwan: In jugo Shibar, Kitam. Doab: Sarasia, 2850 m, Koelz 13844! Doab, Volk 2685! Ghorat: Qala-i Ghor, 2100 m, Rech. 19126! — Afghanistan, Griff. 1724!, 4093!

Pakistan: Swat: Utror, 2200 m, Rech. 30822! In valle Jabba E Kolalai, 1600—2200 m, Rech. 30725! — Peshawar: Tor Khama, 700 m, Rech. 30344! Landi Kotal, 700—1000 m, Rech. 30314! In jugo Khyber, 1100 m, Johnston 154! — Kurram: Parachinar, 1800 m, Afendi 82! — Quetta: Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 19016! — Baluchistan, Lace.

Distr. gen.: Endem.

36. ***P. sarobiense*** Rech. f., sp. nov.
Typus: Rech. 34474, W!

Suffrutex 10—15 cm altus habitu laxo alte lignescens, in parte inferiore ramosissimus, ramis floriferis filiformibus numerosis erectis vel ascendentibus elongatis, papillosis vel glabriusculis saepe brunnescentibus, a basi ad apicem regulariter foliatis, internodiis mediis ± 5 mm longis, axillis fasciculiferis. Ochreae ± 3 mm longae hyalinae lanceolatae fibroso-laceratae. Folia lineari-filiformia, inferiora usque ad 10 mm longa, arcte convoluta, ± 0,5 mm lata, acuta, canescenti-virentia, glabra vel rarius subpapillosa, erecto-patula. Fasciculi tenues, quam folia suffulcrantia breviores, summis exceptis non contigui, vix decidui. Flores plerumque singuli (vel raro bini) axillares, 2—2,5 mm longi, tubo pallide viridi, lobis 0,5—0,8 mm longis, late albo-marginatis rotundatis antice ± truncatis et saepe mucronulatis. Fructus ignotus. — Differt ab affini *P. afghanico* Meisn. habitu laxo multo altius lignescente, ramis elongatis longius articulatis, erectis, tenuissimis, copiose remote foliatis, foliis angustissimis, fasciculis axillaribus tenuibus non deciduis, perigonii lobis brevioribus antice distinctius truncatis et mucronulatis.

Afghanistan: E: Kabul: In saxosis gneiss. faucium fluvii Kabul a Sarobi orientem versus, 900—1000 m, 13. V. 1967, Rech. 34474! Sarobi, Volk 1610! In monte SE Sarobi, 1430 m, Gilli 2283! Tang-i Gharu, 1600—1700 m, Kerst. 565!
Pakistan: Chitral: Koghozi inter Chitral et Mastuj, 1500 m, Stainton 2404!

Distr. gen.: Endem.

37. ***P. paronychioides*** C. A. Mey. ex Hohen., Bull. Soc. Nat. Mosc. 4: 356 (1838). Syn.: *P. Paronychia* C. A. Mey., Verz. Pfl. Cauc. 158 (1831), non Cham. & Schlecht. (1828). *P. mucronatum* Royle ex Bab., Trans. Linn. Soc. 18: 115 (1841). *P. Lemannianum* Meisn. in DC., Prodr. 14: 91 (1856).
Typus: „In locis lapidosis aridis montium Talüsch prope pagum Swant", C. A. Mey. LE!

Planta dense caespitosa, a basi ramosa, glabra, interdum scabriuscula. Rami floriferi 2—10 cm longi, prostrati, lignosi, internodiis abbreviatis rarius ad summum 5 mm longis. Ochreae lanceolatae, margine laceratae, superiores internodia et flores et folia involucrantes, inferiores plerumque quam folia paulo breviores. Folia 2—10(—12) × ±1 mm, linearia, acuta vel acuminata vel mucronata, margine revoluta, sessilia. Flores semper fere solitarii, subsessiles. Nux ±2 mm longa, leviter curvata, laevis, nigra, in parte superiore ± triquetra. Styli 3.

Iraq: Sul.: In jugo Malakawa prope Penjwin, 1400 m, Rech. 10409! Prope Penjwin, 1400—1600 m, Rech. 12243!
Talish: C. A. Mey. Swant, Hohen.
Persia: W: Azerb.: Seyyid Hajjin prope Khvoy, Szov. Tabriz, Grossh. In collibus S Tabriz, Gill.-Sm. Kurd.: Sanandaj, 1800 m, Jacobs 6941! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 98! Esf.: Inter Esfahan et Abadeh, 1500—2500 m, Schmid 5404! Jolfa, ad sepulcrum Aucheri, Rech. 2679! Bakht.: Gahar, 2400 m, Koelz 18007! Lur.: Borj, 2100 m, Koelz 775! Gusheh, Koelz 18615! — S: Bal.: Kuh-e Bazman, 3000 m, Gabr. 61, 71. — E: Khorasan, Bge. — C: Tehr.: M. Tuchal prope Ferosad, 1700 m, Bornm. 8162. Tehran, Koelz 16102!, Mirzayan 6407-E! Bornm. 4231. Inter Tehran et M. Damavand, 1400 m, Bornm. Qazv.: Kuh Dashteh prope Karaj, Rech. 348!
Turcomania: sec. Nikitin.
Afghanistan: NW: Herat: N Herat, 940 m, Gilli 2281! Obeh versus Khwajachisht, Koelz 954! — SW: N Kandahar, 1070 m, Gilli 2282! — E: Kabul: Sher Darwasa, 1820 m, Gilli 2286!, 2020 m, Gilli 2295! Kabul, 2100 m, Koelz 13479!, Volk 93!,

571!, 759! 10 km NW Kabul, 2000—2100 m, Rech. 31159! Band-i Kargha inter Kabul et Paghman, 2000 m, Rech. 19305! Paghman: Takht-i Turkoman, 4200 m, Thesiger 223! M. Sanglakh, 3900 m, Thesiger 202! Inter Shakar Takht et Hauz-e Chas, 4000 m, Gholam Nabi & Wahil in Gilli 2292-b! Supra Begtut, 3300 m, Gilli 2290! Paghman, 4000—4500 m, Neub. 1950/316! In jugo Unai, 3100 m, Rech. 18569! Bagram prope Charikar, 1500 m, Codr.! Inter Gulbahar et Sarobi, 3310 m, Gilli 2291!, 3210 m, Gilli 2294-b! Nijrao, 3000 m, Volk 2334! Laghman: Kail, 2400 m, Koelz 11678! Barbur, 1700 m, Kerst. 26! Bisut, 3000 m, Hdg. & Wdb. 5024! Wazirabad, Neub. 1950/274! Aliabad, Neub. 3378! Kuh-i Qorogh, 2600 m, Gilli 2288! In latere occidentali jugi Lataband, 1800—2100 m, Rech. 31105! Lataband, Kitam. Shashgao, Kitam. 76 km a Kabul versus Gardez, 2050 m, Rech. 31509! Pul-i Alam, 2100 m, Koelz 11863! Shaikhabad inter Kabul et Ghazni, 2300 m, Rech. 17264! Dasht-e Top inter Kabul et Ghazni, 2400 m, Rech. 17240! Ghazni: Inter Okak et Behzud: Nawar Kotal, 3150 m, Rech. 17822! Sang-i Masha, 2500 m, Rech. 17447! W jugi Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 17415! Nuristan: In jugo Purdam, 4200 m, Thesiger 1608!, 3600 m, Thesiger 1616! In jugo Wanasgul, 4500 m, Thesiger 1592! In valle Linar, 3500 m, Thesiger 1524! — NE: Wakhan: Qazi Deh, 2900—3500 m, Roemer 401! Badakhshan: Ad lacum Shiva: Mian Kuh, Lindb. 673! — C: Bamian: Kuh-i Baba, 2900—4100 m, Gilli 2289!, Weiler in Gilli 2293!, Gilli 2293-b!, Gilli 2302! Griff. NW jugi Hajigak, 3000—3200 m, Rech. 18508! Kuh-e Josha NW Panjao, 2900 m, Rech. 18773! Band-i Amir, 1800—2900 m, Rech. 18230! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16762! — Afghanistan, Aitch.

Pakistan: Chitral: Shokor Shal, 3500 m, Wdb. Ojor Gol, 3300 m, Bowes Lyon 829! Brumboret, 2050 m, Bowes Lyon 642! S Barum Glacier, 4500 m, Wdb.! — Swat: Kalam, 2200 m, Rech. 19387! Ushu, 2400 m, Rech. 19517! Bahrain, 1500 m, Stewart & Rahman 25074! Inter Dishei et Taki Taki, 3200 m, Honda 115 — Kurram: Parachinar, 1500—1700 m, Rech. 30892! — S. Wazir.: Tank, Duthie 15634.

Distr. gen.: Caucasus, Persia, Afghanistan, Turcomania, Pamir-Alaj.

Folgende Aufsammlungen, alle aus dem westlichen Teil des Gebietes der Flora Iranica, besitzen auffallend — bis 2,5 mm — breite Blätter: Koeie 775, Koelz 18007 und Rech. 348, 2679, 10409, 12243. — Bei den anschließend angeführten Exemplaren dürfte es sich um eine schmalblättrige — bis 1 mm — östliche Rasse von *P. paronychioides* C. A. Mey. handeln: Koelz 11678, 11863, Rech. 19387, 19517 und Stewart & Rahman 25074. — Wir haben den Typus von *P. macrohymenium* Boiss., Fl. Or. 4: 1041 (1879), Persia: W: Prope Ssof inter Tehran et Esfahan, Bge., nicht gesehen. Keine uns vorliegenden Exemplare entsprechen der Beschreibung dieser Art.

38. ***P. dumosum*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 83 (1846).

Typus: Ky. 242, M!

Frutex 15—20 cm altus, ramosissimus cinerascens. Rami floriferi 15—20 cm longi, erecti vel ascendentes, internodiis 7—12 mm longis, papilloso-puberuli. Ochreae caulinae 6—10 mm longae, florales paulo breviores, ovato-acuminatae, postea laceratae. Folia inferiora 10—12 × 1—2 mm, lineari-elliptica, acuta, margine revoluta, papilloso-velutina, superiora minora. Flores singuli vel bini, subsessiles. Perigonium 2—5 mm longum, extus papilloso-velutinum. Nux triquetra, ± 5 mm longa, laevis. Styli 3.

Persia: S: Kerm.: Kuh-e Jupar, 3000—3700 m, Bornm. 5081. Fars.: Takht-e Jamshid, Kuh Ayub, 1800 m, Wdb. 790! Prope ruinas urbis Persepolis, Ky. 242!

Distr. gen.: Endem.

39. ***P. aridum*** Boiss. & Haussk. in Boiss., Fl. Or. 4: 1042 (1879).

Typus: „In arenosis apricis montium Sawers et Nur Persiae australis", Haussk.

Planta *P. dumoso* Boiss. similis sed differt caulibus et ramis glabris vel papil-

loso-scabriusculis, internodiis mediis plerumque ultra 10 mm longis; ochreis inferioribus 3—5 mm, superioribus ±2 mm longis; foliis minutis 1—3 mm longis, rarius inferioribus usque ad 7 mm longis, lineari-lanceolatis, glabris, mox deciduis, perigonio plerumque papilloso.

Persia: W: Lur.: Kuh-e Saverz, Haussk.! — S: Fars.: Kuh-e Nil, Haussk.

Distr. gen.: Endem.

40. ***P. salicornioides*** Jaub. & Spach, Ill. Pl. Or. 2: 33 (1845).

Icon.: Jaub. & Spach, l. c. tab. 123.

Typus: Auch. 5277, K!

Planta dense fruticoso-caespitosa. Rami usque ad 15 cm alti, rigidi, erecti vel ascendentes, valde ramosi, internodiis plerumque ±5(—10) mm longis vel valde abbreviatis, striato-angulati, tomentoso-puberuli. Ochreae (1—)2(—5) mm longae, juniores ± campanulatae, truncatae, postea bifidae, tandem margine ± incisae. Folia inferiora 4—10 mm longa, oblongo-lanceolata, superiora multo minora, ± subulata, ± tomentosa, mox decidua. Flores singuli vel bini, breviter pedicellati. Perigonium 2—4 mm longum, extus ± tomentellum. Nux triquetra, 4—5 mm longa. Styli 3.

Persia: W: Lur.: Kuh-e Saverz, Haussk. Rabor, Bornm. 5084. — S: Kerm.: M. Jebal Barez: In summo jugo supra Deh Bakri, 2500 m, Rech. 3862! Fars.: Inter Shiraz et Persepolis, 800—1000 m, Schmid 5541! Maharlu prope Shiraz, Gauba. Ruknabad, Stapf 2034! Kuh Bamu, Stapf 2037! Kuh Delu, Ky. 468. Sivand, Behb. 1101-E!, 1102-E! Tal-e Khosravi, Behb. 1100-E! Kuh-e Sabz Pushan, Stapf 2039! Kuh Chah Siah prope Sivand, Stapf 2040! Kuh Bungi prope Dasht-e Arzhan, Stapf 2041! Kuh-e Nil, Haussk.

Distr. gen.: Endem.

41. ***P. spinosum*** H. Gross in Engler, Bot. Jahrb. 49: 340 (1913).

Typus: Bornm. 5083, K!

Planta *P. salicornioidi* Jaub. & Spach similis sed differt notis sequentibus: Rami anni praecedentis indurati divaricati, spinescentes; spinae plerumque ±5 mm longae. Rami hornotini floriferi tenues breves breviarticulati, foliis lineari-lanceolatis acutis. Ochreae non truncatae sed ± acutae.

Persia: S: Kerm.: Kuh-e Nasr, 3400—3900 m, Bornm. 5083!

Distr. gen.: Endem.

42. ***P. corrigioloides*** Jaub. & Spach, Ill. Pl. Or. 2: 34 (1845).

Typus: „Persia inter Teheran et Isphahan" Olivier & Bruguière; sec. Boiss., Fl. Or. 4: 1033 (1879), sed planta revera prope Baghdad lecta.

Icon.: Jaub. & Spach, l. c. tab. 124. Fl. URSS. 5 tab. 42 fig. 3 (1936).

Planta annua vel interdum perennis glabra. Caules (2—)5—20(—45) cm longi, graciles, prostrati, flexuosi, irregulariter ramosi; internodia inferiora 5—10 mm longa, in regione inflorescentiae valde abbreviata. Ochreae hyalinae, ovatae vel ovato-lanceolatae, margine dentato-laceratae. Folia 5—15(—18)×1—2 mm, in regione inflorescentiae minora linearia vel lineari-spathulata, obtusa vel acuta, basi attenuata subsessilia, plana vel margine paulo revoluta. Flores 3—6-ni fasciculati, ad extremos ramos aggregati, quasi inflorescentiam ± compactam, inferne tantum interruptam formantes, pedicellati; pedicelli usque ad 2 mm longi. Perigonium ±2 mm longum, usque ultra medium quinque-lobatum. Nux perigonio brevior, triangularis, nigra. Styli 3.

Persia: S: Lar.: Bandar Abbas: Berentin, Jarkiman 5762-E! — E: Sistan: Daryacheh-ye Sistan, Czernjak. Zabol, Shar. 5738-E! Naroui, Shar. 5740-E! — C: Damgh.-Semn.: Shahmirzad, Mirzayan 5736-E!
Turcomania: sec. Nikitin.
Afghanistan: NW: Herat: Obeh versus Khwajachisht, Koelz 1586! — E: Kabul: Mama Khel, 1200 m, Koelz 11583! Nuristan: In valle Pech, inter Chigha Sarai et Barkandai, 800 m, Kerst. 694-b! Kunar, Volk 2441! Safed Koh: Waziri, 1600 m, Volk 2543! Khost, in argillosis humidis, 1200 m, Rech. 35510! — NE: Kataghan: Pul-i Khumri, Amsel!
Pakistan: Chitral: Arandu SW Drosh, 1350 m, Stainton 2310! — Peshawar: In jugo Landi Kotal, 700—1000 m, Rech. 30315! Inter Attock et Kushalgarh, 500 m, Rech. 30423! Peshawar, Rech. 30998!, Kerst. 2174! — Kohat: In jugo Kohat, 700—900 m, Rech. 30164! — Sind: Inter Amri et Laki, Rech. 28671! Dera Ismail Khan, Rech. 30015! Bal.: Makran: Panjgur, 1000 m, Rech. 28179!

Distr. gen.: Iraq (Mesopotamia), Persia, Afghanistan, Pakistan, Pamir-Alaj, Uzbekistan.

Charakterpflanze der Überschwemmungsgebiete der großen Flüsse der Niederungen. Durch die lebhaft rosa gefärbten, langgestielten Blüten gut gekennzeichnet. In höheren Lagen seltener. In Pakistan neigt die Art stellenweise zum Überwintern bzw. Ausdauern, z. B. Rech. 30315, 30164, 30423.

Die Fundortsangabe des Typus ist sehr zweifelhaft, da die Art in diesem Gebiet nie wieder gefunden worden ist.

43. ***P. polycnemoides*** Jaub. & Spach, Ill. Pl. Or. 2: 30 (1845).
Syn.: *P. Olivieri* Jaub. & Spach, l. c. 31 (1845).
Typus: Baghdad, Auch. 2590, P.
Icon.: Jaub. & Spach, l. c. tab. 120, 121.

Planta semper fere glabra, habitu *P. rottboellioidi* Jaub. & Spach similis sed caules graciliores, ± flaccidi, folia plerumque patentia. Ochreae hyalinae albidae, ovatae vel ovato-lanceolatae, acutae, margine ± inciso-dentatae. Folia inferiora 5—12(15)×1—3 mm, superiora multo minora, anguste lanceolata vel linearia, plana vel revoluta, acuta, sessilia. Flores plerumque 1—2-ni axillares, subsessiles vel interdum brevissime pedicellati. Perigonium ±2 mm longum, ad summum usque ad medium quinquelobatum, fructiferum ovatum. Nux perigonium subaequans ovato-triangularis, subnigra. Styli 3.

Iraq: Kurd.: Sul.: In jugo Malakawa prope Penjwin, 1400 m, Rech. 12324! Penjwin, 1600 m, Rech. 10452! Arbil: Algurd Dagh in valle supra Nowanda, 2000—2600 m, Rech. 11389! Mosul: Supra Basingera N Zakho, 1200 m, Rech. 11521!
Persia: N: Gorg.: M. Shahvar prope Hajjilang, 2400—2600 m, Rech. 6104-b!, 6204! — W: Azerb.: Dizeh Siamek, Knapp. Ahmadabad, Knapp. Sanjud, Knapp. 50—30 km E Tabriz versus Mianeh, Rech. 32623! Kuh-e Mishu Dagh, Gill.-Sm. 2605. Kurd.: In alpibus Kurdistaniae, Haussкn. Bakht.: Gahar, Koelz 17973! Ham.: 73 km NNW Taq-e Bostan, Rech. 14666! In collibus prope Bijar, 1500 m, Furse 3279! Haydere, Pichler. Lur.: 50 km E Khorramabad, 1300 m, Koelz 1220! — S: Kerm.: Kuh-e Laleh Zar, 3000 m, Bornm. 4234. Azna, Koelz. Fars.: Kuh Bamu prope Shiraz, Stapf 2033! Kuh-e Dinar, Remaudière 5759-E! — E: Khor.: Kuh-e Bezg, 1800 m, Rech. 1468!, 1491-a! Torbat-e Heydariyeh, Rech. 1585! N Kuh-e Binalud, Mughan, Schmid 6252! — C: Tehr.: S M. Tuchal in valle Hafthauz, 1300—1500 m, Aell. 847! Ab-e Garm, 2200 m, Aell. 648! In jugo Kandavan, 2400 m, Gilli 1078. Bum Hen inter Tehran et M. Damavand, Bornm. 8177. Qazy.: Karaj, Gauba 1079. Pachenar, Bornm. 8176. Damgh.-Semn.: 10 km N Jashm, Kuh-i Nizwa, 2600 m, Aell. 870! Shahr.-Bust.: S M. Shahvar supra Nokarman, 2300 m, Rech. 5863! Kuh-i Kakashan, 3000 m, Koelz 16350! In jugo Khash Aylan, 70 km E shahrud, 2000—2200 m, Rech. 4559!

Turcomania: Suluklü, Sint. 1022.
Afghanistan: SE: Tirin: Inter lacum artificiale „Arghandab Reservoir" et Tirin, 1400—1700 m, Rech. 35032! 20—25 km S Tirin versus Kandahar, 1800 m, Rech. 35074! — E: Kabul: Qala-e Wazir inter Sar-i Chashma et jugum Unai, 2900 m, Kabul, 1780 m, Gilli 2262! In valle Panjshir: Kur-Petau, 2900 m, Podlech 12322! Prope Gulbahar, 1700 m, Gilli 2268! In declivibus borealibus jugi Altimur, 2500—2700 m, Rech. 31534! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Rech. 32054!, 32055! — NE: Kataghan: In declivibus borealibus jugi Salang, 2000—1100 m, Rech. 31726! — C: Bamian: Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18116! Band-i Amir, 2900 m, Gilli 2270! Ad lacum Band-i Panir, 2800 m, Rech. 18375! Bamian, Volk 2717-b! Ghorat: Dolaini, Darreh Garmak, 2540 m, Rech. 18911! Behzud: Mollah Jakub, 2550 m, Rech. 36115!
Pakistan: Chitral: In jugo Shandur SE Mastuj, 3600 m, Stainton 3091! Laspur, 3600 m, Bowes Lyon 96! Shokor Shal, 3600 m, Wdb. s. n.! — Swat: Kalam, 2200 m, Rech. 19410! — Kohat: Cherat SW Peshawar, 700—950 m, Rech. 30253! — Quetta: Shinghar 50 km N Fort Sandeman, 2050—2300 m, Rech. 29872! — Bal.: Makran: Khudabadan N Panjgur, 950 m, Hotson M 169-A. Panjgur, 950 m, Hotson M 169.
Distr. gen.: Anatolia, Libanon, Caucasus, Persia, Afghanistan, Chitral, Pamir-Alaj.

44. ***P. rottboellioides*** Jaub. & Spach, Ill. Pl. Or. 2: 32 (1845).
Syn.: *P. tubulosum* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 83 (1846). *P. durum* Brenckle, Phytologia 3: 365 (1950), syn. nov.
Typus (Syntypi): „In Persiae arenosis inter Teheran et Isphahan" Olivier & Bruguière P. — Auch. 2590 bis, P. Isotypus G!
Icon.: Jaub. & Spach, l. c. tab. 122.

Planta ochreis exceptis ± papillosa. Caules 3—18 (23) cm longi, decumbentes vel ascendentes, simplices vel pauciramosi, crassiusculi, internodiis saepius valde abbreviatis, saepius foliis et ochreis obtectis, raro usque ad 10 mm longis. Ochreae hyalinae albidae, ovato-lanceolatae, acutae, margine inciso-dentatae. Folia inferiora 5—10(12) × 1—2 mm, superiora multo minora, anguste lanceolato-linearia, sessilia. Flores (1—3)-ni, subsessiles. Perigonium 1,5—2,5(3) mm longum, anguste tubulosum, lobis ovato-lanceolatis plerumque perigonio triplo brevioribus. Nux perigonium ± aequans eo adherens anguste ovata, elongata, nigra. Styli 3.
Iraq: Kurd.: Arbil: M. Qandil supra Pushtashan, 2200 m, Rech. 11218! Mosul: N Zakho in M. Zawita, 1800—2000 m, Rech. 12010!
Persia: N: Maz.: Infra Qomrud Bala, 60 km E Firuzkuh, 2200—2400 m, Behb. & Aell. 858! — W: Azerb.: 55 km W Mianeh, 1600 m, Rech. 32612! Sufian, 1400 m, Grossh. Khosrava, Knapp. Shahr Chay, Knapp. Kuh-e Mishu Dagh prope Yam, 1900 m, Gill.-Sm. Ham.: Yalfan, Pichler. Lur.: Borj, 50 km SSW Arak, 2200 m, Koelz 1219! — S: Fars.: Kuh Delu, Ky. 500! Kuh-e Sabz Pushan prope Shiraz, Stapf 2031!, Ky. 432! Kuh-e Barfi, Stapf 2032! Kerm.: Kuh-e Laleh Zar, 3800—4000 m, Bornm. 5088, Gabr. 245! Kuh-e Jupar, 3300 m, Bornm. 5069. — E: Khorasan, Bge. — C: Tehr.: In declivibus australibus M. Tuchal prope Pas Qaleh, 1500—2000 m, Rech. 1099!; 1300—1500 m, Aell. 843! Supra Ferosad, 1600 m, Bornm. 8173. M. Damavand supra Reneh, 2640 m, Gilli s. n.! Inter pagum Damavand et lacum Tar, 2500 m, Gilli s. n.! Shahrestanak, Bornm. 8169, 8170. Prope Ask, 2100 m, Bornm. 8167. Shahabad, 1200 m, Aell. 890! Ab-e Garm, Behb. 186-E! Qazv.: Inter Qazvin et Rasht, 500—1200 m, Schmid 6577! Pich Kuh prope Karaj, Gauba 2034! Karaj, Gauba 1080. In valle Loura, 2700 m, Buhse 1057. Prope Meidan, 2100 m, Bornm. 8175. Gach Sar, Bornm. 8174. Distr. Talaqan, 2400—2700 m, Bornm. 8168, 8171, 8172.
Afghanistan: E: Kabul: Band-e Kargha, 2000 m, Rech. 19298!, 19306!, 19316!

Wazirabad, Volk 996! Aliabad, Neub. 3202! Kabul, 2100 m, Koelz 13476!, 13477! Tang-i Gharu, 1400—1500 m, Rech. 16946! In jugo Unai, 3100 m, Gilli 2271! Shaikhabad inter Kabul et Ghazni, 2300 m, Rech. 17259! 50 km a Kabul versus Gardez, 1900 m, Rech. 31467! Logar: Pul-i Alam, 2100 m, Koelz 11857! Panjao: Inter Mollah Jakub et Dahan-e Siah Darreh, 2800 m, Rech. 18654! Nuristan: In valle Linar, 3300 m, Thesiger 1523! Ghazni: In jugo Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 17413! W Qarabagh, 2300—2500 m, Rech. 17337! Inter Kotal-e Kechru et Miradina, 2700 m, Rech. 17538! — C: Bamian: Inter jugum Kotal Deraz Kol et Panjao prope Mandigak, 2800—3280 m, Rech. 18665! Dahan-e Abdila, 35 km E Sar-i Chashma, 2800 m, Rech. 17986! Koh-i Baba prope Bamian, 2900 m, Gilli 2264! Doab: 16 km S Doab, 1600 m, Rech. 16654! Darreh-i Shikar, 20 km S Doab, 1500 m, Hdg. & Wdb. 4139!

Distr. gen.: Iraq (Kurdistan), Persia, Afghanistan.

In seiner typischen Form ist *P. rottboellioides* durch in ihrer ganzen Länge dickliche Stengel auch habituell gekennzeichnet. Einige Exemplare sind bei charakteristischen Blüten- und Fruchtmerkmalen durch zarte Stengel und Äste abweichend, z. B. Neub. 3202, Hdg. & Wdb. 4139, Rech. 17337, 17413, 17538, 18654, 19306.

Brenckle vergleicht sein *P. durum* nur mit *P. polycnemoides* Jaub. & Spach, von dem es tatsächlich verschieden ist. Von *P. rottboellioides* Jaub. & Spach läßt es sich allerdings nicht trennen, da der Typus im Gegensatz zur Beschreibung annuell und nicht perennierend ist und da sich auch sonst keinerlei Unterschiede ergeben.

45. ***P. breviarticulatum*** Rech., f., sp. nov.

Typus: Rech. 34831, W!

Annuum, sparse papillosum, ceterum glabrum. Caulis a collo in ramos plures humifusos 1—6(—10) cm longos, simplices, crassos sed fragiles breviarticulatos angulato-sulcatos a basi foliatos et floriferos divisus; internodia 1—3(—5) mm longa, omnia quam folia multo breviora. Ochreae 4—5 mm longae, hyalinae, ovato-lanceolatae, acutae, integrae, patulae, quam internodia plerumque longiores. Folia usque ad 10(—12)×2(—3) mm, quam internodia pluries longiora, lanceolata vel oblanceolata, saepe supra basin latissima, apice acuta, margine reflexa, costa mediana pallida subtus tantum prominente percursa, crassiuscula, ± pallide viridia demum purpurascenti-violascentia, cum ochreis et floribus valde conferta, partes extremae ramorum itaque claviformes videntur. Flores (2,5—)3(—4) mm longi, (1—)2(—3)-ni axillares crasse pedicellati vel subsessiles; perigonium lageniformi-tubulosum, breviter pallide viride, basin versus brunnescens, coriaceum, sulcatum, rugosum et interdum papillosum, demum induratum et foliis ochreisque delapsis persistens, lobis spathulatis tertiam circiter partem perigonii longitudinis attingentibus late albo-marginatis sese basi ± tegentibus. Nux a basi lageniformi-dilatata perigonii inclusa et cum eo concreta. — Affine *P. rottboellioidi* Jaub. & Spach habitu conferto et imprimis nuce perigonio adhaerente sed differt ab eo internodiis multo magis abbreviatis ramis multo crassioribus angulato-costatis, foliis multo latioribus, ochreis multo majoribus, ramis apice floribus ochreis foliis congestis quasi clavatis, perigonii tubo costato-rugoso, lobis spathulatis late albo-marginatis.

Afghanistan: SE: Kandahar: In saxosis aridis 80 km W Kandahar versus Girishk, 1100 m, 21. V. 1967, Rech. 34831! 30 km E Dilaram versus Girishk, 1050 m, Rech. 33514! Ad marginem deserti Registan, 20 km S Kandahar, 1000 m, Rech. 35276!

Distr. gen.: Endem.

46. ***P. molliaeforme*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 84 (1846). — Tab. 7, fig. 2, 3.

Syn.: *P. acaule* Boiss., Fl. Or. 4: 1043 (1879) non Hook. (1890), syn. nov.
Typus: „In glareosis montis Kuh-Daena Persiae australis", Ky. 778, G!

Planta glabra, nana. Caulis dichotome ramosus, usque ad 5 cm altus vel internodiis abbreviatis subnullus. Rami filiformes, teretes, ± fragiles, atropurpurei, internodiis usque ad 15(20) mm longis, superioribus valde abbreviatis. Ochreae hyalinae, 2—5 mm longae, enerviae, lanceolatae, basi subventricosae, ± nitidae, inferiores plerumque acuminatae, superiores dentato-laceratae vel ± indivisae subovatae. Folia 5—10×0,5—1 mm, linearia, basi dilatata, sessilia. Inflorescentia glomerata; folia cum ochreis et floribus capitulum singulum vel capitula plura terminalia formantia. Flores minuti, ad summum 2 mm longi, solitarii, subsessiles. Nux ± 2 mm longa, nitida, subnigra. Styli 2.

Persia: S: Kerm.: Kuh-e Jupar, 2700 m, Bornm. 5085. Fars.: Kuh-e Dinar, Ky. 778. — C: Tehr.: M. Tuchal, Ky. 573. Damavand, Bornm. 8181. 7 km SW Reneh, 4000 m, Grant 16543! Shahr.-Bust.: Prope Shahrud, Bge. Khash Aylan, 70 km E Shahrud, 2000—2200 m, Rech. 1948! Yazd: Inter Yazd et Esfahan, Bge.
Afghanistan: N: Mazar-i Sharif: Inter Chashmeh-i Shafal et Akupruk, 500—1000 m, Rech. 16238!, Hdg. & Wdb. 3903! In faucibus fluvii Balkh, 500—800 m, Rech. 16176! — E: Kabul: Wardak, Volk 848! Kabul, Volk 1705! Paghman: M. Sanglakh, 3900 m, Thesiger 195! Ghazni: Dasht-i Nawar, NW Ghazni, 3000 m, Kasy 61! W jugi Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 17393! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17973! Okak NE Dasht-i Nawar, 3000 m, Rech. 17676! — C: Bamian: Band-i Amir, 2800 m, Volk 2781!, 2950 m, Gilli 2305! Rech. 18292! Bamian, 2800 m, Volk 2716!, 2900 m, Volk 2717a! NE Bamian, 3000 m, Gilli 2306! Koh-i Baba, 3780 m, Gilli 2307! Ghorat: Dolaini, Darreh Garmak, 2540 m, Rech. 18888!
Pakistan: Chitral: Barum Gol: Shokor Shal, 3500 m, Wdb. s. n.!

Distr. gen.: Persia, Afghanistan, Pamir-Alaj, India, Sina.

Die von Bossier l. c. zur Unterscheidung seines *P. acaule* von *P. molliaeforme* angegebenen Unterschiede sind schon am Typus wenig überzeugend: Blütenknäuel sitzend, Stengel fehlend, Blätter verkürzt, Ochreen matt, nicht zugespitzt, Stamina 7—8 (gegen 5). Durch spätere Aufsammlungen verwischen sich die Unterschiede vollständig. Volk 1705 käme *P. acaule* noch am nächsten, die matten Ochreen sind jedoch lang zugespitzt. Die Zahl der Stamina schwankt von 5—8; die Antheren fallen leicht ab, sodaß auch das Merkmal des *P. molliaeforme* „staminibus quinis quarum 2—3 antheriferis" gegenüber „stamina 7—8" bei *P. acaule* hinfällig wird.

47. ***P. lencoranicum*** Komar., Fl. URSS., Addenda 4: 720, 5: 613 (1936).
Typus: Talysch, ad ostium fluvii Busej-dagum, TBI.

Planta glabra. Caules a basi ramosi, ±25 cm longi, prostrati, internodiis abbreviatis. Ochreae late acuminatae, fiimbriatae, 4—8 mm longae. Folia 6—12×2—4 mm, ovata, acuta, breviter petiolata, subtus manifeste nervosa. Flores plerumque solitarii. Perigonium ±2 mm longum. Nux perigonium ± aequans, nigra, opaca, triquetra.

Talish: Ad ostium fluvii Busej-dagum, Grossh.

Distr. gen.: Endem.

Wir haben den Typus dieser Art nicht gesehen, sondern nur eine Aufsammlung von Grossheim aus Lenkoran „ad ostium fluvii Lenkoran-Tshai", die aber wahrscheinlich aus zwei verschiedenen Arten besteht. Wir mußten uns daher in erster Linie an die Erstbeschreibung halten.

48. ***P. arenastrum*** Boreau, Fl. Centr. Fr. ed. 3, 3: 559 (1875).
Syn.: *P. aequale* Lindm., Svensk Bot. Tidskr. 6: 692 (1912). *P. aviculare* L. subsp. *aequale* (Lindm.) Ascherson & Graebner, Syn. Fl. Mitteleur. 4: 848 (1913).
Typus: Non designatus.
Icon.: Lindm., l. c. tab. 23, 26. Fl. URSS tab. 41, fig. 2 (1936).

Planta glabra. Caulis usque ad 60 cm longus, ± erectus vel ascendens, plerumque a basi ramosus; rami ± divaricati plerumque subsimplices, internodiis inferioribus 10—30(35) mm longis, superioribus saepe valde abbreviatis. Folia caulina et ramealia subaequalia, 10—20(—30)×(3)5—10 mm, superiora paulo tantum minora, late vel anguste elliptica, brevipetiolata, nervis subtus distinctis (sed minus quam in *P. aviculare*). Ochreae bipartitae, margine saepe ± profunde laciniatae, plerumque ± manifeste nervosae. Flores solitarii vel interdum 2—3-ni fasciculati, pedicellati. Perigonium ± 2 mm longum. Nux perigonium aequans vel eo paulo longior, triquetra, rugulosa vel punctulata, subnigra. Styli 3.

Iraq: Kurd.: Mosul: N Zakho: Jabal Khantur, 1390 m, Rech. 10817! Kirkuk: Qara Anjir, 600 m, Rech. 12526!

Persia: W: Lur.: Chamchid, 1500 m, Koelz 16011! — E: Khor.: Inter Mayamey et Abbasabad, Rech. 5370! M. Kopet Dagh supra Quchan, 1600 m, Rech. 1613! — C: Tehr.: Inter Tehran et Jaji Rud, 1590 m, Aell. 880! Shahr.-Bust.: Inter Damghan et Sabzevar prope Mayamey, Rech. 1299! — Persia, Linds. 962!

Afghanistan: NW: Herat: Obeh versus Khwajachisht, Koelz 1287! — E: Kabul: Inter Karte Char et Gusargah, 1780 m, Gilli 2276! Kabul, 1780 m, Gilli 2275!, 2279! Sarobi, Volk 1906! Jaji: Inter Qasim Khel et Dobandi in jugo Shutargardan, 3300 m, Rech. 32341! Gardez, 2400 m, Koelz 11902! Ghazni: In jugo Sardalu W Qarabagh, 2300—2500 m, Rech. 17325! — NE: Badakhshan: Jurm, 2100 m, Koelz 12893! Kataghan: Khanabad, 600 m, Koelz 12195! Baghlan, Volk 768-b! In declivibus borealibus jugi Salang, 3300—2700 m, Rech. 31609! — C: Bamian: Qala Sarkhari, 1500 m, Koelz 13907! Doab: In jugo Baligali, 2700 m, Koelz 13851! Doab, 1500 m, Koelz 13518! Pakistan: Swat: Kalam, 2200 m, Rech. 19392!, 19450! — Kurram: Inter Alizai et Thal, Rech. 30984! Parachinar, 1500—1700 m, Rech. 30898!, Afendi 21! In valle Kurram, Aitch. 632, 655! — Quetta: Sariab, 1700 m, Rech. 28808!

Distr. gen.: Probabiliter in toto fere orbi terrarum regionibus arcticis et antarcticis exceptis.

Gilli 2276 ist hochwüchsig und hat im Durchschnitt kleinere Blätter (bis zu 15 mm lang) und neben dreiseitigen, im Perigon eingeschlossenen Nüßchen, die kaum länger als breit sind, Nüßchen, die langgestreckt sind und das Perigon überragen. Bei den im folgenden aufgezählten Belegen handelt es sich möglicherweise um Hybriden zwischen *P. arenastrum* und *P. patulum*.

Persia: W: Lur.: Dow Rud, 1800 m, Koelz 18151!, 18334! — S: Fars.: Deh-e Girdu, Stapf 2030! Bal.: Iranshahr, Shar. 464-E!

Afghanistan: NE: Wakhan: Yamit, 2800 m, Roemer 269! — C: Bamian: Lorinj, 2400 m, Koelz 13705! Ghorat: Qala Shahrak, 2000 m, Rech. 19159!

Alle Pflanzen haben zur Gänze oder wenigstens größtenteils glatte Nüßchen. Bei Koelz 18151 und 18334 und noch mehr bei Stutz 1346 sind die Blätter gegen die Zweigspitzen zu weitgehend reduziert. Bei den Aufsammlungen von Koelz sind die meisten Perigonblätter ± stark warzig-punktiert. Koelz 18334 besteht aus kleinen, unverzweigten, bis zu 8 cm hohen, z. T. fruchtenden Pflänzchen. Die stärkste Blattreduktion unter den genannten Aufsammlungen findet sich bei Roemer 269. Von typischem *P. patulum* M. B. unterscheiden sich aber die erwähnten Pflanzen durch den unverzweigten Wuchs, die fast durchwegs zweiteiligen und nicht zerschlissenen Ochreen und die verhältnismäßig kleinen, meist nur 10 mm langen Blättchen. Unabhängig von unseren

Untersuchungen kamen bereits Komarov und Grigorjev, Fl. URSS 5: 614, 618 (1936) zu dem Ergebnis, daß sowohl *P. aviculare* als auch *P. arenastrum* u. a. mit *P. patulum* bastardieren dürften.

Sharif 464-E aus Baluchistan, Iranshahr, zeigen eine wohl nur schwache Reduktion der oberen Blätter, dafür aber eine Häufung der Blüten an den Zweigenden, ähnlich wie bei *P. corrigioloides*.

49. ***P. aviculare*** L., Spec. Plant. 362 (1753), s. str.
Syn.: *P. heterophyllum* Lindm., Svensk Bot. Tidskr. 6: 960 (1912).
Typus: „Habitat in Europae cultis ruderatis".
Icon.: Lindm., l. c. tab. 23, 24. Fl. URSS., tab. 41, fig. 1 (1936).

Planta glabra. Caulis (20—)25—60(—100) cm longus, ± erectus vel ascendens, ± rigidus, ramosus; rami plerumque suberecti vel interdum procumbentes saepe iteratim ramosi, internodiis (10—)20—40(—50) mm longis, internodiis ramulorum multo brevioribus, 3—10 mm longis vel magis abbreviatis. Folia caulina (15—)20—25(—40)×5—10 mm, late vel ovato-lanceolata, interdum angustiora; folia ramorum dimidio breviora (2—)5—10(—15) mm longa, omnia acuta, brevipetiolata, plerumque subtus manifeste nervosa. Ochreae bipartitae, margine saepe ± profunde laciniatae, caulinae semper fere manifeste nervosae. Flores plerumque solitarii vel interdum usque ad 3-ni fasciculati, pedicellati. Perigonium ± 2 mm longum. Nux perigonium paulo superans, triquetra, semper fere ± rugulosa, brunnea vel subnigra. Styli 3.

Iraq: Kurd.: Mosul: N Zakho prope Basingera, 1200 m, Rech. 11522! Kirkuk: 10 km SE Darbandikhan, Abdul Sattar Sabri & Abdul Hussein 9303!
Talish: Swat, Hohen. Drych, Hohen.
Persia: N: Gorg.: Bandar-i Gaz, Sint. 1360. Gil.: Tunekabun, Buhse. — W: Azerb. 15 km N Khvoy, Rech. 14932! Tabriz, Gill.-Sm. 2147, 2381, 2650, 2651. E Tabriz, Gill.-Sm. 2180. Ham.: Kuh Gerru, Str. Lur.: Dow Rud, 1500 m, Koelz 18501! Shah Bazan, Koeie 1222. Esf.: Lalun, Boroumand 5763-E! Bakht.: Gatvand, Mart.-Escal. In valle Bazoft, Mart.-Escal. Khuz.: In planitie fluvii Karun, Graham. — S: Bal.: Zahedan, 1300 m, Rech. 3938! — E: Khor.: Showkatabad prope Birjand, 1400 m, Rech. 4145!, 4149! Inter Birjand et Torbat-e Heydariyeh, Manuch. 5737-E! — C: Tehr.: Mahmudiyeh, 1250 m, Aell. 904! Tehran, Koelz 18394!, Furse 3104! Qazv.: Karaj, Rech. 6713!, Gauba 1073. Damgh.-Semn.: Jandaq, Buhse.
Turcomania: Kizyl-Arvat, Becker. Ashkhabad, Sint. Suluklü, Sint.
Afghanistan: NW: Maimana, 900 m, Hdg. & Wdb. 3808! Herat: Tirphul, Aitch. 283. — E: Kabul: Rishkor et Kuh-e Nanagak, 1830 m, Lindb. 1317! Kabul, Manger, Neub. 3154! In valle Salang prope Olang, 2600 m, Podlech 12238! Nuristan, Kitam. Jaji: Peiwar Kotal, Aitch. — NE: Kataghan: Kunduz, 450 m, Rech. 16107!, Podlech 12778! Badakhshan: Faizabad, Podlech 12746! — C: Ghorat: Dolaini inter Qala Shahrak et Sar-i Naourak, 2540 m, Rech. 18885! Bamian: 16 km S Doab, 1600 m, Rech. 16660! — Afghanistan, Aitch. 779!
Pakistan: Chitral: Shishi Gol NE Drosh, 2100 m, Stainton 3158! Laspur, 3000 m, Bowes Lyon 31! Bashgalian Deh, SW Chitral, 2100 m, Stainton 3224! — Swat: Kalam, 2200 m, Rech. 19400! — Kurram: Shalozan, Aitch. 315. M. Sikaram, Aitch. — S. Wazir.: Kaniguram, Stewart. Tank, Williams, Stewart. — Quetta: Chaman, Kitam. Quetta, Kitam. — Harboi Hills, H.-B.; 2600 m, Hotson 79. — Baluchistan, Stocks, Lace.

Distr. gen.: In toto fere orbi terrarum, regionibus arcticis et antarcticis exceptis.

Bei Bowes Lyon 31, Stainton 3158 aus Chitral sind die Internodien der Seitenästchen im Verhältnis zur ganzen Pflanze ziemlich langgestreckt und die Heterophyllie ist nicht besonders deutlich (z. B. Bowes Lyon 31 p. p.). Einige Pflänzchen von Stain-

ton 3224 besitzen neben breit dreiseitigen, vom Perigon ± eingeschlossenen Nüßchen auch langgestreckte, das Perigon überragende.

P. aviculare wird hier im Sinne von *P. heterophyllum* Lindm. aufgefaßt. Bei den aus der Literatur übernommenen Verbreitungsangaben handelt es sich jedoch fast durchaus um *P. aviculare* s. l., d. h. es könnte auch *P. arenastrum* Boreau gemeint sein.

50. ***P. olivascens*** Rech. f. & Schiman-Czeika, sp. nov.
Typus: Rech. 3159, W!

Planta annua, glabra, imprimis prope basin divaricato-ramosa. Caules 10—20 cm longi ascendentes, ± tenues ± flaccidi, teretes, striati, fragiles, internodiis 15—20 mm longis apicem versus sensim valde abbreviatis, furcato-ramosi; caules et rami apice semper fere nutantes. Folia caulina 15—22×4—5 mm, mox decidua, folia ramorum multo minora 8—10×±2 mm, apicem versus sensim decrescentia, omnia anguste lanceolata, subacuta, basi attenuata sessilia, nervo mediano tantum subtus paulo prominente, olivacea vel sordide viridia. Ochreae 4—6 mm longae, hyalinae, infundibuliformes, superiores integrae, oblique truncatae, inferiores bipartitae, margine ± profunde laciniatae, obsolete nervosae. Flores plerumque terni fasciculati, virescentes, interdum solitarii, pedicellati. Perigonium 2,5—3 mm longum album. Pedicellus ± 3 mm longus. Nux ± 3 mm longa, perigonio fructificationis tempore subaequilonga, triquetra, laevis atrobrunnea. Styli 3, brevissimi.

Persia: S: Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1700—1900 m, 28. IV. 1948, Rech. 3159! Bal.: Zahedan, in cultis, 1300 m, Rech. 3930! — E: Khor.: Ad deserti margines inter Gonabad inter Qayen et Torbat-e Heydariyeh, 900 m, Rech. 4199!
Afghanistan: N: Mazar-i Sharif: Tashkurghan, in collibus argillosis, 500 m, Rech. 34068! — SE: Kandahar: In valle fluvii Helmand inter Qala Bist et Darweshan, 700 m, Rech. 34545-b! Ad marginem deserti Registan prope Mianpushta inter Darweshan et Safer, 700 m, Rech. 34580!
Pakistan: Makran: Panjgur, in palmetis (*Phoenix dactylifera*), 1000 m, Rech. 28158! Jangal, 1500 m, Popov 219!

Distr. gen.: Endem.

Die Exemplare der Aufsammlungen Popov 219 und Rech. 28158 sind wesentlich größer als die übrigen. Die Stengel sind 35 bzw. 45 cm lang und in der unteren Hälfte auch zum Teil derber ausgebildet, alle übrigen Merkmale sind jedoch völlig gleich. Von gleichem Habitus wie die beiden ebengenannten ist Rech. 3930, deren längster Stengel ebenfalls 45 cm lang ist, sie besitzt außerdem rote Blüten. — *P. olivascens* nimmt in mehrfacher Hinsicht eine Mittelstellung zwischen *P. aviculare* und *P. patulum* ein. Von *P. aviculare* unterscheidet sie sich durch stärker an Größe abnehmende Blätter der Blütenregion und durch die schwächeren, an der Spitze nickenden Zweige; auch sind die Nüsse glatt, während sie bei *P. aviculare* meist eine runzelige Oberfläche haben. — Von *P. patulum* unterscheidet sich *P. olivascens* durch zarten, schlaffen Wuchs, nickende Zweigspitzen, matt olivgrüne Farbe der Blätter; Blüte- und Fruchtzeit des *P. olivascens* ist um mehrere Wochen früher.

51. ***P. patulum*** M. B., Fl. Taur.-Cauc. 1: 304 (1808).
Syn.: *P. Bellardi* auct. non All. p. p. *P. Bellardi* var. *patulum* (M. B.) Meisn. in DC., Prodr. 14: 99 (1856).
Typus: Tauria, M. B., LE!

Planta glabra. Caulis erectus, 25—80 cm altus, imprimis basi crebre ramosus. Rami ± patentes, saepe virgati, tenues, elongati. Internodia caulis et ramorum 20—

40 mm longa. Ochreae manifeste nervosae, laceratae, hyalinae, basin versus induratae. Folia lanceolata 10—40(—45)×3—8(—15) mm, plerumque flavovirentia. Inflorescentia laxa, axis filiformis, floribus 1—4-nis fasciculatis remotis, in parte superiore aphylla. Pedicelli ± 1 mm longi. Nux 2—2,5 mm longa, triquetra, laevis subnigra. Styli 3.

Iraq: Kurd.: Mosul: „Barojet Lamana", Barkley 9035! Jabal Khantur, 1390 m, Rech. 10818! Sul.: Penjwin, 1400 m, Rech. 10459! Inter Sulaymaniyah et Dukan, 700 m, Rech. 10097! Kanispit prope Tawilla, 1000 m, Rech. 12350! Qara Dagh, Buthaina Makki 548! Arbil: Algurd Dagh prope Nowanda, 2000—2600 m, Rech. 11337! Rost, 1500 m, Haley 175! M. Baradost N Rawandiz, 1200—1500 m, Thesiger 1220!
Talish: C. A. Mey. Swant, Hohen.
Persia: N: Gorg.: Shahkuh, Koelz 16447! Maz.: Hasanabad, 300 m, Žumer 52! Gil.: M. Samam prope Shahjan, Buhse. Ardabil, Mir Kamali 6575-E! Persia borealis, Auch., Buhse. — W: Azerb.: E Mianeh, Rech. 32600! 55 km W Mianeh, 1600 m, Rech. 32613! Tabriz, 1450 m, Grossh., Gill.-Sm. 1304, 1614, 1671, 2066, 2067, 2146, 2652, Buhse. Marand, 1300 m, Grossh. Sufian, 1400 m, Grossh. Gasht prope Khvoy, Knapp. Rezaiyeh, Knapp. SW lacus Rezaiyeh, 1300 m, Jacobs 6877! Gömör Khaneh E Rezaiyeh, Knapp. Khamseh: Zanjan, Omidnan 6227-E! Kurd.: 52 km N Sanandaj, 2000 m, Grant 16069! Bakht.: Ajdar Rah, Hakimi 5761-E! Ham.: Chichian versus Malayer, Pichler. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 100! 65 km S Sanandaj, 1400 mm Grant 16035! Arak: M. Rasvand, Ste. Lur.: 50 km E Khorramabad, 1200 m, Koeie 1221! Dow Rud, 1500 m, Koelz 15469!, 18190! Chamchid, 1500 m, Koelz 16009! Khuz.: Haft Tappeh, Bent & Wr. 427—207! Rud-e Dez, 7 km E Haft Tappeh, Bent & Wr. 427—107! — S: Kerm.: Tomagoa, Koelz 14309! Kerman, Bornm. 4240. Fars.: Kuh Bamu prope Shiraz, Stapf 2035! Ad lacum Shiraz, Stapf 1036! Bal.: Khash, 1300 m, Rech. 4291! — E: Sistan: Zabol, Shar. 5735-E! Naroui, Shar. 5739-E! Khor.: Inter Dasht et Loveh, 13 km W Bojnurd, 1200 m, Rech. 37615! Kopet Dagh supra Quchan, 1600 m, Rech. 1616! Torbat-e Jam, Aitch. 696! 1153. — C: Tehr.: Garmsar, 1100 m, Aell. 921! Varamin, Manuch. 5758-E! M. Tuchal prope Pas Qaleh, 1500—2000 m, Rech. 1086! Prope Mahmudiyeh, 1250 m, Aell. 837!, 848! Qazv.: Soltaniyeh, 1650 m, Furse 3222! Prope Karaj, Rech. 177! Rech. 6705!, 6847! Soltanabad prope Qazvin, 1500 m, Linds. 273!, Sarkissian 5742-E! Gach Sar, Bornm. 8179. Qazvin, 1200 m, Schmid 6460! Shahr.-Bust.: M. Shahvar prope Nokarman, Rech. 5834! Dihi, 2500 m, Rech. 5947! Shahrud, Rech. 5375! Qom: Rahjerd, 1900 m, Koeie 1218.
Turcomania: Suluklü. Sint.
Afghanistan: N: Mazar-i Sharif: Wazirabad, 400 m, Rech. 16147! — Polat, 2700 m, Koelz 13942! — E: Kabul: Wazirabad, 1750 m, Gilli 2278! Chelsotun, 1780 m, Lindb. 1280! Kabul versus Sarobi, 1700 m, Rech. 16906! In jugo Salang N Charikar, 1900—2200 m, Rech. 31342! Gardez: M. Safed Kuh W jugi Altimur, 2600—2700 m, Rech. 31903! — NE: Kataghan: Baghlan, Volk 768-a! Khanabad, 360 m, Koelz 12216! In paludosis fluvii Kunduz, 400 m, Rech. 16040! Takhar: In valle Namaqab prope Taqcha Khana, 1450 m, Podlech 11434-a! Kunduz, Bala Hissar, 400 m, Rech. 16068! — C: Doab: In valle Kamard W Doab, 1630 m, Gilli 2274! Bamian: Inter Doab et Doshi, 1380 m, Rech. 37027! — Afghanistan, Griff. 4095!

Distr. gen.: Europa australis, Anatolia, Caucasus, Persia, Afghanistan, Pamir-Alaj.

Typisches *P. patulum* M. B. ist vorwiegend basal verzweigt, die Zweige stehen bogig ab und laufen in zarte, lockere und scheinbar blattlose Infloreszenzen aus. Die Blätter sind freudig grün und ± breit lanzettlich. Das Perigon ist grünlich. In der hier angenommenen Fassung ist die Art jedoch in mehreren Merkmalen ziemlich variabel. So sind z. B. Rech. 5375 und 6705 erst im oberen Teil verzweigt. Aell. 837, Linds. 273, Bent & Wr. 427—107 und 427—207, Koelz 14309 und Rech. 4291 haben schmale, nahezu lineal-

lanzettliche, fahl grüne bis graugrüne Blätter. Bei diesen Exemplaren sind auch die Infloreszenzen mit verhältnismäßig großen Blättern versehen; diese Aufsammlungen sowie auch Grant 16069 und Koelz 18190 fallen ferner durch größere Blüten auf, die zumeist lebhaft rosa sind. Zukünftige Untersuchungen müssen — wie bei vielen anderen Arten der *Avicularia* — erweisen, wie weit fixierte Merkmalskombinationen bestehen, die eine weitere Aufteilung ermöglichen oder ob und in wie fern die Variabilität durch Hybridisierung mit verwandten Arten bedingt ist.

P. oxanum Komar. soll nach Komarov, Fl. URSS: 633 (1936) und Kitamura, Fl. Afgh.: 94 (1960) in Iran und Afghanistan vorkommen. Die Art soll sich von *P. patulum* M. B. durch mehr fleischige Blätter mit kaum sichtbarer Nervatur und deutlich punktierte Früchte unterscheiden; es wird erwogen, ob es sich um eine Kreuzung von *P. patulum* und *P. aviculare* handeln könnte. Wir haben den Typus des *P. oxanum* nicht gesehen. Afghanistan: N: Mazar-i Sharif, Kitam. — E: Kabul: Sarobi, Kitam. — NE: Kataghan: Inter Pul-i Khumri et Haibak, Kitam.

52. ***P. Kitaibelianum*** Sadl., Fl. Comit. Pest ed. 1, 1: 287 (1825).
Syn.: *P. Bellardi* Boiss., Fl. Or. 4: 1034 (1879), non All. (1785). *P. Bellardi* var. *typicum* Beck in Reichenb., Icon. Fl. Germ. 24: 67 (1905).
Icon.: Reichenb., l. c. tab. 209, fig. 1—4.
Typus: „In monte Sancti Gerardi prope Budapest", Sadler.

Planta glabra, habitu *P. patulo* M. B. similis. Caulis usque ad 70 cm altus, erectus, ramosus. Rami elongati, virgati, subsimplices, internodiis elongatis plerumque 40—50 mm longis. Ochreae semihyalinae, manifeste nervosae, laceratae. Folia oblongo-lanceolata plana plerumque 20—35 mm longa, superiora valde decrescentia. Inflorescentia elongata in parte superiore aphylla. Flores 2—5-ni fasciculati, pedicellati. Pedicelli ±2 mm longi. Fasciculi valde remoti. Nux 4—5 mm longa, triquetra, subnigra, minute punctata. Styli 3.

Persia: N: Gil.: Ispili, Linds. 1339! — W: Kurd.: Inter Sanandaj et Saqqez prope Hoseynabad, Rech. 14721! — C: Qazv.: Karaj, Gauba 1072.

Distr. gen.: Europa meridionalis et orientalis, Caucasus, Anatolia, Persia.

Rech. 14721 weicht durch verhältnismäßig kleine Nüßchen von ± 4 mm Länge ab und nähert sich hiedurch *P. patulum* M. B.

53. ***P. argyrocoleon*** Steud. ex Kunze, Linnaea 20: 17 (1847).
Icon.: Fl. URSS 5, tab. 44, fig. 1.
Typus: „In arena insularum Tigridis prope Mosul", Ky. 440, M (Isotypus!).

Planta glabra, annua vel perhiemans, canescenti-viridis. Caulis 50—100 cm altus, ± erectus, striatus, ramosus, saepius inferne subsimplex, in regione inflorescentiae plerumque iteratim ramosus; internodiis mediis ± 40 mm longis. Ochreae semihyalinae, manifeste nervosae, basi brunnescentes, superne valde laceratae. Folia anguste lanceolata, plana, mox decidua, media 20—40×4—8 mm, superiora minora, plerumque glauca. Flores plerumque 3-ni, inflorescentiam basi laxiusculam, apicem versus subaphyllam densam ± clavaeformem formantes. Pedicelli ±2 mm longi. Nux plerumque 2 mm longa, triquetra, subnigra, laevis. Styli 3.

Persia: N.: Maz.: Pol-e Zanguleh, Gauba 1715. — W: Kurd.: M. Zagros, Haussk. Kermansh.: Karand, Noë. Bakht.: Gatvand, Mart.-Escal. Khuz.: Ahvaz, Koelz 14946! Sush, Nab. 983. — S: Bal.: Khash, 1300 m, Rech. 4292! — E: Khor.: Sistan: Zabol, 700 m, Rech. 4116! Showkatabad prope Birjand, 1400 m, Rech. 4160! — C: Tehr.: Istgah-e Bahram, 1100 m, Aell. 893! Shahr Rey, Abbassabad, Bruns. Tehran, Bornm. 8178.

Turcomania: sec. Nikitin.

Afghanistan: N: Mazar-i Sharif: SE Tashkurghan versus Haibak, 600—700 m, Rech. 16357! Robatak, Neub. 1950/244! SE: Kandahar: Ad marginem deserti Registan prope Bhagat, 600 m, Rech. 34610! — E: Nangarhar: 20 km E Jalalabad versus Tor Khama, 700 m, Rech. 37434!

Distr. gen.: Iraq (Mesopotamia), Armenia, Persia, Afghanistan, Kara-Kum. In Americam boreali-occidentalem introducta.

P. argyrocoleon gehört seiner Verbreitung nach ähnlich wie *P. corrigioloides* Jaub. & Spach vorwiegend den heißen Niederungen der großen Ströme an. Wieweit die aus der Literatur übernommenen Angaben aus dem iranischen Hochland zutreffend sind, bleibt fraglich. Die Art ist durch die graugrüne Färbung, die Verzweigung der Infloreszenzregion und die gedrängten blassen Blüten gut gekennzeichnet.

Zweifelhafte Angabe

P. arenarium Waldst. & Kit. ist von Mitteleuropa bis Kleinasien und Transkaukasien verbreitet. Es soll nach Boissier & Buhse, Mém. Soc. Nat. Mosc. 18: 193 (1860), in Tabriz vorkommen. Da wir aber keinerlei Belege aus dem Gebiet der Flora Iranica gesehen haben, halten wir die Angabe für zweifelhaft.

9. *Fagopyrum*

Fagopyrum Miller, Gard. Dict. Abr. ed. 4 (1754).

Herbae annuae, erectae, caulibus cavis. Folia triangulari-sagittata, cordata. Ochreae breves, truncatae, integrae. Flores heterostyli, andromonoici, in paniculas angustas terminales et axillares racemiformes dispositi. Pedicelli perianthium aequantes, supra medium articulati. Perianthium campanulatum, segmentis 5 non accrescentibus. Stamina 8 in disco cum nectariis flavis alternantia. Styli 3, longi et tenues. Stigma minutum, capitatum. Nux triquetra, perianthium valde excedens.

1a. Perianthium 3—4 mm longum. Nux faciebus et angulis laevibus ..... 1. *F. esculentum* Moench

b. Perianthium 2 mm longum. Nux faciebus rugosis, angulis sinuato-dentatis. ..... 2. *F. tataricum* (L.) Gaertn.

1. ***F. esculentum*** Moench, Meth. 290 (1794).

Syn.: *F. vulgare* T. Nees, Gen. Fl. Monochlam. 53 (1835). *F. sagittatum* Gilib., Exerc. Phyt. 2: 435 (1792), nom. illeg. *Polygonum Fagopyrum* L., Spec. Plant. 364 (1753).

Typus: „Habitat in Asia".

Caulis 15—60 cm altus, glaber vel puberulus, maturitate rubro-suffusus. Folia usque ad 7×6 cm, latitudine plerumque paulo longiora, integra vel sinuata, atroviridia, inferiora petiolata, superiora sessilia. Paniculae axillares, breves et compactae, longe pedunculatae. Perianthii segmenta 3—4 mm longa, virescenti-albida rubro-apiculata. Nux 5—6 mm longa, atrobrunnea, maturitate opaca, faciebus laevibus, angulis acutis integris.

Pakistan: Swat: Kalam, 2100 m, cult., R. R. Stewart s. n.!

Distr. gen.: Asia centralis et orientalis. In multis terris culta et subspontanea.

2. ***F. tataricum*** (L.) Gaertn., Fruct. Sem. Pl. 2: 182 (1790).

Syn.: *Polygonum tataricum* L., Spec. Plant. 364 (1753). *Fagopyrum subdentatum*

Gilib., Exerc. Phyt. 2: 436 (1792), nom. illeg. *F. dentatum* Moench, Meth. 290 (1794).

Typus: „Habitat in Tataria".

Speciei praecedenti similis sed saepe elatius, glabrum, raro rubro-suffusum. Folia plerumque longitudine latiora, laetius viridia. Paniculae longiores, laxiores. Perianthii segmenta 2 mm longa, plerumque omnino viridia. Nux irregulariter rugosa, angulis obtusis sinuato-dentatis.

Afghanistan: E: Panjshir: Porandeh, Doalana, 2400 m, Gilli 2308! Shingar, 2200 m, Gilli 2309! Nuristan: Parun, Edelb. 2018! Pashki, 2300 m, Kerst. 1317! — NE: Wakhan: Urghend, 2700 m, Roemer 283! Badakhshan, Ribat-e Pain, 2500 m, Koelz 12832! Pakistan: Chitral: Laspur, 36° 2′ N, 72 ° 27′ E, Bowes Lyon 102!

Distr. gen.: Sibiria, Asia centralis unde in terras multas introducta, rarius culta.

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(*P. lapathifolium* L. subsp. *tomentosum* (Schrank) Danser) 59
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(*P. lapathifolium* L. var. *incanum* Boiss.) 59
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R. angustifolius Campd. 14
R. angustifolius Campd. subsp. *angustifolius* 15

R. angustifolius Campd. subsp. *libanoticus* Rech. f. 15
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(*R. digynus* L.) 24
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(*R. Drobovi* E. Korov.) 19
(*R. elbrusensis* Boiss.) 12
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(*R. hastaefolius* M. B.) 6
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R. × *oryzetorum* Rech. f. 23
R. × *pakistanicus* Rech. f. 22
(*R. pamiricus* Rech. f.) 11
R. Patientia L. 10
(*R. Patientia* L. subsp. *eu-Patientia* Rech. f.) 11
R. Patientia L. subsp. *orientalis* (Bernh.) Danser 11
R. Patientia L. subsp. *pamiricus* (Rech. f.) Rech. f. 11
R. Patientia L. subsp. *Patientia* 11
R. Patientia L. subsp. *tibeticus* (Rech. f.) Rech. f. 12
(*R. Patientia* L. var. *kurdicus* Boiss.) 12
R. Paulsenianus Rech. f. 10
(*R. peregrinus* Boiss.) 20
R. ponticus E. H. L. Krause emend. Rech. f. 12
R. × *promiscuus* Rech. f. 22
R. × *pseudopulcher* Haussk. 24
R. pulcher L. 16
R. pulcher L. subsp. *anodontus* (Haussk.) Rech. f. 17
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R. × *remotiflorus* Samuelss. 24
(*R. reticulatus* Bess.) 22
(*R. roseus* L.) 7
R. sanguineus L. 15
R. × *Schulzei* Hausskn. 23
R. scutatus L. 6
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(*R. strictus* Link) 22
R. × *subdubius* Rech. f. 23
(*R. syriacus* Meisn. apud DC.) 18
R. × *talaricus* Rech. f. 23
R. tenuifolius (Wallr.) Löve 4
R. thjanschanicus (*tianschanicus*) Los. 10
(*R. tibeticus* Rech. f.) 12
R. tuberosus L. 6
R. tuberosus L. subsp. *horizontalis* (C. Koch) Rech. f. 7
R. tuberosus L. subsp. *turcomanicus* (Rech. f.) Rech. f. 7
(*R. tuberosus* L. var. *turcomanicus* Rech. f.) 7
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R. vesicarius L. 8
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Addenda

3. *Oxyria*

1. ***O. digyna*** (L.) Hill
Afghanistan: E: Kabul: In glareosis granit. declivium australium jugi Salang, 3300 m, Rech. 37478!

5. *Atraphaxis*

1. ***A. spinosa*** L.
Afghanistan: C: Panjao: 37 km SW Panjao versus jugum Waras, 2600 m, Rech. 36560!

3. ***A. pyrifolia*** Bge.
Afghanistan: E: Urgun: 35 km NW Urgun versus Surmat, in saxosis (Tonschiefer), 2400 m, Rech. 35914! — NE: Kataghan: In declivibus borealibus jugi Salang, 2100 m, Amsel s. n.!

4. *Rheum*

5. ***R. Ribes*** L.
Afghanistan: C: Deh Kundi: Inter juga Waras et Khonak, 2600 m, Rech. 36624! In declivibus australibus jugi Waras, 2900 m, Rech. 36693!

3. ***R. turkestanicum*** Janisch
Persia: E: Khor.: Inter Mashhad et Fariman, Rech. 33201! Afghanistan: N: Mazar-i Sharif: In faucibus calc. 21 km SE Tashkurgan versus Haibak, 600 m, Rech. 34031!

Polygonum bucharicum Grig. — Rech. 16852

Tab. 2

Fig. 1

Fig. 2

Fig. 1: *Polygonum rumicifolium* Royle ex Bab. — Bowes Lyon 124
Fig. 2: *P. Gilesii* Hemsl. in Hook. — Rech. 19565

Polygonum tortuosum D. Don — Rech. 17643

Tab. 4

Polygonum nepalense MEISNER — RECH. 19557

Fig. 1

Fig. 2

Fig. 1: *Polygonum amplexicaule* D. Don — Rech. 19426
Fig. 2: *P. affine* D. Don — Stainton 3108

Polygonum hyrcanicum Rech. f. — Rech. 1892

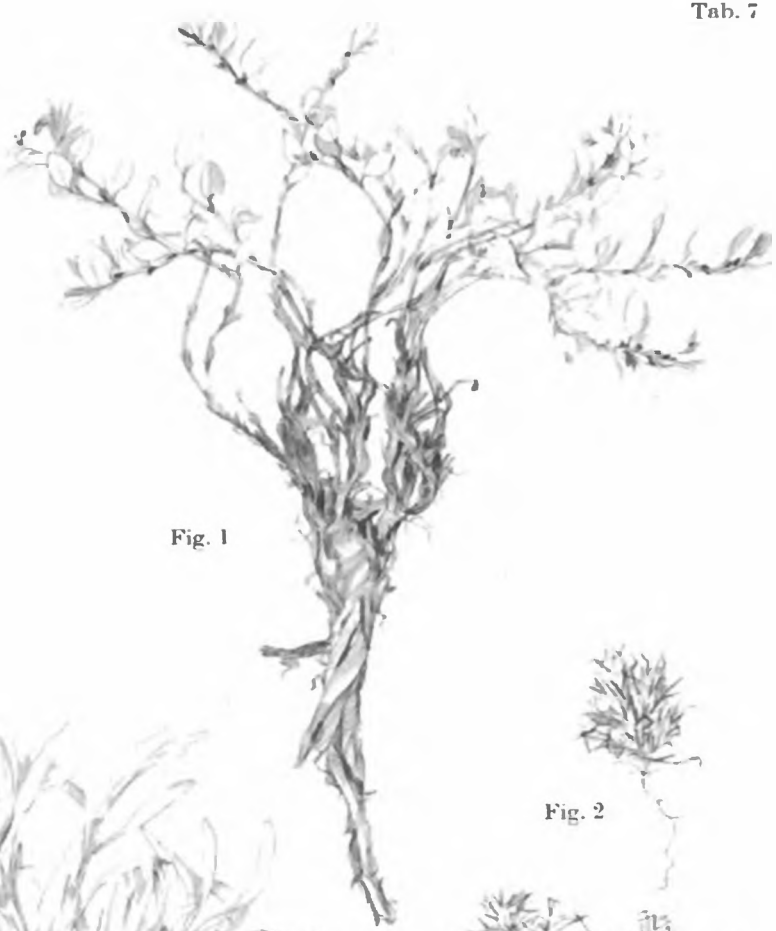


Fig. 1

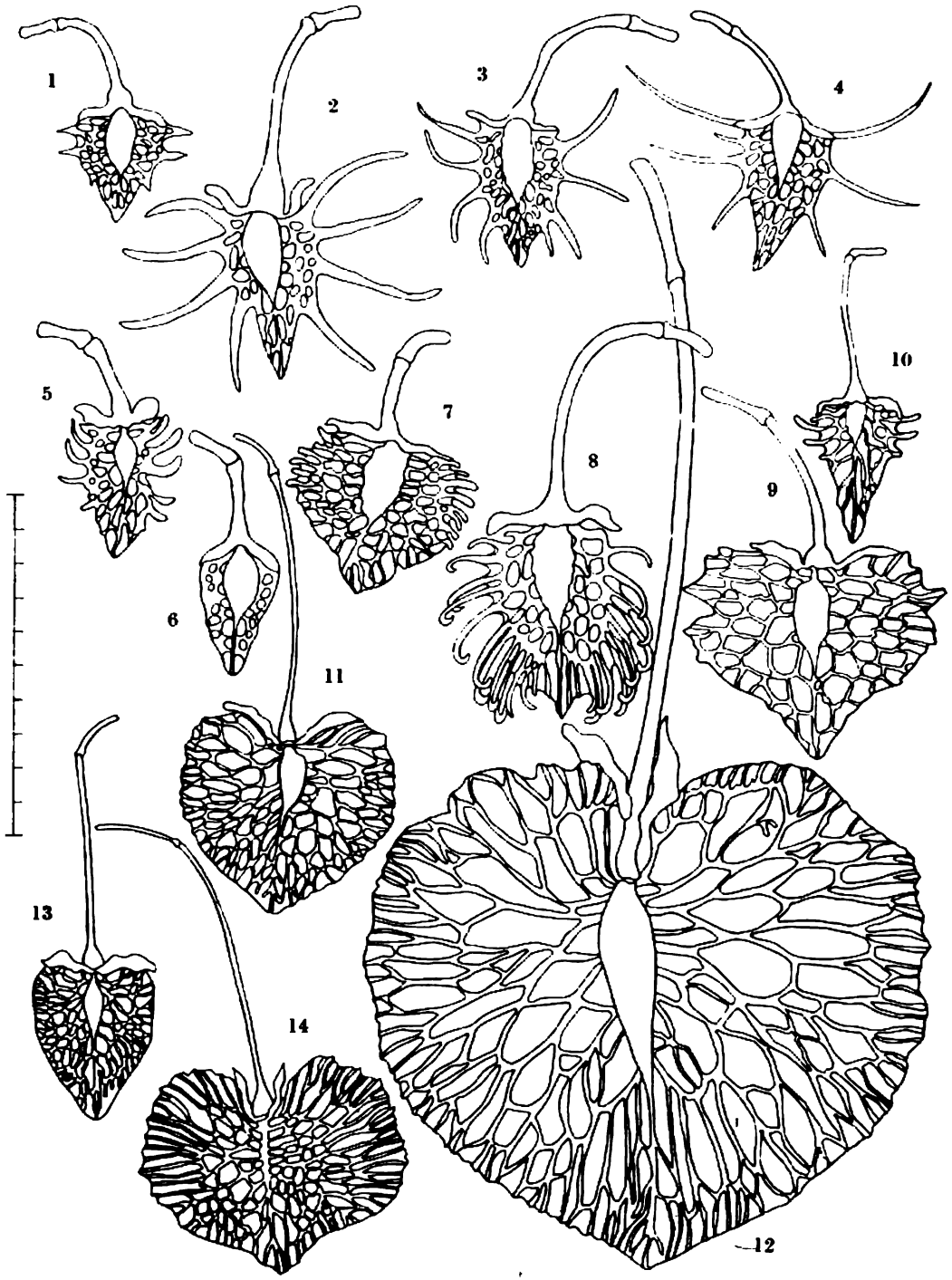
Fig. 2

Fig. 3

Fig. 4

Fig. 1: *Polygonum chitralicum* Rech. f. & Schiman-Czeika — Bowes Lyon 78
Fig. 2, 3: *P. molliiforme* Boiss. — Rech. 18888
Fig. 4: *P. sibiricum* Laxm. subsp. *Thomsonii* (Meisner ex Steward) Rech. f. & Schiman-Czeika — Rech. 17762

Tab. 8



1: *Rumex dentatus* subsp. *Klotzschianus* — 2: *R. dentatus* subsp. *mesopotamicus* — 3: *R. dentatus* subsp. *Halacsyi* — 4: *R. dentatus* subsp. *reticulatus* — 5: *R. pulcher* subsp. *pulcher* — 6: *R. pulcher* subsp. *anodontus* — 7: *R. pulcher* subsp. *divaricatus* — 8: *R. nepalensis* — 9: *R. chalepensis* — 10: *R. obtusifolius* subsp. *subalpinus* — 11: *R. Patientia* subsp. *pamiricus* — 12: *R. elbursensis* — 13: *R. Patientia* subsp. *tibeticus* — 14: *R. Paulsenianus*

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Die in Kursiv gesetzten Familien sind bereits erschienen

	Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
PTERIDOPHYTA					
Equisetaceae	1	2	143	(2)	(2)
Lycopodiaceae	2	1	142	(1)	(1)
Marsileaceae	5	5	144	(4)	(4)
Ophioglossaceae	3	3	140	(6)	(6)
Polypodiaceae	4	4	141	(3)	(3)
Salviniaceae	6	6	145	(5)	(5)
GYMNOSPERMAE					
Cupressaceae	9	8	136	(8)	(8)
Ephedraceae	10	10	138	(10)	(10)
Pinaceae	8	9	135	(7)	(9)
Taxaceae	7	7	137	(9)	(7)
ANGIOSPERMAE					
Acanthaceae	138	110	84	86	135
Aceraceae	86	83	30a	42a	76
Aizoaceae	48	27	50	57	106
Alismataceae	16	127	115	124	146
Amaranthaceae	45	23	93	92	112
Amaryllidaceae	27	134	128	114	162
Ampelidaceae	91	91	32	41	66
Anacardiaceae	81	81	46	43	75
Apiaceae	113	94	54	58	127
Apocynaceae	125	117	82	75	82
Aquifoliaceae	82	86	70	38	58
Araceae	22	143	120	122	158
Araliaceae	112	93	55	59	19
Aristolochiaceae	40	35	103	97	96
Asclepiadaceae	126	118	74	76	84
Asparagaceae	26	133	129	116	155,7pp.
Asteraceae	146	126	61	65	131
Balanophoraceae	42	20	102	103	63
Balsaminaceae	89	85	25	33b	140
Berberidaceae	54	40	3	13	96
Betulaceae	33	11	112	108	25
Bignoniaceae	137a	108a	76a	85a	86a
Boraginaceae	129	104	80	79	142
Brassicaceae	60	46	7	16	101
Buddleiaceae	123	115	75	77	80
Burseraceae	75	78	33	36	72
Butomaceae	17	128	116	124a	145
Buxaceae	80	31	105	104a	23
Caesalpiniaceae	68b	59b	38b	45b	13
Callitrichaceae	79	32	47	50b	117
Campanulaceae	145	125	62	66	130
Cannabiaceae	37	17a	106	105	30
Capparidaceae	59	45	8	17	36
Caprifoliaceae	141	121	57	61	20
Caryophyllaceae	50	29	13	23	105
Celastraceae	83	87	35	39	60
Ceratophyllaceae	52	42	15	110	94
Chenopodiaceae	44	22	92	93	111
Cistaceae	99	49	10	19	33
Commelinaceae	24	138	132	117	154
Compositae	146	126	61	65	121
Convolvulaceae	127	102	78	80	133
Cornaceae	114	92	56	60	18
Corylaceae	33	11	112	108	27
Crassulaceae	63	56	51	48	123
Cruciferae	60	46	7	16	101
Cucurbitaceae	144	124	48	55	42
Cupuliferae	33-4	11-2	111-2	108	25-7
Cusculaceae	128	103	79	80a	141
Cynocrambaceae	111	25	91	105c	113
Cyperaceae	20	139	134	126	169
Cytinaceae	41	36	101	96	98
Datiscaceae	101	54	49	56	43
Dioscoreaceae	28	137	131	115	164
Dipsacaceae	143	123	60	64	129
Ebenaceae	121	100	69	72	68
Ehretiaceae	129	104	80	79	87
Elaeagnaceae	103	61	97	100	64
Elatinaceae	96	52	18	26	103
Ericaceae	116	99	63	67	51
Euphorbiaceae	78	30	104	104	49
Fabaceae	68	59	38	45	13-5
Fagaceae	34	12	111	108a	26
Ficoidaceae	48	27	50	57	106
Frankeniaceae	97	51	17	22	38
Fumariaceae	58	44	6	15a	100
Gentianaceae	124	116	76	78	118
Geraniaceae	70	74	26	33	138
Globulariaceae	137	108	85	87	142
Graminae	19	140	135	127	170
Grossulariaceae	64	57	52	47	17
Guttiferae	95	55	19	27	54
Halorrhag(id)-aceae	109	67	46	50	115
Hamamelidaceae	65	33	53	49	21
Helleboraceae	53	39	1	11	90
Hippocastanaceae	87	84	30b	42b	77
Hippuridaceae	110	68	45	50a	116
Hydrangeaceae	64	57	52	47	16a
Hydrocharitaceae	18	129	114	111	146
Hypericaceae	95	55	19	27	54
Ilicineae	82	86	70	38	58
Illecebraceae	50	29	13	23	109
Iridaceae	29	135	126	113	163

	Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
Juglandaceae	32	13	109	107	28
Juncaceae	25	136	133	118	168
Juncaginaceae	14a	130	117a	125b	148
Labiatae	131	112	87	89	144
Lamiaceae	131	112	87	89	144
Lauraceae	56	37	98	98	11
Leguminosae	68	59	38	45	13-5
Lemnaceae	23	144	119	123	159
Lentibulariaceae	136	107	65	84	137
Liliaceae	26	133	128	116	155
Linaceae	71	72	23	31	47
Loganiaceae	123	115	75	77	79
Loranthaceae	39	19	100	101	61
Lythraceae	104	62	43	53	114
Malvaceae	93	69	20	28	46
Meliaceae	76	79	31	37	73
Menispermaceae	55	38	2	12	95
Menyanthaceae	124	116	76	78	119
Mimosaceae	68a	59a	38a	45a	14
Molluginaceae	48	27	50	57	105
Monotropaceae	115	98	64	67a	52
Moraceae	36	15	107	105a	31
Moringaceae	62	48	37	44	37
Myrsinaceae	117	97	67	70	67
Myricaceae	107	64	40	52	55
Najadaceae	15	132	118	125	153
Nyctaginaceae	46	26	95	91	35
Nymphaeaceae	51	41	4	14	93
Oenotheraceae	108	66	44	54	115
Oleaceae	122	119	71	73	81
Onagraceae	108	66	44	54	115
Orchidaceae	30	141	125	112	167
Orobanchaceae	135	108	83	83	136
Oxalidaceae	69	73	24	33a	139
Paeoniaceae	53	39	1	11	89
Palmae	21	142	121	119	165
Pandanaceae	12	145	122	120	166
Papaveraceae	57	43	5	15	99
Papilionaceae	68c	59c	38c	45c	15
Parnassiaceae	64	57	52	47	126
Pedaliaceae	134	109	77	85	86
Periplocaceae	126	118	74	76	83
Philadelphaceae	64	57	52	47	16
Phytolaccaceae	47	24	90	94	110
Plantaginaceae	139	114	89	90	122
Platanaceae	66	34	110	106	22
Plumbaginaceae	119	95	88	68	121
Poaceae	19	140	135	127	170
Podophyllaceae	54	40	3	13	93
Polygalaceae	77	80	12	21	41
Polygonaceae	43	21	94	96	108
Portulacaceae	49	28	14	24	107
Potamogetonaceae	14	131	117	125a	150
Primulaceae	118	96	66	69	120
Punicaceae	105	65	42	53	57
Pyrolaceae	115	98	64	67a	50
Rafflesiaceae	41	36	101	96	98
Ranunculaceae	53	39	1	11	91
Resedaceae	61	47	9	18	102
Rhamnaceae	90	90	36	40	65
Rhizophoraceae	106	63	41	51	56
Rosaceae	67	58	39	46	12
Rubiaceae	140	120	58	62	85
Ruppiaceae	14	131	117	125a	151
Ruscaceae	26	133	129	116	157
Rutaceae	73	76	28	34	70
Salicaceae	31	14	113	109	24
Salvadoraceae	84	88	72	74	59
Santalaceae	38	18	99	102	62
Sapindaceae	88	82	30	42	74
Sapotaceae	120	101	68	71	69
Saxifragaceae	64	57	52	47	124
Scheuchzeriaceae	–	130	117a	125b	148
Scrophulariaceae	133	106	82	82	134
Selaginaceae	137	108	85	87	–
Simar(o)ubaceae	74	77	29	35	71
Smila(ca)ceae	26	133	130	116	156
Solanaceae	132	105	81	81	132
Sparganiaceae	13	146	123	121a	160
Staphyleaceae	85	89	30c	42c	78
Sterculiaceae	94	71	21	29	45
Tamaricaceae	98	50	16	25	39
Theligonaceae	111	25	91	105c	113
Therebinthaceae	81	81	46	43	75
Thymelaeaceae	102	60	96	99	34
Tiliaceae	92	70	22	30	44
Typhaceae	11	147	124	121	161
Ulmaceae	35	16	108	105b	29
Umbelliferae	113	94	54	58	127
Urticaceae	37	17	106	105	32
Vacciniaceae	116	99	63	67	53
Vahliaceae	64	57	52	47	125
Valerianaceae	142	122	59	63	128
Verbenaceae	130	111	86	88	88
Violaceae	100	53	11	20	40
Vitaceae	91	91	32	41	66
Zannichelliaceae	14	131	117	125a	152
Zosteraceae	14	131	117	125a	149
Zygophyllaceae	72	75	27	32	48

Folgende Neubeschreibungen und neue Namens-Kombinationen wurden in Flora Iranica, Cruciferae, Liefg.57 (1968) veröffentlicht

Neue Kombinationen

Aethionema trinervium (DC.) Boiss. var. *apterocarpum* (Rech. f. & Aell.) Hedge, p.107.
Brassica deflexa Boiss. subsp. *leptocarpa* (Boiss.) Hedge, p.35.
Camelina rumelica Velen. subsp. *transcaspica* (Fritsch) Hedge, p.339.
Hymenolobus procumbens (L.) Hedge & Lamond, p.119.
Isatis cappadocica Desv. subsp. *Besseri* (Trautv.) Hedge & Lamond, p.82.
Isatis cappadocica Desv. subsp. *stenophylla* (Bornm. & Gauba) Hedge & Lamond, p.81.
Lepidium cartilagineum (J.Mayer) Thell. subsp. *pumilum* (Boiss. & Bal.) Hedge, p.67.
Lepidium persicum Boiss. subsp. *arianum* Hedge var. *spathulatum* (Rech. f.) Hedge, p.71.
Micrantha multicaulis (Boiss.) Dvořák
Pachypterygium Stocksii (Boiss.) Hedge, p.92.
Rorippa kurdica (Boiss. & Hausskn.) Hedge, p.217.
Sterigmostemum ramosissimum (O.E. Schulz) Rech. f., p.280.
Thlaspi stenocarpum (Boiss.) Hedge, p.116.
Thlaspi tenue (Boiss. & Buhse) Hedge, p.117.
Torularia afghanica (Gilli) Hedge, p.326.
Winklera afghanica (Rech. f. & Koeie) Hedge, p.74.

Neue Gattungen

Cyphocardamum Hedge, p.122.
Micrantha Dvořák, p.274.
Pseudofortuynia Hedge, p.56.

Neue Arten

Arabidopsis eseptata Hedge, p.334.
Arabidopsis gamosepalum Hedge, p.334.
Arabis ariana Hedge, p.208.
Chthareloma registanicum Rech. f., p.249.
Clausia Podlechii Dvořák, p.275.
Cyphocardamum aretioides Hedge, p.122.
Erysimum acrotonum Polatschek & Rech. f., p.351.
Erysimum Koelzii Polatschek & Rech. f., p.298.
Erysimum macrospermum Cullen & Rech. f., p.293.
Erysimum nuristanicum Polatschek & Rech. f., p.296.
Erysimum salangense Polatschek & Rech. f., p.299.
Fibigia compacta Rech. f., p.345.
Hesperis Borbasii Dvořák, p.270.
Hesperis odorata Dvořák, p.272.
Koeiea altimurana Rech. f., p.248.
Matthiola macranica Rech. f., p.238.
Matthiola tenera Rech. f., p.235.
Pseudofortuynia Esfandiarii Hedge, p.57.
Sisymbrium gamosepalum Hedge, p.313.

Cruciferae

auctoribus Ian Hedge, Edinburgh et K. H. Rechinger, Wien

Cruciferae A. L. De Jussieu, Gen. Plant. 237 (1789)
Syn.: *Brassicaceae* Lindl., Nat. Syst. ed. 2: 58 (1836).

E. Boissier, Flora Orientalis 1: 139—409 (1867). Engler & Prantl, Natürliche ızenfamilien ed. 1, 3 (2): 145—206 (1891). A. Hayek, Beiheft zum Botanischen ıtralblatt 27, 1, (2): 127—335 (1911). O. E. Schulz in Engler, Das Pflanzenreich, ıciferae - Brassiceae 70 (IV. 105): 1—290 (1919) et l. c. 84 (IV. 105): 1—100 (1923). Ə. Schulz in Engler, Das Pflanzenreich, Cruciferae 86 (IV. 105): 1—388 (1924). Ə. Schulz in Engler & Prantl, Natürliche Pflanzenfamilien ed. 2, 17 B: 227—658 ı36). Komarov, Flora URSS. 8: 28—606 (1939). E. Janchen, Österreichische Botanihe Zeitschrift 91: 1—28 (1942). M. Zohary, Palestine Journal of Botany 4: 158—165 ı948). A. Grossheim, Flora Kawkaza, ed. 2, IV: 108—251 (1950) cum tabulis geograıicis. R. Blakelock, Kew Bulletin 497—509 (1955). K. H. Rechinger, Biologische ırifter af Det Kongelige Danske Videnskabernes Selskab 10, 3: 13—52 (1958). P. H. ıavis, Flora of Turkey 1: 248—495 (1965). V. V. Nikitin, Illjustrirovannij Opreditel ıstjenij Okresnostei Ashkhabada 152—179 (1956).

Herbae annuae vel perennes vel suffrutices. Folia alterna simplicia, non stipuıata, cellulis myrosiniferis provisa. Flores fere semper radiati, in racemos saepissime ebracteatos dispositi. Sepala 4. Petala 4, unguiculata, cruciatim disposita, cum sepalis alternantia. Stamina 6, raro 4 vel 2, tetradynamia, in cyclis 2 disposita,duo exterioria breviora; filamenta saepe alata, appendiculata vel dentata. Glandulae nectariferae in toro forma varia saepe evolutae. Ovarium superum bicarpellatum syncarpicum placentis marginalibus plerumque septo spurio (replo) divisum. Fructus modo valde vario evolutus, saepius bilocularis, valvis duabus a basi secedentibus dehiscens aut siliqua (id est latitudine plus quam triplo longior) aut silicula (id est latitudine minus quam triplo longior) aut (rarius) nucula aut lomentum (id est ırticulatus transverse septatus). Semina saepe humiditate mucilaginosa, sine endovermio, cotyledonibus planis radicula iis dorso incumbens (embryo notorhizus) vel ırgini eorum accumbens (embryo pleurorhizus), rarius cotyledones canaliculatonplicati radicula in sulco sita (embryo orthoplocus), vel spiraliter convoluti.

Synopsis Generum

Brassiceae[1])

1. *Brassica*
2. *Sinapis*
3. *Hirschfeldia*
4. *Diplotaxis*
5. *Eruca*
6. *Raphanus*
7. *Enarthrocarpus*
8. *Calepina*
9. *Crambe*
10. *Rapistrum*
11. *Erucaria*
12. *Cakile*
13. *Physorhynchus*
14. *Fortuynia*
15. *Carrichtera*
16. *Savignya*
17. *Moricandia*
18. *Douepia*
19. *Pseudofortuynia*
20. *Spryginja*
21. *Chalcanthus*
22. *Conringia*

Lepidieae[1])

23. *Lepidium*
24. *Coronopus*
25. *Acanthocardamum*
26. *Winklera*
27. *Cardaria*
28. *Isatis*
29. *Pachypterygium*
30. *Sameraria*
31. *Coluteocarpus*
32. *Didymophysa*
33. *Iberis*
34. *Heldreichia*
35. *Biscutella*
36. *Moriera*
37. *Aethionema*
38. *Brossardia*
39. *Thlaspi*
40. *Capsella*
41. *Hymenolobus*
42. *Stroganowia*
43. *Cyphocardamum*

Euclidieae[1])

44. *Anastatica*
45. *Lachnoloma*
46. *Octoceras*
47. *Spirorhynchus*
48. *Myagrum*
49. *Tauscheria*
50. *Schimpera*
51. *Euclidium*
52. *Neslia*
53. *Glastaria*
54. *Bunias*

Lunarieae[2])

55. *Peltariopsis*
56. *Peltaria*

Alysseae[2])

57. *Farsetia*
58. *Straussiella*
59. *Clastopus*
60. *Physoptychis*
61. *Fibigia*
62. *Alyssum*
63. *Lobularia*
64. *Buchingera*
65. *Clypeola*

Drabeae[1])

66. *Petrocallis*
67. *Draba*
68. *Erophila*
69. *Graellsia*

Arabideae[1])

70. *Cardamine*
71. *Phaeonychium*
72. *Barbarea*
73. *Alyssopsis*
74. *Arabis*
75. *Ermania*
76. *Drabopsis*
77. *Turritis*
78. *Nasturtium*
79. *Rorippa*

Matthioleae[3])

80. *Aubrieta*
81. *Pseudocamelina*
82. *Notoceras*
83. *Tetracme*
84. *Diceratella*
85. *Pyramidium*
86. *Matthiola*
87. *Chorispora*
88. *Diptychocarpus*
89. *Parrya*
90. *Koeiea*
91. *Chithareloma*

Hesperideae[3])

92. *Leptaleum*
93. *Malcolmia*
94. *Eremobium*
95. *Hesperis*[3])
96. *Micrantha*[3])
97. *Clausia*[3])
98. *Atelanthera*
99. *Cryptospora*
100. *Sterigmostemum*
101. *Anchonium*
102. *Goldbachia*
103. *Erysimum*[4])
104. *Gynophorea*
105. *Maresia*
106. *Zerdana*

Sisymbrieae[1])

107. *Alliaria*
108. *Sobolewskia*
109. *Parlatoria*
110. *Sisymbrium*
111. *Microsisymbrium*
112. *Murbeckiella*
113. *Arcyosperma*
114. *Dielsiocharis*
115. *Streptoloma*
116. *Torularia*
117. *Braya*
118. *Nasturtiicarpa*
119. *Arabidopsis*
120. *Cymatocarpus*
121. *Christolea*
122. *Camelina*
123. *Descurainia*
124. *Sophiopsis*
125. *Smelowskia*
126. *Robeschia*

[1]) Auctore IAN HEDGE, Edinburgh
[2]) Auctore K. H. RECHINGER, Wien
[3]) Auctore F. DVOŘÁK, Brno
[4]) Auctoribus A. POLATSCHEK et K. H. RECHINGER, Wien

Clavis ad determinandos greges artificiales.

1a. Plantae glabrae 2
b. Plantae pilosae, pilis simplicibus vel ramosis 5
2a. Fructus latitudine minus quam 3-plo longior 3
b. Fructus latitudine 4-plo vel magis longior 4
3a. Fructus valde compressus, planus, alatus vel exalatus ..... Grex A p. 4
b. Fructus non valde compressus, sectione transversali ovatus, numquam alatus, interdum inflatus ..... Grex B p. 8
4a. Fructus rostro stylari praeditus vel manifeste biarticulatus ..... Grex C p. 10
b. Fructus nec rostratus nec biarticulatus ..... Grex D p. 12
5a. Indumentum e pilis simplicibus tantum consistens 6
b. Pili ramosi nonnulli quidem immixti 9
6a. Fructus latitudine minus quam triplo longior 7
b. Fructus latitudine quadruplo vel magis longior 8
7a. Fructus compressus; si non compressus aut alatus aut didymus . Grex E p. 14
b. Fructus non compressus nec alatus nec didymus ..... Grex F p. 16
8a. Fructus rostratus vel manifeste biarticulatus, lobis carpidialibus aut decurrentibus aut non decurrentibus ..... Grex G p. 18
b. Fructus nec rostratus nec biarticulatus, lobis carpidialibus non decurrentibus ..... Grex H p. 20
9a. Fructus latitudine minus quam triplo longior ..... Grex I p. 22
b. Fructus latitudine 4-plo vel magis longior 10
10a. Plantae perennes ..... Grex J p. 26
b. Plantae annuae vel biennes ..... Grex K p. 28

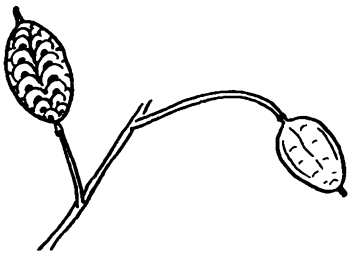
Grex A - Plantae glabrae. Fructus silicula compressa alata vel exalata.

1a. Silicula manifeste 2-articulata; articulus inferior stipiformis, dehiscens, superior late alatus, indehiscens; stigma lobis carpidialibus decurrentibus praeditum ..... 14. *Fortuynia* Shuttlew.
b. Silicula non vel indistincte biarticulata, alata vel exalata; stigma lobis carpidialibus decurrentibus non praeditum 2
2a. Silicula paralleliter cum septo compressa, numquam cornuta nec alata 3
b. Silicula aut angulo recto cum septo aut vix compressa, saepe cornuta vel alata 7
3a. Folia carnosa, inferiora breviter petiolata vel subsessilia. Plantae annuae 4
b. Folia non carnosa, inferiora longe petiolata, petiolo 3—12 cm longo. Plantae aut perennes aut annuae, tum *Allium* redolentes 6
4a. Silicula rostrata, valde compressa, 10—13 × 5—8 mm; semina alata ..... 16. *Savignya* DC.
b. Silicula nec rostrata nec valde compressa, 2—8 × 1,5—3 mm; semina non alata 5
5a. Semina 8—10; silicula c. 7 × 3 mm. Caulis rectus ..... 55. *Peltariopsis* (Boiss.) N. Busch
b. Semina 2; silicula c. 2 × 1,5 mm. Caulis tenuis, angulato-flexuosus ..... 81. *Pseudocamelina* (Boiss.) N. Busch
6a. Plantae perennes radice lignescente; caudex residuis petiolorum obsitus. Pedicelli fructiferi erecto-patuli, raro penduli ..... 69. *Graellsia* Boiss.
b. Planta annua. Fructus pendulus ..... 56. *Peltaria* Jacq.
7a. Plantae frutescentes spinosae 8
b. Plantae herbaceae non spinescentes, annuae vel perennes 9
8a. Fructus indehiscens late alatus, monospermus ..... 36. *Moriera* Boiss.
b. Fructus dehiscens, anguste vel non alatus, bispermus (M. Zagros) ..... 25. *Acanthocardamum* Thell.
9a. Fructus pendulus, 1—3-spermus 10
b. Fructus erectus vel patulus, 1- vel polyspermus 13
10a. Planta perennis. Flores roseo-purpurei ..... 38. *Brossardia* Boiss.
b. Plantae annuae vel biennes. Flores flavi 11
11a. Stylus distinctus. Fructus manifeste alatus ..... 30. *Sameraria* Desv.
b. Stylus brevissimus vel nullus. Fructus aut alatus aut exalatus 12
12a. Silicula margine non incrassata ..... 28. *Isatis* L.
b. Silicula incrassato-marginata ..... 29. *Pachypterygium* Bge.

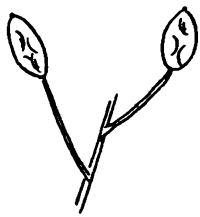
Fortuynia Garcinii

Peltaria angustifolia

Pseudocamelina campylopoda



Savignya parviflora



Peltariopsis planisiliqua

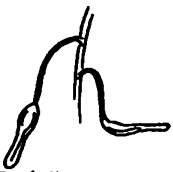
Graellsia saxifragifolia

Acanthocardamum erinaceum

Moriera spinosa

Isatis cochlearis

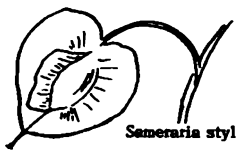
Isatis cappadocica



Pachypterygium Stocksii

Pachypterygium multicaule

Sameraria armena



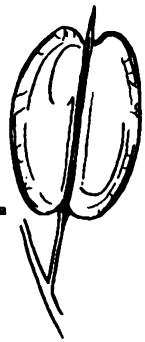
Sameraria stylophora

Brossardia papyracea

13a. Plantae perennes, caudice crasso, lignoso, residuis petiolorum persistentibus 14
b. Plantae annuae vel perennes, caudice nec crasso lignoso nec residuis petiolorum persistentibus ... 16
14a. Folia basalia subintegra vel rhomboidea, saepe lobata; petiolus lamina multo longior ... 69. *Graellsia* Boiss.
b. Folia basalia pinnata vel lanceolata integra; petiolus lamina brevior vel eam aequans ... 15
15a. Folia pinnata vel si integra elliptica vel ovato-lanceolata, 5—8 cm longa. Siliculae orbiculares vel ellipticae ... 26. *Winklera* Regel
b. Folia integra, lineari-lanceolata, 20 cm longa. Silicula obovata triangularis (non illustrata) ... 34. *Heldreichia* Boiss.
16a. Semina 1—2 ... 17
b. Semina 4 vel plura ... 21
17a. Herbae annuae vel biennes ... 18
b. Herbae perennes ... 20
18a. Petala flava. Folia basalia integra ... 29. *Pachypterygium* Bge.
b. Petala alba vel rosea. Folia basalia pinnata vel pinnatifida ... 19
19a. Fructus interdum indehiscens. Valvae crassae, verrucosae. Racemi axillares ... 24. *Coronopus* Zinn
b. Fructus semper dehiscens. Valvae tenues, laeves. Racemi terminales ... 23. *Lepidium* L.
20a. Petala rosea. Fructus manifeste alatus ... 37. *Aethionema* R. Br.
b. Petala alba. Fructus vix alatus ... 23. *Lepidium* L.
21a. Herbae annuae ... 22
b. Herbae perennes ... 24
22a. Planta heterocarpa vel racemis fructiferis condensatis. Silicula c. 4-sperma ... 37. *Aethionema* R. Br.
b. Planta homocarpa, racemo fructifero raro condensato imbricato, tunc silicula c. 12-sperma ... 23
23a. Silicula non valde compressa. Planta delicatula, procumbens raro erecta. Folia pinnatifida vel integra ... 41. *Hymenolobus* Nutt.
b. Silicula valde compressa. Plantae erectae. Folia integra ... 39. *Thlaspi* L.
24a. Flores plerumque rosei, raro flavi vel albi. Fructus late alati, non corniculati ... 37. *Aethionema* R. Br.
b. Flores plerumque albi, raro lilacini. Fructus apice tantum alati ... 39. *Thlaspi* L.

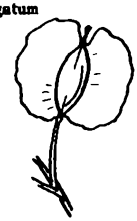
Graellsia stylosa

Winklera silaifolia



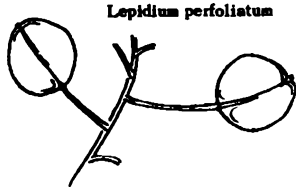
Pachypterygium brevipes

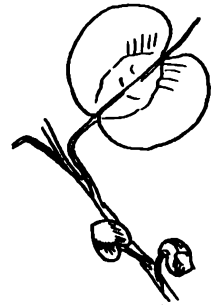
Aethionema elongatum



Coronopus squamatus

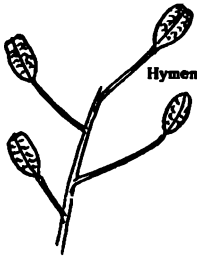
Lepidium perfoliatum





Aethionema syriacum

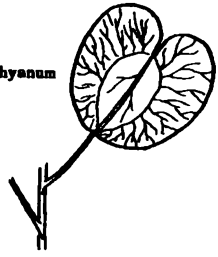
Hymenolobus procumbens

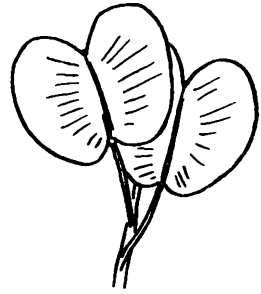


Aethionema fimbriatum

Thlaspi kurdicum

Thlaspi Kotschyanum

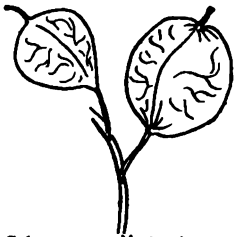




Aethionema grandiflorum

Grex B - Plantae glabrae. Silicula non compressa, interdum inflata.

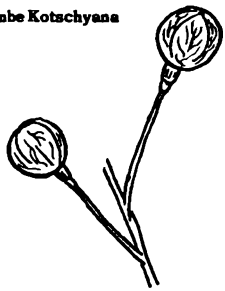
1a. Fructus vesiculoso-inflatus 2
b. Fructus non vesiculoso-inflatus 3
2a. Silicula usque ad 30 mm longa, utrinque ± acutiuscula ..... 31. *Coluteocarpus* Boiss.
b. Silicula usque ad 7 mm longa, utrinque emarginata ..32. *Didymophysa* Boiss.
3a. Folia basalia longe petiolata, basi ± cordata..... 4
b. Folia basalia nec longe petiolata nec basi cordata 6
4a. Pedicelli fructiferi suberecti non incrassati; fructus globosus. Plantae non alliaceae ..... 9. *Crambe* L.
b. Pedicelli fructiferi horizontales recurvi vel deflexi, incrassati; fructus oblongus. Plantae alliaceae 5
5a. Annua. Folia acute lobata ..... 109. *Parlatoria* Boiss.
b. Perennis. Folia obtuse lobata ..... 108. *Sobolewskia* M. B.
6a. Pedicelli fructiferi deflexi vel recurvi..... 7
b. Pedicelli fructiferi patuli, erecti, vel axi appressi 10
7a. Pedicelli fructiferi deflexi; fructus pendulus..... 8
b. Pedicelli fructiferi demum recurvi; fructus patulus vel suberectus 9
8a. Fructus globosus, laevis ..... 53. *Glastaria* Boiss.
b. Fructus irregulariter ovoideus, rugosus ..... 30. *Sameraria* Desv.
9a. Petala flava. Folia integra ..... 49. *Tauscheria* Fisch. ex DC.
b. Petala violacea vel purpurea. Folia ± dentata ..... 102. *Goldbachia* DC.
10a. Plantae palustres vel aquaticae, annuae vel perennes, foliis nonnullis quidem pinnatis, petalis flavis ..... 79. *Rorippa* Scop.
b. Plantae terrestres annuae vel perennes, foliis pinnatis vel integris, petalis albis, roseis vel pallide flavis 11
11a. Folia simplicia, margine integra vel dentata 12
b. Folia pinnatifida, trifida vel pinnata 15
12a. Perennis. Petala rosea vel violacea, 15—20 mm; stigma lobis carpidialibus decurrentibus ..... 13. *Physorhynchus* Hook.
b. Annua vel perennis. Petala alba vel flava, 2—5 mm longa; stigma lobis carpidialibus non decurrentibus 13
13a. Perennis. Fructus dehiscens ..... 42. *Stroganowia* Kar. & Kir.
b. Annua. Fructus indehiscens 14
14a. Pedicelli fructiferi axi arcte appressi, crassi ..... 48. *Myagrum* L.
b. Pedicelli fructiferi patuli, tenues ..... 8. *Calepina* Adans.
15a. Plantae robustae perennes, usque ad 1,5 m altae ..... 9. *Crambe* L.
b. Plantae humiles, perennes vel annuae 16
16a. Herbae perennes glaucae, foliis basalibus carnosis trifidis; racemi terminales ..... 66. *Petrocallis* R. Br.
b. Herbae annuae vel biennes, foliis basalibus semel vel bis pinnatifidis; racemi axillares ..... 24. *Coronopus* Zinn



Coluteocarpus Vesicaria

Didymophysa Aucheri

Crambe Kotschyana

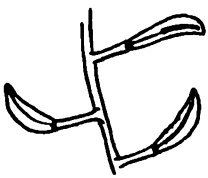


Sobolewskia clavata

Glastaria glastifolia

Semeraria bullata

Perlatoria cakiloidea

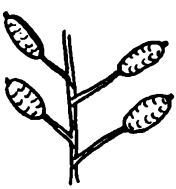


Goldbachia verrucosa

Goldbachia laevigata

Tauscheria lasiocarpa

Rorippa islandica



Rorippa amphibia

Physorhynchus brahuicus

StroganowiaLitwinovii

Calepina irregularis

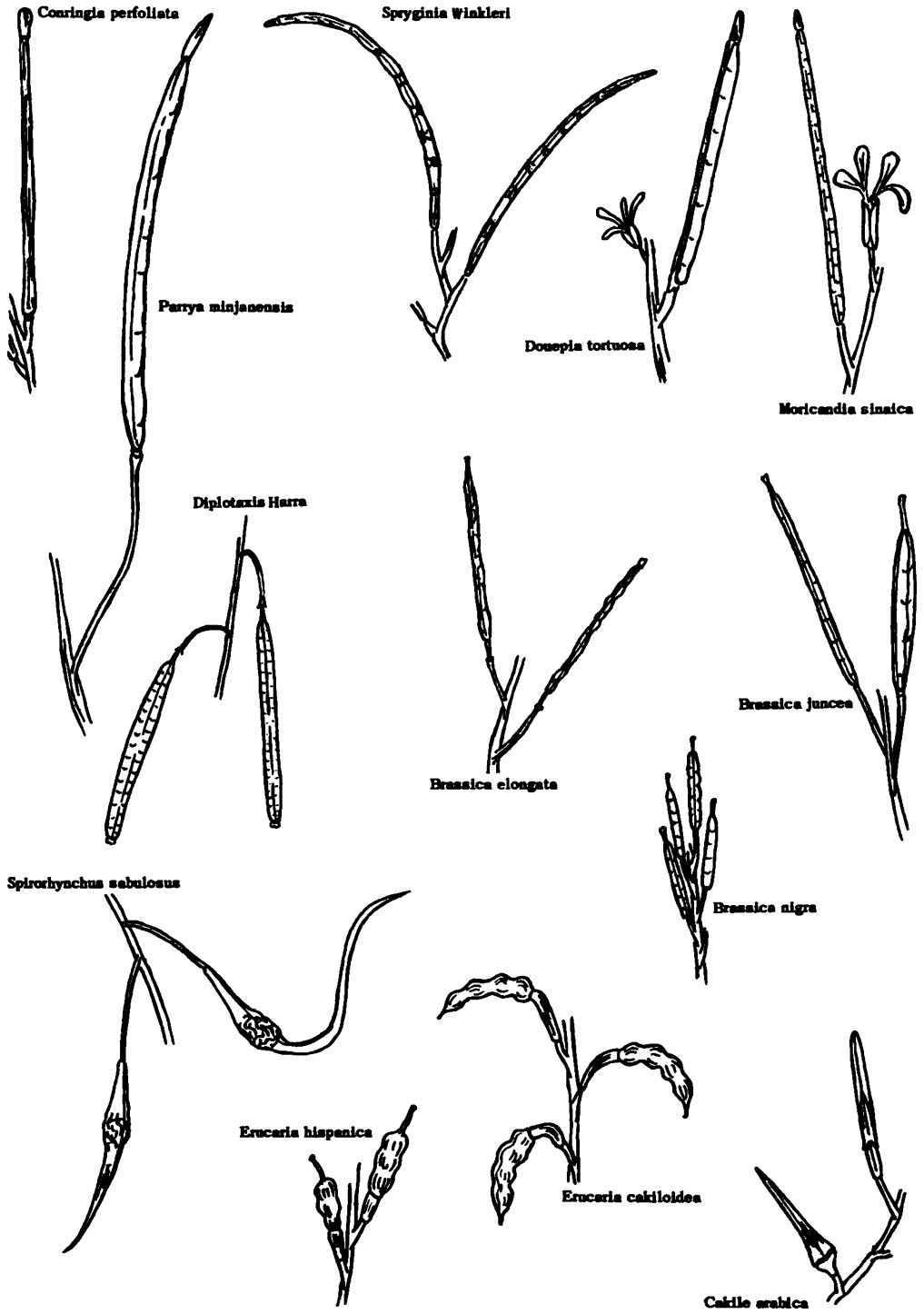
Myagrum perfoliatum

Petrocallis fenestrata

Coronopus didymus

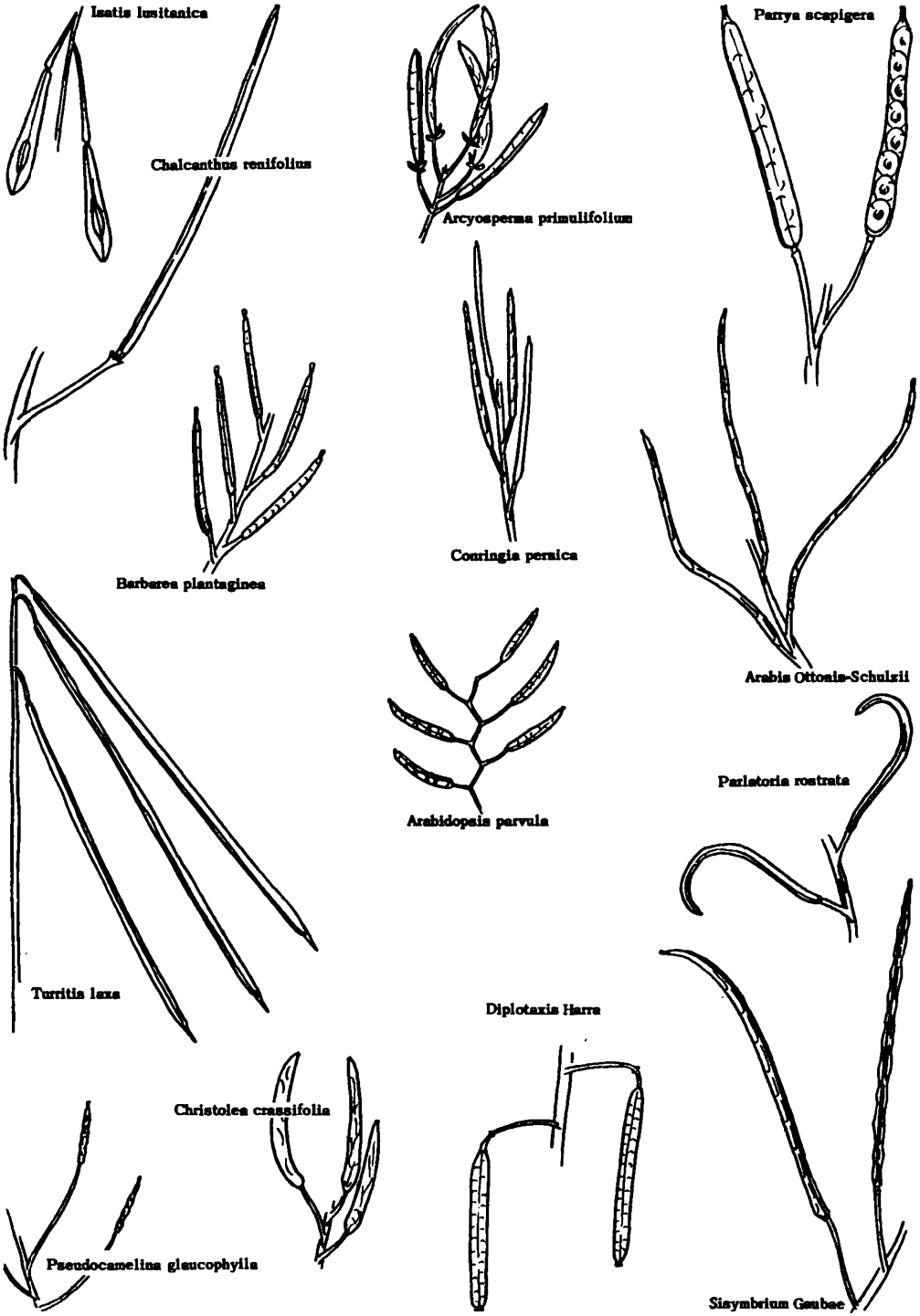
Grex C - Plantae glabrae. Siliqua rostrata.

1a. Stigma lobis carpidialibus decurrentibus 2
b. Stigma sine lobis carpidialibus decurrentibus, capitatum vel bilobum 6
2a. Petala flava. Plantae annuae ..... 22. *Conringia* Adans.
b. Petala rosea vel lilacina. Plantae annuae vel perennes..... 3
3a. Herbae perennes scaposae ..... 89. *Parrya* R. Br.
b. Herbae annuae vel perennes non scaposae 4
4a. Folia superiora ± sessilia, oblongo-ovata; herbae annuae vel perennes. Petala 9—13 mm longa 5
b. Folia superiora oblonga. Herbae annuae. Petala 18 mm longa .....
..... 20. *Spryginia* M. Pop.
5a. Folia superiora cuneata. Petala linearia. Sepala interiora non saccata. ....
..... 18. *Douepia* Camb.
b. Folia superiora amplexicaulia. Petala obovata. Sepala interiora saccata ...
..... 17. *Moricandia* DC.
6a. Fructus textura tenui, valvis dehiscens 7
b. Fructus textura crassi, lomentaceum vel indehiscens 8
7a. Semina biseriata ..... 4. *Diplotaxis* DC.
b. Semina uniseriata ..... 1. *Brassica* L.
8a. Petala flava. Folia integra vel dentata. Fructus indehiscens, longe rostratus
..... 47. *Spirorhynchus* Kar. & Kir.
b. Petala violacea. Folia pinnatisecta. Fructus in segmenta diffractus, in stylum vel in rostrum excurrens..... 9
9a. Fructus segmentum superius 1-polyspermum, in stylum excurrens .....
..... 11. *Erucaria* Gaertn.
b. Fructus segmentum superius monospermum, in rostrum planum excurrens; stigma sessile ..... 12. *Cakile* Miller


Conringia perfoliata
Spryginia Winkleri
Parrya minjanensis
Dontopia tortuosa
Moricandia sinaica
Diplotaxis Harra
Brassica elongata
Brassica juncea
Brassica nigra
Spirorhynchus sabulosus
Erucaria hispanica
Erucaria calcitoides
Calcile arabica

Grex D - Plantae glabrae. Siliqua non rostrata.

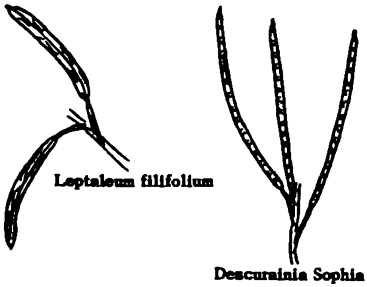
1a. Fructus cum septo angulo recto compressus, alatus, pendulus .... 28. *Isatis* L.
b. Fructus cum septo paralleliter vel non compressus, numquam alatus, raro pendulus 2
2a. Folia inferiora simplicia, integra vel dentata 3
b. Folia inferiora pinnata vel pinnatifida 16
3a. Herbae perennes radice tuberosa, foliis basalibus longe petiolatis cordatis, floribus violaceis ..... 21. *Chalcanthus* Boiss.
b. Herbae annuae vel perennis, radice non tuberosa. Petala alba, flava vel violacea 4
4a. Herba pumila perennis, radice crassa lignosa, collo prominenter cicatricoso. Folia basalia obovata, 3—10 cm longa (Dir et Swat). ..... 113. *Arcyosperma* O. E. Schulz
b. Herba annuae vel perennes, collo non cicatricoso 5
5a. Folia caulina deficientia vel amplexicaulia 6
b. Folia caulina non amplexicaulia, sessilia vel breviter petiolata 10
6a. Folia caulina deficientia. Stigma lobis carpidialibus decurrentibus praeditum ..... 89. *Parrya* R. Br.
b. Folia caulina amplexicaulia. Stigma capitatum 7
7a. Folia caulina dentata. Herbae biennes vel perennes, saepe in locis humidis crescentes ..... 72. *Barbarea* R. Br.
b. Folia caulina integra. Herbae annuae vel biennes, in locis aridis vel in ruderatis crescentes 8
8a. Petala flava vel alba, 5—12 mm longa. Radicula incumbens ..... 22. *Conringia* Adans.
b. Petala alba vel violaceo-suffusa, 5—6 mm longa. Radicula accumbens 9
9a. Pedicelli fructiferi incrassati, patuli. Folia caulina pauca ..... 74. *Arabis* L.
b. Pedicelli fructiferi tenues, patuli vel deflexi. Folia caulina numerosa ..... 77. *Turritis* L.
10a. Herbae annuae humiles. Folia carnosa. Petala deficientia ..... 119. *Arabidopsis* Heynh.
b. Herbae annuae elatiores, foliis non carnosis vel herbae perennes. Petala evoluta 11
11a. Petala alba vel rosea 12
b. Petala flava interdum purpurascentia 13
12a. Herba annua. Folia basalia ± cordata, lobata ..... 109. *Parlatoria* Boiss.
b. Herba perennis. Folia basalia ± spathulata, integra. ..... 81. *Pseudocamelina* (Boiss.) N. Busch
13a. Herba 8—30 cm alta. Folia carnosa. Petala c. 7 mm longa, basi saepe purpurascentia ..... 121. *Christolea* Camb.
b. Herba 20—100 cm alta. Folia raro carnosa. Petala non purpurascentia, plerumque 10 mm longa vel longiora 14
14a. Semina biseriata. Silicula manifeste stipitata ..... 4. *Diplotaxis* DC.
b. Semina uniseriata. Silicula numquam stipitata 15
15a. Petala 6—14 mm longa. Stigma capitatum ..... 110. *Sisymbrium* L.
b. Petala 25—29 mm longa. Stigma bilobum (non illustrata) .... 95. *Hesperis* L.

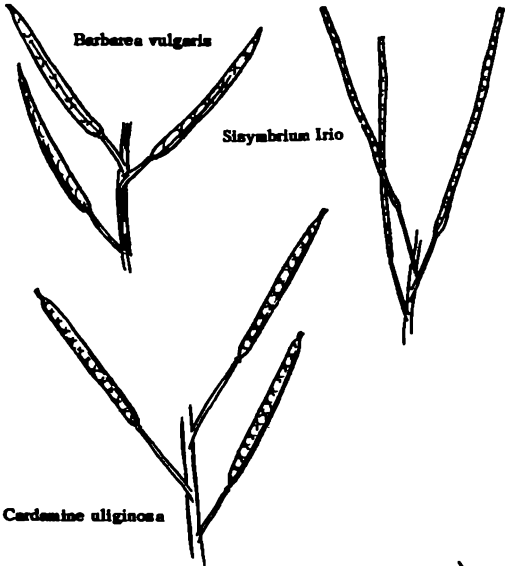

Isatis lusitanica
Chalcanthus renifolius
Arcyosperma primulifolium
Parrya scapigera
Barbarea plantaginea
Conringia persica
Arabis Ottonis-Schulzii
Arabidopsis parvula
Turritis laxa
Pastatoria rostrata
Diplotaxis Harra
Christolea crassifolia
Pseudocamelina glaucophylla
Sisymbrium Gaubae

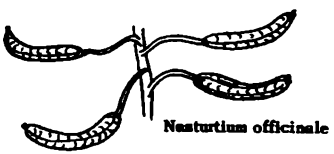
16a. Herba annua nana, floribus paucis solitariis. Foliorum segmenta filiformia ..... 92. *Leptaleum* DC.
b. Herbae annuae vel perennes elatiores. Flores non solitarii. Foliorum segmenta non filiformia 17
17a. Folia bis vel ter pinnatifida..... 123. *Descurainia* Webb & Berth.
b. Folia simpliciter pinnata 18
18a. Petala flava 19
b. Petala alba vel rosea 20
19a. Folia caulina amplexicaulia auriculata ..... 72. *Barbarea* R. Br.
b. Folia caulina nec amplexicaulia nec auriculata ..... 110. *Sisymbrium* L.
20a. Folia basi auriculis expansis provisa. Semina 1- vel 2-seriata ..... 78. *Nasturtium* R. Br.
b. Folia non auriculata vel auriculis parvis filiformibus provisa. Semina uniseriata ..... 70. *Cardamine* L.

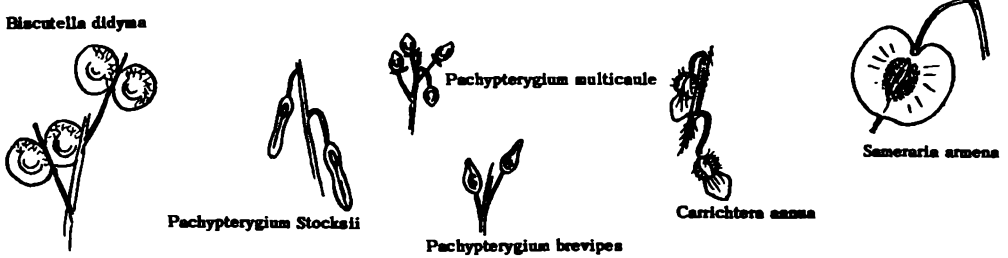
Grex E - Pili simplices. Silicula compressa vel alata.

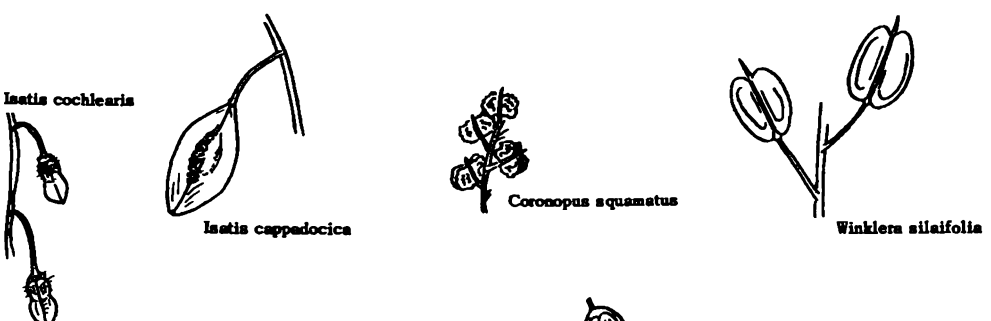
1a. Petala flava vel si alba conspicue violaceo-venosa 2
b. Petala rosea vel alba, numquam violaceo-venosa, vel petala nulla 7
2a. Fructus pendulus 5
b. Fructus erectus 3
3a. Plantae annuae 4
b. Plantae perennes (non illustrata) ... 67. *Draba* L. (*D. trinervis* O. E. Schulz)
4a. Fructus didymus. Tota planta pilosa ..... 35. *Biscutella* L.
b. Fructus non didymus. Fructus tantum pilosus ..... 29. *Pachypterygium* Bge.
5a. Folia pinnata. Fructus valvis dehiscens ..... 15. *Carrichtera* DC.
b. Folia integra. Fructus indehiscens 6
6a. Stylus nullus vel brevissimus ..... 28. *Isatis* L.
b. Stylus distinctus ..... 30. *Sameraria* Desv.
7a. Valvae fructus crassae verrucosae. Racemi axillares ..... 24. *Coronopus* Zinn
b. Valvae fructus non crassae verrucosae. Racemi terminales 8
8a. Fructus angulo recto cum septo valde compressus vel didymus 9
b. Fructus paralleliter cum septo valde compressus 11
9a. Planta annua vel biennis. Fructus quam 6 mm brevior 10
b. Plantae perennes. Fructus ultra 7 mm longus ..... 26. *Winklera* Regel
10a. Fructus alatus, apice acutus. Pedicelli fructiferi patulo-ascendentes ..... 33. *Iberis* L.
b. Fructus non alatus aut apice rotundatus aut si acutus pedicellis applanatis appressis ..... 23. *Lepidium* L.
11a. Folia caulina evoluta. Valvae fructiferae planae carnosae, 10—13 × 5—8 mm ..... 16. *Savignya* DC.
b. Folia caulina deficientia. Valvae fructiferae leviter convexae, tenues, 3—10 × 3 mm ..... 68. *Erophila* DC.

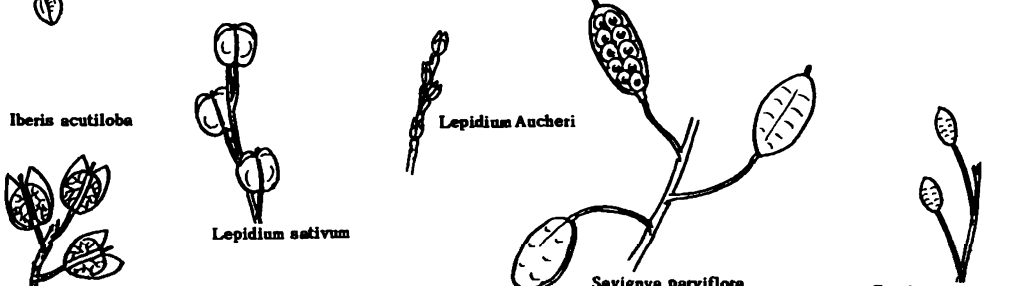

Leptaleum filifolium
Descurainia Sophia


Barbarea vulgaris
Sisymbrium Irio
Cardamine uliginosa


Nasturtium officinale


Biscutella didyma
Pachypterygium Stocksii
Pachypterygium multicaule
Pachypterygium brevipes
Carrichtera annua
Semeraria armena

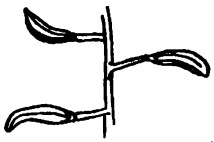

Isatis cochlearia
Isatis cappadocica
Coronopus squamatus
Winklera silaifolia


Iberis acutiloba
Lepidium sativum
Lepidium Aucheri
Savignya parviflora
Erophila minima

Grex F - Pili simplices. Silicula nec compressa nec alata.

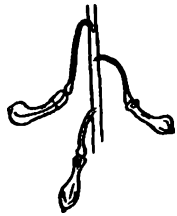
1a. Folia basalia longe petiolata, basi ± cordata 2
b. Folia basalia non ut supra descripta 4
2a. Pedicelli fructiferi suberecti non incrassati. Fructus globosus. Planta *Allium sativum* non redolens ..... 9. *Crambe* L.
b. Pedicelli fructiferi patuli, recurvati vel deflexi, incrassati. Fructus ± oblongus et curvatus. Planta *Allium sativum* redolens 3
3a. Planta annua. Folia acute lobata ..... 109. *Parlatoria* Boiss.
b. Planta perennis. Folia obtuse lobata ..... 108. *Sobolewskia* M. B.
4a. Fructus valvis dehiscens 5
b. Fructus indehiscens 9
5a. Planta perennis rhizomate lignoso 6
b. Planta annua vel biennis 8
6a. Inflorescentia ± capitata ..... 117. *Braya* Sternb. & Hoppe
b. Inflorescentia laxe ramosa 7
7a. Herba pulvinato-caespitosa. Inflorescentia scaposa, pauciflora, usque ad 25 cm alta (vide tab. 10, fig. 1) ..... 43. *Cyphocardamum* Hedge
b. Herbae non pulvinatae. Caules foliati (8—) 20—100 cm. Inflorescentia paniculata valde ramosa ..... 42. *Stroganowia* Kar. & Kir.
8a. Petala 6—7 mm longa, alba flavescentia. Folia caulina integra ..... 122. *Camelina* Crantz
b. Petala 1—5 mm longa, flava. Folia caulina pinnatifida vel subintegra ..... 79. *Rorippa* Scop.
9a. Fructus biarticulatus 10
b. Fructus uniarticulatus 11
10a. Fructus articulus superior laevis, apice rotundatus, stylo nullo ..... 9. *Crambe* L.
b. Fructus articulus superior costatus, apice in stylum attenuatus ..... 10. *Rapistrum* Crantz
11a. Petala flava 12
b. Petala alba vel rosea 14
12a. Planta perennis glanduloso-tuberculata ..... 54. *Bunias* L.
b. Planta annua, eglandulosa 13
13a. Planta glauca, fructu excepto glabra. Folia simplicia ..... 49. *Tauscheria* Fisch. ex DC.
b. Planta manifeste pilosa. Folia pinnatifida vel pinnata ..... 50. *Schimpera* Hochst. & Steud.
14a. Pedicelli fructiferi axi appressi, c. 1,5 mm longi ..... 51. *Euclidium* R. Br.
b. Pedicelli fructiferi erecto-patuli, deflexi vel recurvati 15
15a. Petala alba. Pedicelli fructiferi erecto-patuli ..... 27. *Cardaria* Desv.
b. Petala rosea. Pedicelli fructiferi deflexi vel recurvati .... 102. *Goldbachia* DC.

Crambe orientalis

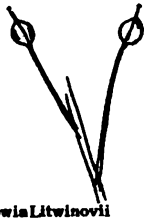


Parlatoria cakiloidea

Sobolewskia clavata



Braya oxycarpa



Stroganowia Litwinovii

Camelina rumelica

Rorippa islandica

Rapistrum rugosum

Bunias orientalis

Tauscheria lasiocarpa

Schimpera arabica

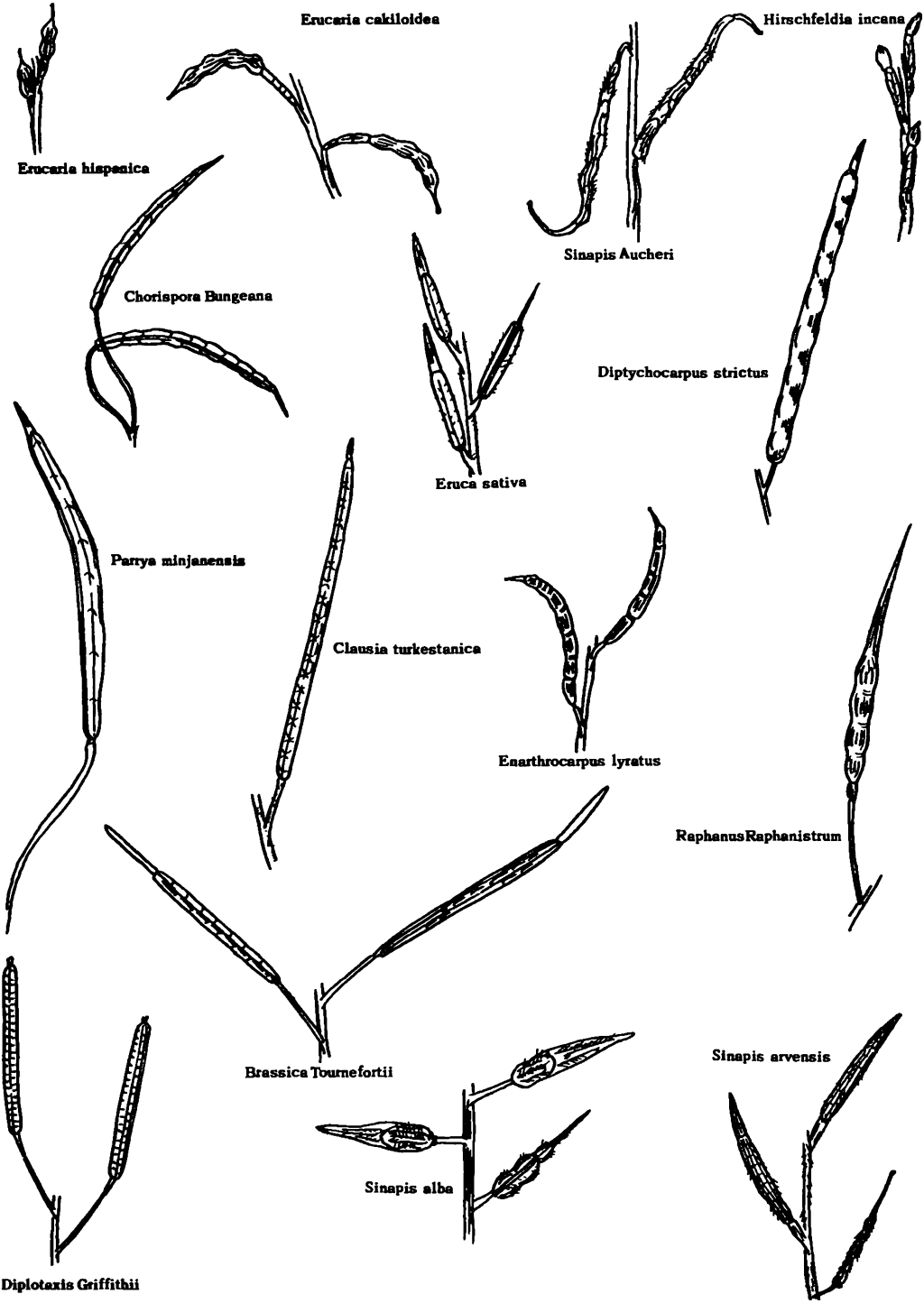
Cardaria Draba ssp. chalepensis

Euclidium tenuissimum

Goldbachia laevigata

Grex G - Pili simplices. Siliqua rostrata vel biarticulata

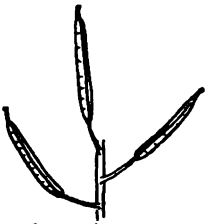
1a. Pedicelli fructiferi cauli appressi 2
b. Pedicelli fructiferi erecti, patuli vel deflexi 4
2a. Petala rosea vel lilacina. Foliorum segmenta ± linearia 11. *Erucaria* Gaertn.
b. Petala flava vel alba. Foliorum segmenta non linearia 3
3a. Rostrum fructus 6—9-spermum, torulosum. Valvae pilis rigidis retrorsis obsitae ..... 2. *Sinapis* L.
b. Rostrum fructus 0—1-spermum, non torulosum. Valvae glabrae vel pilis paucis dispersis obsitae ..... 3. *Hirschfeldia* Moench
4a. Stigma lobis carpidialibus decurrentibus 5
b. Stigma capitatum vel depresso-capitatum 9
5a. Fructus omnes lomentacei ..... 87. *Chorispora* R. Br.
b. Fructus superiores quidem valvis dehiscentes 6
6a. Petala flava, venis brunneis vel violaceis conspicuis ..... 5. *Eruca* Miller
b. Petala alba violacea vel lilacina, non conspicue venosa 7
7a. Planta annua ..... 88. *Diptychocarpus* Trautv.
b. Plantae perennes 8
8a. Glandulae stipitatae indumenti e cellulis pluriserialiter dispositis compositae. Cellulae septi transversaliter elongatae, parenchymaticae. Cotyledones pleurorhizae ..... 97. *Clausia* Korn.-Tr.
b. Glandulae stipitatae indumenti e cellulis uniserialiter dispositis compositae. Cellulae septi transversaliter non elongatae. Cotyledones notorhizae ..... 89. *Parrya* R. Br.
9a. Fructus in segmenta transversa diffractus 10
b. Fructus valvis dehiscens 11
10a. Articulus superior fructus curvatus inferior 1—3-spermus ..... 7. *Enarthrocarpus* Labill.
b. Articulus superior fructus rectus inferior sterilis ..... 6. *Raphanus* L.
11a. Semina biseriata ..... 4. *Diplotaxis* DC.
b. Semina uniseriata 12
12a. Fructus valvae nervo mediano conspicuo, lateralibus inconspicuis ..... 1. *Brassica* L.
b. Fructus valvae nervis 3—7 ± conspicuis 13
13a. Fructus stipitatus. Corolla violacea. Folia inferiora ad basin petiolorum pulvinulis pilorum praedita (Tab. 4) ..... 19. *Pseudofortuynia* Hedge
b. Fructus non stipitatus. Corolla alba vel flava. Folia inferiora ad basin petiolorum sine pulvinulis pilorum ..... 2. *Sinapis* L.


Erucaria cakiloidea
Hirschfeldia incana
Erucaria hispanica
Sinapis Aucheri
Chorispora Bungeana
Diptychocarpus strictus
Eruca sativa
Parrya minjanensis
Clausia turkestanica
Enarthrocarpus lyratus
Raphanus Raphanistrum
Brassica Tournefortii
Sinapis arvensis
Sinapis alba
Diplotaxis Griffithii

Grex H - Pili simplices. Siliqua nec rostrata nec biarticulata.

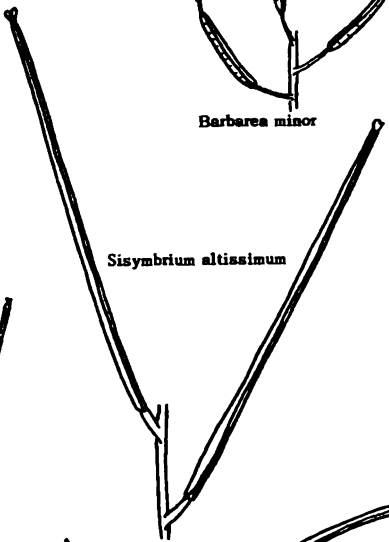
1a. Folia pinnatifida vel manifeste pinnata 2
b. Folia simplicia, margine integra vel dentata 7
2a. Folia bis vel ter pinnata ..... 123. *Descurainia* Webb & Berth.
b. Folia pinnatifida vel simpliciter pinnata 3
3a. Petala flava 4
b. Petala alba vel rosea 6
4a. Folia caulina amplexicaulia ..... 72. *Barbarea* R. Br.
b. Folia caulina non amplexicaulia 5
5a. Fructus pendulus, c. 3 mm latus ..... 28. *Isatis* L.
b. Fructus erectus vel patulus, quam 2 mm angustior ..... 110. *Sisymbrium* L.
6a. Pedicelli fructiferi crassi ..... 116. *Torularia* O. E. Schulz
b. Pedicelli fructiferi tenues ..... 70. *Cardamine* L.
7a. Folia basalia longe petiolata, ± cordata. Petala alba. Planta *Allium sativum* redolens 8
b. Folia basalia non cordata. Petala alba, flava vel rosea. Planta *Allium sativum* non redolens 9
8a. Fructus ± erectus, rectus ..... 107. *Alliaria* Scop.
b. Fructus patulus vel recurvatus ± curvatus ..... 109. *Parlatoria* Boiss.
9a. Fructus pendulus vel recurvatus, angulo recto cum septo compressus, alatus ..... 28. *Isatis* L.
b. Fructus erectus vel patulus, paralleliter cum septo compressus, numquam alatus 10
10a. Plantae annuae, in parte inferiore caulis longissime pilosae ..... 120. *Cymatocarpus* O. E. Schulz
b. Plantae perennes vel biennes, non ut supra descriptae 11
11a. Plantae perennes ± pumilae regionum altiorum 12
b. Plantae perennes vel biennes elatiores 14
12a. Folia plurima basalia lamina 3—10 cm longa. Stigma capitatum (Swat et Dir) ..... 113. *Arcyosperma* O. E. Schulz
b. Folia per totam plantam dispersa, lamina c. 1—2 cm. Stigma bilobum 13
13a. Petala flava. Folia ± carnosa. Radicula incumbens ... 121. *Christolea* Camb.
b. Petala violacea. Folia non carnosa. Radicula accumbens.. 75. *Ermania* Cham.
14a. Folia caulina amplexicaulia ..... 72. *Barbarea* R. Br.
b. Folia caulina sessilia vel breviter petiolata 15
15a. Fructus 15—45 mm longus, manifeste stipitatus. Cotyledones plicatae ... 1. *Brassica* L.
b. Fructus 30—150 mm, non stipitatus. Cotyledones non plicatae ..... 110. *Sisymbrium* L.

Descurainia Sophia



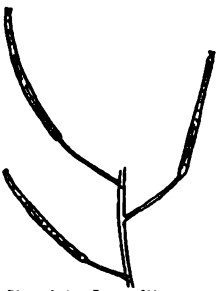
Barbarea minor

Isatis lusitanica

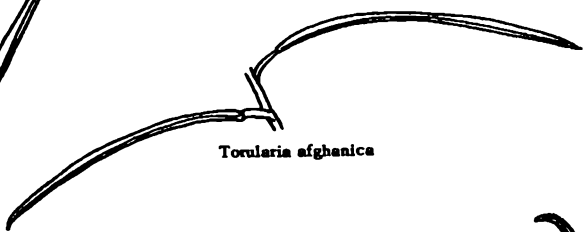


Sisymbrium altissimum

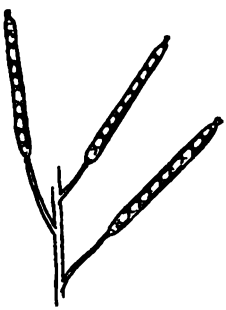
Sisymbrium officinale



SisymbriumLoeselii

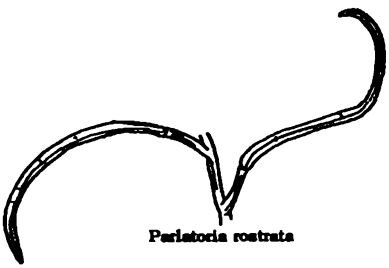


Torularia afghanica

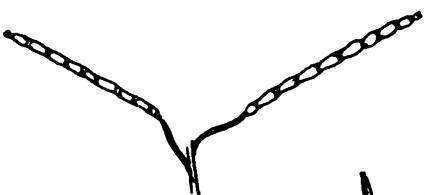


Cardamine uliginosa

Alliaria petiolata

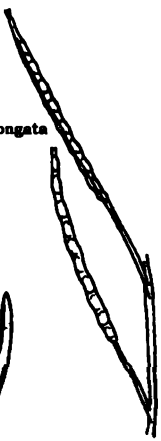


Parlatoria rostrata



Cymatocarpus pilosissimus

Arcyosperma primulifolium



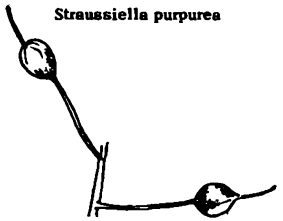
Brassica elongata

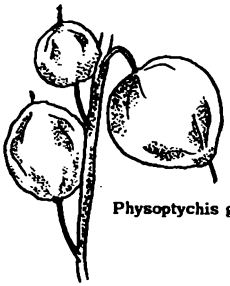
Ermania himalayensis

Christolea crassifolia

Grex I - Pili stellati. Fructus silicula

1a. Fructus inflatus 2
b. Fructus non inflatus 5
2a. Stylus in statu fructifero 7 mm longus ..... 58. *Straussiella* Haussk.
b. Stylus in statu fructifero brevior 3
3a. Fructus ± globosus, c. 20 mm diametro. Sepala saccata .....
..... 60. *Physoptychis* Boiss.
b. Fructus globosus vel ovoideus vel ellipsoideus 3—6 mm longus. Sepala non saccata 4
4a. Fructus globosus. Planta non caespitosa. Caulis foliatus .....62. *Alyssum* L.
b. Fructus ovoideus vel ellipticus. Planta caespitosa scaposa ..... 67. *Draba* L.
5a. Fructus densissime longe lanato-villosus, pilis usque ad 5 mm longis (vide Tab. 10, Fig. 2) ..... 45. *Lachnoloma* Bge.
b. Fructus numquam densissime longe lanato-villosus 6
6a. Pedicelli fructiferi appressi. Fructus indehiscens 7
b. Pedicelli fructiferi erecti vel patuli vel reflexi; fructus dehiscens, raro indehiscens 12
7a. Petala c. 20 mm longa, violacea. Stigma lobis carpidialibus decurrentibus. Fructus pyramidalis, 15—20 mm longus ..... 85. *Pyramidium* Boiss.
b. Petala quam 5 mm breviora, alba vel flava. Stigma capitatum. F ctus non ut supra descriptus 8
8a. Fructus apice cornibus 2— pluribus acutis vel spinis lateralibus provisus .. 9
b. Fructus apice simpliciter rostratus 11
9a. Fructus ± ovoideus irregulariter spinosus ..... 46. *Octoceras* Bge.
b. Fructus ± oblongus, cornutus 10
10a. Fructus bicornutus ..... 82. *Notoceras* R. Br.
b. Fructus quadricornutus ..... 83. *Tetracme* Bge.
11a. Fructus apice transverse auriculatus ..... 44. *Anastatica* L.
b. Fructus non auriculatus..... 51. *Euclidium* R. Br.
12a. Fructus obverse triangularis, transverse cum septo valde compressus .....
..... 40. *Capsella* Medicus
b. Fructus ellipticus vel orbicularis vel obovatus, cum septo paralleliter vel non compressus 13
13a. Pedicelli fructiferi deflexi 14
b. Pedicelli fructiferi patuli vel erecti 17
14a. Flores in axillis foliorum solitarii. Silicula dehiscens .....
..... 64. *Buchingera* Boiss. & Hohen.
b. Flores in racemos bracteatos dispositi. Silicula indehiscens 15
15a. Plantae perennes vel annuae. Silicula ultra 10 mm longa 16
b. Plantae annuae. Silicula 2—3,5 mm longa ..... 65. *Clypeola* L.
16a. Silicula glabra ..... 56. *Peltaria* Jacq.
b. Silicula dense stellato-tomentosa ..... 61. *Fibigia* Medicus
17a. Folia caulina amplexicaulia sagittata. Plantae annuae vel biennes 18
b. Folia caulina sessilia, cuneata, si amplexicaulia non sagittata vel folia petiolata. Plantae annuae vel perennes 20


Straussiella purpurea


Physoptychis gnaphalodes

Alyssum turgidum

Draba bruniifolia

Pyramidium Griffithianum

Octoceras Lehmannianum

Notoceras bicorne

Tetracme recurvata

Tetracme quadricornis

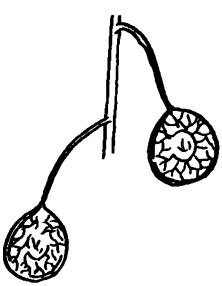
Anastatica hierochuntica

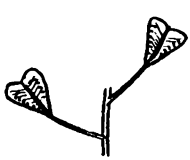
Euclidium syriacum

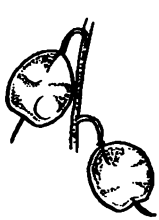
Buchingera axillaris

Clypeola Jonthlaspi

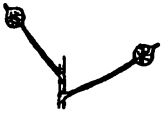
Clypeola aspera


Peltaria angustifolia


Capsella bursa-pastoris


Fibigia membranacea

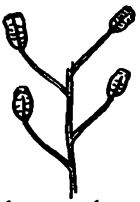
18a. Fructus indehiscens, globosus ..... 52. *Neslia* Desv.
b. Fructus dehiscens, ellipticus vel obovoideus 19
19a. Silicula obovoidea valvis firmis. Planta 20—60 cm alta 122. *Camelina* Crantz
b. Silicula elliptica valvis tenuibus. Planta 2—10 cm alta (Afghanistan orientalis) ..... 118. *Nasturtiicarpa* Gilli
20a. Plantae annuae 21
b. Plantae perennes 24
21a. Plantae tenerae procumbentes, foliis pinnatifidis ..... 41. *Hymenolobus* Nutt.
b. Plantae erectae, foliis simplicibus integris 22
22a. Petala manifeste bifida. Plantae annuae rosulis foliorum basalibus, caule aphyllo ..... 68. *Erophila* DC.
b. Petala integra, retusa vel emarginata. Plantae annuae rosulis foliorum basalibus, caule foliato 23
23a. Folia rosulato. Indumentum e pilis ± patulis compositum ..... 67. *Draba* L.
b. Folia non rosulata. Indumentum e pilis ± appressis compositum ..... 62. *Alyssum* L.
24a. Folia pinnatisecta (Afghanistan boreo-orientalis, Chitral) ..... 125. *Smelowskia* C. A. Mey.
b. Folia simplicia integra vel dentata 25
25a. Stigma lobis carpidialibus decurrentibus 26
b. Stigma capitatum 27
26a. Plantae suffruticosae. Indumentum e pilis appressis bifidis compositum. Fructus applanatus ..... 57. *Farsetia* Turra
b. Plantae pulvinatae. Indumentum e pilis ± patulis ramosis consistens. Fructus non applanatus ..... 59. *Clastopus* Bge.
27a. Sepala interiora saccata 28
b. Sepala interiora non saccata 29
28a. Plantae erectae. Fructus applanatus valvis coriaceis. Semina alata ..... 61. *Fibigia* Medicus
b. Plantae procumbentes vel ascendentes. Fructus valvis tenuibus convexis. Semina non alata ..... 80. *Aubrieta* Adans.
29a. Siliculae ± orbiculares 30
b. Siliculae ellipticae vel oblongae 31
30a. Indumentum omnino fere e pilis appressis mediofixis paralleliter dispositis consistens ..... 63. *Lobularia* Desv.
b. Indumentum e pilis appressis stellatis consistens ..... 62. *Alyssum* L.
31a. Radicula accumbens ..... 67. *Draba* L.
b. Radicula incumbens 32
32a. Petala alba vel rosea. Silicula ± elliptica (Wakhan) ..... 117. *Braya* Sternb. & Hoppe
b. Petala flava. Silicula ± oblonga ..... 114. *Dielsiocharis* O. E. Schulz



Neslia apiculata

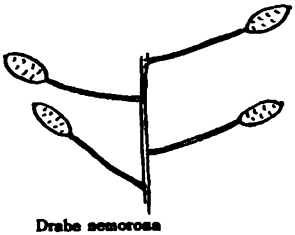
Camelina microcarpa

Nasturtiicarpa notorrhiza



Hymenolobus procumbens

Erophila verna

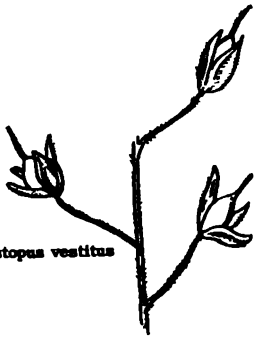


Drabe nemorosa

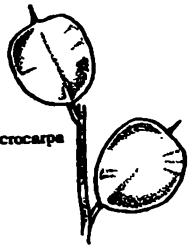
Alyssum meniocoides

Smelowskia calycina

Farsetia Edgeworthii

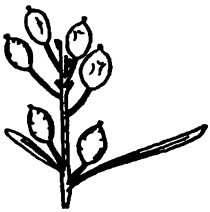


Clastopus vestitus



Fibigia macrocarpa

Aubrieta parviflora



Lobularia libyca

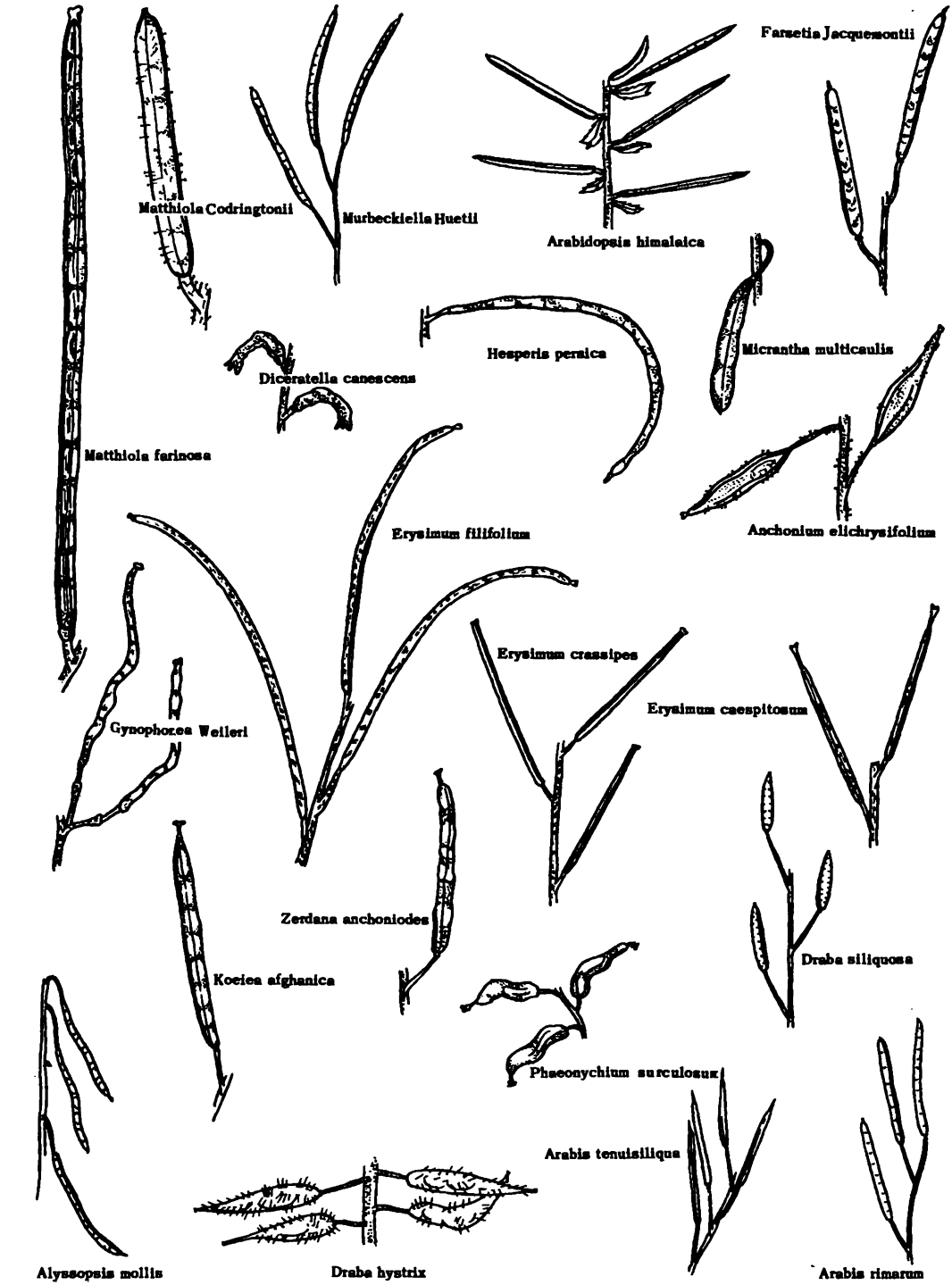
Alyssum lanceolatum

Braya oxycarpa

Dielsiocharis Kotschyi

Grex J - Fructus siliqua. Pili ramosi. Plantae perennes.

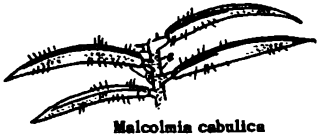
1a. Folia inferiora pinnata vel pinnatifida 2
b. Folia inferiora simplicia, integra vel dentata 4
2a. Petala alba vel rosea, 3—8 mm longa 3
b. Petala sordida longiora ..... 86. *Matthiola* R. Br.
3a. Folia caulina pinnata vel profunde pinnatifida (M. Ararat) ..... 112. *Murbeckiella* Rothm.
b. Folia caulina simplicia, integra vel dentata ..... 119. *Arabidopsis* Heynh.
4a. Stigma lobis carpidialibus decurrentibus 5
b. Stigma capitatum vel bilobum 9
5a. Indumentum e pilis bifidis mediofixis paralleliter dispositis consistens ..... 57. *Farsetia* Turra
b. Indumentum e pilis patulis dendroideis vel stellatis consistens 6
6a. Siliqua quadrangularis, apice bicorniculata. Folia rhomboidea vel oblonga (Persia australis) ..... 84. *Diceratella* Boiss.
b. Siliqua teres vel ± compressa, numquam corniculata. Folia ovato-lanceolata vel linearia 7
7a. Semina alata. Radicula accumbens ..... 86. *Matthiola* R. Br.
b. Semina non vel vix alata. Radicula incumbens 8
8a. Siliqua basi attenuata, apice compressa subrotundata. Petala anguste linearia, 7—8 mm longa. Glandulae stipitatae indumenti e cellulis pluriseriaaliter dispositis compositae ..... 96. *Micrantha* Dvořak
b. Siliqua cylindrica. Petala obovata, quam 8 cm longiora. Glandulae stipitatae indumenti e cellulis uniserialiter dispositis compositae ..... 95. *Hesperis* L.
9a. Siliqua indehiscens ..... 101. *Anchonium* Dc.
b. Siliqua dehiscens 10
10a. Indumentum e pilis appressis bifidis mediofixis ± paralleliter dispositis consistens 11
b. Indumentum e pilis furcatis dendroideis vel stellatis vix appressis consistens 12
11a. Siliqua gynophoro distincto provisa ..... 104. *Gynophorea* Gilli
b. Siliqua gynophoro non provisa ..... 103. *Erysimum* L.
12a. Plantae non caespitosae, 20—60 cm altae, caulibus ± foliatis. Folia basalia raro rosulata, si rosulata, margine ± dentata 13
b. Plantae ± caespitosae, 1—25 cm altae, saepe scaposae. Folia basalia saepe rosulata, semper integra 15
13a. Petala flava 14
b. Petala alba vel rosea ..... 119. *Arabidopsis* Heynh.
14a. Folia caulina sagittata, amplexicaulia. Stylus in statu fructifero c. 0,5 mm longus. Pedicelli fructiferi deflexi ..... 73. *Alyssopsis* Boiss.
b. Folia caulina sessilia, numquam sagittato-amplexicaulia. Stylus in statu fructifero 1—3 mm longus. Pedicelli fructiferi erecti ..... 90. *Koeiea* Rech. f.
15a. Petala flava, ungue interdum roseo vel purpurascente. Caules 3—5 cm alti 16
b. Petala alba vel rosea, si flava, caules 10—15 cm alti 17
16a. Stamina longiora filamentis connatis (Persia australis) ... 106. *Zerdana* Boiss.
b. Filamenta omnia libera (Afghanistan)..... 71. *Phaeonychium* O. E. Schulz
17a. Semina biseriata, numquam alata. Petala saepe flava, interdum alba 67. *Draba* L.
b. Semina uniseriata vel subbiseriata, interdum alata. Petala alba raro flava ..... 74. *Arabis* L.


Matthiola Codringtonii
Murbeckiella Huetii
Arabidopsis himalaica
Farsetia Jacquemontii
Hesperis persica
Micrantha multicaulis
Dicsratella canescens
Matthiola farinosa
Erysimum filifolium
Anchonium elichrysifolium
Erysimum crassipes
Gynophorea Weileri
Erysimum caespitosum
Zerdana anchoniodes
Koelea afghanica
Draba siliquosa
Phaeonychium surculosum
Arabis tenuisiliqua
Alyssopsis mollis
Draba hystrix
Arabis rimarum

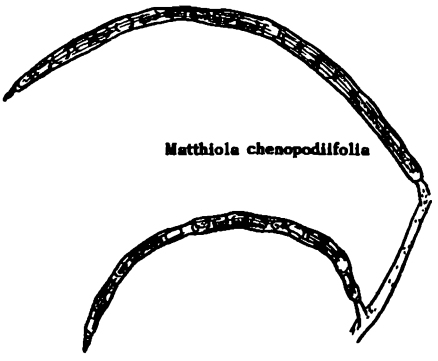
Grex K - Fructus siliqua.
Pili ramosi, mediofixi vel stellati. Plantae annuae vel biennes.

1a. Folia pinnatifida vel pinnata 2
b. Folia simplicia, margine integra vel dentata 13
2a. Pedicelli fructiferi incrassati 3
b. Pedicelli fructiferi tenues 9
3a. Stigma lobis carpidialibus decurrentibus 4
b. Stigma capitatum vel bilobum 6
4a. Antherae uniloculares. Flores solitarii vel in racemos paucifloros dispositi ..... 92. *Leptaleum* DC.
b. Antherae biloculares. Flores in racemos multifloros dispositi 5
5a. Petala alba vel rosea ..... 93. *Malcolmia* R. Br.
b. Petala sordida ..... 86. *Matthiola* R. Br.
6a. Siliquae cornibus apicalibus 4 praeditae ..... 83. *Tetracme* Bge.
b. Siliquae sine cornibus apicalibus 7
7a. Folia bipinnatisecta ..... 126. *Robeschia* Hochst. ex Fourn.
b. Folia pinnatifida 8
8a. Petala alba vel rosea. Indumentum sine pilis bifidis mediofixis appressis .. .. 116. *Torularia* O. E. Schulz
b. Petala flava. Indumentum pilis ad minimum nonnullis bifidis mediofixis appressis ..... 103. *Erysimum* L.
9a. Petala alba vel rosea 10
b. Petala flava 12
10a. Planta 3—10 cm alta. Siliqua 9—25 mm longa 11
b. Planta usque ad 40 cm alta. Siliqua 50—75 mm longa .... 119. *Arabidopsis* Heynh.
11a. Petala rosea. Folia pinnatifida. Planta ± scaposa ..... 105. *Maresia* Pomel
b. Petala alba. Folia pinnata. Caulis foliatus .... 111. *Microsisymbrium* O. E. Schulz
12a. Sepala angusta, linearia, oblonga. Pili glanduliferi nonnulli quidem immixti ..... 123. *Descurainia* Webb & Berth.
b. Sepala lata, oblonga. Planta pilis glanduliferis omnino carens (Chitral) .... 124. *Sophiopsis* O. E. Schulz
13a. Pili mediofixi bifidi appressi ± paralleliter dispositi 14
b. Pili dendroidei vel substellati nonnulli quidem immixti 17
14a. Pedicelli fructiferi incrassati 15
b. Pedicelli fructiferi tenues 16
15a. Siliqua crassiuscula nec torulosa nec circinnata..... 103. *Erysimum* L.
b. Siliqua tenuis, torulosa interdum circinnata .....115. *Streptoloma* Bge.
16a. Stigma lobis carpidialibus decurrentibus. Planta annua valida .... 57. *Farsetia* Turra
b. Stigma capitatum. Planta annua tenera .. 98. *Atelanthera* Hook. f. & Thoms.

Leptaleum filifolium



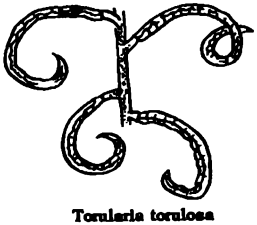
Malcolmia cabulica



Matthiola chenopodiifolia

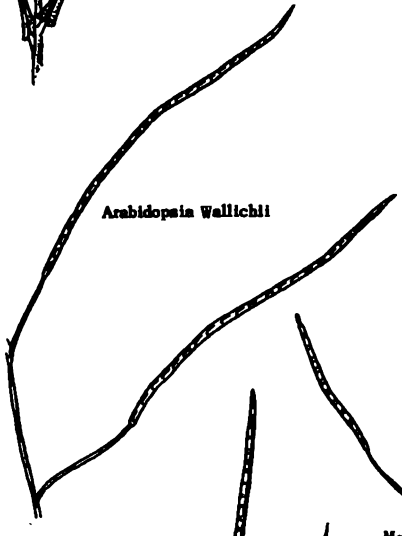
Robeschia Schimperi

Tetracme quadricornis

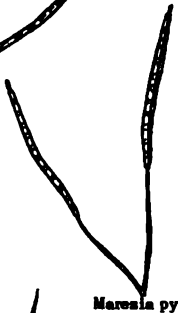


Torularia torulosa

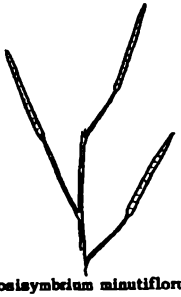
Torularia torulosa



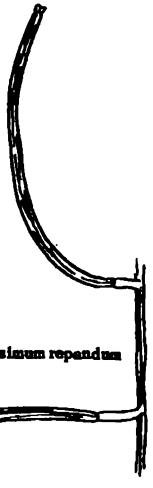
Arabidopsis Wallichii



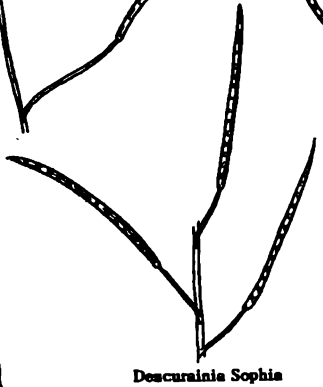
Maresia pygmaea



Microlsymbrium minutiflorum

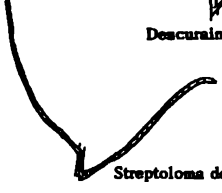


Erysimum repandum

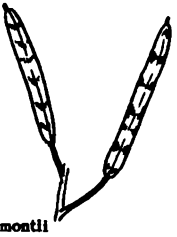


Descurainia Sophia

Sophiopsis flavissima



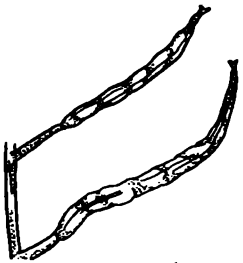
Streptoloma desertorum



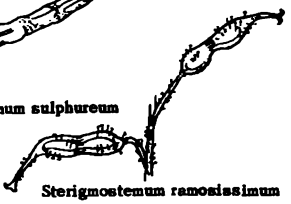
Farsetia Jacquemontii

Atalanthera perpusilla

17a. Stigma lobis carpidialibus decurrentibus 18
b. Stigma capitatum vel bilobum 21
18a. Fructus indehiscens, lomentoideus. Filamenta staminum interiorum per paria connata ..... 100. *Sterigmostemum* M. B.
b. Fructus dehiscens, non lomentoideus. Filamenta staminum interiorum libera 19
19a. Stigma interdum appendicibus lateralibus praeditum. Petala sordida ..... 86. *Matthiola* R. Brown
b. Stigma appendicibus nullis. Petala lilacina, rosea vel alba 20
20a. Folia oblonga vel ovato-lanceolata, margine dentata vel integra, saepe petiolata. Pedicelli fructiferi incrassati ..... 93. *Malcolmia* R. Br
b. Folia linearia vel oblonga, margine integra, sessilia. Pedicelli fructiferi tenues ..... 94. *Eremobium* Boiss.
21a. Pedicelli fructiferi siliquas maturas crassitudine aequantes 22
b. Pedicelli fructiferi non incrassati, siliquis maturis tenuiores 27
22a. Siliqua indehiscens ± falcato-curvata. Stigma bilobum lobis erectis ..... 99. *Cryptospora* Kar. & Kir.
b. Siliqua dehiscens recta vel circinnata. Stigma capitatum vel bilobum, lobis ± divergentibus 23
23a. Petala flava 24
b. Petala rosea vel alba 25
24a. Herbae scaposae pilis bifidis mediofixis appressis nullis 76. *Drabopsis* C. Koch
b. Herbae non scaposae pilis bifidis mediofixis appressis nonnullis quidem immixtis ..... 103. *Erysimum* L.
25a. Plantae annuae procumbentes vel ascendentes. Folia caulina sessilia. Petala rosea vel alba. Radicula incumbens 26
b. Plantae annuae erectae. Folia caulina plerumque amplexicaulia. Petala alba. Radicula accumbens ..... 74. *Arabis* L.
26a. Indumentum e pilis simplicibus et ramosis consistens. Petala alba vel rosea ..... 116. *Torularia* O. E. Schulz
b. Indumentum e pilis stellatis tantum consistens. Petala rosea vel violacea ..... 105. *Maresia* Pomel
27a. Siliqua c. 20×5 mm. Semina 4—5 mm longa, alata ... 91. *Citharelloma* Bge.
b. Siliqua usque ad 100×1—3 mm. Semina quam 2 mm breviora, alata vel non alata 28
28a. Semina biseriata 29
b. Semina uniseriata 30
29a. Planta usque ad 100 cm alta. Siliqua 50—90 mm longa. Folia caulina glabra, glauca, amplexicaulia ..... 77. *Turritis* L.
b. Planta 1—20 cm alta. Siliqua 3—15 mm longa. Folia caulina nulla vel sessilia, hirsuta ..... 67. *Draba* L.
30a. Folia caulina plerumque amplexicaulia, auriculata. Petala alba. Radicula accumbens ..... 74. *Arabis* L.
b. Folia caulina sessilia vel breviter petiolata, si amplexicaulia petala flava. Radicula incumbens ..... 119. *Arabidopsis* Heynh.

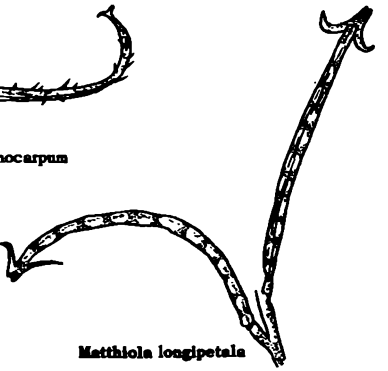


Sterigmostemum sulphureum

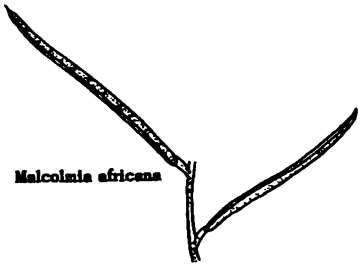


Sterigmostemum ramosissimum

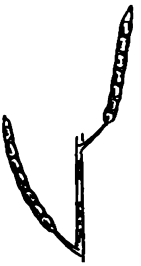
Sterigmostemum acanthocarpum



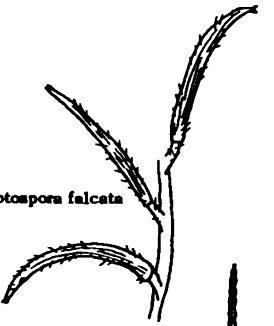
Matthiola longipetala



Malcolmia africana



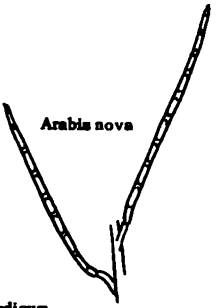
Eremobium aegyptiacum



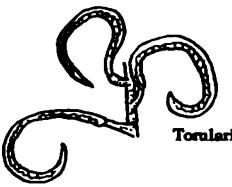
Cryptospora falcata

Drabopsis verna

Erysimum kurdicum

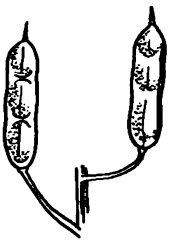


Arabis nova

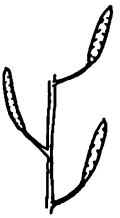


Torularia torulosa

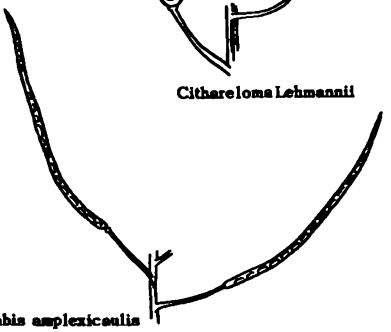
Maresia nana



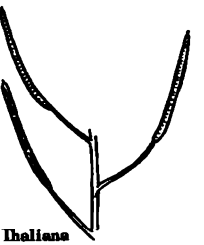
Cithareloma Lehmannii



Draba stenocarpa



Arabis amplexicaulis



Arabidopsis Thaliana

Turritis glabra

Tribus ***Brassiceae***

auctore I. HEDGE, Edinburgh

Pili simplices vel deficientes. Fructus plerumque siliqua rostro stylari distincto seminifero vel sterili. Cotyledones longitudinaliter plicatae vel spiraliter involutae vel curvato-incumbentes. — Genera 1—22.

1. ***Brassica***

Brassica L., Spec. Plant. 666 (1753). Gen. Plant. ed. 5:299 (1754).

Lit.: O. E. SCHULZ in ENGLER, Das Pflanzenreich, Cruciferae-Brassiceae 70 (IV. 105): 21—84 (1919). G. BERGGREN, Reviews on the taxonomy of some species of the genus Brassica based on their seeds, Svensk Bot. Tidskr. 56, 1: 65—135 (1962).

Herbae annuae, biennes vel perennes, floribus flavis vel albis, indumento e pilis simplicibus saepe setosis raro nullo. Folia sessilia, amplexicaulia vel petiolata, simplicia vel lyrato-pinnatifida. Sepala erecta vel patentia, interiora leviter saccata. Petala obovata, non manifeste venosa. Glandulae nectariferae medianae prominentes. Stigma prominens, capitatum. Siliqua linearis vel oblonga, recta, rostro conico vel filiformi. Valvae nervo unico mediano prominente; nervi laterales inconspicui. Semina sphaerica, uniseriata. Cotyledones longitudinaliter plicatae.

Many species of *Brassica* have been cultivated as food plants for centuries and others are widespread segetals. The most frequently cultivated food plants are turnip (*B. Rapa* subsp. *Rapa*), rape and swede (*B. Napus* subsp. *oleifera* and subsp. *Napobrassica* respectively) and cabbage (*B. oleracea*). To distinguish between wild, cultivated and naturalised species is particularly difficult and in our area the problem is aggravated by shortage of herbarium material.

1a. Siliqua stipitata; rostrum 1—2,5 mm longum. Plantae perennes vel biennes ..... 1. *B. elongata* EHRH.
b. Siliqua non (vel raro) stipitata; rostrum siliquae plerumque ultra 3 mm longum. Plantae annuae vel biennes 2
2a. Folia caulina superiora amplexicaulia 3
b. Folia caulina superiora sessilia vel petiolata, non amplexicaulia 4
3a. Flores sub anthesi alabastra superantes. Folia laete viridia ..... 6. *B. Rapa* L.
b. Flores sub anthesi alabastra non superantes. Folia glauca ... 5. *B. Napus* L.
4a. Siliqua 10—17 mm longa, cauli arcte appressa; rostrum usque ad 4 mm longum ..... 7. *B. nigra* (L.) KOCH
b. Siliqua ultra 30 mm longa, patens, deflexa vel erecta; rostrum ultra 4 mm longum 5
5a. Siliqua horizontaliter patens vel deflexa ..... 3. *B. deflexa* BOISS.
b. Siliqua suberecta vel vario modo patula 6
6a. Rostrum siliquae 6—10 mm longum, apice quam stigma tenuior..... 2. *B. juncea* (L.) CZERN.
b. Rostrum siliquae 10—20 mm longum, apice stigma crassitudine aequans ..... 4. *B. Tournefortii* GOUAN

1. ***B. elongata*** EHRH., Beitr. Naturk. 7: 159 (1792).
Syn.: *B. persica* BOISS. & HOHEN. in BOISS., Diagn. Pl. Or. Nov. Ser. 2, 8: 26 (1849.)
Icon.: Clavis p. 11 et 21.
Typus: Europa.

Herba biennis vel perennis, basi saepe crasse lignescens, usque ad 1 m alta. Caulis plerumque glaber raro hispidus, pallide viridis, basi saepe violascens. Folia inferiora petiolata, oblongo-ovata, firma vel subcarnosa, saepe laete viridia, integra vel grosse dentata, utrinque setis tuberculatis curvatis obsita. Folia superiora oblonga vel lanceolata, breviter petiolata. Petala flava, 6—10×3—4 mm. Ovarium 15-ovulatum. Pedicelli fructiferi 6—14 mm longi, patentes, glabri. Siliqua linearis, 1,5—4,5×1—2,5 mm, torulosa; stipes 1—4 mm longus; rostrum non seminiferum, 1—2,5 mm longum. Semina humiditate mucilaginea.

Persia: N: Gil.: Kaluraz, Lipsky. Persia borealis Auch. 219! — W: Azerb.: Qareh Dagh, in valle Gusjumbet, Buhse. Khvoy, Knapp. Chahriq inter Shahpur et Rezaiyeh, Knapp. Einal Zeinal prope Tabriz, Grossh. In collibus a Tabriz meridiem versus, Gill.-Sm. 2552!, 1813! Bazargan, 2000 m, Rech. 16215! Kurd.: 5 km W Sanandaj, inter Sanandaj et Dezh Shahpur, Bent & Wr. 519—1101! Arak: Prope Mowdar, Str. Khuz.: Masjed Soleyman, McMillan 30! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 188! Lur.: Chamchid, Koelz 16028! Sheshom, 800—1000 m, Jacobs 6437! — E: Khor.: In montibus Kopet Dagh supra Quchan, 1500—1600 m, Rech. 1615!, 1622! Inter Mashhad et Torbat-e Heydariyeh, in montibus serpentinicis ditionis Robat-i Safid, 1700 m, Rech. 1523!, Gauba 119! Inter Mashhad et Fariman, 1000—1300 m, Rech. 1359! Inter Quchan et jugum Alam Ali, 2000 m, Rech. 4783-b! M. Hazar Masjed inter Gush et Talqur, 1600—1800 m, Rech. 5207!, 5181! Inter Ardak et Talqur, 1200—1600 m, Rech. 4980! Inter Chanaran et Quchan, 1200—1300 m, Rech. 4736! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4593! In collibus ad Torbat-e Heydariyeh, 1300 m, Rech. 4359! Inter Shahrud et Neyshabur, Bge. — C: Tehr.: Prope Ab-e Garm, Buhse 760, 1090. Qasr-e Qajar, Bruns. In declivibus M. Damavand supra Ask, 1900 m, Gauba & Esfand. 118! Qazv.: Ad pagum Sultanabad prope Qazvin, Linds. 163. Damgh.-Semn.: Inter Semnan et Damghan, Rech. 1271! Chashmeh-i Ali prope Jashm, 2000 m, Aell. 1072!

Turcomania: Gaudan, Litw. 621! Cheirabad, Litw. 622! Suluklü, Sint. Prope Ashkhabad, Sint. 217, 840!, Litw. 182.

Afghanistan: NW: Qala Nau versus Sauzak, 1400 m, Koelz 3955! — C: Bamian: Inter Bamian et Band-e Amir, Podlech 12090. Band-e Amir, 2900 m, Hdg. & Wdb. 4810!, Koelz 2835!, Gilli 1195!, Rech. 18435!, 18256!, Volk 2853!

Distr. gen.: Europa austro-orientalis, Caucasia, Anatolia, Persia, Kara Kum, Kizil Kum, Afghanistan, Sibiria occidentalis.

In fruit *B. elongata* has a superficial resemblance to *Sisymbrium* because of the inconspicuous beak and to *Diplotaxis* on account of the torulose siliquae. It is a variable species in which several varieties have been described (cf. O. E. Schulz in Engler, Pflanzenr., l. c. 53—54). These varieties (e. g. var. *armoracioides* (Czern.) Schmalh., var. *turcomanica* O. E. Schulz and var. *integrifolia* Boiss.) were based on leaf shape and indumentum. With the available material from our area, these infraspecific taxa appear to be merely local forms scarcely worth formal recognition.

2. ***B. juncea*** (L.) Czern., Consp. Pl. Chark. 8 (1859).
Syn.: *Sinapis juncea* L., Spec. Plant. 668 (1753).

Lit.: K. Frandsen, The experimental formation of B. juncea, Dansk Bot. Ark. 11,4: 1—17 (1943).

Icon.: Clavis p. 11.
Typus: „Hab. in Asia".

Herba annua usque ad 1 m alta, plerumque valde ramosa, glabra vel pilis rigidis ad basim caulis et ad folia et petiolos foliorum inferiorum obsita. Folia basalia

lyrato-pinnatisecta, petiolata; superiora subintegra, glabra. Petala pallide flava, 6—10 mm longa. Pedicelli fructiferi 0,5—1,5 cm longi, erecto-patentes vel suberecti. Siliqua 30—60×2—3,5 mm, subtetragona, torulosa; rostrum 6—12 mm longum, non seminiferum.

Talish: sec. Fl. URSS.
Afghanistan: E: Kabul: Tagao, KOELZ 11789! — NE: Kataghan: Ishkamish, 1150 m, PODLECH 10662.

Distr. gen.: Europa, Talish, Afghanistan, Asia centralis, Asia orientalis.

Cultivated for its seeds in Asia and an introduced weed in parts of Europe.

3. ***B. deflexa*** BOISS., Ann. Scienc. Nat. Ser. 2, 17: 87 (1842).
Syn.: *B. lasiocalycina* (BOISS. & HAUSSKN.) BOISS., Fl. Or. Suppl. 66 (1888).

Lit.: J. BORNMÜLLER, Beihefte zum Botanischen Centralblatt 28, 2: 124 (1911). S. M. H. JAFRI, Notes from the Royal Botanic Garden, Edinburgh 22, 2: 103—104 (1956).

Typus: Syria, Aleppo, AUCH. 229, K!, G.

Herba annua usque ad 60 cm alta, plerumque a basi ramosa, raro subsimplex. Caulis plerumque inferne hispidus, superne glabrescens. Folia inferiora petiolata, oblongo-ovata, grosse dentata vel lyrata, longe albo-pilosa; superiora oblonga, sessilia. Petala citrina vel laete flava, 1—1,3 cm longa, late ovata, nervis numerosis inconspicuis. Ovarium 30—40-ovulatum. Pedicelli fructiferi (4—)10—18 mm longi, deflexi, glabri vel parce longe albo-pilosi. Siliqua glabra torulosa, 30—60× c. 2 mm, rostro prominente turgido usque ad 7 mm longo. Semina c. 0,7 mm diametro hilo nigro.

1a. Pedicelli fructiferi 10—18 mm longi, deflexi; siliqua usque ad 6 cm longa ..... subsp. *deflexa*
b. Pedicelli fructiferi 4—9 mm longi, horizontaliter patentes vel deflexi; siliqua 3,5—4,5 cm longa ..... subsp. *leptocarpa* (BOISS.) HEDGE

— — subsp. ***leptocarpa*** (BOISS.) HEDGE, comb. et stat. nov.
Syn.: *B. leptocarpa* BOISS., Fl. Or. 1: 392 (1867). B. *deflexa* BOISS. var. *leptocarpa* (BOISS.) O. E. SCHULZ in ENGLER, Pflanzenr. l. c.: 64. *B. iranica* RECH. f., AELL. & ESFAND., Phyton 3: 44 (1951).
Typus: Tehran, BGE., K!

Iraq: Kut-al Imara: Badrah, RECH. 9176!
Persia: S: Fars.: Bushehr, STAPF! Kerm.: In deserto Persiae austro-orientalis inter Khabis et Kerman, BGE. Kerman, 1900 m, BORNM. 2236! (*B. deflexa* var. *aurantiaca* BORNM.) Darzin prope Bam, 1200 m, RECH. 3621! Inter Saidabad et jugum Chah-e Chaghak, 1900 m, RECH. 3521! Bal.: M. Taftan prope Sangan, 1600 m, RECH. 4065! (Typus *B. iranicae*). Inter Khash et Karevandar, MIRZAYAN 227-e! — E: Khor.: Ad Sabzevar prope Neyshabur, RECH. 5254! Inter Neyshabur et Mashhad prope Sharifabad, 1000—1300 m, RECH. 1350-a! Mashhad, RECH. 4867! — C: Tehr.: Hauz-i Sultan inter Tehran et Esfahan, BGE.! Prope Ab-e Garm, BRUNS. Qulhak prope Tehran, TROTT 58! Inter Manjil et Pachenar, 400—500 m, et supra Pachenar in montibus, BORNM. 6299. M. Tuchal prope Kan, BRUNS. Qazv.: Karaj, GAUBA, RECH. 183!, RECH. 739!
Afghanistan: SE: Kandahar: Pirzada, 1000 m, KOELZ 2182! Kandahar, GRIFF.!

Distr. gen.: Endem.

Although the differences between the two subspecies show a degree of intergradation, the taxa are sufficiently different to warrant formal recognition. The type subspecies does not occur in our area but is in Syria, Arabia, Lower Iraq and Turkey.

4. ***B. Tournefortii*** Gouan, Obs. Bot. 44, tab. 20a (1773).
Icon.: Clavis p. 19.
Typus: „Europa".

Herba annua usque ad 70 cm alta; caulis simplex vel a basi ramosus. Caulis et folia inferiora ± dense pilis rigidis albis obsita, superne glabrescentia. Folia basalia rosulata, breviter late petiolata, lyrato-pinnatisecta; superiora valde decrescentia, summa bracteiformia. Pedicelli fructiferi 10—35 mm longi, erecto-patentes. Petala pallide flava, basi saepe violascentia, interdum alba, 7×2—3 mm. Ovarium c. 15-ovulatum. Siliqua 30—70×2,5 mm rostro 10—20×1—2 mm metiente incluso. Semina humiditate mucilaginea.

Iraq: Kurd.: Diyala: Khanaqin: As Sadiyah, Evans. Jabal Hamrin, Peile, Haines! Kirkuk: In alveo fluvii Zab prope Kirkuk, Grigg 52! Kut-al Imara: Shatt at-Tib, 70 km N Amarah, Rech. 8881!
Talish: Lenkoran, Hohen. Sallian, C. A. Mey.
Persia: N: Maz.: Shahi, Mirzayan 5842-E! In litore caspico in arenosis prope Babol Sar, Rech. 5635!, Gauba 269! Kenar Darya 30 km N Sari, Grant 17359! Gil.: Bandar-e Pahlavi, Lipsky, Buhse 932. — W: Arak: Arak, Trott 1181! Khuz.: Inter Dezful et Dehloran, Nab. Ad rivulum Cher-e Saucha, Nab. 1372. Ad rivulum Chekab, Nab. 1336. — S: Kerm.: Tomagoa, Koelz 14321! Fars.: Bushehr, Bornm. 76, 97, Koelz 1831, Koelz 14838!, Stapf 213!, Horner 10—13! In ins. Khark, Ky. 8! In ins. Hormoz, Bornm. 75!, Popenoe 21! Bandar Abbas, Bornm. 73, 74!, Mird. 166! Kerm.: Inter Kerman et Bandar Abbas, Mird. 104! Iranshahr: Damin, Shar. 209!

Distr. gen.: Europa occidentalis et australis, Africa borealis, Syria occidentalis, Iraq, Anatolia, Cyprus, Persia, Talish.

5. ***B. Napus*** L., Spec. Plant. 666 (1753).

Lit.: E. N. Sinskaja, Bulletin of Applied Botany and Plant Breeding Leningrad 33: 233—250 (1960).

Typus: „Hab. in arenosis maritimis Gotlandiae, Belgii, Angliae."

Herba glauca annua vel biennis usque ad 150 cm alta, radice tenui vel valida. Folia basalia petiolata, lyrata vel subintegra, glabra vel pilis simplicibus sparse obsita; folia caulina superiora sessilia integra, oblonga vel oblongo-ovata. Flores sub anthesi alabastra non superantes. Sepala erecto-patentia. Petala flava, 10—18 mm longa. Pedicelli fructiferi 1—3 cm longi. Siliqua 50—80×2,5—4 mm (raro stipitata); rostrum 5—25 mm longum, non seminiferum vel semen unicum proferens.

Persia: N: Maz.: Hazar Jerib, Shar. 559!, 561! — S: Bal.: Inter Zahedan et Khash, Savafi & Dezfoulian 6354-E!
Afghanistan: E: Kabul: Farakulum, 2700 m, Koelz 2585! Sharenao, Neub. 3047! Maidan ad fl. Kabul, Thesiger 191! Kabul, Scheibe 42!; cult., Gilli 1193!, 1194! — NE: Badakhshan: E Faizabad in valle fluvii Warduj, Furse 6281! — C: Bamian: Darreh-i Shikar, 1500 m, Hdg. & Wdb. 4142! Inter juga Unai et Hajigak, 2950 m, Hdg. & Wdb. 4592!
Pakistan: Chitral: Yarkhun, Bowes Lyon 925! — Quetta, Duthie 8595!

Distr. gen.: Asia et Europa.

Much cultivated. There are innumerable cultivars of this and the following species. With both of them, there have been numerous different treatments of their taxonomy

and interrelationships. The distribution of the original species is obscured by cultivation, but some plants from Afghanistan and other parts of C Asia are apparently wild. — A synopsis of the different classifications is given by E. Sinskaja, l. c.

6. ***B. Rapa*** L., Spec. Plant. 666 (1753).
Typus: „Hab. in arvis Angliae, Belgii".

Speciei praecedenti simillima sed folia basalia laete viridia, flores sub anthesi alabastra superantes.
Distr. gen.: Incerta.

In our area occurring as a cultivated plant. The cultivated turnip is subsp. *Rapa* with a tuberous tap-root. Other subspecies are: subsp. *campestris*, the wild form, with a non tuberous tap-root and subsp. *oleifera* the turnip rape.

7. ***B. nigra*** (L.) Koch in Röhling, Deutschl. Fl. ed. 3, 4: 713 (1833).
Syn.: *Sinapis nigra* L., Spec. Plant. 668 (1753).
Icon.: Clavis p. 11.
Typus: „Hab. in aggeribus ruderatis Europae septentrionalioris".

Herba annua usque ad 1,5 m alta vel elatior, plerumque a medio ramosa. Caulis plerumque inferne setosus, superne glaber, raro omnino glaber. Folia basalia, petiolata, lyrato-pinnatisecta, segmento terminali magno, utrinque hispida; folia superiora oblongo-linearia, integra, glabra. Petala c. 8×3—4 mm, laete flava. Siliqua 10—17× 1,5—2 mm rostro tenui 1,5—3 mm longo incluso. Semina humiditate non mucilaginea.

Iraq: Kurd.: Sul.: 55 km E Sulaymaniyah, Rawi 21820! Qara Dagh, Haines 1165! Ad viam versus Qara Dagh ducentem, Haines!
Persia: W: Azerb.: Khosrava prope Shahpur, Knapp. — S: Makran: Nikshahr, Hotson.
Afghanistan: E: Kabul: Neasi in valle Logar, 1830 m, Gilli 1192! Kabul, 1780 m, Gilli 1191!
Pakistan: Kurram: In valle Kurram, Griff.! — S. Wazir.: Tank, Duthie (?) 7103! — Quetta, Jafri 2890!

Distr. gen.: Europa, Africa borealis, Asia austro-occidentalis.

Introduced in many other temperate parts of the world.

2. *Sinapis*

Sinapis L., Spec. Plant. 668 (1753). Gen. Plant. ed. 5: 299 (1754).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 70 (IV. 105): 117—136 (1919).

Herbae annuae (nostrae), foliis pinnatifidis vel pinnatisectis, pilis simplicibus, floribus albis vel flavis. Sepala non saccata. Siliqua lineari-cylindrica, rostro manifesto. Valvae 3—7-nerviae. Cotyledones longitudinaliter plicatae.

1a. Rostrum fructus valde compressum; ovarium 4—8-ovulatum; valvae dense setosae ..... 1. *S. alba* L.
b. Rostrum fructus non valde compressum; ovarium 8—14-ovulatum; valvae glabrae vel retrorse pilosae 2
2a. Rostrum fructus 1—2-spermum, conicum; valvae glabrae vel hispidae vel retrorse pilosae ..... 2. *S. arvensis* L.
b. Rostrum fructus 6—9-spermum, torulosum; valvae retrorse pilosae ..... 3. *S. Aucheri* (Boiss.) O. E. Schulz

1. ***S. alba*** L., Spec. Plant. 668 (1753).
Icon.: Clavis p. 19.
Typus: „Hab. in agris Belgii, Angliae, Galliae".

Herba annua 20—70 cm alta, plerumque hispida, raro glabra. Folia hispida, raro glabra, pinnatifida vel lyrata, omnia petiolata. Pedicelli fructiferi ± quadrangulares, patuli, 5—14 mm longi. Siliqua 20—40 × 2—4,5 mm longa, rostro 15—30 mm longo, incluso.

Iraq: Kurd.: Mosul: In montibus supra Al Qosh, 16 km SE Dihok, 900 m, Thesiger 769! Persia: W: Khuz.: Kuhanak inter Dezful et Shushtar, Nab. 1364. Ad ruinas Shush, Nab. 1390. — S: Fars.: Ad pagum Hawize in montibus prope Bushehr, Nab. 1378.

Distr. gen.: Europa occidentalis, centralis et australis, Asia austro-occidentalis.

2. ***S. arvensis*** L., Spec. Plant. 668 (1753).
Icon.: Clavis p. 19.
Typus: „Hab. in agris Europae".

Herba annua, 20—60 cm alta, plerumque hispida, raro glabra. Folia plerumque hispida, raro glabra, petiolata, inferiora lyrata, superiora lanceolata, simplicia, sessilia. Pedicelli fructiferi crassi, patuli, 3—5 mm longi. Siliqua 25—40 × 2,5—4 mm, rostro recto 10—12 mm longo incluso; valvae plerumque glabrae, raro pilis rigidis retrorsis obsitae (var. *orientalis* (L.) Koch & Ziz).

Iraq: Kurd.: Kirkuk: Darbandikhan, Haines! Kirkuk, Guest 1495. Arbil: Shaqlawa, Haines! Ad radices M. Baradost, 10—20 km SSW Shanidar, 700 m, Erdtman & Goedemans in Rech. 15609! Arbil, Guest 1466. Diana prope Rawandiz, Guest 703! Mosul: Dihok, Guest 1311. Sul.: Sulaymaniyah, Cowan 2409. — Diyala: Mandali, Guest 1806. M. Jabal Darawishka prope Khanaqin, Guest 1754, 1795. Kani Masi, Morck 6.
Talish: Swant, Hohen. M. Talish, C. A. Mey.
Persia: N: Gorg.: Bandar-i Gaz, Freyn 1496. Gil.: Astara, Mir Kamali 6576-E! — W: Azerb.: Tabriz, Gill.-Sm. 1573, 1622, 1623, 1708. Yam, Gill.-Sm. 2028. Arak: Malayer NW Arak, Str. Lur.: Ilam, Jacobs 6298! Posht Kuh, Behb.! Khuz.: „Shoudesht", Espand. — S: Lar.: In ins. Qeshm, Bornm. Bandar Abbas, Bornm. 78. Fars.: Jahrom, Koelz 14551! — E: Khor.: Circa Sharifabad inter Neyshabur et Mashhad, Rech. 1350-b! — C: Qazv.: Ad pagum Sultanabad prope Qazvin, Linds. 262.
Turcomania: Aktepe, Litw. 620.
Afghanistan: N: Mazar-i Sharif: Inter Chashmeh-i Shafal et Akupruk, 500 m, Hdg. & Wdb. 3905! — NW: Maimana: Prope Maimana, Hdg. & Wdb. 3809! — SE: Kandahar: Tshilsina prope Kandahar, 1000 m, Kerst. 337. Kandahar, 1020 m, Gilli 1197!, Scheibe 15! — E: Kabul: Kabul, Volk 56, 266-D, Hdg. & Wdb. 3225! Paghman, Frey 480! — NE: Kataghan: In declivibus borealibus jugi Salang, 2200 m, Rech. 31623! S Taliqan, 900 m, Podlech 10404. Farkhar, 1250 m, Podlech 10480. Ishkamish, 1150 m, Podlech 10683. Kunduz, in paludosis fluvii Kunduz, 400 m, in cultis, Rech. 16036!
Pakistan: In valle Kurram, Griff.!

Distr. gen.: Europa occidentalis, centralis et australis, Africa borealis, Asia austro-occidentalis.

A variable species with many described infraspecific taxa.

3. ***S. Aucheri*** (Boiss.) O. E. Schulz, Bot. Jahrb. 54, 119: 56 (1916).
Syn.: *Brassica Aucheri* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 88 (1842). *Raphanus Aucheri* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 45 (1849). *Enarthrocarpus tragiceras* Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 67 (1888).

Icon.: Clavis p. 19.
Typus: AUCH. 203, G.

Herba annua, 10—40 cm alta, hispida. Folia basalia lyrato-pinnatisecta, petiolata; superiora breviter petiolata, subsimplicia. Inflorescentia fructifera valde elongata. Petala c. 15 mm longa. Pedicelli fructiferi 6—10 mm longi. Siliqua 30—60× 3 mm, rostro 20—40 mm longo incluso, ascendens, axi appressa, recurva vel pendula.

Iraq: Kurd.: Mosul: Prope Dihok, coll. ign. 15335! Mosul, AUCH. 203. Kirkuk: Inter Kirkuk et Altin Köprü, BORNM. 932! Tuz Khormatu, HAINES 715! 7 km NW Kirkuk, 390 m, RAWI 27940! 13 km N Kirkuk, 400 m, RAWI 10559! In collibus Kani Domlan, GUEST 4356! Jarmo, 800 m, HELBAEK 312!, HAINES! — Diyala: Prope Khanaqin, GUEST 13597!
Persia: W: Kermansh.: Qasr Shirin, SHAR. 5674-E! Inter Karand et Khanaqin prope Sar-i Pul, STR.! Lur.: Shah Bazan, 500 m, KOELZ 1446! Khuz.: 1 km E Andimeshk, BENT & WR.! Bandar-e Deylam, SOLTANI 6384-E! — S: Fars.: Gere inter Bushehr et Shiraz et Kuh-e Barfi, KY. 103! Inter Kumaraj et Dalaki, HAUSSKN.! (Typus *Enarthrocarpi tragiceras*).

Distr. gen.: Endem.

Anomalous in the genus on account of the long, torulose beak, and treated by O. E. SCHULZ in the monotypic section *Chondrosinapis*.

3. *Hirschfeldia*

Hirschfeldia MOENCH, Meth. 264 (1794).

Lit.: O. E. SCHULZ in ENGLER, Das Pflanzenreich, Cruciferae-Brassiceae, 70 (IV. 105): 136—143 (1919).

Herba annua vel biennis, floribus pallide flavis vel albis, foliis divisis, indumento e pilis rigidis consistente. Sepala erecto-patula, interiora leviter saccata. Fructus siliqua dehiscens, axi arcte appressa, rostro basi inflato. Cotyledones longitudinaliter plicatae.

1. ***H. incana*** (L.) LAGRÈZE-FOSSAT, Fl. Tarn. Gar. 19 (1847).
Syn.: *Sinapis incana* L., Cent. Plant. 1: 19 (1755). *Hirschfeldia adpressa* MOENCH, Meth. 264 (1794).
Icon.: Clavis p. 19.
Typus: „Hab. in Gallia, Lusitania, Hispania".

Herba annua vel biennis, 20—100 cm. Folia basalia rosulata mox emarcida, petiolata, lyrata; superiora ± sessilia, subsimplicia. Petala 8×3 mm. Pedicelli fructiferi crassi, axi appressi, 3—4 mm longi. Siliqua glabra vel pilis nonnullis laxe obsita, 12—15 mm longa, obscure 3-nervia, 3—9-sperma; rostrum 3—6 mm longum, sterile vel monospermum.

Iraq: Kurd.: Kirkuk: Tuz Khormatu, ROGERS 0360! Jarmo, HELBAEK 696! Darbandikhan, HASHIM 373! Kirkuk, BORNM. 925. Arbil: Inter Arbil et Shaqlawa, 1080 m, HELBAEK 731! Hawi Yanimjah, SHARNA AL DIN 5598! Sul.: Qara Dagh, GILLETT 7954! Mosul: Nimrud, HELBAEK 885! Mosul, Tigris, RECH. 1260! Diyala: Ad fl. Diyala, BARKLEY 7384! Jabal Darawishka, GUEST 1800! Khanaqin, Jabal Hamrin, HAINES!
Talish: Prope Kisilagach, HOHEN. Sallian, Lenkoran, C. A. MEY.
Persia: N: Gorg.: Gonbad-e Kavus, 150 m, MOONEY 6516! Malek Tappeh, MIRZAYAN 5845-E. Gorgan, GAUBA 268! Gil.: Lahijan, LINDS. 901! Prope Kaluraz, LIPSKY —

W: Kermansh.› Qasr Shirin, Evans. Bakht.: Chashmehghirin, Koelz 15287! Khuz.: Inter Dezful et Dehloran prope Shush, Nab. 1395. Behbehan, Esfand.! — S: Fars.: Bushehr, Bornm. 72, Stapf 210. Inter Shiraz et Persepolis, 800—1000 m, Schmid 5528! Shiraz, 1600 m, Rech. 15452! Dalaki, Stapf 211. Kerm.: M. Jebal Barez inter Bam et Jiroft, in declivibus borealibus infra Deh Bakri, 1800 m, Rech. 3739! Jiroft, Hamun-e Jaz Murian, 400 m, Starm. 86!

Distr. gen.: Tota Europa occidentalis et australis, Rossia australis et Asia austro-occidentalis usque ad Persiam australem.

4. *Diplotaxis*

Diplotaxis DC., Reg. Veg. Syst. Nat. 2: 628 (1821).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 70 (IV. 105): 149—180 (1919).

Herbae annuae vel perennes, glabrae vel hispidae, floribus flavis vel lilaciniis, foliis indivisis vel pinnatifidis. Sepala patentia, interiora non vel leviter saccata. Gynophorum saepe evolutum; ovarium polyspermum, seminibus biseriatis. Fructus siliqua linearis compressa dehiscens valvis uninerviis; siliqua breviter rostrata. Cotyledones longitudinaliter plicatae.

1a. Siliqua stipitata 2
b. Siliqua subsessilis vel sessilis ..... 3. *D. erucoides* (L.) DC.
2a. Petala lilacina lamina et ungue distinctis. Sepala inaequalia, interiora quam exteriora latiora ..... 1. *D. Griffithii* (Hook. f. & Thoms.) Boiss.
b. Petala flava; lamina in unguem sensim transiens. Sepala subaequala ..... 2. *D. Harra* (Forssk.) Boiss.

1. ***D. Griffithii*** (Hook. f. & Thoms.) Boiss., Fl. Or. 1: 388 (1867).
Syn.: *Brassica Griffithii* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 171 (1861).
Icon.: Clavis p. 19.
Typus (Syntypi): Afghanistan, Griff. 101, K!; Baluchistan, Stocks 707, K!; Punjab, Fleming.

Herba annua usque ad 30 cm alta, indumentum caulis et foliorum e pilis eglandulosis albis consistens. Folia petiolata ovato-lanceolata, dentata. Petala lilacina, 10—15 mm longa. Antherae acutae. Siliqua 35—65 × 1,5 mm, stipite c. 1 mm longo; pedicelli fructiferi 10—20 mm longi, erecto-ascendentes.

Afghanistan: E: Kabul: In valle Bagram, 1900 m, Neub. 4549. Khyber versus Jalalabad, Podlech 10181! In valle Kunar inter Chigha Sarai et Jalalabad, 600—800 m, Kerst. 663! — In agris ad „Oostad", Griff. 101! Reg. Kabul, Honigberger.
Pakistan: N. Wazir.: Miram Shah Fort, Fz. 306, 416, 809. Ad fl. Chasmai, Blatt. & Fz. 249. Ad fl. Tochi, Blatt. 496. Spinwam Fort, Meynell 245-a. Shewa Post, Blatt. & Fz. 868. Anghar, Meynell 753. — S. Wazir.: Dargai Post, Fz. 3781. — Bannu: Tutaki, 50 km N Bannu, 700 m, Rech. 30092! — Quetta: Gumbaz, Rech. 29644! Inter Duki et Gumbaz, 900 m, Rech. 29617! Prope Duki ad viam versus Sanjawi ducentem, 1150 m, Lamond 1334! — Baluchistan: Nushki: Padag versus Nushki, 700 m, Lamond 158!, Rech. 27311! Gati, Lace! Baluchistan, Stocks 707! Makran: 70 km NE Panjgur, 1100 m, Rech. 28220! Hoshab versus Panjgur, Lamond 583!, Rech. 30107!

Distr. gen.: Baluchistan, Waziristan, Afghanistan, Punjab.

2. ***D. Harra*** (FORSSK.) BOISS., Fl. Or. 1: 388 (1867).
Syn.: *Sinapis Harra* FORSSK., Fl. Aegypt.-Arab. 118 (1775).
Icon.: Clavis p. 11 et 13.
Typus: „Kahirae", FORSSK., C.

Herba annua vel perennis, 20—60 cm alta, indumentum caulis et foliorum e pilis rigidis albis consistens vel planta glabra. Folia petiolata, obovata vel late ovata, grosse dentata. Petala sulfurea, c. 10 mm longa. Antherae obtusae. Pedicelli fructiferi 1 cm longi, erecto-ascendentes vel pendentes. Siliqua 3—5 cm longa, manifeste stipitata, stipite 2—2,5 mm longo.

Iraq: Kurd.: Kirkuk: In faucibus Kifri prope Tuz Khormatu, GUEST 420. Kirkuk, BORNM. 924!, ROGERS! Diyala: Naft Khana, GUEST 1848. Kani Masi prope Khanaqin, 150 m, GUEST 1861! Jabal Hamrin, BORNM. 923, GUEST 1816! Amarah: Shatt at-Tib, 70 km N Amarah, RECH. 8930! Inter Dehloran et Amarah, NAB. 1321 — Khafaj, MADARI 3933!
Persia: N: Gil.: Inter Qazvin et Rasht, 500—1200 m, SCHMID 6592! Prope Rudbar, Manjil, 200—400 m, BORNM. 6297! Inter Manjil et Pachenar, BORNM. 6298. In valle Safid Rud prope Kaluraz, BORNM. 6297. — W: Kermansh.: 7 km E Qasr Shirin, MERTON 3226! Lur.: Posht Kuh, BEHB. 112! Khuz.: 15 km NE Haft Gel, BENT & WR. 503—202! In ruinis Shush et Tell, NAB. 1334. Khorramabad versus Dezful, FURSE 1168! Masjed Soleyman, FURSE 1208! — S: Fars.: Prope Shiraz, TROTT 913! Gere, inter Bushehr et Shiraz, KY. 35! Kazerun, GAUBA & SAB. 267!, STAPF!, HAUSSKN. Kumaraj, STAPF 209. Bushehr, Kotal-e Dokhtar, SOLTANI 6398-E! Inter Hajjiabad prope Tarom et Bandar Abbas, 700 m, RECH. 3370! Prope Bushehr, HORNER 171! Lar.: Bandar-e Lengeh, BORNM. 86! E Gardaneh-ye Bezan, Inter Bandar Abbas et Lar, 500 m, MERTON 3603! Kerm.: M. Jebal Barez inter Bam et Jiroft, 1600 m, RECH. 3813! Inter jugum Chah-e Chaghak et Tarom, 1400 m, RECH. 3200! Bal.: Makran: Sarbaz, SALAVATIAN 206-E! — C: Damgh.-Semn.: SE Kuh-i Nizwa, 2200 m, BEHB. & AELL. 1074! In desertis ad Sorkheh prope Semnan, 1600 m, RECH. 1223!, 2808! Qazvin: Ravandeh prope Karaj, GAUBA & SAB. 155! In montibus Halkedar ad Mardabad, 1300 m, RECH. 1027! Mardabad, GAUBA.
Afghanistan: E: Nangarhar: Torkham versus Jalalabad, 700 m, LAMOND 1908!, RECH. 31031!
Pakistan: Makran: Prope Panjgur, POPOV 172! 70 km NE Panjgur, 1100 m, RECH. 28247!

Distr. gen.: Africa borealis, Sinai, Syria, Palaestina, Iraq, Persia, Afghanistan, Pakistan occidentalis.

Very variable in leaf size: in some of the smaller specimens the lower leaves, including petiole, are c. 5 cm whereas in sturdier specimens the length may be as much as 20 cm. Long, scattered, white hairs are often characteristic of the species.

3. ***D. erucoides*** (L.) DC., Reg. Veg. Syst. Nat. 2: 631 (1821).
Syn.: *Sinapis erucoides* L., Cent. Plant. 2: 24 (1756).
Typus: „Hab. in Italia, Hispania, ad vias, vineas".

Herba annua, 15—40 cm alta; indumentum e pilis albis recurvis consistens. Folia basalia laxe rosulata, oblonga, lyrata vel pinnatisecta, petiolata; superiora sessilia, amplexicaulia. Petala 7—12 mm longa, alba, saepe violaceo-venosa, exsiccando purpureo-lilacina. Antherae obtusae. Pedicelli fructiferi 10 mm longi, erecto-ascendentes. Siliqua 20—40 × 1,5—2 mm, rostro conico usque ad 5 mm longo.

Iraq: Kurd.: Kirkuk: Tuz Khurmatu, 210 m, GUEST 1403! Kirkuk, ROGERS 0188! Darbandikhan, ISSAC 320! Diyala: Khanaqin, HAINES! 23 km N Jalula, MOHAMMAD 5090! Baquba versus Muqdadiya, RECH. 8967! Kut al Imara: Badrah, RECH. 9184!

-Persia: W: Khuz.: Inter Dezful et Dehloran, Nab. 1332. Posht Kuh, Mehran, Behb. 114, 118!

Distr. gen.: Europa austro-occidentalis, Europa centralis, Africa borealis, Regio Mediterranea usque ad Persiam australem.

5. *Eruca*

Eruca Miller, Gard. Dict. Abridg. ed. 4 (1754).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 70 (IV. 105): 180—190 (1919).

Herbae annuae foliis pinnatifidis, pilis simplicibus rigidis (raro glabrae), floribus flavescentibus manifeste brunneo- vel violaceo-venosis. Sepala erecta, interiora leviter saccata. Petala longe unguiculata. Stigma bilobum, lobis carpidialibus subdecurrentibus. Siliqua dehiscens, compressa, oblonga, rostro lato plano. Semina ± biseriata. Cotyledones longitudinaliter plicatae.

1. ***E. sativa*** Miller, Gard. Dict. ed. 8: 1 (1768).
Syn.: *E. sativa* Lam., Fl. Fr. 2: 496 (1778). *E. cappadocica* Reut., Catal. Hort. Genève 2 (1857). *E. lativalvis* Boiss., Fl. Or. 1: 396 (1867). *E. vesicaria* (L.) Cav. subsp. *sativa* (Miller) Thell. in Hegi, Ill. Fl. Mitteleur. 4, 1: 201 (1918).
Icon.: Clavis p. 19.
Typus: Non designatus.

Herba annua, 10—50 cm alta, foetida; caulis simplex vel ramosus. Folia basalia interdum rosulata, petiolata, lyrato-pinnatifida vel raro subintegra; folia superiora ± sessilia. Petala 15—21×5—6 mm, obovata. Pedicelli fructiferi axi appressi, 2—7 mm longi, c. 1 mm crassi. Siliqua 17—38×3,5 mm, rostro 5—9 mm incluso; valvae 1-nerviae, glabrae vel hispidae.

Iraq: Kurd.: Kirkuk: 25 km S Kirkuk, Rawi 10333! Kirkuk, Bornm. 927. Mosul: Nimrud, Helbaek 9491! — Diyala: Khanaqin, Rech. 9044! Jabal Hamrin, Bornm. 928, 1817, Haines 316!, Ludlow-Hewitt 1547!, Rawi 7316!, Guest 1817!, Sutherland 156. Diyala, Guest 1816! — Kut al-Imara: Chlat, Rawi 25716!
Persia: N: Gorg.: Dasht-e Gorgan, Shar. 573! Pahlavi Dezh, Gauba 265! Maz.: In valle Haraz E Emarat, 800 m, Wdb. 499! Kalar Dasht N Takht-i Suleiman, Furse 2835! Gil.: Kaluraz, Bornm. 6300-b. — W: Azerb.: Khvoy, Knapp. Tabriz, Gill.-Sm. 1483!, 1621!, 1707! Kermansh.: Qasr Shirin, Fahrahbakhsh 5639-E! Arak: Arak, 1800 m, Bornm. 2237, Str. Esf.: 32 km SE Esfahan, Furse 1355! Esfahan, 1600 m, Bornm. 2238. Khuz.: Andimeshk, Bent & Wr. 426—204! N Ahvaz, Wdb. 20! Shush, Nab. 1397, 1398. Lur.: Posht Kuh, Mehran, Behb. 110!, 111!, 318! Ham.: Hamadan, Sab. 264! Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 192! Khuz.: Inter Khorramabad et Dezful, 192 km N Dezful, Furse 1151! Abarqu, 1500 m, Grant 15289! — S: Fars.: Prope Ali Changi in ditione Bushehr, Nab. 1342. Bushehr, Bornm. 81!, Koelz 14844!, Stapf 208!, Koeie 54!, Horner 17—18! Jahrom, Koelz 14559! Shiraz, 1600 m, Grant 15453! Lar.: Minab, Popov 20! In arenosis ad Bandar Abbas, Bornm. 82! In ins. Hormoz, Bornm. 84. In ins. Qeshm, Bornm. 83. Ad sinum Persicum, Auch. 4169 (Typus *E. lativalvis* Boiss.). Parabedin, Mird. 263! Kerm.: Kerman, 1900 m, Bornm. 2241! Khabis, Bge. — E: Khor.: In montibus inter Bojnurd et Tappeh-ye Moraveh, 1300 m, Rech. 1928! Inter Mashhad et Quchan, 1200 m, Rech. 1602! In agris incultis inter Birjand et Qayen, 1900 m, Rech. 4174! 96 km SE Mashhad, 1220 m, Furse 5299! Showkatabad prope Birjand, 1400 m, Rech. 4147! — C: Tehr.: Tehran, 1200 m, Zargari, Schmid 5094! Inter segetes ad Garmsar, 900 m, Rech. 2771-b!, 2775! Mahmudiyeh 15 km N Tehran, Aell. 1006!

Qazv.: In montibus prope Karaj, Gauba. Prope Karaj, Rech. 533! 36° 30′ N, 51° E, Jacobs 6160! Damgh.- Semn.: Qomrud Pain, Behb. & Aell. 1018! Yazd: Inter Qom et Jandaq, Gabr. 72. Qom, 900 m, Bornm. 2239. Inter Yazd et Qom, 1700 m, Bornm. 2240. Turcomania: Kizyl Arvat, Sint. 1659, Becker.
Afghanistan: NW: Roznak, Aitch. In valle fluvii Hari Rud, Tirphul, Aitch. 225!, 261! — SE: Kandahar: Pirzada, 900 m, Koeie 2024! Kandahar, Gilli 1198! Inter Kandahar et Girishk, 1000 m, Kerst. 281. — E: Kabul: Paghman, Hdg. & Wdb. 2817! Kabul, Volk 97, 98, 303!, Hay 113!, Gilli 1199!, Neub. 3039!, Kitam. Charikar, 1580 m, Kerst. 57. In planitie Koh-e Daman, 1750 m, Gilli 1201! In valle Panjshir inter Dasht-i Rewat et Deh Khawak, 2300 m, Hdg. & Wdb. 5316! Inter Kabul et Ghazni, 1800 m, Gilli 1200! Ghazni: In monte ad occidentem jugi Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 17399! Erak, Griff. — NE: Wakhan: Qala Panja, Lindb. 1081! Badakhshan: In valle fluvii Warduj, 96 km W Faizabad, 900 m, Furse 6471! Kataghan: Ishkamish, 1150 m, Podlech 10755. Inter Taliqan et Mashhad, Furse 6073!, Taliqan, 720 m, Podlech 10429. In declivibus borealibus jugi Salang, 3100 m, Lamond 2225! In valle Andarab NE Deh Salah, 1800 m, Podlech 11666. In faucibus fluvii Balkh supra Akupruk, 700 m, Rech. 16292! Inter Haibak et Mazar-i Sharif, Kitam. — C: Bamian: Lorinj, 2700 m, Koelz 13710! Inter Bulola et Doab, Kitam.
Pakistan: Swat: Inter Mingora et Khwazakhiela, 900 m, Rech. 30508! — Kohat: In declivibus australibus jugi Kohat, 900 m, Rech. 30151!, Lamond 1547! — N. Wazir.: Datta Khel, Blatt. & Fz. 1503. — Quetta: Loralai distr., Loralai Gaz. 364. Loralai, Jafri & Akhar 2300! Prope Sanjawi, 1500 m, Rech. 29581!, Lamond 1322! Sibi, Gaz. 94. Quetta, Rech. 28804!, Lamond 946! — Baluchistan, Pierce!, Lace!

Distr. gen.: Europa occidentalis, centralis et australis, Africa borealis, Asia austro-occidentalis.

A variable species, with an uncertain wild distribution in which several infraspecific taxa have been recognised (cf. O. E. Schulz l. c.) A common weed of cultivated and fallow fields, sometimes cultivated as a salad plant, for medicinal uses or for the extraction of oil from its seeds.

6. *Raphanus*

Raphanus L., Spec. Plant. 669 (1753). Gen. Plant. ed. 5: 300 (1754).

Lit.: A. Thellung in G. Hegi, Illustrierte Flora von Mittel-Europa 4: 272—286 (1918). O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 70 (IV. 105): 194—210 (1919). F. Markgraf in G. Hegi, Illustrierte Flora von Mittel-Europa, ed. 2, 4: 499—514 (1963).

Herbae annuae vel perennes, foliis lyrato-pinnatifidis, pilis rigidis albis, floribus albis vel violaceis (raro flavis). Sepala erecta, interiora leviter saccata. Glandulae nectariferae medianae semiglobosae. Ovarium bipartitum, 2—20-ovulatum; stigma parvum, capitatum. Fructus biarticulatus; segmentum inferius breve, pedunculiforme, sterile; superius longe cylindricum, indehiscens, inter semina constrictum vel inconstrictum. Cotyledones longitudinaliter plicatae.

1. ***R. Raphanistrum*** L., Spec. Plant. 669 (1753).
Icon.: Clavis p. 19.
Typus: „Hab. inter segetes Europae".

Herba annua, hispida, 15—50 cm alta. Folia basalia non rosulata, petiolata, lyrata. Petala 14—17×4—8 mm, alba, pallide rosea, lilacina vel flava, plerumque atrovenosa. Pedicelli fructiferi 10—30 mm longi, erecto-ascendentes. Siliqua 14—66×3—7 mm. Semina reticulata.

1a. Siliqua 3,5—4 mm crassa; rostrum 10—30 mm longum ..... a.) subsp. *Raphanistrum*

b. Siliqua ultra 5 mm crassa; rostrum 15—70 mm longum ..... b.) subsp. *rostratus* (DC.) Thell.

— — subsp. ***Raphanistrum***

A widespread weed in Europe, N Africa and SW Asia. Although no specimens have been seen it is unlikely that it is absent from our area.

— — subsp. ***rostratus*** (DC.) Thell. in Hegi, Ill. Fl. Mitteleur. 4: 279 (1918).
Syn.: *R. rostratus* DC., Reg. Veg. Syst. Nat. 2: 666 (1821).
Typus: „Hab. in Persia boreali prope Lenkoran", Fisch., G.

Iraq: Diyala: Jabal Hamrin, Sutherland 171.
Talish: Grossh. Kisilagach, Hohen.

Distr. gen. subspeciei: Asia austro-occidentalis.

R. sativus L., the cultivated radish, is of unknown but probably hybrid origin. It has a stout napiform root and an inflated fruit scarcely constricted between the seeds (5—12). It is not known in the wild state but is widely grown throughout much of the world. Some of the records of *R. sativus* from our area are cited here:
Persia: N: Gorg.: Bandar-i Gaz, Sint. 1477. Gil.: Bandar-e Pahlavi, ins. Mianposhteh, Bornm. 6301. — W: Azerb.: M. Sahand, Buhse. — S: Kerm.: Prope Kerman, 2200 m, Bornm. 2242.
Afghanistan: E: Kabul, Gilli 1203! Ghazni: Versus Sardalu W Qarabagh, Rech. 17349! — NE: Badakhshan: In valle Warduj, Furse 6405!
Pakistan: Quetta: Sariab, 1700 m, Rech. 28816!, 28819!
Some of the cultivated forms approach *R. Raphanistrum*.

7. *Enarthrocarpus*

Enarthrocarpus Labill., Icon. Pl. Syr. 5: 4 (1812).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 70 (IV. 105): 210—218 (1919).

Herba annua foliis lyratis, indumento brevi e pilis simplicibus albis consistente, floribus pallide flavis purpureo-venosis. Calyx apertus, non saccatus. Glandulae nectariferae medianae clavatae. Siliqua cylindrica torulosa biarticulata, rostrata. Cotyledones longitudinaliter plicatae.

1. ***E. lyratus*** (Forssk.) DC., Reg. Veg. Syst. Nat. 2: 611 (1821).
Syn.: *Raphanus lyratus* Forssk., Fl. Aegypt. Arab. 119 (1775).
Icon.: Clavis p. 19.
Typus: Aegyptus: „Prope pyramides Gizenses ad agrorum margines et in insula Djesiret ed dahab inter arundines copiose; Flor. Jan.", Forssk., C.

Herba annua, 5—50 cm alta, a basi ramosa. Folia basalia petiolata, lyrato-pinnatisecta; folia superiora breviter petiolata. Racemi inferne bracteati. Petala 7 mm longa, anguste spathulata. Pedicelli fructiferi 2,5—6 mm longi. Siliquae articulus inferior 7—14 mm longus, 1—3-spermus; articulus superior inferiore duplo longior, 3—6-spermus, rostro 4—5 mm longo.

Pakistan: Bal.: Makran; Palmer.

Distr. gen.: Aegyptus, Arabia, Cyprus, Palaestina, Pakistan.

Only known from our area on the basis of the cited specimen which was recorded by Lewin in Engler, Bot. Jahrb. 56, 123: 34 (1921). The record needs confirmation.

8. *Calepina*

Calepina Adans., Fam. 2: 423 (1763).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 70 (IV. 105): 225—227 (1919).

Herba annua vel biennis glabra, floribus albis, foliis basalibus lyrato-pinnatifidis. Sepala non saccata. Filamenta lata, ± dilatata. Ovarium uniovulatum; stigma capitatum, sessile. Pedicelli fructiferi erecti, tenues. Fructus ovoideus, indehiscens. Cotyledones latae, radiculam versus involutae, basi radiculam incumbentens amplectantes. — Genus monotypicum.

1. ***C. irregularis*** (Asso) Thell. in Schinz & R. Keller, Fl. Schweiz ed. 2, 1: 218 (1905).
Syn.: *Myagrum irregulare* Asso, Syn. Stirp. Arag. 82 (1779).
Calepina Corvinii Desv., Journ. Bot. Appl. 3: 158 (1814).
Icon.: Clavis p. 9.
Typus: Non designatus.
Herba annua 15—70 cm alta, simplex vel a basi ramosa. Folia basalia saepe rosulata; superiora oblongo-lanceolata, amplexicaulia, sagittata. Petala 2—3 mm longa. Pedicelli fructiferi 6—12 mm longi, sursum curvati. Fructus 2—3 mm longus, 2 mm latus, apice in rostrum breve conicum attenuatus, superficie indistincte reticulata.

Iraq: Kurd.: Kirkuk, Bornm. 929. Jarmo prope Chamchamal, Haines 360; Helbaek 534!, 581! Arbil: 5 km N Shaqlawa versus Harir, 700 m, Erdtman & Goedemans in Rech. 15575! Mosul: Amadiyah, Guest 1218!, 1253! Mosul, Bayliss 11! Sul.: Dukan, Barkley & Haddad 7597! Qarachitan prope Pira Magrun, 900 m, Gillett 7698! Diyala: Khanaqin, Haines! Inter Kani Kirmaj et Haji Lar, Poore 476!
Talish: In pratis arenosis prope Lenkoran, Hohen.
Persia: N: Maz.: In valle Haraz: Zardman, Wdb. 369! — W: Kermansh.: Inter Bisotun et Sallian, Str. Qasr Shirin, Koelz 17053! Lur.: Gilan-e Gharb, Behs. 103! Posht Kuh, Khas Ali, Behs. 108! Khorramabad, Gauba & Sab. 261! Khuz.; Kuhanak inter Shushtar et Dezful, Nab. 1387 — S: Fars.: Inter Shiraz et Firuzabad, Gauba. Fars, Ky. — C: Qazv.: Fashand prope Karaj, 1000 m, Gauba 1387.
Turcomania: Ashkhabad, in pratis montanis supra Nephton, Sint. 78.

Distr. gen.: Europa australis, Africa borealis, Asia austro-occidentalis.

9. *Crambe*

Crambe L., Spec. Plant. 671 (1753). Gen. Plant. ed. 5: 310 (1754).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 70 (IV. 105): 228—249 (1919).

Herbae validae perennes radicibus magnis palaribus vel herbae tenues annuae, glabrae vel pilis simplicibus obsitae. Calyx erectus, sepalis interioribus leviter saccatis. Petala alba. Filamenta staminum interiorum appendicibus erecto-patentibus dentiformibus provisa, raro edentula. Ovarium biloculare, loculis uniovulatis. Fructus indehiscens biarticulatus; segmentum superius globosum monospermum; inferius sterile stipitiforme. Cotyledones longitudinaliter plicatae.

1a. Herba annua monocaulis ..... 1. *C. hispanica* L.
b. Herbae perennes pluricaules 2
2a. Segmentum superius fructus manifeste rugosum. Pedicellus fructifer 10—40 mm longus. Folia inferiora cordata ..... 2. *C. Kotschyana* Boiss.
b. Segmentum superius fructus laeve. Pedicellus fructifer 4—10 mm longus. Folia inferiora numquam cordata ..... 3. *C. orientalis* L.

1. ***C. hispanica*** L., Spec. Plant. 671 (1753).
Syn.: *C. gracillima* Rech. f., Phyton 3: 45 (1951), syn. nov.
Typus: „Hab. In Hispania".

Herba annua usque ad 60 cm alta, pilis albis rigidis obsita caule profunde sulcato, inflorescentiae ramis longis gracilibus. Folia longe petiolata, membranacea, pinnatisecta, lobo terminali reniformi, lobis lateralibus 1-jugis vel folia integra ovata, subcordata, irregulariter dentata. Petala alba, 2—4 × 1—2 mm. Stamina dentata. Pedicelli fructiferi 5—10 mm longi, tenues, erecto-patuli vel axi appressi. Segmentum inferius fructus 0,5—1 mm longum, pedicello paulo crassior; segmentum superius laeve, globosum 2,5—3 × 2,5—3 mm.

Persia: W: Khuz.: Siachal, Koelz 15249! (Typus *C. gracillimae* Rech. f.). Lur.: Sheshom, 700—750 m, Jacobs 6423! — S: Fars.: Kazerun, Haussk.n.

Distr. gen.: Passim per Regionem Mediterraneam ab Hispania usque ad peninsulam Balcanicam; Palaestina, Persia.

The only annual species in our area. A review of this widely distributed species might reveal that sub-specific taxa could be recognised, but with the rather scanty material at hand there are no reasons for regarding the Persian specimens as different from those of the East Mediterranean.

2. ***C. Kotschyana*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 19 (1845).
Icon.: Clavis p. 9.
Typus: Ky. 380, W!

Herba perennis gigantea usque ad 2 m alta, ramosissima, glabra vel pilis simplicibus parce obsita. Folia basalia cordata vel subreniformia, usque ultra 50 cm lata, petiolo laminam aequante, lobata vel irregulariter dentata; caulina breviter petiolata, ovata, acuta. Racemi laxi. Petala (4—) 6—10 × (2—) 4—6 mm, alba. Pedicelli fructiferi 10—40 mm longi, erecto-patuli vel suberecti. Segmentum inferius fructus 1,5—3 × 0,5—1 mm, superius (3—)4—6,5 × 4—6 mm, reticulato-nervosum.

Persia: N: Maz.: 48 km S Shahi, Furse 2918! In valle Haraz supra Panjab, 1500 m, Wdb. 318! In vallo fluvii Talar prope Abbasabad, 1500 m, Gauba & Sab. 273! Inter jugum Gaduk et Abbasabad, 1600 m, Rech. 1984! — S: Fars.: Sabz Pushan prope Shiraz, Ky. 380! Makran: Sirah prope Nikshahr, Hotson. Khash, H.-B. 19105. — E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4639! Inter Shirvan et Bojnurd, Rech. 1842! Inter Binabad et Neyshabur, Czern. Kuh-e Hazar Masjed, inter Ardak et Talqur, 1200—1600 m, Rech. 4990! In montibus inter Birjand et Qayen, 1900 m, Rech. 4169! Mashhad, 1520 m, Furse 5268!
Turcomania: Kizyl Arvat, Kuntze. Ashkhabad, Durun, Radde 74. Chuli, Radde 581. Kara Kala, Sint. 1761! Suluklü, Sint. 128-b. Nephton, Sint. 128-a! In montibus prope Ashkhabad, Litw. 224!
Afghania: NW: Maimana: Belchiragh, 1200 m, Hdg. & Wdb. 3773! Herat: Tirphul, Hari Rud, Aitch. 244! Badghiz, Sim Koh, Aitch. Prope Qala Nao, 700 m, Koelz 3539! Obeh versus Khwajachisht, 1800 m, Koelz 3663! — E: Kabul: Sher Darwasa, Gilli

1207!, KOELZ 11416! NEUB. 511!, HDG. & WDB. 2921!, KERST. 98. Tang-e Gharu, HAY 67!, NEUB. 4050. Top Darra, 1800 m, VOLK 2555! Charikar, SUZUKA. — **NE**: Kataghan: In declivibus W Farkhar, 1600 m, PODLECH 10560. Koh-i Ishkamish, 7 km SE Ishkamish, 1500 m, PODLECH 10630. — **C**: Bamian: Inter jugum Shibar et Doshi, 1670 m, FURSE 5851!

Pakistan: S.-Wazir.: Shindar, Fz. 1595. Quetta: Urak, CROOKSHANK 93!, LACE 3751! Harnai, LACE. Hindubagh, H.-B. 19868, 19869. Qila Saifulla, H.-B. 19172. Quetta, REPP! — Bal.: Chagai distr.: Nushki, H.-B. 17303. — Doband, STOCKS!

Distr. gen.: Caucasus usque ad Asia centralem.

Study of fairly abundant material showed that, despite the large range of petal size and fruiting pedicel length, there were no clear grounds for recognising sub-specific taxa. *C. Kotschyana* is clearly very closely allied to *C. cordifolia* STEV. but in the latter species the stems are glabrous, the leaves are of thinner texture and usually more coarsely toothed. It is only known from the Ciscaucasus.

3. ***C. orientalis*** L., Spec. Plant. 671 (1753). s. l.

Incl.: *C. juncea* M. B., Fl. Taur.-Cauc. 3: 421 (1819). *C. persica* BOISS., Fl. Or. 1: 407 (1867). *C. edentula* FISCH. & C. A. MEY. ex KORSH., Bull. Acad. Sci. Petersb. 5 ser. 9 (5): 421 (1898). *C. aculeolata* (N. BUSCH) CZERN. in Fl. URSS. 8: 488, 651 (1939).

Icon.: Clavis p. 17.

Typus: „Hab. in Oriente", TOURNEFORT.

Herba valida perennis usque ad 1,5 m alta, inferne hispida raro glabra; inflorescentia ampla ramosissima laxa. Folia hispida, basalia; lamina usque ad 40 cm longa, pinnatipartita, irregulariter dentata; petiolus usque ad 20 cm longa; folia superiora multo minora, breviter petiolata. Petala 3—5 × 1,5—3 mm, breviter unguiculata, alba, raro flava (var. *sulphurea* STAPF). Pedicelli fructiferi 4—10 mm longi. Segmentum superius fructus 3,5—4 × 3,5—4 mm, inferius 0,5—1 mm longum.

Iraq: Kurd.: Arbil: Jabal Qarachoq, 700 m, GILLETT 11230!

Talish: Swant, C. A. MEY.

Persia: **N**: Gorg.: Shah Kuh, KOELZ 16327! Maz.: In valle fluvii Chalus, 2200—2600 m, Pol-e Zanguleh, RECH. 6388! — **W**: Azerb.: Ad lacum Rezaiyeh, 1400 m, JACOBS 6648! Rezaiyeh, FURSE 2224! Supra Senjanab et Sahand, GILL.-SM. 2511. In collibus Sahand, COWAN & DARLINGTON 1856! Tabriz, GILL.-SM. 1583! Khosrava prope Shahpur, KNAPP. Ham.: Inter Kangavar et Tuysarkan, STR. Inter Gerrus et Kangavar-e Kohneh, STR. Lur.: Posht Kuh, BEHB. 20 km S Borujerd, inter Borujerd et Khorramabad, BENT & WR. 508—301! 48 km W Azna, FURSE 1528! Arak: „Chaladschistan" prope Arak, STR. — **S**: Fars.: Didegan, 200 m, PRAVITZ 722. Kerm.: Inter Baghin et jugum Sang Bur, RECH. 2992! Inter Saidabad et jugum Chah-e Chaghak, 1800 m, RECH. 3135! 100 km S Yazd versus Kerman, RECH. 27138. — **C**: Tehr.: In montibus prope Shahrestanak, 2200 m, BORNM. 6304!, 6305. Ad pagum Ferosad prope Shimran, 1700 m, BORNM. 6303. Pul-i Jaji Rud, BRUNS. In montibus Elburs prope Darband, KY. 683. Polur, GILLI! Damavand prope Polur, 2400 m, WDB. 2058!, AUCH. 4131! Qazv.: Gach Sar, 80 km NE Karaj, FURSE 2643! In valle Loura, BUHSE. Soltanabad prope Qazvin, LINDS. 164. Fashand, 1600 m, GAUBA 1396. In montibus ad pagum Kalak, RECH. 112! In alveo fluvii Karaj, RECH. 196! Inter Zamanabad et Qazvin, STAPF. Qazvin, BORNM. 6304-b. Karaj, KOELZ 33457!, RECH. 7121. Damgh.-Semn.: Kuh-i Nizwa, in declivibus borealibus Shahmirzad Kuh, 2500 m, WDB. 1302! Inter Firuzkuh et jugum Bashm, 2000 m, RECH. 1177! In parte superiore fluvii Chashmeh-i Ali, SE Kuh-e Nizwa, 2000 m, AELL. 1007! Qomrud Pain, 60 km E Firuzkuh, 2200 m, AELL. 1000! Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 2300 m, RECH. 5901!

Turcomania: Kizyl Arvat, BECKER. In montibus Kopet Dagh [illegible]. 652 466.

Afghanistan: **NW**: Herat: Khwajachisht, 1700 m, KOELZ [illegible]!

Distr. gen.: Ab Anatolia usque ad Asiam centralem.

A very broad view has been taken of this species. It contains many specimens that have been previously treated as varieties or species. It is inadvisable to split off further taxa, defined by very narrow differences, without a revision of the species throughout its range, and, in particular, detailed study of the Russian species; conf. Fl. URSS. 8: 477—491 (1939). Although I consider that the cited specimens, although variable, should be regarded as one species complex; the following are anomalous:
A. — A form with very large petals 7—9×3,5—5 mm.
Afghanistan: NW: Herat: Obeh, Lindb. 75!, 766! — C: Bamian: Farakulum, 3000 m, Koelz 3006! Deh Kundi, 2700 m, Edelb. 1933!
B. — Smaller plants than the typical form with leaves almost all basal and irregularly pinnatisect.
Afghanistan: E: Ghazni: Distr. Malestan inter Miradina et jugum Ghoutch Kol, N Sang-i Masha, 3300 m, Rech. 17604! In jugo Ghoutch Kol NNE Sang-i Masha, 3300 m, Rech. 17645! — C: Bamian: In faucibus Paimuri, 2700 m, Hdg. & Wdb. 4690! Inter Unai et jugum Hajigak, 2950 m, Hdg. & Wdb. 4579! Panjao, 2700 m, Koelz 1978!

These probably represent distinct subspecies but I have deferred formal description of them till a more general comprehensive account of the complex is available.

10. *Rapistrum*

Rapistrum Crantz, Class. Crucif. 105 (1769).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 70 (IV. 105): 252—261 (1919).

Herbae annuae floribus flavis vel albis, foliis lyrato-pinnatifidis, indumento hispido. Sepala erecto-patula, interiora leviter saccata. Ovarium 1—3-ovulatum; stigma capitatum. Silicula biarticulata, rostro recto; articulus superior ± sphaericus, indehiscens, monospermus; articulus inferior superiore angustior, cylindricus, dehiscens. Cotyledones longitudinaliter plicatae.

1. ***R. rugosum*** (L.) All., Fl. Pedem. 1: 257 (1785).
Syn.: *Myagrum rugosum* L., Spec. Plant. 640 (1753).
Icon.: Clavis p. 17.
Typus: „Hab. in Europa australis".
Herba annua usque ad 1 m alta. Caulis basi longe retrorse hispidus. Folia inferiora petiolata, lyrato-pinnatifida, superiora sessilia integra. Petala 8×4 mm, flava, venis intensius flavis. Pedicelli fructiferi crassi, axi appressi. Silicula 6—10 mm diametro, glabra vel hispidula; articulus inferior 2—3×1,5 mm, 1—3-spermus, interdum sterilis; articulus superior monospermus; rostrum 1—4 mm longum.

Iraq: Kurd.: Mindan, Rawi 11356.
Talish: Kisilagach, Hohen. 144. Lenkoran, C. A. Mey.
Persia: N: Maz.: In valle Haraz prope Emarat, 500 m, Wdb. 491! Chalus, Furse 2864! Babol Sar, Esfand. 5646-E! In montibus Elbursensibus prope „Surcharieh", Buhse. Gil.: Prope Kaluraz in valle fluvii Safid Rud, Buhse. Ispili, Linds. 1201. — W: Azerb.: Qareh Dagh prope Qeshlaq, Buhse. Tabriz, Gill.-Sm. 1571, 1690. — E: Khor.: In valle fluvii Atrak inter Shirvan et Bojnurd, Rech. 1800-a!, 1804! Bojnurd, Esfand. 286! Chanaran, Sab. 259! Mashhad, Rech. 4856! Inter Ardak et Talqur, M. Hazar Masjed, Rech. 5016! — C: Damgh.-Semn.: Qomrud Pain, 2200 m, Behb. & Aell. 1001! Shahr.-Bust.: In jugo Khash Aylan, c. 70 km ab oppido Shahrud orientem versus, 2000 m, Rech. 5499!
Turcomania: Ashkhabad, Sint. 290. Karakala Sint. 1759!

Distr. gen.: Europa occidentalis, australis et centralis, Africa borealis, Rossia australis, Caucasia, Syria occidentalis, Anatolia, Iraq, Persia, Talish, Turcomania.

Very variable in the size and shape of the fruit. Several sub-specific taxa have been recognised throughout its range. The most commonly cited are:

a) *orientale* — fruiting pedicel thinner than in b) and 1,5—3× length of the narrow straight lower part of the fruit;

b) *rugosum* — fruiting pedicel thick, as long as 1,5× length of the elliptic lower fruit member;

c) *Linnaeanum* — fruiting pedicel narrow, 2—5× length of the stalk-like lower fruit member.

There is complete intergradation of these three taxa in our area. A range of different fruit types is illustrated in Flora of Turkey 1, fig. 11, tab. 17—21 (1965).

11. *Erucaria*

Erucaria Gaertn., Fruct. Sem. Pl. 2: 298 (1791).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 84 (IV. 105): 8—18 (1923).

Herbae annuae glabrae vel pilis simplicibus obsitae, foliis pinnatisectis, floribus roseo-violaceis. Sepala erecta, non saccata, linearia. Stigma capitatum. Siliqua ± cylindrica, biarticulata, segmentis ambobus fertilibus, inferiore dehiscente septato, superiore in toto deciduo, non septato. Cotyledones variabiles, aut laxe spiraliter involutae, aut replicatae aut rectae. Radicula incumbens.

1a. Siliqua omnino erecta. Stylus filiformis ..... 1. *E. hispanica* (L.) Druce

b. Siliqua parte inferiore erecta, superiore recurva. Stylus conicus.....
..... 2. *E. cakiloidea* (DC.) O. E. Schulz

Sect. *Erucaria*

Segmentum superius fructus erectum in stylum filiformem abrupte contractum.

1. ***E. hispanica*** (L.) Druce, Rep. Bot. Exch. Club Brit. Is. 3: 418 (1914).
Syn.: *Sinapis hispanica* L., Spec. Plant. 669 (1753). *Erucaria aleppica* Gaertn., Fruct. Sem. Pl. 2: 298 (1791). *E. lineariloba* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 290 (1842). *E. grandiflora* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 13 (1845). *E. myagroides* (L.) Halacsy, Consp. Fl. Graec. 1: 123 (1900).

Lit.: B. L. Burtt, Kew Bulletin 1949: 288—290 (1949).

Icon.: Clavis p. 11 et 19.
Typus: Hispania, Hort. Cliff., BM.

Herba annua vel biennis usque ad 60 cm alta. Folia petiolata, ± carnosa, pinnatisecta, lobis linearibus vel oblongis, raro subintegra. Petala 11—14×3—4 mm, ungue 6—8 mm longo incluso. Pedicelli fructiferi 2—3 mm longi, axi appressi, crassi. Siliqua 11—17 mm longa; articulus inferior 4—6 (—9)×1—1,5 mm, superior 3—6 (—8)×1—3 mm; rostrum 2—5 mm longum.

Iraq: Kurd.: Kirkuk: Tuz Khormatu versus Tauq, 220 m, Gillett & Rawi 7454!, Kirkuk, Ali 3857, Rogers 0187! 8 km N Kirkuk, Barkley & Brahim 4543! 40 km N Kirkuk, Barkley & al. 1353! Ad fluvium Zab prope Kirkuk, Grigg 33! Diyala: Prope Jalula, Barkley & Mohamed 4366! Koma Sang prope Mandali, 300 m, Guest 1747! Mandali, Rech. 9631!, 12794! Jabal Darawishka prope Khanaqin, 240 m, Guest 1756! Khanaqin, Haines 983!, Guest 13596! Ruz, Sutherland 170! Amarah: Wadi at-Tib, Rech. 8875! et in exsicc. Univ. Baghdad 156. Kut al Imara: Badrah, Rech. 9185!

Persia: W: Bakht.: Gaomis, Koelz 15453! Khuz.: In planitie Karim, Graham. Dehloran, Nab. 1386. Inter Kuhanak et Dezful prope Shushtar, 150 m, Nab. 1394. N Ahvaz, Wdb.1! Khorramabad versus Dezful, Furse 1175! Gatvand prope Dezful, Mart.-Escal. Haft Tappeh, Bent & Wr. 427—202! In planitie prope Shush, Furse 1182! Rud-e Dez, 40 km a Shush, Gomb. & Jov. Lur.: 3 km S Bagh-i Sarab, inter Khorramabad et Andimeshk, Bent & Wr. 418—204! Posht Kuh, Behb. 120! Ilam, 400 m, Jacobs 6262! — S: Fars.: In ins. Khark, Grant 17113! Inter Bushehr et Shiraz, Ky. 74! (Typus *E. grandiflorae* Boiss.). Bushehr, Stapf 198!, Ky. 4148, Horner 24!, Koelz 198!, Bornm. 67, Koelz 14814! Jahrom, Koelz 14540! Inter Shiraz et Kazerun, Gauba & Sab. 256! Kotal-e Malu, Koelz 14808! Maharlu prope Shiraz, Gauba & Sab. 257! Bushehr, Auch. 4140! (Typus *E. linearilobae* Boiss.). Pireh Zan prope Shiraz, 1300 m, Gauba & Sab. 255! 64 km W Kazerun, Stutz 890! Lar.: Hormud-e Bagh, 800 m, Behb. 247! Hajjiabad prope Tarom, 900 m, Rech. 3248! Parabedin inter Saidabad et Bandar Abbas, Mird. 165! Bandar Abbas, Bornm. 70! Inter Bandar Abbas et Minab, Merton 3550! Bandar-e Lengeh, Bornm. 68. Minab, Popov 16! In ins. Hormoz, Bornm. 69. Ins. Qeshm, Bornm. 70-b. Makr.: Iranshahr, Manuch. 5633-E! Biaban: Bahmadi, Behb. 212-E! Kerman: Inter Saidabad et jugum Chah-e Chaghak, 1800 m, Rech. 3177!, 3184! Hamun-e Jaz Murian, Shahdab, Starm. 108! — C: Tehr.: Inter Tehran et Shimran, Deicke 463.

Distr. gen.: Europa australis, Africa borealis, Cyprus, Anatolia, Syria occidentalis, Iraq, Persia, Arabia.

Sect. *Hussonia* (Boiss.) O. E. Schulz

Segmentum superius fructus recurvatum, in stylum conicum sensim attenuatum.

2. ***E. cakiloidea*** (DC.) O. E. Schulz, Bot. Jahrb. 54, 3: 56 (1916).
Syn.: *Raphanus* (?) *cakiloideus* DC., Reg. Veg. Syst. Nat. 2: 669 (1821). *E. hamrinensis* Bornm., Mitt. Thür. Bot. Ver. 27: 23 (1910).
Icon.: Clavis p. 11 et 19.
Typus: „Hab. in Oriente inter Mossul et Baghdad", Olivier.

Herba annua vel biennis usque ad 40 cm alta. Folia petiolata, pinnatisecta, lobis linearibus, glabra vel pilosa. Petala 11—15×4—6 mm, apice rotundata vel retusa. Pedicelli fructiferi 1,5—3 mm longi, crassi, axi appressi. Siliquae articulus inferior 5—9×c. 1,5 mm; articulus superior stylo incluso (11—) 18—24×3—4 mm; articuli ambo seminiferi; valvae glabrae vel pilosae in segmentis superioribus semina in constrictionibus sita.

Iraq: Kurd.: Kirkuk: In montibus prope Kirkuk et Baba Gurgur, Guest 1359! Kirkuk, Barkley & Selman 7713!, Rech. 14109!, Rogers 0187! In desertis prope Kirkuk, 400 m, Bornm. 934; 400 m, Bornm. 933! (Typus *E. hamrinensis* Bornm.) Ad fluvium Diyala 7 km S Darbandikhan, Mughair & al. 117! Tuz Khormatu, Guest 667. Mosul: Qaiyara, Bayliss 71! Diyala: 10 km S Khanaqin, Rech. 9069! Khanaqin, Haines! Shahraban versus Jalula, Rech. 9002! Jabal Hamrin N Mansuriyah, Barkley & al. 6874. Jabal Hamrin, Haines 317!, 722!, Guest 1784!, Nab. 1345. Jabal Kumatas inter Keyrabad et Khanaqin, 200 m, Nab. 1346. Amarah: Shatt at-Tib, 70 km N Al-Amarah, Rech. 8903!, 8910! 30 et 60 km SE Badrah, Rech. 9125!, 9158!
Persia: W: Kermansh.: Qasr Shirin, Shar. 5666-E! Sar-i Pul E Karand, Str. Lur.: Posht Kuh, Halat-e Mehran, Behb. 113!, 116!

Distr. gen.: Endem.

Similar facies to the preceding species but with delicate leaf divisions. Often growing together with *E. hispanica* and possibly, although no convincing specimens have been seen, hybridising with it.

12. *Cakile*

Cakile MILLER, Gard. Dict. 1: 118 (1754).

Lit.: O. E. SCHULZ in ENGLER, Das Pflanzenreich, Cruciferae-Brassiceae 84 (IV. 105): 18—28 (1923). E. POBEDIMOVA, A Review of the genus Cakile, Zhurn. Bot. 48, 12: 1762—75 (1963); Genus Cakile, Novit. Syst. Leningrad (1964); 90—128 (1964).
Icon.: l. c.: 95.

Herba annua, glabra (raro pili simplices obsita), ± succulenta, foliis simplicibus vel pinnatifidis, floribus roseis vel violaceis. Calyx erectus; sepala interiora leviter saccata. Siliqua biarticulata, articuli trinervii ± tetragoni, superior ab inferiore disarticulatus. Radicula incumbens vel accumbens.

1. ***C. arabica*** VELEN. & BORNM., Feddes Repert. 9: 114 (1911).
Icon.: Clavis p. 11; tab. 1, fig. 1.
Typus: Central Arabia, Nefud nr. Slih, MUSIL 1909, PR.

Herba annua, usque ad 40 cm alta, valde ramosa. Folia pinnatifida lobis linearibus. Petala 10×2,5 mm, violacea, longe unguiculata. Pedicelli fructiferi 1—4 mm longi, crassi, appressi, demum patuli. Siliqua 11—18×c. 2,5 mm; articulus superior monospermus, inferiore 2—3-plo longior; inferior 0—1-spermus, cornibus duobus internis apicalibus excavationibus articuli superioris apti.

Persia: S: Makran: Biaban, Gevan versus Kargushki, BEHB. 222-E!

Distr. gen.: Arabia, Iraq inferior, Persia australis.

The only non-maritime species of the genus. — POBEDIMOVA has suggested (Zhurn. Bot. l. c.) that *Erucaria* and *Cakile* are on the same evolutionary line and that there are reasons for believing that the generally maritime *Cakile* has been derived from the essentially desert genus *Erucaria*. *C. arabica* is clearly distinct both in fruit characters and its desert habitat from all the other species of the genus and POBEDIMOVA in her monograph (Novit. Syst. l. c. 93) has created the monotypic sect. *Eremocakile* to accommodate it. Although the rather inadequate cited specimen is glabrous, the material from Lower Iraq shows a clear indumentum especially on the ventral surface of young leaves. Re-gathering of this species is needed from Makran.

13. *Physorrhynchus*

Physorrhynchus HOOK., Icon. Pl. 5 ser. 2: 821—822 (1852).

Lit.: O. E. SCHULZ in ENGLER, Das Pflanzenreich, Cruciferae-Brassiceae, 84 (IV. 105): 33—35 (1923).

Suffrutex elatus glaber, foliis magnis simplicibus carnosis, petalis roseis raro albis. Sepala erecta, basi leviter saccata. Fructus biarticulatus; articulus inferior pedunculiformis, bilocularis, sterilis; superior ovoideus, indehiscens, bilocularis, loculo quoque 1- vel 2-spermo, sensim in rostrum conicum articulo superiori aequilongum attenuato. Cotyledones longitudinaliter plicatae.

1a. Ovarium 4-ovulatum. Articulus fructus inferior conspicuus, superior basi rotundatus ..... 1. *Ph. brahuicus* HOOK.
b. Ovarium 2-ovulatum. Articulus fructus inferior inconspicuus, superior basi truncatus ..... 2. *Ph. Chamaerapistrum* (BOISS.) BOISS.

1. ***Ph. brahuicus*** HOOK., Icon. Pl. 5, ser. 2: 821 (1852).
Icon.: Clavis p. 9; tab. 2, fig. 1.
Typus: Pakistan: STOCKS 515, K! Afghanistan, GRIFF. K!

Suffrutex usque ad 1 m altus, glaucus. Folia obovata, basi attenuata, in sicco crasse coriacea; superiora sessilia oblongo-lanceolata, semiamplexicaulia. Inflorescentia valde ramosa. Petala c. 15 (—20) mm longa, lamina elliptica, ungue longa. Pedicelli fructiferi c. 6 mm longi. Fructus 10—15 mm longus.

Persia: S: Fars.: Hawize in montibus Kuh-e Khormuj prope Bushehr, Nab. 1379. Makran: Chah Bahar, Shar. 220-E! — Persia australis maritima, Auch. 4146. — E: Sistan: Lab-e Bareng, Annandale 71.
Afghanistan: Griff.
Pakistan: Quetta: Sibi, Lace 3430! Sind: In montibus Brahuicis, Stocks 515! Karachi: N Nazimabad, Alvi. Thano Bula Khan, Cooke. Sorjana Hills, Ticehurst 30872, 30875. Kalat: 30—50 km W Bela, Rech. 27623! Makran: 10—30 km a Turbat versus Gwadar, 150—200 m, Lamond 417!, Rech. 27787! Bal.: Saindak, Maynard. In montibus S Kolwa, Hotson 266.

Distr. gen.: Endem.

2. ***Ph. Chamaerapistrum*** (Boiss.) Boiss., Fl. Or. 1: 403 (1867).
Syn.: *Zilla Chamaerapistrum* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 381 (1842). *Z. schouwioides* Boiss., l. c. 382.
Icon.: Tab. 2, fig. 2.
Typus: Auch. 4169-a, G.

Habitu praecedenti similis, ab eo tantum characteribus in clavi indicatis diversus.

Persia: W: Khuz.: Dow Gonbadan E Behbahan, 700 m, Merton 3722! Behbahan, Esfand. 79-E!, Haussk. Masjed Soleyman, 300 m, Furse 1209! 20 km NW Masjed Soleyman, 300 m, Lee 47!, 49!, 125! Esf.: Gav Khuni, Stapf 206!, 238! — S: Lar.: 25 km SE Bastak, 500 m, Grant 16974! Fars.: 35 km NE Bushehr, Koelz 110! Dalaki, Stapf 205!, 466! — Persia australis, Auch. 4169-a!

Distr. gen.: Endem.

14. *Fortuynia*

Fortuynia Shuttlew., Ann. Scienc. Nat. Ser. 2, 16: 379 (1841).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 84 (IV. 105): 35—38 (1923). S. M. H. Jafri, A Note on the Genus Fortuynia, Pakistan Journal For. 8, 4: 335—336 (1958).

Herbae suffrutescentes, glabrae, glaucae, foliis simplicibus carnosis, floribus lilacinis. Sepala erecta, interiora vix saccata. Stigma lobis carpidialibus decurrentibus. Siliculae biarticulatae; articulus inferior stipitiformis, linearis bilocularis sterilis, valvis dehiscentibus; articulus superior ellipticus, coriaceus, indehiscens, late alatus, seminibus 1 vel 2. Cotyledones longitudinaliter plicatae.

1a. Silicula apice profunde emarginata, latitudine ± aequilonga ..... 1. *F. Bungei* Boiss.
b. Silicula apice acuminata vel leviter emarginata, latitudine longior ..... 2. *F. Garcinii* (Burm.) Shuttlew.

1. ***F. Bungei*** Boiss., Fl. Or. 1: 402 (1867).
Syn.: *F. Aucheri* Shuttlew. var. *Bungei* (Boiss.) Parsa, Fl. de l'Iran 1: 897 (1951).
Icon.: Tab. 3, fig. 1 et 2.
Typus (Syntypi): Persia, Bge!, Buhse 1289, G; Afghania, Bge.

Perennis, basi lignescens, 30—60 cm alta, valde ramosa. Folia basalia breviter petiolata, ovata vel lanceolata, acuta, integra, 7—10×3—6 cm, caulina lanceolata

vel elliptica, sessilia. Racemi laxi. Petala 16×4 mm, lamina angusta. Glandulae nectariferae medianae columnares. Silicula (12—) 18—23×(10—) 15—18 mm; ala 4—6 mm lata, emarginatio usque ad 2,5 mm; loculus laevis vel rugosus; articulus inferior stipitiformis 5—8 mm longus. Semina 2.

Persia: S: Kerm.: Tahrud inter Kerman et Bam, 1500 m, RECH. 3586! Prope Kerman, BGE.! Inter Kerman et Saidabad, inter Baghin, 1670 m, et jugum Sang Bur, 2200 m, RECH. 2962! Kuh Tagh Ali, 2000 m, BORNM. 2244. Chaharfarsakh, KOELZ 14253! 30—40 km SE Zahedan versus Mirjaveh, RECH. 27227! Ad marginem austro-orientalem deserti Lut SW Nosratabad Sipi, RECH. 3911!, RECH. 27177! 19 km SW Nosratabad Sipi, LAMOND 98!, 99!, RECH. 27187! Grant 15313! Hamun-e Jaz Murian, 400 m, POPOV 35! Bal.: Makran: Sarbaz, SALAVATIAN 219-E! Iranshahr, Bazman, SHAR. 5844-E! — E: Sistan: Kuh Khadjeh, SHAR. 5843-E! Khor.: Ozbagu, RUTTNER 427! Tabas, RUTTNER 526! — C: Yazd: Inter Yazd et Esfahan, BGE.! In deserto c. Jandaq, BUHSE 1289. Ad pedem M. Shir Kuh, 1500 m, BORNM. 2245. Hoscynabad et Bambis inter Yazd et Isfahan, BORNM. 2243! 96 km N Yazd, FURSE 1348! 100 km S Yazd versus Kerman, RECH. 27139, LAMOND 72! Ad limites deserti inter Nain et Aqda, 1000 m, RECH. 2700! — Lut: Nay Band, RUTTNER 513! — Aliabad prope Khorassan (?), CZERN.
Afghanistan: SW: Herat: Anarderrah, BGE. Sistan, 600 m, KOEIE 3692. Girishk versus Dilaram, 1100 m, KOEIE 3828!, FURSE 556! Inter Dilaram et Qala-i Kang, VOLK 2913!
Pakistan: Bal.: Bandagan Nala, CROOKSHANK 123! Kacha Thana, WATSON! Kharan, POPOV 206! Makran: Hoshab versus Panjgur, 20—30 km a Panjgur, LAMOND 586!, RECH. 30103!

Distr. gen.: Endem.

A variable and in some places very abundant species in more or less desert-like localities.

2. ***F. Garcinii*** (BURM.) SHUTTLEW., Ann. Scienc. Nat. Ser. 2, 17: 178 (1842).
Syn.: *Peltaria Garcinii* BURM., Fl. Ind. 139 (1768). — *Fortuynia Aucheri* SHUTTLEW., Ann. Scienc. Nat. Ser. 2, 16: 379 (1841) et l.c.: 178 (1842).

Lit.: J. BORNMÜLLER, Beihefte zum Botanischen Centralblatt 28, 2: 126 (1911).

Icon.: Clavis p. 5.
Typus: Locus non designatus, GARCIN.
Differt a *F. Bungei* foliis latioribus et characteribus in clavi indicatus.

Persia: S: Lar.: Bandar Abbas, AUCH. 4145! (Typus *F. Aucheri* SHUTTLEW.), BORNM. 91! Inter Genu et Bandar Abbas, RECH. 3437! Inter Hajjiabad prope Tarom et Bandar Abbas ad jugum Gohreh, 700 m, RECH. 3320! Hajjiabad prope Tarom, 900 m, RECH. 3350!

Distr. gen.: Endem.

Only known from a few gatherings in Laristan, *F. Garcinii* is very doubtfully specifically different from *F. Bungei*. In floral characters and dimensions and in general facies the two species are identical. Only in mature fruit do they differ and in *F. Bungei* there is much variation in the size and shape of the silicule and in the degree of apical emargination. For example, in the POPOV and LAMOND specimens cited under *F. Bungei* there are emarginate and acuminate fruits in the same gathering. When the two species are better known it is probable that there will be no clear boundary between them.

15. *Carrichtera*

Carrichtera DC., Mem. Mus. Hist. Nat. Paris 7: 250 (1821).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 84 (IV. 105): 41—44 (1923).

Herba annua foliis pinnatis, floribus flavescenti-albis, indumento pilorum simplicium rigidorum. Sepala erecta vix saccata. Pedicelli fructiferi deflexi. Fructus biarticulatus; articulus inferior ellipsoideus, dehiscens, bilocularis, loculo quoque seminibus c. 3; superior sterilis, valde compressus, marginibus involutis, late spathulatus. Cotyledones longitudinaliter plicatae. — Genus monotypicum.

1. ***C. annua*** (L.) DC., Mém. Mus. Hist. Nat. Paris 7: 250 (1821).
Syn.: *Vella annua* L., Spec. Plant. 641 (1753).
Icon.: Clavis p. 15.
Typus: „Hab. in Hispania".

Herba annua, 5—40 cm alta, fructifera stricte erecta, pilis deflexis. Folia petiolata, bipinnata, segmentis obtusis linearibus. Racemi pauciflori. Petala violaceo-venosa. Fructus c. 8 mm longus. Pedicelli breves deflexi.

Iraq: Kurd.: Kirkuk: Kifri, Nab. 1329. Kirkuk, 400 m, Bornm. 930!, Grigg 35! Sul.: Sulaymaniyah, Graham 738! Mosul: Altin Köprü versus Guwair, Guest 1019! Mosul, Bayliss 133! Diyala: Khanaqin ad confines Persiae, Rech. 9049! Mandali, Haines 543! Jabal Hamrin: Inter Shahraban et Jalula, Rech. 8989! Jabal Hamrin, Guest 1820!, Bornm. 931. Injana, Guest 1427!, 5083. — Kut-al Imarah: 30 km SE Badrah, Rech. 9159!
Persia: W: Khuz.: Inter Dehloran et Amarah, Nab. 1363. Kermansh.: S Qasr Shirin, Merton 3231! — S: Fars.: Prope Gere, Ky. Bushehr, Horner!, Trott 744!, 738! Lar.: Inter Hajjiabad prope Tarom et Bandar Abbās, ad jugum Gohreh, 700 m, Rech. 3375! Lar, 1000 m, Gauba & Sab. 262!

Distr. gen.: Insulae Canarienses. Regio Mediterranea, Asia austro-occidentalis usque ad Persiam (in Anatolia deest).

16. *Savignya*

Savignya DC., Reg. Veg. Syst. Nat. 2: 283 (1821).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 84 (IV. 105): 57—59 (1923).

Herbae annuae foliis simplicibus dentatis carnosis, floribus roseis vel lilacinis. Sepala erecto-patentia vix saccata. Silicula breviter stipitata, majuscula, lata elliptica, valde compressa; rostrum manifestum. Semina numerosa, funiculis horizontaliter patentibus, ala late circulari, translucente, imbricata, biseriata, humiditate mucilaginea. Cotyledones longitudinaliter plicatae.

1. ***S. parviflora*** (Delile) Webb, Fl. Aeth.-Aegypt. in Parl., Giorn. Bot. Ital. 2: 215 (1847).
Syn.: *Lunaria parviflora* Delile, Fl. Egypt. Explic. Pl. 104, tab. 35, fig. 3 (1812).
Savignya aegyptiaca DC., Reg. Veg. Syst. Nat. 2: 283 (1821).
Icon.: Clavis p. 5 et 15.
Typus: Aegyptus: „Dans le sable, aux environs de la pyramide à cinq étages de Saqqârah", Delile, MPU.

Herba annua a basi ramosa, 5—30 cm alta, inferne pilis simplicibus glanduliferis obsita, superne vel omnino glabra. Folia petiolata, obovata, sinuato-dentata, denti-

bus utrinque 4—6; folia summa linearia, sessilia. Petala 4—4,5×2 mm. Pedicelli fructiferi 10—25 mm longi, tenues, patuli vel reflexi. Silicula 10—13×5—8 mm; rostrum 1,5—2,5 mm; stigma rostro non latius; stipes 0—1 mm longus. Semina c. 10, ala inclusa c. 3 mm diametro.

Iraq: Distr. Kut-al Imara ad confines Persiae in ditione Badrah in collibus arenaceis, Rech. 14010! Shatt at-Tib, 70 km N Amarah, Rech. 14186!
Persia: S: Kerm.: Lut, Chah Sam, 800 m, Gabr. 1578. 30—40 km E Zahedan versus Mirjaveh, Lamond 125!, Rech. 27235! Iranshahr, Shar. 210-E! — E: Sistan: Naroui, Shar. 5643-E! 30 km SE Zabol, 500 m, Grant 15339. Saravan, Salavatian 5642-E! Sistan, McMahon! Khor.: Inter Birjand et Zahedan, 800 m, Gauba & Sab. 194!
Afghanistan: SE: Kandahar: Helmand, McMahon 21/50!
Pakistan: Bal.: 45 km E Mirjaveh, 800 m, Grant 15326. Chahar Sar, Crookshank 80! — Makran: Hoshab versus Panjgur, Lamond 577! Hoshab versus Panjgur N planitie Balgathar, 850 m, Lamond 547! 60 km S Panjgur, 850 m, Rech. 28079.

Distr. gen.: Africa borealis, Aegyptus usque ad Afghanistan et Pakistan occidentalem.

Confined to more or less desert areas.

17. *Moricandia*

Moricandia DC., Reg. Veg. Syst. Nat. 2: 626 (1825).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 84 (IV. 105): 64—72 (1923).

Herbae annuae vel perennes, glabrae, floribus roseis vel violaceis, foliis simplicibus integris. Sepala saccata. Petala obovata, antice truncata. Ovarium multi-ovulatum; stigma lobis carpidialibus decurrentibus. Siliqua dehiscens, linearis, compressa, breviter rostrata. Cotyledones longitudinaliter plicatae.

1. ***M. sinaica*** (Boiss.) Boiss., Fl. Or. 1: 386 (1867).
Syn.: *Brassica sinaica* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 85 (1842).
Icon.: Clavis p. 11.
Typus: Sinai, Auch. 167, G!

Annua (id est primo anno florens) usque perennis, 8—40 cm alta, glauca. Folia in parte inferiore caulis approximata, late obovata vel ovalia, integra; basalia breviter petiolata; superiora profunde cordata et amplexicaulia. Petala c. 13 mm longa. Pedicelli fructiferi c. 6 mm longi. Siliqua erecta, patula vel recurva, 50—80×1—2 mm; valvae uninerviae; semina minutissima, biseriata.

Persia: S: Fars.: Inter Kazerun et Borazjan, Gauba & Sab. 275! Prope Borazjan, Stutz 902! Dalaki, 800 m, Koelz 1428!, Stapf 92!, 716!, 721! 28 km SE Khormuj ad fluvium Mand, 40 m, Grant 17010. Kerm.: Inter Khabis et Kerman, Bge. Lar.: Bandar Khamir, Soltani s. n.! — E: Sistan: Lab-e Bareng, Annandale 49. Kuh-e Khajeh, Shar. 5635-E., Czern.
Pakistan: N. Wazir.: Fl. Tochi, Fz. 1127, 1128. Shakai, Harsukh 15696! — Quetta: Inter Fort Sandeman et Dera Ismail Khan, 45 km a Fort Sandeman, 1750—1900 m, Rech. 29914!, Lamond 1485-A! — Bal.: Baluchistan, Stocks! Nai Ubbo, Harsukh 20465. Cheppar rift, Lace! Makran: Nag inter Panjgur et Surab, 1300 m, Rech. 28257!

Distr. gen.: Aegyptus, Sinai, Arabia Petraea, Persia australis, Pakistan occidentalis.

The record of the W Mediterranean *M. arvensis* (L.) DC., from Makran in S Persia is certainly an error. It probably refers to *M. sinaica*; conf. Blatter & Hallb., Journ. Bomb. Nat. Soc. 724 (1918).

18. *Douepia*

Douepia Camb. in Jacquem., Voy. Ind. 4: 18 (1844).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae, 84 (IV. 105): 72-73 (1923).

Herbae suffrutescentes glabrae, foliis simplicibus carnosis, floribus roseis vel lilacinis. Sepala acuta, non saccata, apice cucullata. Petala linearia, rosea plerumque violaceo-venosa. Glandulae nectariferae medianae columnares. Antherae ± irregulariter sagittatae. Stigma lobis carpidialibus decurrentibus. Siliqua linearis, teres, dehiscens, rostrata. Cotyledones longitudinaliter plicatae. — Genus monotypicum.

1. ***D. tortuosa*** Camb. in Jacquem., Voy. Ind. 4: 18, tab. 18 (1844).
Syn.: *Moricandia tortuosa* (Camb.) Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 172 (1861).
Icon.: Clavis p. 11.
Typus: NW India, Punjab; Pind Dadan Khan, Jacquemont, K!

Caules usque ad 80 cm alti, basi lignosa, valde ramosi. Folia inferiora ellipticooblonga, petiolata, integra; folia superiora oblongo-ovata, sessilia. Racemi floriferi et fructiferi laxi. Petala 9—13 × 1,5—2 (—3) mm. Pedicelli fructiferi 4—5 mm longi, crassi, erecto-patentes. Siliqua 18—75 × 1,5—2,5 mm, erecta vel ascendens; rostrum 1,5—7 mm longum, sterile.

Pakistan: S. Wazir.: Tank, Williams 7768, 7958. Dera Ismail Khan: M. Sulaiman, inter Mughal Kot et Daraban, 700—900 m, Rech. 29973.

Distr. gen.: India boreo-occidentalis, Pakistan occidentalis.

Closely allied to *Moricandia* but differing in the non-saccate inner sepals, the strap shaped petals and the columnar median honey glands.

19. *Pseudofortuynia*

Pseudofortuynia Hedge, gen. nov.

Cruciferae — Brassiceae. Perennis caudicibus crasse lignosis residuis petiolorum copiose comosis. Planta praeter pilos simplices sepalorum et ad bases petiolorum inferiorum glabra. Folia petiolata, subcarnosa. Inflorescentia racemosa laxa pauciflora. Sepala erecta, leviter saccata, membranaceo-marginata. Petala violacea, ungue tenui, lamina late ovata. Antherae basi sagittatae. Glandulae nectariferae laterales hippocrepidiformes, medianae vestigiales. Ovarium lineare, multiovulatum. Fructus siliqua dehiscens stipitata, valvis trinerviis; semina numerosa, non alata, uniseriata. Stigma depresso-capitatum. Genus novum in *Moricandiinas* inserendum, nullo alio arcte affine combinatione characterum sequentium distinctum: Folia petiolata, sepala leviter saccata, stigma depresso-capitatum, siliqua stipitata valvis trinervis, semina numerosa, non alata, uniseriata. — Species singula in Persia austro-occidentali indigena.

A new genus in the *Moricandiinae* without a close ally distinct on the following combination of characters: leaves petiolate, sepals slightly saccate, stigma depressed capitate, siliqua stipitate, valves 3-veined, seeds many, not winged, uniseriate. One species in SW Persia.

1. ***P. Esfandiarii*** HEDGE, sp. nov.

Icon.: Tab. 4.

Typus: SCHMID 5335, Holotypus W!, Isotypus G.

Perennis basi lignosa, caudicibus pluribus ascendentibus caulibus floriferis 35—40 cm altis, erectis, herbaceis. Pili simplices ad basin petiolorum infimorum fasciculato-congesti. Folia petiolata, subcarnosa, ambitu oblongo-lanceolata, lobata vel pinnatifida, glabra. Racemi pauciflori. Flores pedicellati. Sepala subsaccata, violacea, pilis simplicibus parce obsita. Petala 17—18 mm longa, violacea. Pedicelli fructiferi c. 4 mm longi, vix incrassati, erecti. Siliqua 65 × 1,5 mm, anguste linearis, valvis glabris trinerviis; semina numerosa, uniseriata; rostrum stylare c. 2 mm longum, stigma depresso-capitatum, quam stylus paulo crassius.

Persia: S: Fars.: 64 km NW Abadeh, 2430 m, STUTZ 803! Inter Abadeh et Dowlatabad, 1500—2000 m, 26. 4. 1956, SCHMID 5335! Inter Abadeh et Najafabad, BOROUMAND (Typus fructus)!

Distr. gen.: Endem.

This distinct plant was first collected by F. SCHMID in 1956. His gathering consisted of flowering material only and although it seemed probable that it was a generic novelty, it needed fruiting material to confirm this. A later gathering of the same plant was made by STUTZ in 1961 but again it consisted only of flowering material. It was not until 1966, through the kind agency of Dr. E. ESFANDIARI, Secretary of State at the Ministry of Agriculture, Tehran, that fruiting material was finally obtained.

In flower *Pseudofortuynia* bears a strong resemblance to *Fortuynia* species (e. g. *F. Garcinii* [BURM.] SHUTTL.) in general habit, leaves, inflorescence and flowers but in fruit characters *Pseudofortuynia* is totally different — a siliqua in contrast to the distinctive silicule of *Fortuynia*. As pointed out in the diagnosis, it is the combination of characters, not unusual in themselves, that gives *Pseudofortuynia* its isolated position in sub-tribe *Moricandiinae*. For example, in addition to the similar habit it shares with *Fortuynia*, *Pseudofortuynia* has sepals and petals similar in size, colour and shape to *Moricandia*; sagittate anther bases occur in *Moricandia* and *Spryginia*; markedly stipitate fruits occur in some *Brassica* species (*B. elongata* EHRH.) and in *Diplotaxis* (*D. Harra* [FORSSK.] BOISS.); 3-veined fruit valves are general in *Sinapis*; the fruiting stigma is similar to some *Brassica* species. It is the unusual permutation of characters that makes its correct generic position hard to assess. No mature seeds are represented on the fruiting material and consequently the position of the embryo and radicle is still unknown. I am inclined to regard *Moricandia* as the closest (yet distant) ally of *Pseudofortuynia*. Counterbalancing the points of similarity mentioned, *Moricandia* differs in the ovate-oblong clasping stem leaves, the absence of indumentum, the non-stipitate and single nerved siliquas and the decurrent carpidial lobes.

The species is named in honour of His Excellency Dr. E. ESFANDIARI in recognition of his and his collaborators' numerous valuable contributions to the exploration of the flora of Iran.

20. *Spryginia*

Spryginia M. POP., Trans. Scienc. Soc. Turk. 1: 35 (1923).

Lit.: O. E. SCHULZ in ENGLER, Das Pflanzenreich, Cruciferae-Brassiceae 84 (IV. 105): 73—77 (1923), sub *Orychophragmo*.

Herbae annuae glabrae, foliis simplicibus, floribus magnis lilacino-violaceis. Sepala vix saccata. Filamenta staminum interiorum tota longitudine per paria connata. Ovarium c. 50-ovulatum. Siliqua linearis, compressa, erecta vel patula. Stylus brevissimus. Stigma lobis carpidialibus decurrentibus. Semina magna. Radicula incumbens. — Genus monotypicum.

1. ***S. Winkleri*** (Regel) M. Pop., Trans. Scienc. Soc. Turk. 1: 35 (1923).
Syn.: *Moricandia Winkleri* Regel, Acta Hort. Petrop. 9: 612 (1884). *Orychophragmus Winkleri* (Regel) O. E. Schulz, Bot. Jahrb. 54, Beibl. 119: 56 (1916).
Icon.: Clavis p. 11; tab. 5.
Typus: Vide addenda!

Herba annua 10—50 cm alta, erecta. Folia inferiora petiolata, oblongo-ovata, integra vel irregulariter dentata; superiora multo minora, oblonga breviter petiolata, Sepala saepe violascentia. Petala c. 18 mm longa, lamina obovata, ungue tenuissimo. Pedicelli fructiferi 5—8 mm longi, leviter incrassati. Siliqua usque ad 100×2,5 mm, recta vel spiraliter contorta; valvae uninerviae; rostrum 2 mm longum. Semina 1 mm longa.

Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 175 (1965).

Afghanistan: NE: Kataghan: Eshanan 22 km E Khanabad versus Taliqan, 720 m, Podlech 10243! In jugo Paigah Kotal, SE Samangan, Hdg. & Wdb. 4012! — C: Bamian: 15 km W Doab, 1450 m, Hdg. & Wdb. 3445! In valle Ajar „Königstal", a Doab occidentem versus, 1400—1500 m, Rech. 16596! Doab, Volk 2682! Inter jugum Shibar et Doshi, Furse 5926!

Distr. gen.: Turcomania, Amu Darya, Pamir-Alaj, Kizyl Kum, Afghanistan.

21. *Chalcanthus*

Chalcanthus Boiss., Fl. Or. 1: 211 (1867).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 84 (IV. 105): 83—84 (1923).

Planta herbacea perennis glabra glauca vel in calyce et in proximitate eius pilis sparsis simplicibus obsita, foliis simplicibus, floribus purpureis. Sepala erecta, membranaceo-marginata, non saccata. Glandulae nectariferae laterales prominentes. Siliqua longissima, linearis ± teres, non rostrata, dehiscens. Semina numerosa. Radicula accumbens.

1. ***Ch. renifolius*** (Boiss. & Hohen.) Boiss., Fl. Or. 1: 212 (1867).
Syn.: *Hesperis renifolia* Boiss. & Hohen. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 22 (1849).
Icon.: Clavis p. 13.
Typus: Ky. 228, E!

Planta perennis, radice tuberosa, usque ad 60 cm alta. Folia basalia longe petiolata, late ovata, cordata, apice obtusa, margine integra; residua petiolorum persistentia; folia caulina ovata vel lanceolata, amplexicaulia; folia omnia violaceo-venosa. Inflorescentia fructifera valde elongata. Petala c. 12×3 mm, copiose parallele venosa. Siliqua 80—150×3—4 mm; pedicelli fructiferi 2—4 cm longi, erecto-ascendentes. Funiculi dependentes.

Persia: N: Maz.: Inter Gach Sar et Chalus, Schmid 5754! — W: Arak: Tshal SSW Arak, Str. M. Rasvand, SW Arak, Str. Anjidan ad M. Latetar ESE Arak, Str. Kuh-e Safid Khaneh, WNW Arak, Str. Kuh-e Darreh Bid, Golpayegan versus Damaneh, Furse 1756! Ham.: Tafresh, Str. Lur.: Oshtoran Kuh, Str. In rupestribus calcareis M. Saverz, Haussknecht! Kuh-e Safid, 2200 m, Koelz 17518! Dow Rud, 2200 m, Koelz 17380! Esf.: Kuh-e Darabshah supra Damaneh, 3000 m, Furse 1431! Esfahan versus Damaneh, 96 km W Esfahan, Furse 1420! — C: Tehr.: Inter Emamzadeh Dawud et Shahrestanak, 2400—3100 m, Bornm. 6150. In valle Latkan prope Shah Neshin in M. Tuchal, Ky. 228!

M. Tuchal, 2600—3100 m, Bornm. 6149! Qazv.: Fashand, Gauba. Kuh Dashteh, 2000 m, Gauba. Yazd: In montibus prope Yazd, Buhse 1361!
Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 175 (1965).
Afghanistan: NW: Ghorat: Khwajachisht, 2100 m, Koelz 3758! Sauzak, 2400 m, Koelz 4134!

Distr. gen.: Endem.

22. *Conringia*

Conringia Adans., Fam. 2: 418 (1763).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Brassiceae 84 (IV. 105): 84—94 (1923).

Herba annua, glabra, glauca, foliis integris ovato-ellipticis amplexicaulibus, floribus flavis vel albis. Sepala erecta, interiora plerumque manifeste saccata. Fructus siliqua longa tenuis rostrata vel erostris, teres, applanata, aut 4- aut 8-angulata, facile dehiscens. Radicula incumbens. Cotyledones interdum longitudinaliter plicatae.

1a. Petala per totam longitudinem violaceo-venosa. Siliqua plana. Glandulae nectariferae medianae evolutae ..... 3. *C. planisiliqua* Fisch. & C. A. Mey.
b. Petala evenia vel non per totam longitudinem venosa; siliqua teres vel 4—8-angulata. Glandulae nectariferae medianae deficientes 2
2a. Sepala aequalia, interiora vix vel non saccata. Petala c. 5 mm longa. Stigma punctiforme ..... 4. *C. persica* Boiss.
b. Sepala inaequalia, interiora saccata quam exteriora majora. Petala 7—12 mm longa. Stigma capitatum vel clavatum 3
3a. Siliqua apice clavata ..... 5. *C. perfoliata* (C. A. Mey.) Busch
b. Siliqua non clavata 4
4a. Siliqua patens, 4-angula ..... 1. *C. orientalis* (L.) Andrz.
b. Siliqua suberecta, 8-angula ..... 2. *C. austriaca* (Jacq.) Sweet

1. ***C. orientalis*** (L.) Andrz. in DC., Reg. Veg. Syst. Nat. 2: 508 (1821).
Syn.: *Brassica orientalis* L., Spec. Plant. 666 (1753).
Typus: „Hab. in Oriente", Tournefort.

Annua vel biennis, plerumque non ramosa. Petala 8—12 × 4 mm, lactea. Pedicelli fructiferi 4—15 mm longi, erecto-patentes. Silicula irregulariter patens, tetragona, recta vel curvata, 60—90 × 1—2,5 mm, uninervia. Radicula incumbens.

Talish: Swant, Hohen., C. A. Mey.
Persia: N: Gorg.: Shahkuh, Koelz 16309! Gil.: Inter Manjil et Pachenar, 400—500 m, Bornm. 6148. 8 km infra summum jugi Astara, Cowan & Darlington 1639! Harsevil prope Rudbar, 600 m, Sab. 129! — W: Azerb.: Khvoy, Knapp. Rezaiyeh, Knapp. Prope Band, Cowan & Darlington 2060! Ardabil, Mir Kamali 6574-E! Bostanabad versus Ardabil, 48 km NE Bostanabad, Furse 2407! Tabriz, Gill.-Sm. 1319!, 1403!, 1461!, 1473! 96 km N Tabriz, Cowan & Darlington 2032! 35°23′ N, 46°46′ E, Jacobs 6597! Kermansh.: Kermanshah, Cowan & Darlington 282! Ham.: Yalfan, Pichler. Aq Bolagh-e Aqdaq, Rioux & Golv. 194! Bahar, Bahai 6699-E! Arak: Arak, Str. Lur.: Borj prope Istgah-e Nurabad, 2000 m, Koelz 1449! Khorramabad, Bent & Wr. 410—207! Oshtoran Kuh, Azna, Furse 1818! — S: Kerm.: Kerman, Rech. 3641! Fars.: Persepolis, Ky. 251! Fl. Salaki prope Bushehr, Horner 173! — C: Tehr.: In collibus prope Tehran, Furse 1683! Prope Abbasabad, Bruns. Qazv.: Qazvin, Bornm. 6147! Soltanabad prope Qazvin, Linds. 81. Inter Khur et Fashand, Rech. 670! 8 km E Qazvin, Stutz 726! Shahr.-Bust.: Shahvar ad Nokarman, 2000 m, Rech. 6253!
Turcomania: Rannowska, Litw. 519.

Afghanistan: E: Kabul, Gilli 947!, Hay 115! — NE: Kataghan: Banu in valle Andarab, Podlech 10925. — C: Bamian: Inter jugum Kotal Deraz Kol et Panjao, 2800—3280 m, Rech. 18689! Lorinj, Koelz 13704! Band-i Amir, 2900 m, Podlech 12126.
Pakistan: Kurram: Habibkala in valle Kurram, Aitch. 206!

Distr. gen.: Europa australis, centralis et orientalis, Africa borealis, Asia austro-occidentalis.

2. ***C. austriaca*** (Jacq.) Sweet, Hort. Brit. 1: 25 (1826).
Syn.: *Brassica austriaca* Jacq., Fl. Austr. Icon. 3: 45 tab. 283 (1775).
Typus: Austria.

C. orientali habitu simillima sed differt ab ea siliculae 8-angularis valvis trinerviis et petalis plerumque aliquantum brevioribus.

Talish: S Talish sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 208 (1950).

Distr. gen.: Europa centralis et australis, Anatolia, Caucasus, Talish.

3. ***C. planisiliqua*** Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 3: 32, Nr. 564 (1837).
Typus: E Caucaso descripta, LE.

Annua, 14—40 cm alta; caulis plerumque simplex basi saepe violascens. Petala c. 6×1,5—2 mm, pallide flava vel alba. Pedicelli fructiferi 5—15 mm longi. Siliqua valde compressa, suberecta, torulosa, 45—90×1—2 mm, enervis. Cotyledones longitudinaliter plicatae.

Persia: N: Gorg.: M. Shahvar prope Hajjilang, 2400—2600 m, Rech. 6132! Maz.: Inter Gach Sar et Chalus, Schmid 5757! 48 km S Shahi, Furse 2917! — W: Esf.: Esfahan, Bge. Arak: M. Kohrud, Bge. — C: Tehr.: Tehran, Bge. Qazv.: Karaj in alveo fluvii Karaj, Rech. 166! In valle fluvii Karaj, Rech. 422! Karaj, Gauba.
Turcomania: In montibus Karanki dictis prope Ashkhabad, Litw. 524. In montibus ad Gaudan prope Ashkhabad, Litw. 523.
Afghanistan: NE: Munjan: Ptili, 2700 m, Edelb. 2138! Badakhshan: In parte superiore vallis Zebak, 2130 m, Furse 6357! Wakhan: M. Noshaq, in valle Qazi Deh, 3040 m, Yoshi 424. Prope Jamit, 2800 m, Roemer 264! — C: Bamian: Band-e Amir, 2800 m, Rech. 18348!, Rech. 18255!, Koelz 2842!, Gilli 956! In jugo Shibar versus Doshi, Furse 5833!, 5879! In faucibus Paimuri, Hdg. & Wdb. 4691!
Pakistan: Chitral: In jugo Shah Jinali, 3400 m, Bowes Lyon 1014! — Quetta: Urak, Lace 3744!, Crookshank 109! Quetta, 2200 m, Lace 3744! — Baluchistan: Harsukh 20458!

Distr. gen.: Regio Caucasica, Anatolia, Persia, Afghanistan, Asia centralis, Pakistan occidentalis.

4. ***C. persica*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 12 (1845).
Icon.: Clavis p. 13.
Typus: Ky. 339, K!

Annua, 5—25 cm alta, ramosa vel subsimplex, caule saepe violaceo. Petala 5×2 mm, flava vel aurea interdum purpureo-venosa. Pedicelli floriferi 2 mm, fructiferi incrassati c. 4 mm longi. Siliqua erecta, axi laxe appressa, 20—40×1,5 mm, nervis pluribus indistinctis. Radicula incumbens.

Iraq: Kurd.: Sulaymaniyah, Eig & Zohary.
Talish: Kosmaljan in M. Diagu sec. Fl. URSS. 8: 497 (1939).
Persia: N: Persia borealis, Ky. 114 — W: Azerb.: Inter Tabriz et Khvoy, Knapp. Tabriz, Knapp, Grossh. Khosrava prope Shahpur, Knapp. Esf.: W Esfahan, Furse 1418!

Kuh-e Darabshah supra Damaneh, FURSE 1440! Ham.: Behar, BAHAI 6343-E! — S: Fars.: Shiraz, Kuh Barfi, KY. 339! In collibus W Khaneh-ye Zenyan, Shiraz versus Kazerun, 2000 m, MERTON 3827! 58 km W Shiraz, 1600 m, GRANT 15542! Kuh Charmakan, STAPF 90! 100 km S Abadeh, 2300 m, RUTTNER 639! Kerm.: Inter Khabis et Kerman, BGE. — C: Tehr.: NE Firuzkuh, FURSE 2948! Qazv.: In jugo Kharzan, 2000 m, BORNM. 6146. — 10 km W Kiraj, 1520 m, STUTZ 674!

Turcomania: Ashkhabad sec. NIKITIN, Fl. Ashkhabad 175 (1965).

Afghanistan: SW: Herat: Shindand, 1200 m, KOEIE 4140! — E: Kabul: Paghman, 2400 m, HDG. & WDB. 2870!, NEUB. 4325!, 4714! Tang-e Gharu, 1740 m, GILLI 949! Jabal Seraj, 1730 m, GILLI 948! Sher Darwasa, GILLI 950!, 951!, 952!, 953!, NEUB. 540! Aliabad, NEUB. 96! Istalif, GILLI 954! Ad collem Koshuk, GRIFF. Unai prope pagum, 3000 m, HDG. & WDB. 4550! — C: Bamian: Band-e Amir, KERST. 2842.

Pakistan: Quetta: Quetta versus Chaman, in jugo Khojak, 2300 m, RECH. 29043!, LAMOND 1066! — Chitral: Supra Shokor Shal, 3600 m, WDB. s. n.!

Distr. gen.: Caucasus, Anatolia, Iraq, Talish, Persia, Turcomania, Afghanistan, Pakistan occidentalis.

5. ***C. perfoliata*** (C. A. MEY.) BUSCH in KOMAROV, Fl. URSS. 8: 497 (1939).

Syn.: *Sisymbrium perfoliatum* C. A. MEY., Verz. Pfl. Cauc. 188 (1831). *Conringia clavata* BOISS., Ann. Scienc. Nat. Ser. 2, 17: 84 (1842).

Icon.: Clavis p. 11.

Typus: Talish prope Swant, C. A. MEY., LE.

Annua, 4—20 cm alta, caule simplice vel ramoso. Folia basalia obovata, breviter petiolata, perparva, caulina saepe violaceo-marginata. Pedicelli 2,5 mm longi, fructiferi incrassati. Petala 11×2—2,5 mm, pallide flava interdum purpureo-venosa. Siliquae erectae vel erecto-patulae, 40—75×1—1,5 mm; valvae prominenter univel inconspicue plurinerviae. Radicula incumbens.

Iraq: Kurd.: Kirkuk: Jarmo, HELBAEK 403! Mosul: Dihok versus Zakho, 450 m, GUEST 2246! Arbil: Shaqlawa, HAINES. Salah ad-Din, 900 m, CHAPMAN 11992! In collibus W Bastura Chai, 750 m, GILLETT 10413! Sul.: In glareosis serpentinicis jugi Malakawa prope Penjwin, 1400 m, RECH. 12309!

Talish: Swant prope Tatuni, HOHEN.! In montibus Talish prope Swant, C. A. MEY.

Persia: N: Gil.: Rudbar, 200—300 m, BORNM. 6145. In valle Safid Rud ad Rudbar, BORNM. 6150. Persia borealis, SZOV. — W: Azerb.: Inter Einal et Sufian, GROSSH. Prope Tabriz, GILL.-SM. 1461!, GROSSH. 35°30′ N, 46°38′ E, JACOBS 6575! Lur.: In montibus Oshtoran Kuh SW Arak, STR. Dow Rud, KOELZ 17220! Khorramabad, BENT & WR. 412—202! Kharon, 1400 m, KOEIE 1429! — S: Fars.: Inter Shiraz et Firuzabad, GAUBA & SAB. 274! — E: Khor.: Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, RECH. 7223! — C: Tehr.: Prope Ab Ali, SCHMID 5596! Inter Tehran et Delijan, SCHMID 5152! M. Tuchal, BRUNS. Qazv.: Karaj. GAUBA.

Turcomania: M. Kopet Dagh, FEDTSCH. Gaudan, LITW. 520. Firyuza prope Ashkhabad, LITW. 522. In montibus prope Ashkhabad, LITW. 521.

Afghanistan: NW: Inter Obeh et Khwajachisht, KOEIE 3630! In valle fluvii Hari Rud, Gal-i Cha, AITCH. 346. — SW: 48 km S Herat, FURSE 5416!

Distr. gen.: In regione Caucasica, Anatolia, Iraq, Amu Darya, Turcomania, Talish, Persia, Afghanistan.

Tribus ***Lepidieae***

auctore I. Hedge, Edinburgh

Pili simplices vel raro ramosi vel deficientes. Filamenta saepe appendiculata vel applanata. Fructus silicula angustisepta dehiscens. Radicula incumbens vel accumbens. — Genera 23—43.

23. ***Lepidium***

Lepidium L., Spec. Plant. 643 (1753). Gen. Plant. ed. 5: 291 (1754).

Lit.: A. Thellung, Die Gattung Lepidium, Mitteilungen des Botanischen Museums der Universität Zürich 28: 1—340 (1907) et Nouv. Mem. Soc. Helvet. Sc. Nat. 41: 1—340 (1907).

Herbae annuae, biennes vel perennes, glabrae, papillosae vel pilis simplicibus obsitae. Folia simplicia vel pinnatipartita. Sepala non saccata. Petala alba, raro flava, raro deficientia. Stamina 6, 4 vel 2. Filamenta nec alata nec dentata. Glandulae nectariferae medianae evolutae. Ovarium biovulatum. Stylus brevis vel nullus. Silicula valde compressa, angustisepta, dehiscens, alata vel exalata. Semina 2, ex apice loculi pendentes, humiditate mucilaginosa. Radicula incumbens vel oblique incumbens.

1a. Herbae annuae vel biennes 2
b. Herbae perennes 7
2a. Pedicelli fructiferi appressi 3
b. Pedicelli fructiferi patuli vel ascendentes 4
3a. Silicula 2,5—3 mm longa. Cotyledones integrae ..... 1. *L. Aucheri* Boiss.
b. Silicula 5—6 mm longa. Cotyledones trilobae ..... 2. *L. sativum* L.
4a. Folia caulina media et superiora ovata, integra, amplexicaulia, auriculis basalibus magnis. Petala flava ..... 5. *L. perfoliatum* L.
b. Folia caulina media et superiora pinnata vel lineari-oblonga, integra. Petala alba vel nulla 5
5a. Caulis ad nodos turbinato-incrassatus. Petala evoluta. Stamina 6 ..... 6. *L. vesicarium* L.
b. Caulis non incrassatus. Petala nulla vel rudimentaria. Stamina 2 vel 4 6
6a. Siliculae juveniles et maturae cum pedicellis glabrae. Petala nulla. Folia basalia pinnata ..... 3. *L. ruderale* L.
b. Siliculae juveniles et saepe etiam maturae cum pedicellis pubescentes. Folia basalia pinnatifida ..... 4. *L. pinnatifidum* Ledeb.
7a. Planta pilis clavatis nonnullis quidem obsita. Siliculae maturae reticulato-alveolatae ..... 7. *L. cartilagineum* (J. Mayer) Thell.
b. Planta glabra vel pilis non clavatis obsita. Siliculae maturae laeves 8
8a. Inflorescentia dense racemoso-paniculata, fructifera paulo tantum elongata. Stigma stylo circiter duplo crassius 9
b. Inflorescentia densa vel laxa, fructifera valde elongata. Stigma stylo paulo crassius ..... 10. *L. persicum* Boiss.
9a. Herba flavescenti-viridis, 20—30 cm alta. Folia carnosa dense disposita .. .. 9. *L. tofaceum* Rech. f.
b. Herba elata usque ad 1 m alta, laete viridis, glabra vel pubescens. Folia non carnosa, laxe disposita ..... 8. *L. latifolium* L.

Sect. *Lepidocardamon* Thell.

Siliqua apice late alata; ala basi styli adnata. Stamina 6.

1. ***L. Aucheri*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 195 (1842).
Icon.: Clavis p. 15.
Typus (Syntypi): Baghdad, Auch. 319 G!; Persia, Auch. 4142 G!

Herba annua, 2—30 cm alta, plerumque a basi valde ramosa, glabra vel parce pilosa. Folia basalia interdum rosulata, pinnatilobata vel subintegra obtuse dentata, petiolata; folia caulina similia. Racemi terminales et laterales, floriferi condensati, fructiferi valde elongati, cylindrici. Petala 1—1,5×0,5 mm. Siliculae 2,5—3×1,5—2 mm, axi appressae, saepe imbricatae, apice cornubus 0,5 mm longis provisae; stylus c. 0,5 mm longus; pedicelli 1—2,5 mm longi. Semina 2. Cotyledones pedunculatae.

Persia: W: Khuz.: Ahvaz, Koelz 14963! — S: Persia australis maritima, Auch. 4142! Kerm.: Distr. Jiroft, Hamun-e Jaz Murian, 400 m, Reshad, Starm. 111!; Rig Mati, Starm. 104! — E: Sistan: Kuh Khajik, Shar. 5662-E! Sistan, Daly 16!
Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 176 (1965).
Afghanistan: NW: Herat: Ad fluvium Hari Rud prope Roznak, Aitch. 607, 451! — SW: Farah versus Shindand, Jija, 800 m, Koelz 4172! — Afghanistan, Griff.!
Pakistan: S. Wazir.: Tank, Williams 7102! — Quetta: Sibi, Lace 3458! — Bal.: Prope Nushki, Popov 249! — Baluchistan, Stocks!

Distr. gen.: Aegyptus, Syria, Iraq, Persia, Turcomania, Pakistan, Afghanistan.

L. Borszczowii (Regel) Busch, Fl. URSS. 8: 652 (1939) is probably a local form of *L. Aucheri*. Other than the dwarfer habit, the original description is identical with that of *L. Aucheri*. It probably is the same as some of the dwarf plants from salt marshes such as Koelz 4172 from SW Afghanistan. The distribution of *L. Borszczowii* is given as Balkhash and Kara Kum.

Sect. *Cardamon* DC.

Siliculae apice anguste alatae. Stamina 6; cotyledones trilobae.

2. ***L. sativum*** L., Spec. Plant. 644 (1753).
Icon.: Clavis p. 15.
Typus: Non indicatus.

Annuum, caule 20—50 cm alto, singulo erecto superne ramoso, glabro vel piloso. Folia basalia lyrato-pinnata, petiolata, mox marcescentia; caulina minus incisa, segmentis oblongo-linearibus; summa integra. Petala alba vel lilacina, 2—3 mm longa. Silicula late elliptica vel ovato-orbicularis, emarginata, 5—6×4—5 mm; pedicelli fructiferi 2—3 mm longi, ascendentes.

Iraq: Kurd.: Jindian supra Rawandiz, 800 m, Gillett 8307! Sul.: Khurmal, Rawi 8847!
Persia: N: Gorg.: Gonbad-e Kavus, Merton 3309! Maz.: Ramsar, Gauba 248! Gil.: Lahijan, Linds. 884! Inter Rasht et Bandar-e Pahlavi, Mir Kamali 6640-E! — W: Azerb.: Tabriz, Gill.-Sm. 1496! Khosrava prope Shapur, Knapp. Khuz.: Shush, Nab. 1335. Bisheh, 1200 m, Koelz 671! Masjed Soleyman, Macmillan 35! Esf.: Esfahan, Auch. 327. — S: Fars.: Baghmani S Bushehr, Bornm. 62. Lar.: Insula Khark, Ky. 25! Insula Hormoz, Bornm. 61. Kerm.: Baghin prope Kerman, Bornm. 2220. Kerman, Bornm. 2219. Bal.: Kisihar, Shebvinovsky 170! Biaban: Sirik, Behs. 221-E! — E: Sistan: Zabol, 600 m, Rech. 7289!, Shar. 5664-E! — C: Qazv.: Gach Sar, Schmid 5756!
Turcomania: Ashkhabad, Sint. 382.
Afghanistan: SW: Farah, Koelz 13255! — SE: Kandahar, Kerst. 350, Scheibe 29. — E: Kabul: Darulfanun, Manger 114. Kabul, 1780 m, Gilli 1141! Nuristan: Kandai,

KITAM. Gusalak, EDELB. 149. — C: Qala Qansi, ad ripas fluvii Hari Rud, 2200 m, RECH. 18841!
Pakistan: Chitral: Mastuj — Baroghil track, STAINTON 2952! — N. Wazir.: Miram Shah, BLATT. & Fz. 492. — S. Wazir.: Tank, WILLIAMS 7101. — Quetta: Loralai, JAFRI & AKHTAR 2317! Quetta, LACE 3523!

Distr. gen.: Per regionem temperatam borealem.

Two subspecies are recognisable in fruit; some intermediates occur.

1a. Rami fructiferi non spinescentes. Pedicelli fructiferi dimidium longitudinis siliculae attingentes. Stylus sinum apicalem siliculae non superans ..... subsp. *sativum*

b. Rami fructiferi spinescentes. Pedicelli fructiferi dimidia longitudine siliculae breviores. Stylus sinum apicalem siliculae superans ..... subsp. *spinescens* (DC.) THELL.

Subsp. *sativum* is much cultivated for salads.

Subsp. *spinescens* (DC.) THELL. is apparently a xerophytic form.

Sect. *Dileptium* DC.

Silicula non alata, si alata stylus liber; stamina 2—4.

3. ***L. ruderale*** L., Spec. Plant. 645 (1753).
Typus: „Hab. in Europae ruderatis et ad vias".

Annuum vel bienne, foetidum, 10—30 cm altum, caulo singulo superne valde ramoso, glabrum vel pilis brevibus patulis laxe obsitum. Folia basalia pinnata, petiolata, saepe rosulam mox evanescentem formantia. Folia caulina pinnata, segmentis angustis integris, folia summa oblonga, sessilia. Petala deficientia. Silicula ovata vel late elliptica 2—2,5 × 1,5—2 mm, apice anguste alata; pedicelli 2—4 mm longi, tenues.

Iraq: Kurd.: Mosul: Amadiyah, HAINES 1822! — Diyala: Jabal Hamrin, SUTHERLAND 160.
Persia: W: Azerb.: Qareh Dagh, Hasan Beyglu, KNAPP. Bakht.: Gatvand, MART.-ESCAL. In valle Bazoft, 2000 m, MART.-ESCAL.
Turcomania: Ashkhabad sec. NIKITIN, Fl. Ashkhabad 176 (1965).

Distr. gen.: Per Europam et Asiam occidentalem late dispersum.

Sect. *Lepidium*

Silicula non vel inconspicue alata, apice non vel brevissime tantum emarginata. Stamina 6.

4. ***L. pinnatifidum*** LEDEB., Fl. Ross. 1: 206 (1842).
Syn.: *L. Neubaueri* RECH. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 58 (1954), syn. nov.
Typus: „Hab. in regione Astrachanensi", BLUME, LE.

Annuum vel bienne, usque ad 50 cm altum, glabrum vel pilis simplicibus laxe obsitum, superne valde ramosum, tota longitudine foliatum. Folia basalia ± rosulata, pinnatifida, petiolata, mox marcescentia; caulina lineari-oblonga, integra, breviter petiolata. Sepala saepe roseo-tincta. Petala nulla vel rudimentaria. Stamina 2—4. Silicula 1,5—3 × 1—2 mm, parce pilosa, elliptica vel ovato-orbicularis, apice indistincte emarginata; stigma sessile. Semina 2, saepe valvis delapsis persistentia.

Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 176 (1965).
Afghanistan: E: Kabul: In collibus ad septentriones urbis Kabul, 1800 m, Rech. 17035! Kabul, Gilli 1154!, 1155!, 1156!, 1157!, Hdg. & Wdb. 2955!, 5108!, Rech. 18018!, Neub. 514!, 550! (Typus *L. Neubaueri* Rech. f.) Sher Darwasa, 1880 m, Gilli 1158!, 1159! — C: Doab, 1200 m, Volk 1760.

Distr. gen.: Regio caspica, Turcomania, Afghanistan, Himalaya.

5. ***L. perfoliatum*** L., Spec. Plant. 643 (1753).
Icon.: Clavis p. 7.
Typus: „Hab. in Persia, Syria".

Annuum vel bienne, 15—50 cm altum, inferne pilosum, superne glabrum. Folia basalia longe petiolata, bipinnata, segmentis linearibus apiculatis, caulina ovata vel ovato-orbicularia, amplexicaulia, late auriculata. Petala flava, 1—1,5 mm longa. Silicula 3—5×2,5—4,5 mm, forma variabilis, orbicularis usque ovata, apice anguste alata; pedicelli fructiferi 3—7 mm longi, ascendentes; stylus sinum vix superans.

Iraq: Kurd.: Sulaymaniyah, 800 m, Gillett 7661!, Graham. — Diyala: Jabal Hamrin 500 m, Bornm. 911.
Talish: Swant, Hohen.
Persia: N: Dasht-e Gorgan, Shar. 568! Gil.: Ispili, Linds. 1317! — W: Azerb.: Khosrava prope Shahpur, Knapp. Khvoy, Knapp. Tabriz, Gill.-Sm. 1377! Ad lacum Rezaiyeh, 1300 m, Jacobs 6621! Shendabad prope Khvoy, Knapp. Kuhha-ye Sabalan, 32 km W Ardabil, Furse 2457! Kermansh.: Qalapain 22 km W Kermanshah, Bent & Wr. 401—123! Ham.: M. Alvand, Str. Arak: M. Kohrud, Str. Khuz.: In ruinas ad Shush, Nab. 1393. — S: Fars.: Inter Abadeh et Dowlatabad, Schmid 5337! — C: Qazv.: Karaj, Gauba. Qazvin, 1200 m, Schmid 5016!, 5057! Tehran; Tajrish, Bruns.
Turcomania: Kizyl Arvat, Becker. Ashkhabad, Sint 51-c., Litw. 77.
Afghanistan: NW: Herat: Hari Rud, Aitch. 284! — E: Kabul: Maslakh-Jakatut, Neub. 82! Kabul, Neub. 517!, Gilli 1160!, Collett c. l! — Afhganistan, Griff.! — NE: Taloqan, 720 m, Podlech 10258.
Pakistan: Baluchistan, Stocks!

Distr. gen.: Europa centralis et australis, Asia austro-occidentalis et centralis.

A widespread weed, very distinct on account of the markedly dimorphic leaves.

6. ***L. vesicarium*** L., Spec. Plant. 643 (1753).
Syn.: *L. Pichleri* Boiss., Fl. Or. Suppl. 63 (1888).
Icon.: Tab. 6.
Typus: „Hab. in Iberiae, Mediae aridis", Tournefort.

Annuum vel bienne, usque ad 70 cm altum, ± glabrum, erectum, superne valde ramosum, ramis laevibus nitidulis. Folia basalia petiolata, 2—3-pinnata, mox marcescentia; caulina bipinnata, segmentis linearibus saepe elongatis. Petala 3 mm longa, alba. Silicula 2—3×1,5—2 mm, ovoidea, anguste alata vel exalata; pedicelli fructiferi 3—7 mm longi, erecto-patuli.

Talish: sec. Fl. URSS. 8: 513 (1939).
Persia: N: Persia borealis, Auch. 322!, Szov., Bge. — W: Azerb.: Jolfa, Grossh, Zanjireh, Knapp. Gesht inter Shahpur et Khvoy, Knapp. In valle Liqvan prope Tabriz, Gill.-Sm. 1286! Tabriz, Koelz 17011!, Gill.-Sm. 1486. In jugo Shebli, 46 km E Tabriz, Furse 2358! 48 km S Khvoy, Furse 2275! Rezaiyeh, Cowan & Darlington 1475! 72 km N Rezaiyeh, Cowan & Darlington 1494! Ad lacum Rezaiyeh, 1300 m, Jacobs 6638! Azerbaijan, Auch. 4136. Ham.: Ad pagum Mehran prope Hamadan, Stapf. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 207! Esf.: Inter Esfahan et Kashan, Buhse. Esfahan, Bge. Inter Esfahan et Abadeh, 2000 m, Schmid 5362! Arak:

M. Latetar inter Arak et Qom, Str. Istgah-e Ananjerd inter Arak et Qom, Rech. 5792! — S: Fars.: Deh-i Girdu, Stapf 177! — E: Khor.: Inter Mashhad et Soltanabad prope Sabzevar, Rech. 5271! In montibus a Sabzevar orientem versus, Rech. 1316! — C: Ad margines deserti Kavir: Hizomeh, 1200 m, Gabr. 38. Tehr.: Tehran, Brown 784! Trott 13! Qazv.: Karaj, Gauba, Rech. 147! Qazvin, Bornm. 6283!, Schmid 6429!, 6451! Soltanabad prope Qazvin. Linds. 162!

Distr. gen.: Caucasia, Talish, Anatolia, Persia.

Distinct in the genus and the family on account of the nodal swellings.

7. ***L. cartilagineum*** (J. Mayer) Thell., Viert. Naturf. Ges. Zürich 51: 173 (1906).
Syn.: *Thlaspi cartilagineum* J. Mayer, Abh. Böhm. Ges. Wiss. (Math.-Nat.) 235, tab. 7 (1786).

Lit.: J. Bornmüller, Beihefte zum Botanischen Centralblatt 32: 359 (1918).

Perenne, valde ramosum, caulibus 5—30 cm altis, diffusis, ascendentibus vel erectis subglabris vel pilis brevibus subclavatis obsitis. Folia omnia crassa, in vivo subcarnosa, in sicco coriacea, basalia longe petiolata, elliptica ovata vel linearilanceolata; caulina oblongo-lanceolata, auriculata vel exauriculata. Petala alba, 2—4 × 1—2 mm. Pedicelli fructiferi c. 5 mm longi, crassi. Silicula 2,5—3 × 2,5—3 mm, late ovata, apice inconspicue emarginata; stylus brevis.

1a. Planta ad summum 15 cm alta, pauciramosa. Folia lineari-lanceolata, caulina exauriculata vel auriculis minutis provisa ..... b) subsp. *pumilum* (Boiss. & Bal.) Hedge

b. Planta ultra 20 cm alta, valde ramosa. Folia late ovata vel elliptica, caulina manifeste auriculata ..... a) subsp. *cartilagineum*

a) — — subsp. ***cartilagineum***
Syn.: *L. crassifolium* Waldst. & Kit., Pl. Rar. Hung. 1: 4, tab. 4 (1799). *L. cartilagineum* subsp. *crassifolium* (Waldst. & Kit.) Thell., Neue Denkschr. Schweiz. Ges. Naturw. 41: 153 (1906). *L. kabulicum* Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 58 (1954), syn. nov.
Typus: „Sibiria, in deserto Baraba, locis salinis", Martini & Gmelin.

Persia: W: Arak: M. Kohrud S Kashan, Str. M. Latetar inter Arak et Qom, Str. — C: Qazv.: In montibus prope Mardabad, Gauba.
Turcomania: Ashkhabad, Sint. 523, Litw. 51.
Afghanistan: NW: Herat: In valle Hari Rud, Aitch. 1012! — SE: Katawaz, Sarwand, Neub. 553! — E: Kabul: Murghab infra Bala Hissar, 1780 m, Hdg. & Wdb. 3221! Bala Hissar, Rech. 16009!, Neub. 134! 20 km a Kabul orientem versus Lataband, 1800 m, Hdg. & Wdb. 3040!, Volk 104!, Hay 94!, Kitam. Guzar Gah, Neub. 152! Maslakh, Neub. 143! (Typus *L. kabulici* Rech. f.) Sharenau, 1750 m, Gilli 1145!, 1146!, 1146-b!, Neub. 154! Inter Kabul et Tang-e Gharu, 1700 m, Gilli 1147! Inter Kabul et Sarobi, 1700 m, Rech. 16882! Inter Bulola et Doab, Kitam. — C: Bamian: Darreh-i Shikar, 2200 m, Hdg. & Wdb. 3355!
Pakistan: Quetta: Zang-i Lora prope Quetta, Lace 3314! Quetta, Griff. 392, Duthie 943!, Stocks!

Distr. gen.: Rossia australis, Caucasia, Anatolia, Persia, Afghanistan, Pakistan, Asia centralis.

b) — — subsp. ***pumilum*** (Boiss. & Bal.) Hedge, comb. et stat. nov.
Syn.: *L. pumilum* Boiss. & Bal. in Boiss., Diagn. Pl. Or. Nov. Ser. 2, 6: 21 (1859).

L. cartilagineum (J. Mayer) Thell. subsp. *crassifolium* (Waldst. & Kit.) Thell. var. *pumilum* (Boiss. & Bal.) Thell., Neue Denkschr. Schweiz. Ges. Naturw. 41: 155 (1906). *L. Bornmuelleranum* Thell., Feddes Repert. 12: 192 (1913), syn. nov.
Typus: Turkey: „Hab. in salsis ad margines paludum ad occidentem Caesareae", Balansa, G!

Persia: W: Azerb.: Ad ripam austro-orientalem salsam lacus Rezaiyeh inter Bunab et Khanian, Rech. 14794! Ad lacum Rezaiyeh prope Sharif Khaneh, 1220 m, Aell. 1065! Ad lacum Rezaiyeh, 1300 m, Jacobs 6840! 94 km N Khvoy inter Shahabad et Maku, 1000 m, Rech. 32710. Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 203!, 204! Arak: M. Kohrud, Str. — S: Fars.: Deh Bid, 2250 m, Pravitz 743!

Distr. gen.: Crimea, Anatolia centralis, Persia.

Apparently restricted to the central part of the species range, subsp. *pumilum* is generally a low-growing, erect plant with a more or less condensed inflorescence and infructescence. *L. Bornmuelleranum* Thell. is a very small form of subsp. *pumilum* but otherwise not different from it. There are intermediates between the subsp. *cartilagineum* and *pumilum* and the Turkish endemic *L. caespitosum* Desv. Further gatherings and field observations may show that the classification requires modification.

8. ***L. latifolium*** L., Spec. Plant. 644 (1753).
Typus: „Hab. in Galliae, Angliae umbrosis, succulentis".

Herba perennis stolonifera usque ad 1 m alta, superne valde ramosa, dense paniculata, glabra vel pubescens. Folia basalia longe petiolata, indivisa, ovato-lanceolata dentata, glabra vel pilis simplicibus obsita; folia caulina lanceolata, sessilia vel breviter petiolata. Petala alba raro rosea, 2,5—3 mm longa. Silicula orbicularis vel obovata, 1,5—2×1—2 mm, apice non emarginata; stigma subsessile; pedicelli fructiferi tenues, 3—5 mm longi.

Iraq: Kurd. Kirkuk, Haussk.! Arbil: M. Algurd, 1700 m, Rawi 13799! Mosul: Sirsang, Haines 501! Niniveh versus Mosul, 250 m, Chapman 25369! Jabal Bakhair, Field & Lazar.
Talish: Swant, Hohen.
Persia: N: Gil.: Inter Rudbar et Manjil, Buhse. — W: Azerb.: Chahriq prope Shahpur, Knapp. Tabriz, Buhse, Gill.-Sm. 1863! Kurd.: 31 km N Sanandaj, 2000 m, Grant 16068. Kermansh.: Nahavand, 1400 m, Jacobs 6990! Ham.: Yalfan, Stapf. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 200! Khamseh: Zanjan, Furse 3251! Esf.: Prope Esfahan, Stapf 173! Arak: Inter Arak et Oshtoran Kuh, Str.! Lur.: Dow Rud, Koelz 18206-a!, 18131! Azna, 1800 m, Koeie 1437! Oshtoran Kuh, Str.! Bakht.: Gatvand, Mart.-Escal. — S: Kerm.: Ad pagum Laleh Zar, 3000 m, Bornm. 2225! Bahramjerd S Kerman, 2300 m, Bornm. 2224. — E: Khor.: In valle fluvii Atrak inter Shirvan et Bojnurd, Rech 1799! Mashhad, Donaldson! Kavir: Malheh, 1030 m, Gabr. 41. — C: Tehr.: Pul-i Jaji Rud, Bruns. Ask in M. Damavand, Buhse. In jugo Kandavan, Davis 828! Hableh Rud prope Simin Dasht, 1150 m, Manuch. & Aell. 1063! Polur, 1900 m, Gilli. M. Tuchal, in fauce Dudera, Ky. 426!, 674! Qazv.: Karaj, Gauba, Rech. 436!, 6846! Damgh.-Semn.: In jugo Gaduk-e Bashm, Rech. 7508! In valle Tedzhen a Qomrud Pain usque ad jugum, 60 km E Firuzkuh, 2200—2500 m, Behb. & Aell. 1017!
Turcomania: Ashkhabad, Suluklü, Sint. 915. Ashkhabad, Litw. 598, Sint. 343!
Afghanistan: N: Mazar-i Sharif, Balkh, 400 m, Rech. 16169! — NW: Maimana, 900 m, Hdg. & Wdb. 3813! Herat: M. Paropamisus, Chashmeh Obeh, 1800 m, Rech. 19217! — SW: Herat: In valle Hari Rud, Aitch. 607! — SE: Kandahar, Kitam. Helmand, Thesiger 2! — E: Kabul: Kabul, 1800 m, Gilli 1148!, 1149!, 1150! Rech. 17064!, Neub. 512!, Hay 368!, 433!, Kitam. Hauz-i Mahiha, 2600 m, Koeie 2435! Pul-i Alam, Koelz 11826! Sarobi, Lindb. 138! Arghandeh, Kitam. Ghazni: Sang-i

Masha, Rech. 17481! In jugo Ghoutch Kol NNE Sang-i Masha, 3300 m, Rech. 17654! Ghazni, 2400 m, Chaw.-Must. Gardez, Volk 810, 1036! Panjshir: Kur-Petau, 3200 m, Podlech 12496. In faucibus vallis Dehkhawak, 2600 m, Podlech 12503. Nuristan: In valle Parigel, 1810 m, Kerst. 1164! In valle Rangul, Thesiger 1441! In valle Linar, Thesiger 1508! — NE: Wakhan: Urghend-i Bala, 3200 m, Roemer 245! Khandud, Lindb. 1076. M. Noshaq, in valle Qazi Deh, 3040 m, Yoshi 458, 462, 463. Munjan: Ptili, 2700 m, Edelb. 1247. Kataghan: Taliqan versus Khanabad, Furse 6500! Baghlan, Furse 6014! Pul-i Khumri, Amsel! In valle Andarab: Dahan-i Badjga, Podlech 11299. Mughul, 20 km NW Taliqan, 740 m, Podlech 11380. Ak Masjed SW Taliqan, 800 m, Podlech 11396. In valle Namakab, Taqcha Khana, 1405 m, Podlech 11444. In valle Bangi, Afaqi, Podlech 11532. Darreh-i Shahshan NE Deh-Salah, 2300 m, Podlech 12006. Badakhshan: Ribat-e Pain, Koelz 12829! Anjuman, 3100 m, Podlech 12430. — C: Bamian: Codrington, Podlech 12182. Doab, Volk 1771! Ghorat: SW Sar-i Naorak, 2480 m, Rech. 18928! — Afghanistan, Griff.
Pakistan: Chitral: Mastuj, Bowes Lyon 906! — Kurram: Shalozan, Aitch. 94!, 621!, 694. Alizai, Afendi 237!

Distr. gen.: Europa australior, Africa borealis, Asia austro-occidentalis et centralis usque ad Orientem extremum.

In our area, I am unable to distinguish the two sub-species that Thellung l. c. 159 recognised: subsp. *sibiricum* (Schweigg) Thell. with sessile cauline leaves and glabrous or glabrescent silicules and subsp. *latifolium* with subsessile cauline leaves and pubescent silicules. There appears to be no correlation between characters and geography in our specimens and many are intermediate. It is possible that the Flora Iranica area is the meeting point of the two subspecies — the western subsp. *latifolium* and the eastern *sibiricum* — but as *L. latifolium* has often been cultivated and is now often to be found near cultivation, the original distribution of the wild species is uncertain. — *L. latifolium* grows in a great variety of habitats; fields, waste ground, stony slopes, marshes and riversides.

9. ***L. tofaceum*** Rech. f., Dan. Biol. Skr. 10, 3: 20 (1958).
Typus: Volk 2843, W!

Perenne, flavescenti-viride, 20—30 cm altum, ramis rigide erectis, glabrum, ± dense foliatum. Folia carnosa, oblongo-elliptica, basalia mox emarcida, petiolata; caulina basi attenuata sessilia. Racemi axillares et terminales. Petala ignota. Silicula 1,5—2,5 × 1—2 mm, orbicularis, obcordata; stigma sessile. Semina 1 vel 2. Radicula incumbens.

Afghanistan: C: Bamian: Band-e Amir, Volk 2843!, Podlech 12099. Ad lacum Band-i Gholaman, 2800 m, Rech. 18486! Ad radices montium Koh-i Baba, Thesiger 98! Orozgan: Prope Dorah-i Tarbulak inter Panjao et Lal-i Sar Jangal, 2700 m, Rech. 18811!

Distr. gen.: Endem.

With a certain degree of superficial resemblance to *L. latifolium* this species is related to the Central Asiatic and Mongolian species *L. cordatum* Willd., *L. obtusum* Bas. and *L. amplexicaule* Willd. *L. tofaceum* shares with these species the characters of fleshy leaves and stiffly erect habit but differs from them all in the non-cordate, non-auriculate leaf bases. It differs from *L. obtusum* in the deciduous, non-persistent calyces.

10. ***L. persicum*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 196 (1842).

Perenne, (10—) 30—80 cm altum; pilis brevibus simplicibus densiuscule vel laxe obsitum vel glabrum. Folia basalia integra vel dentata, petiolata, oblongo-lanceolata, apice rotundata, basi attenuata; caulina ± numerosa vel nulla, breviter petiolata. Racemi floriferi saepe condensati, fructiferi valde elongati. Petala alba, (1,5—)

2 (—3) mm longa. Silicula (1,5—) 2—3 (—4)×(1—) 2 (—3) mm, non valde compressa, ovata vel elliptica; stylus c. 3 mm longus; semina 2, basi alata vel exalata; pedicelli fructiferi subappressi, patuli vel ascendentes, 1—5 mm longi.

A most variable species with a strong tendency to form distinctive local populations. The taxonomic treatment of the complex has varied greatly with different authors. Thellung, l. c. 164—170, taking an extremely wide view of the species, regarded all the taxa in our area as varieties of *L. lyratum* L. subsp. *lyratum* or *L. lyratum* subsp. *lacerum* (C. A. Mey.) Thell. Most of the recent Russian accounts have a very narrow specific concept. For example, in Flora Kazakhstan 4: 316—318 (1961), seven separate species are recognised, most of which Thellung regarded as varieties of the two cited subspecies. The ideal treatment probably lies between the two extremes but until a fresh overall review of the group is undertaken, regional accounts can only be provisional.

In our area I have recognised two widespread and two very local subspecies.

1a. Pedicelli fructiferi flaccide patule ascendentes, 4—6 mm longi. Folia caulina oblongo-lanceolata, consistentia ± tenui. Semina exalata ..... b) subsp. *arianum* Hedge

b. Pedicelli fructiferi rigidi, erecti vel patuli, 1—4 (—5) mm longi. Folia caulina lineari-oblonga vel nulla, consistentia crassa vel tenui. Semina alata vel exalata 2

2a. Folia caulina numerosa. Planta glabra. Silicula 3—4×2—3 mm ..... c) subsp. *macrocarpum* Hedge

b. Folia caulina pauca vel nulla. Planta simpliciter pilosa. Silicula ad summum 3 mm diametro 3

3a. Folia caulina nulla. Folia basalia apice tridentata, dense pilosa. Planta c. 10 cm alta ..... d) subsp. *trifidum* Hedge

b. Folia caulina evoluta, plerumque pauca; folia basalia vario modo dentata, laxe pilosa. Planta ultro 30 cm alta ..... a) subsp. *persicum*

a) — — subsp. ***persicum***

Syn.: *L. lyratum* L. subsp. *lacerum* (C. A. Mey.) Thell. var. *persicum* (Boiss.) Bge. in Lehm., Reliq. Bot. 1: 212 (1848). *L. lignescens* Rech. f., Feddes Repert. 48: 37 (1940), syn. nov. *L. persicum* Boiss. subsp. *ellipticum* Bornm. & Gauba, Feddes Repert. 50: 373 (1941), syn. nov.

Typus (Syntypi): Persia, Buhse, Auch. 321 et 4141, G! Afghanistan, Griff.

Persia: W: Azerb.: In collibus a Tabriz septentriones versus, Gill.-Sm. 2488! Prope Tabriz, Merton 3518! Esf.: In montibus prope Esfahan, Buhse 1415. M. Shahkuh, Deicke 377. Esfahan, Auch. 321, 4141! Ham.: M. Alvand prope Hamadan, Str. Arak: Kuh Shahsinde, WNW Arak, Str. Mowdar prope Arak, Str. Kuh-e Safid Khaneh, SW Arak, Str. Lur.: Oshtoran Kuh, Str. Kuh Saverz et Kuh-e Eshger, Haussкn.! Kebara, Koelz 18251! Dow Rud, Koelz 16049!, 18319! — S: Fars.: NW Takht-e Jamshid, 1800 m, Wdb. 801! NW Ardakan, Archibald 2897! Inter Persepolis et Dowlatabad, 1000—2000 m, Schmid 5469!, 5487!, 5488! Kuh-e Barfi prope Shiraz, Ky. 343!, Stapf 175! Shiraz, Behb. 987! — E: Khor.: Kopet Dagh, Czern. M. Hazar Masjed, Czern. Inter Torbat-e Heydariyeh et Abbasabad, Rech. 4415! Inter Mashhad et Torbat-e Heydariyeh, in montibus serpentinicis ditionis Robat-i Safid, 1700 m, Rech. 1528! (Typus *L. lignescentis* Rech. f.) — C: Qazv.: Gandab, Buhse. Kuh Jarub prope Mardabad S Karaj, Gauba 1752 (Typus subsp. *elliptici* Bornm. & Gauba). Tehr.: Firuzkuh, Gauba! Damgh.-Semn.: Inter Firuzkuh et jugum Bashm, 1900—2000 m, Rech. 1168! E Firuzkuh, Furse & Synge 641! 32 km SE Firuzkuh, Furse 3025! Shahmirzad Kuh, Wdb. 1306-a!, 1319-a!, 1363! Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 2300 m, Rech. 5867! Qom: Rahjerd, Koelz 1425!

Afghanistan: C: Bamian: In valle Ajar, W Doab, 1200 m, HDG. & WDB. 4098!, RECH. 16628! Inter jugum Shibar et Bamian, 2600 m, KOEIE 2795! In faucibus Paimuri, 2700 m, HDG. & WDB. 4689! Gulgola, 2500 m, HDG. & WDB. 4635! Doab, VOLK 1760!, KOELZ 13503-a!

Distr. gen.: Endem.

With the fairly abundant material available, there are no apparent grounds for further sub-division of this taxon. It is variable in height, degree of branching, leaf shape and density of indumentum. The aspect of the plant differs considerably with age: some specimens that are very woody at the base have a different facies from the more herbaceous plants. For latin descriptions of subspecies see Addenda.

b) — — subsp. ***arianum*** HEDGE, subsp. nov.
Typus: GILLI 1152, W!

Afghanistan: E: Kabul: Hauz-i Mahiha, 2700 m, EDELB. 1831!, KOEIE 2348! Sher Darwasa, 1900 m, HDG. & WDB. 3175!, GILLI 1152!, RECH. 17001!, KERST. 476-a. Kabul, KOELZ 11408! In latere occidentali jugi Lataband, 1800—2100 m, RECH. 31114. Ghorband, VOLK 487! Logar, 2500—2700 m, VOLK 1718! Parvan: In valle Panjshir, Lalandar, 1870 m, GILLI 1153! Mukeni, 2300 m, HDG. & WDB. 5307! N Dasht-i Rewat, 2500 m, PODLECH 12264 — NE: Kataghan: In faucibus S Namakab, 1600 m, PODLECH 11460. Khost-o Fereng in valle N jugi Yula, 2200 m, PODLECH 11938. Paigah Kotal SE Haibak, 1350 m, HDG. & WDB. 4031!, RECH. 16472! Badakhshan: Inter Mashhad et Faizabad, FURSE 6164! — C: Deh Kundi, 2700 m, EDELB. 1932!

Distr. gen.: Endem.

With adequate material, this subspecies should not be confused with subsp. *persicum*. It is difficult to know what its nearest ally is, but it is certainly nearer to some of the Soviet Central Asiatic taxa than to subsp. *persicum*. I have not seen a sufficient representation of the Soviet species for a certain assessment but from their descriptions, subsp. *arianum* appears to be distinct from them. In THELLUNG's rather unsatisfactory key to the subspecies and varieties of *L. lyratum* our new subspecies runs down to subsp. *lacerum* var. *eremophilum* (SCHRENK) THELL. (*L. eremophilum* SCHRENK, Bull. Phys.-Math. Acad. Petersbg. 2: 199 [1844]).

Most of the cited specimens are not very variable in characters but the following variety requires mention.

— — — var. ***spathulatum*** (RECH. f.) HEDGE, comb. nov.
Syn.: *L. spathulatum* RECH. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 2 (1954).
Typus: NEUB. 13, W!

Folia basalia integra, carnosa, suborbiculato-spathulata; folia caulina parva, anguste lineari-lanceolata.

Afghanistan: E: Kabul: Guzar Gah, NEUB. 13! Ghorband, VOLK 487!

Distr. gen.: Endem.

These two rather inadequate specimens may prove with better material to be local forms not worth recognition. Both were collected in more or less saline habitats.

c) — — subsp. ***macrocarpum*** HEDGE subsp. nov.
Typus: HDG. & WDB. 3960, E!, BG.

Afghanistan: N: Mazar-i Sharif: SE Tashkurghan inter Tashkurghan et Haibak, 600 m, HDG. & WDB. 3960!, RECH. 16360!

Distr. gen.: Endem.

Although known only from the two cited gatherings made at the same locality, this taxon differs sufficiently from the other subspecies of the complex to justify separate recognition.

d) — — subsp. ***trifidum*** Hedge, subsp. nov.
Typus: Hdg. & Wdb. 4952, E!, BG.

Afghanistan: C: Bamian: W Panjao, Kotal-e Narges, 3100 m, Hdg. & Wdb. 4952!

Distr. gen.: Endem.

A curious plant only known from the one gathering in central Afghanistan and by a combination of characters differing markedly from the other taxa in the complex.

24. *Coronopus*

Coronopus Zinn, Cat. Pl. Hort. Acad. Gött. 325 (1757).
Syn.: *Senebiera* DC., Mem. Soc. Hist. Nat. Paris 140 (1799).

Lit.: R. Muschler, Die Gattung Coronopus, Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 41: 111—147 (1907—08).

Herbae annuae vel biennes, glabrae vel pilis tuberculi-formibus obsitae. Folia pinnata. Racemi axillares et terminales. Sepala oblique patentes, non saccata, saepe violacea. Petala alba, minutissima vel deficientia. Stamina 2—6. Fructus indehiscens vel in dimidia secedens, 2-spermus; valvae crassae, hemisphaericae vel subglobosae, verrucosae vel reticulatae. Radicula incumbens.

1a. Silicula 2—3×3—4 mm rotundata. Stamina fertilia 6 ..... 1. *C. squamatus* (Forssk.) Aschers.on
b. Silicula c. 1,5×2—3 mm, emarginata. Stamina fertilia plerumque 2..... 2. *C. didymus* (L.) Sm.

1. ***C. squamatus*** (Forssk.) Aschers.on, Fl. Brandenb. 1: 62 (1864).
Syn.: *Lepidium squamatum* Forssk., Fl. Aegypt.-Arab. 117 (1775). *Cochlearia Coronopus* L., Spec. Plant. 648 (1753). *Coronopus procumbens* Gilib., Fl. Lithuan. 2: 52 (1781). *Senebiera Coronopus* (L.) Poir., Encycl. Meth. 7: 76 (1806). *Coronopus verrucarius* (Gars.) Muschler & Thell., Mitt. Bot. Mus. Zürich 28: 318 (1906).
Icon.: Clavis p. 7 et 15.
Typus: Aegyptus: „Alexandriae in desertis vicinis", Forssk., C.

Herba annua vel biennis, prostrata vel ascendens, 5—10 cm longa, valde ramosa. Folia basalia simpliciter vel bipinnatifida. Inflorescentiae axillares fructiferae non vel vix elongatae. Petala 1—1,5 mm longa. Pedicelli fructiferi 1—2 mm longi. Silicula reniformis, apiculata, verrucosa, 2,5—3×3,5—4 mm; margo septi crassissimus; stylus 0,5 mm longus.

Iraq: Diyala: As Sadiyah, Graham. Badrah, Gillett 6602.
Talish: Lenkoran, Swant, Hohen.

Distr. gen.: Europa et Asia austro-occidentalis.

2. ***C. didymus*** (L.) Sm., Fl. Brit. 2: 691 (1800).
Syn.: *Lepidium didymum* L., Mantissa 1: 92 (1767). *Senebiera didyma* (L.) Pers., Syn. Pl. 2: 185 (1807).
Icon.: Clavis p. 9.
Typus: Non designatus.

Habitu *C. squamato* simillimus sed gracilior, foliis minoribus magis dissectis, floribus paulo minoribus, racemis laxioribus. Fructus in segmenta ovoidea secedens.

Afghanistan: E: Jalalabad, in valle Mingar, 600—700 m, Kerst. 652! Jalalabad, Lindb. 133! Khaizon Kel, 30 km NW Jalalabad, Lindb. 137! Kalat-us Siraj, Volk 1937! Nuristan: Chigha Sarai, 820—850 m, Gilli 1161!, Neub. 4558.
Pakistan: Chitral: In pago Chitral, 1500 m, Stainton 2152. — Kurram: Inter Alizai et Thal, Rech. 30986! Kohat: Kohat versus Thal, 675 m, Lamond 1562!, Rech. 30217. — N.-Wazir.: Miram Shah Fort, Blatt. & Fz. 140, 640. — Quetta: Mach, Jafri 2857! — Dera Ismail Khan, in inundatis ad Indus flumen, Rech. 30017!

Distr. gen.: Verosimiliter in America australi indigenus unde in regiones plurimas alias introductus et multis locis inquilinus.

25. *Acanthocardamum*

Acanthocardamum Thell., Viert. Naturf. Ges. Zürich 51: 221 (1906).

Frutex spinosus glaber. Folia simplicia carnosa. Flores parvi. Sepala fere erecta, interiora leviter saccata. Filamenta non dilatata, libera. Silicula compressa, dehiscens, anguste ovata, acuta, superne anguste alata vel exalata, e ramulis spinosis orta. Ovula et semina 2. Radicula in seminibus juvenilibus accumbens, quam cotyledones longior. — Genus monotypicum.

1. ***A. erinaceum*** (Boiss.) Thell., Viert. Naturf. Ges. Zürich 51: 221 (1906).
Syn.: *Lepidium erinaceum* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 17 (1845).
Icon.: Clavis p. 5.
Typus: Ky. 701, G!

Frutex intricate ramosus spinosus, usque ad 15 cm altus. Folia pauca, crasse carnosa, oblonga, glauca, integra, subsessilia, usque ad 5—10 × 1—3 mm. Flores in racemis pauci- (2—6-) floris, brevissime pedicellati. Petala 5 × 1 mm. Pedicelli fructiferi c. 1,5 mm. Silicula c. 6 × 2 mm. Stylus c. 2 mm.

Persia: S: Fars.: In alpe Kuh-e Dinar, Ky. 701!

Distr. gen.: Endem.

Only known from one gathering, this interesting genus is apparently most closely allied to *Lepidium* but without better material its status cannot be accurately assessed. It is of similar habit, but not related, to *Moriera spinosa* Boiss.

26. *Winklera*

Winklera Regel, Acta Hort. Petrop. 9: 617 (1886).
Syn.: *Uranodactylus* Gilli, Feddes Repert. 61: 209—211 (1959).

Lit.: W. Lipsky, Contributio ad Floram Asiae Mediae, Acta Hort. Petrop. 18: 19—21 (1901). A. Gilli, Umbenennung der Gattung Winklera in Uranodactylus, Feddes Repert. 66: 191—194 (1962). V. Botschantzev, Noch einmal über die Gattungen Winklera und Uranodactylus, l. c. 67—68 (1964).

Perennis, caudice crasso lignescente. Folia plurima basalia, integra vel pinnata, pilis simplicibus obsita vel glabra. Sepala erecto-patula, non saccata. Petala lactea, lamina ovato-orbiculari, ungue angusto. Glandulae nectariferae laterales et medianae separatae. Silicula ± teres vel elliptica, dehiscens, erecta non alata, 1- vel 2-sperma, valde compressa, stylo prominente. Cotyledones transverse plicatae; radicula in-

cumbens. — Species 3 Asiam centralem, Afghanistan et Pakistan occidentalem inhabitantes.

1a. Folia simplicia; folia caulina evoluta. Caulis usque ad 80 cm altus ..... 1. *W. afghanica* (Rech. f. & Koeie) Hedge
b. Folia pinnata, omnia fere basalia. Caulis ad summum 50 cm altus 2
2a. Folia simpliciter pinnata. Silicula ambitu ± elliptica ..... 3. *W. patrinoides* Regel
b. Folia bipinnata. Silicula ambitu ± orbicularis ..... 2. *W. silaifolia* (Hook. f. & Thoms.) Korsh.

1. ***W. afghanica*** (Rech. f. & Koeie) Hedge, comb. nov.
Syn.: *Stubendorffia afghanica* Rech. f. & Koeie, Anz. Math.- Nat. Kl. Österr. Akad. Wiss. 1954, 7: 59 (1954).
Typus: Koeie 3007, W, C!

Caudex residuis petiolorum comosus. Caulis erectus, glaber, superne valde ramosus. Folia basalia petiolata, elliptica vel ovato-lanceolata, c. 5—8×2—3,5 cm, basi cuneata, apice rotundata, prominenter nervosa; folia caulina minora, sessilia. Petala 3,5—5 mm longa. Silicula (7,5—) 10 (—16)×(8—) 12 (—17,5) mm, basi rotundata vel cordata, apice emarginata; stylus 0,5—1,5 mm, septum angustissimum, c. 0,5 mm latum, crasse marginatum pedicelli fructiferi erecto-ascendentes, (5—) 10 (—13) mm longi. Semina 1 vel 2, c. 6 mm longa.

Afghanistan: E: Kabul: Dahan-e Abdila, 24 km E Sar-i Chashma, 2800 m, Rech. 18605! In jugo Unai, 3000 m, Hdg. & Wdb. 4554! Farakulum, 3200 m, Koeie 3007! Hauz-i Mahiha, 2600 m, Koeie 2424! Deh Kundi, 3000 m, Edelb. 1976! Panjao, 2700 m, Hdg. & Wdb. 4895! Ghazni: Inter Miradina et jugum Ghoutch Kol, 3300 m, Rech. 17607! — C: Bamian: Kotal-e Narges, 3100 m, Hdg. & Wdb. 4955! Inter jugum Deraz Kol et Panjao prope Mandigak, 2800—3280 m, Rech. 18658!

Distr. gen.: Endem.

Originally described in *Stubendorffia* this distinct species differs from that genus in the separate median and lateral honey glands, the compressed, dehiscent, stylose silicules and the thick framework of the septum. It differs from the other two species of *Winklera* in the entire leaves (a character of *Stubendorffia*) but shares with *Winklera* the honey gland and fruit characters, petal shape and erect posture of the silicules.

2. ***W. silaifolia*** (Hook. f. & Thoms.) Korsh., Bull. Acad. Sci. Petersbg. ser. 4, 9: 219 (1898).
Syn.: *Heldreichia silaifolia* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 176 (1861). *Uranodactylus afghanicus* Gilli, Feddes Repert. 61: 209—211 (1959). *Uranodactylus silaifolius* (Hook. f. & Thoms.) Gilli, Feddes Repert. 66: 194 (1962). *Lepidium hindukushense* Kitam., Act. Phytotax. Geobot. 19: 97 (1963), syn. nov.
Icon.: Clavis p. 7 et 15.
Typus: Afghanistan, Siahsung, Griff., K!

Caudex petiolorum residuis dense comosus. Caulis 30—50 cm altus, rigide erectus, superne ramosus. Folia glabra vel pilis simplicibus obsita, plurima basalia, bipinnata, segmentis linearibus vel lineari-lanceolatis, petiolata. Petala 4—6×2—2,5 mm. Silicula 9—11 (—12)×9—11 (—14) mm, antice emarginata basi rotundata vel cordata; septum c. 1 mm latum, crasse marginatum; stylus 1—2,5 mm longus; pedicelli fructiferi erecti, (5—) 7—13 mm longi. Semina 2 vel 1, c. 5 mm longa.

Afghanistan: E: Parvan: In valle Panjshir, inter Shanez et Chimar, 2600—3000 m, Hdg. & Wdb. 5357! Darreh Rastagal supra Mukeni, 3300—4100 m, Hdg. & Wdb. 5157! Till Pain, Lindb. 1007! Kabul: In declivibus australibus jugi Salang, 3300 m, Rech. 31580. Prope Panjao, 2700 m, Hdg. & Wdb. 4912! Nuristan: In declivibus occidentalibus jugi Semenek, 3400 m, Kerst. 1513-c! In parte superiore valli Kantivo inter Brubruts et jugum Mamgel, 2500—3000 m, Kerst. 968! In jugo Wanasgul, 4600 m, Thesiger 1601! Pirdum, 2700 m, Thesiger 1609! — NE: Badakhshan: In declivibus orientalibus jugi Anjuman, 3800—4000 m, Hdg. & Wdb. 5455! Kataghan: In declivibus borealibus jugi Salang, 2600 m, Furse 6602! In valle Andarab: Darrah-i Til S Doab-i Til, 2800 m, Podlech 11189. W jugi Khawak, 2900 m, Podlech 11203. Khost-o Fereng, in valle Kala, 3900 m, Podlech 11759. In valle fluvii Echani, 3800 m, Podlech 11861. — C: Bamian: Siahsang, Griff.! Band-e Amir, in decl. saxosis aridis, 2800—2900 m, Rech. 18222! Band-e Amir, 2900—3200 m, Volk 2747!, Gilli 1161-b!, Hdg. & Wdb. 4743! In jugo Aogardan, 3150 m, Hdg. & Wdb. 4999!
Pakistan: Chitral: Owir An SE Tirich Mir, 3600 m, Stainton 2757! Chumarkhan E Mastuj, 3600 m, Stainton 2905! Shoghot, Bowes Lyon 753! Shah Jinali, 3000 m, Toppin 252-A!, Harriss 16179! Lutko, Toppin 252! In jugo Dorah, Giles 264!

Distr. gen.: Pamir-Alaj, Afghanistan, Chitral, Gilgit.

Variable in stature and leaf segmentation. The taller specimens, Hdg. & Wdb. 5157 and the Thesiger specimens from Nuristan, approach *W. patrinoides* Regel.

3. ***W. patrinoides*** Regel, Acta Hort. Petrop. 9: 617 (1886).
Syn.: *Uranodactylus patrinoides* (Regel) Gilli, Feddes Repert. 66: 194 (1962).
Typus: „In Turkestaniae orientalis regione bucharica orientali apud fluvium Tschorabdärrä fluvium Kysylsu baldschuanicum constituens Majo 1884; eodemque mense prope oppidum Mumynawad provinciae Kulab (!) et in montibus Kuh-i Fur e vicinis ad alt. 5000' et prope pagum Hasset Sultan ad declivia occidentalia montium darvasicorum situm. Majo et Junio 1884", Regel, LE.

Habitu *W. silaifoliae* similis; differt ab ea foliis simpliciter pinnatis, habitu minus rigide erecto, siliculis minus compressis. Caulis 10—30 cm altus. Folia petiolo incluso 8—12 cm longa, segmentorum paribus 4—9.

Pakistan: Chitral: Shah Jinali, 3400 m, Bowes Lyon 1024!

Distr. gen.: Amu Darya, Pamir-Alaj, Chitral.

Although only known from one gathering in our area, further exploration will probably reveal its presence in the high mountains of eastern Afghanistan.

27. *Cardaria*

Cardaria Desv., Journ. Bot. Appl. 3: 163 (1814).
Syn.: *Hymenophysa* C. A. Mey. in Ledeb. Fl. Alt. 3: 180 (1831), syn. nov.

Lit.: A. Thellung, Die Gattung Lepidium, Nouv. Mem. Soc. Helv. Sc. Nat. 41: 9—340 (1907).

Herba perennis stolonifera. Indumentum e pilis brevibus appressis simplicibus consistens, raro nullum. Sepala oblique patentia, non saccata, late membranaceo-marginata. Ovarium 2-ovulatum. Silicula late ovata usque cordata, indehiscens, haud compressa. Radicula incumbens.

1. ***C. Draba*** (L.) Desv., Journ. Bot. Appl. 3: 163 (1814).
Syn.: *Lepidium Draba* L., Spec. Plant. 645 (1753).
Typus: „Hab. in Germania praesertim Austria, Gallia, Italia".

Herba perennis 20—60 cm alta, superne valde ramosa. Folia basalia obovato-spathulata, dentata; caulina oblonga usque oblongo-lanceolata, amplexicaulia, interdum auriculata. Inflorescentia dense corymboso-paniculata, fructifera vix elongata. Petala 3,5—4 mm longa, alba. Fructus 4—5×3,5—4,5 mm; pedicelli fructiferi 5—15 mm longi, erecto-ascendentes; stylus 1—2 mm longus. Semina 2 (raro 1).

Very variable and sometimes split into separate species. Two sub-species can usually be recognised in fruiting material. In our area only subsp. *chalepensis* has been recorded.

1a. Fructus basi cordatus, folia semper auriculata ..... subsp. *Draba*
b. Fructus basi truncatus vel rotundatus; folia auriculata vel exauriculata ... . subsp. *chalepensis* (L.) O. E. Schulz

— — subsp. ***chalepensis*** (L.) O. E. Schulz in Engler, Natürl. Pflanzenfam. ed. 2, 17b, Cruciferae: 417 (1936).

Syn.: *Lepidium chalepense* L., Cent. Plant. 2 (1756). *L. repens* (Schrenk) Boiss., Fl. Or. 1: 356 (1867). *L. propinquum* Fisch. & C. A. Mey. in Hohen., Enum. Talysch 142 (1838). *Hymenophysa fenestrata* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 197 (1842), syn. nov. *H. persica* Gilli, Feddes Repert. 57: 219 (1955), syn. nov.

Icon.: Clavis p. 17.

Typus: „Syria, Aleppo".

Iraq: Kurd.: Sul.: M. Avroman ad confines Persiae in ditione Tawilla, 1000 m, Rech. 10395! (ad subsp. *Draba* vergens). Susakan, 1200 m, Rech. 10155! In planitie Sulaymaniyah, Thesiger 377!, 378! Qara Dagh, Makki 479. Mosul: Prope Shaikh Adi 10 km NW Ayn Sifni, Thesiger 647!, 668!, 674! Mosul, Thesiger 778!, Hand.-Mzt. Arbil: Salah ad-Din, Helbaek 735! In faucibus prope Rawandiz, 750 m, Guest 2106. Diyala: Jabal Hamrin, Sutherland 159.

Talish: Kisilagach, Hohen. Lenkoran, Hohen. Swant, Hohen. Sallian, Hohen.

Persia: N: Maz.: In valle Talar E Gaduk, 2300 m, Behb. & Aell. 994! In valle Haraz prope Panjab, Wdb. 656! In valle Chalus, Furse & Synge 365! Gil.: Ispili, Yehlah, Linds. 1185! — W: Azerb.: Ad lacum Rezaiyeh, 1300—1400 m, Jacobs 6650! Zanjireh inter Tabriz et Khvoy, Knapp. Prope Einal Zeinal in viciniis Tabriz, 1500 m, Grossh. Tabriz, Gill.-Sm. 1812!, Buhse. M. Sher Dara, 1450—1500 m, Grossh. Azerbaijan, Auch. 4155. Kurd.: Sanandaj, 1800 m, Jacobs 6964! Kuh-e Dalakhani supra Songor, Haussk. Kermansh.: 40 km W Kermanshah inter Kermanshah et Shahabad, Bent & Wr. 514—118! Inter Arak et Kermanshah in valle Jam Tueh, Str. Ham.: In M. Tafresh, Str. Bahar, Bahai 6703-E. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 201! M. Alvand, Str. Chichian, Stapf. Arak: Yekab inter Arak et Kashan, Str. Girdu prope Arak, Str. Arak, Str. Esf.: Inter Esfahan et Abadeh, 1500—2500 m, Schmid 5410! Esfahan, Iliff 6! Lur.: Dow Rud, Koelz 17724!, 15494! Kharon, Koeie 1435! Bisheh, Koeie 1434! Ad radices Kuh-e Nil, Haussk. Khorramabad, Bent & Wr. 410—103!, 410—209! Posht Kuh, Behb. 106! Shah Bazan, 1200 m, Koeie 1433! — S: Fars.: Bushehr, Nab. 1361, Stapf 171!, 177! 35 km NE Bushehr, Koeie 66! Rud-e Mand, Stapf 93! Shiraz, 1600 m, Stapf 168!, 169! Grant 15455. Persepolis versus Yazd, 32 km NE Persepolis, Furse 1295! Pireh Zan, Auch. 4095!, (Typus *Hymenophysae fenestratae* Boiss.). Pasargadae, 2000 m, Grant 15814. Kerm.: Prope Shirinak inter M. Laleh Zar et M. Hazaran, 3000 m, Bornm. 2221. Kerman, 1900 m, Bornm. 2223; 1700 m, Rech. 3689-b! Jiroft, Sabzvaran, 900 m, Starm. 308! In cultis ad Zahedan, 1300 m, Rech. 3942! Tomagoa, Koelz 14343! Ad marginem australem deserti Kavir, 1480 m, Gabr. 70. Bal.: Khash, 1300 m, Rech. 4297! In regione M. Taftan prope Sangan, Rech. 4084-b! Saravan, Shahestan, Mirzayan 225-E! Sistan: Zabol, 600 m, Rech. 4112!, 7291! Qilah-e Rostam, Annandale 93. Prope Deh Hajji, Henderson 265! — E: Khor.: In montibus inter Birjand et Qayen, 1900 m, Rech. 4180! M. Hazar Masjed, Ardak, 1200 m, Rech. 5234! Ad marginem orientalem deserti Kavir, Ozbagu, Ruttner 102!, 401!, 463! Kuh-e

Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4532! 80 km SE Mashhad, Furse 5298! 64 km W Bojnurd, Furse 5178! M. Kopet Dagh, Quchan, 1500 m, Rech. 1610! — C: Tehr.: Garmsar inter Tehran et Semnan, 900 m, Rech. 2781! M. Shahrestanak, 2200 m, Bornm. 6282. Tehran, Bruns. Qazv.: Gach Sar, 80 km NE Karaj, Furse 2617! Karaj, Gauba. Shahr.-Bust.: In declivibus australibus montium Shahvar, Nokarman, 2000 m, Rech. 5880! Damgh.- Semn.: Kuh-e Nizwa, 10 km N Jashm, 2600 m, Behb. & Aell. 1010! Prope Sorkheh W Semnan, Gilli! (Typus *Hymenophysae persicae* Gilli). Qom, Rech. 2647! Yazd: In M. Shir Kuh prope Taft, Bornm. 2222. In montibus prope Yazd, Buhse.

Turcomania: Kizyl Arvat, Becker, Sint. 1658-a. In cultis prope Ashkhabad, Litw. 596! Kazandzhik prope Ushak, Sint. 1658-b. Ashkhabad, Sint. 59!

Afghanistan: NW: Tirphul, Hari Rud, Aitch. 315! — SW: Herat, Amsel, Koelz 3008! — SE: Helmand, Thesiger! Kandahar, Scheibe 22! Kalat-i Ghilzai, Kerst. 147! Mukur, inter Kandahar et Kabul, Frey 1571! — E: Kabul: Kabul, 1800 m, Hdg. & Wdb. 2903! Neub. 513, Gilli 1144!, 1143! Rech. 16885!, Koelz 11451! Chaman Wazirabad, 1750 m, Gilli 1142! Band-e Kargha, 1900—2000 m, Lamond 2026! Darulfanun, Manger 50! Tang-e Gharu, 1800 m, Hdg. & Wdb. 4254!, Hay 79! Sharenau, 1800 m, Neub. 3045. Lataband, Regel! Tagao, Koelz 11802! Paghman, Chaw.-Must. In valle Ghorband, Furse 5798! Gardez: Sirotai, Koelz 11960! Ghazni: Sang-i Masha, Rech. 17471!, 17492! — NE: Taloqan: Badam Darrah, 900 m, Podlech 10394. Taloqan, 720 m, Podlech 10312. Kataghan: Kunduz, in paludosis fluvii Kunduz, 400 m, Rech. 16037! In valle Andarab, Banu, 1550 m, Podlech 10938. Ishkamish, 1150 m, Podlech 10751. In declivibus borealibus jugi Salang, 2200 m, Rech. 31663. — C: Bamian: Kuh-i Baba, Thesiger 31!, 63!, 98! Bamian, 2400 m, Podlech 12183. Ghorat: SW Sar-i Naorak, 2480 m, Rech. 18920! In jugo Sabz, Koelz 13811!

Pakistan: Peshawar: In jugo Khyber, Halcro Johnston 47! — Kurram: In valle Kurram, Aitch. 58, 182. — N.-Wazir.: Miram Shah, Fz. 492, 832. Miram Shah Fort, Blatt. & Fz. 235. Boya, Fz. 566, 1027, 1095, 1173. Datta Khel, Fz. 1211, 1213. — S. Wazir.: Sora Rogha, Fz. 83. Razmak, Fz. 1588, 1988. Quetta: Mastung, H.-B. 17173. Loralai, H.-B. 19611. Zhob Distr., Gaz. 321. Musa Khel Bazar, Sanjawi et Bori, Lor. Gaz. 358. Ad viam versus Sariab, 1700 m, Lamond 910!, Rech. 28843! Quetta versus Pishin, Gaz. 351. Quetta, Lace 3552!, Duthie 8600! Kalat: Surab versus Kalat, c. 20 km a Surab, 1800 m, Lamond 673! Wad, Jhalowan, H.-B. 1749. Jangal, Popov 215!, 222! Kochau SSW Kalat, Hotson 184-A. Basima prope Jangal inter Panjgur et Surab, 1350 m, Rech. 28290. Makran: Panjgur, 1000 m, Rech. 28154. Panjgur, Hotson M 157. Bal.: Nushki, H.-B. 19215. Kharan Distr., Gaz. 103. — Huidar peak, Blatt. & Fz. 1569. Kila Saifulla, H.-B. 19139. Kohlu, H.-B. 19421. Mazarjuk, Hotson 157-E. Teghab, Hotson 184. Harbud, Hotson 157-C.

Distr. gen.: Europa, Asia austro-occidentalis et centralis.

A widely distributed and often very abundant weed throughout our area.

28. *Isatis*

Isatis L., Spec. Plant. 670 (1753). Gen. Plant. ed. 5: 301 (1754).

Lit.: V. Avetisian, Not. Syst. Tbil. 23: 72—86 (1963). P. H. Davis, Notes from the Royal Botanic Garden Edinburgh 26: 11—25 (1964) and in Flora of Turkey 1: 287—307 (1965).

Herbae annuae, biennes vel perennes, glabrae vel pilis simplicibus obsitae, saepe glaucae. Folia simplicia integra rarius pinnatifida; caulina amplexicaulia, plerumque auriculata. Inflorescentia corymboso-paniculata. Petala flava. Pedicelli fructiferi deflexi, tenues, superne saepe incrassati. Fructus indehiscens, orbicularis usque linearis, alatus vel exalatus, 1-spermus; loculus costa mediana prominente provisus; radicula accumbens vel incumbens.

Very closely allied to *Isatis* are *Pachypterygium*, *Tauscheria*, *Sameraria* and the C Asiatic *Chartoloma* Bge. The differences between these genera are slight and often of single characters — e. g. in *Sameraria* the style is distinct and in *Isatis* the style is very short or absent. Together these genera form a very natural group.

A most difficult genus taxonomically often represented in herbaria by inadequate material, the limits of many species are uncertain. Most of, if not all, the diagnostic characters used in the classification of *Cruciferae* e. g. fruit size and shape, are extremely variable in *Isatis* species. Many of the problems can probably only be solved with the aid of detailed field studies.

In this account, Davis's treatment of the genus in the Flora of Turkey has been used as a framework. The treatment is provisional.

1a. Herbae annuae 2
b. Herbae biennes vel perennes 12
2a. Silicula ovata vel elliptica 3
b. Siliqua lineari-oblonga 5
3a. Silicula valde compressa; loculus ± herbaceus 4
b. Silicula c. 5 mm crassa; loculus crustaceus .. 13. *I. Boissieriana* Reichenb. f.
4a. Pedicellus fructifer 10—15 mm longus; silicula apice truncato-emarginata, c. 9×4,5 mm ..... 1. *I. emarginata* Kar. & Kir.
b. Pedicellus fructifer 5—8 mm longus; silicula apice acuta, 6—7×3—5 mm ..... 2. *I. Harsukhii* O. E. Schulz
5a. Loculus fructus maturi tuberculato-rugosus.... 19. *I. rugulosa* Bge. ex Boiss.
b. Loculus non tuberculato-rugosus 6
6a. Petala 1,5 mm longa, quam sepala vix longiora. Siliqua apice latissima, basin versus sensim attenuata ..... 15. *I. minima* Bge.
b. Petala 3—5 mm longa, quam sepala evidenter longiora. Siliqua characteribus aliis 7
7a. Basis caulis pilis usque ad 1,5 mm longis albis hirsuta .... 21. *I. iberica* Stev.
b. Basis caulis glabra, pubescens vel pilis ad summum 0,5 mm longis deflexis vel patentibus obsita 8
8a. Siliqua 8—12 mm longa 9
b. Siliqua 15—24 mm longa 10
9a. Petala 4—5 mm longa. Folia integra. Pedicelli fructiferi 3—5 mm longi ... . 12. *I. trachycarpa* Trautv.
b. Petala 3 mm longa. Folia lobata. Pedicelli fructiferi c. 8 mm longi .... 16. *I. campylocarpa* Boiss.
10a. Siliqua apice latissima, basin versus attenuata, non vel vix curvata .... 10. *I. lusitanica* L.
b. Siliqua in medio circiter latissima evidenter curvata 11
11a. Siliqua 22×4 mm. Folia integra ..... 18. *I. Koeiei* Rech. f.
b. Siliqua 15×3 mm. Folia lyrato-pinnatifida ..... 17. *I. raphanifolia* Boiss.
12a. Fructus latitudine 1—2 (raro 3)-plo longior. Ala loculo plerumque latior, membranacea 13
b. Fructus latitudine plus quam 2-plo longior. Ala loculo plerumque angustior, crassa 14
13a. Loculus transverse rugosus. Basis caulis hispida ..... 4. *I. latisiliqua* Stev.
b. Loculus non transverse rugosus. Basis caulis glabra vel pubescens .... 3. *I. cappadocica* Desv.
14a. Fructus maturus infra loculum cylindrico-inflatus. Plantae biennes 15
b. Fructus maturus infra loculum applanatus. Plantae biennes vel perennes 16

15a. Loculus prope basin siliquae situs. Fructus obovatus usque oblongus ..... 11. *I. cochlearis* Boiss.
b. Loculus in media circiter siliqua situs. Fructus linearis ..... 20. *I. Buschiana* Schischk.
16a. Fructus oblongo-ovatus. Folia ± crassa; folia caulina breviter obtuse auriculata ..... 5. *I. Kotschyana* Boiss. & Hohen.
b. Fructus obovato-ellipticus usque lineari-oblongus; folia tenuia, caulina longiuscula acute auriculata 17
17a. Siliqua lineari-oblonga 18
b. Siliqua oblonga usque obovato-elliptica 19
18a. Siliqua 20—27×2—4 mm. Folia basalia oblongo-spathulata vel elliptica .. .. 9. *I. Gaubae* Bornm.
b. Siliqua 12—14×3—4 mm. Folia basalia oblonga ..... 6. *I. leuconeura* Boiss. & Buhse
19a. Folia hirtula. Silicula velutina, obovato-elliptica. Loculus carinatus .... 14. *I. pachycarpa* Rech. f., Aell. & Esfand.
b. Folia et siliculae glabrae vel pubescentes. Silicula oblonga vel ab apice basin versus attenuata; loculus non carinatus 20
20a. Fructus oblongus basi et apice rotundatus ..... 8. *I. Koelzii* Rech. f.
b. Fructus ab apice basin versus attenuatus, raro oblongus .... 7. *I. tinctoria* L.

Sect. *Eremoglaston* Bge.

Loculus siliculae membranaceus, ala cinctus. Pedicelli fructiferi apice non incrassatae. Herbae annuae.

1. ***I. emarginata*** Kar. & Kir., Enum. Pl. Songor. no. 126 in Bull. Soc. Nat. Mosc. 15 (1842).
Syn.: *I. violascens* Bge., Rel. Lehm. 214, no. 140 (1854).
Typus: Turkestan, Kar. & Kir., LE, K.

Annua, glabra, fructu excepto glauca. Caulis 25—60 cm altus, erectus, superne valde ramosus. Folia basalia ovata, mox marcescentia; caulina ovato- usque oblongo-lanceolata, ± integra, auriculus obtusis usque acutis. Sepala saepe violacea. Petala 1,5 mm longa, pallide flava, quam sepala paulo longiora. Pedicelli fructiferi 10—15 mm longi, tenues. Silicula c. 9×4,5 mm late elliptico-ovata, basi rotundata, antice truncato-emarginata, pubescens; loculus circumcirca alatus, ala omnino aequilata, margine leviter incrassata.

Persia: S: Kerm.: Inter Saidabad et jugum Chah Chaghak, 1700 m, Rech. 3528!; 1700—1900 m, Rech. 3168! In deserto Lut: Ab Kharan, 800 m, Gabr. 154. — E: Khor.: In deserto ad Sar Chah, Bge.
Turcomania: Kizyl Arvat, Becker. Ashkhabad, in arenosis inter Annaju et Gyaurs, Sint. 79!
Pakistan: Bal.: Kalat: Basima prope Jangal inter Panjgur et Surab, 1350 m, Rech. 28284.

Distr. gen.: Persia australis et orientalis, in regionibus inferioribus Asiae centralis, Baluchistan.

Intermediate between *Isatis* and *Pachypterygium* on account of the slightly thickened fruit margins.

2. ***I. Harsukhii*** O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1085 (1927).
Syn.: *Pachypterygium leptoloma* Rech. f., Phyton 3: 47 (1951). *P. afghanicum* Gilli, Feddes Repert. 57: 218 (1955).
Typus: Harsukh 20464, CAL.

Annua, a basi ramosa, 10—40 cm alta, siliculis exceptis et foliis interdum sparse ciliatis glabra, glauca. Folia basalia oblongo-lanceolata, integra, amplexicaulia, auriculata. Petala flava, 3—4 mm longa. Pedicelli fructiferi tenues, patule deflexi, 5—8 mm longi, superne leviter incrassati. Silicula late elliptica, 5—7×3—5 mm, margine papilloso-ciliata.

Afghanistan: E: Jalalabad, Koelz 11380! (Typus *Pachypterigii leptolomae* Rech. f.), Volk 1990! Inter Seh Baba et Nimla ad viam inter Kabul et Jalalabad, Kerst. 616! Inter Lataband et Sarobi, Volk 1880!, Gilli 1183! (Typus *P. afghanici*). Khairou Khil, 30 km NW Jalalabad, Lindb. 62/132-b! Mian Ali Sahab, E Jalalabad, Podlech 10167. Pakistan: Bal.: Sinkachh, Harsukh 20464.

Distr. gen.: Endem.

Similar in fruit shape to *Pachypterygium multicaule*, *I. Harsukhii* is rather intermediate between the two genera.

Sect. *Samerarioides* Boiss.

Silicula latitudine 1—2—(raro 3—) -plo longior; loculus fungosus, ala latitudine loculi plerumque latiore tenui membranacea cinctus. Herbae perennes vel biennes.

3. ***I. cappadocica*** Desv., Journ. Bot. Appl. 3: 174 (1814).
Syn.: *I. latisiliqua* sensu Boiss., Fl. Or. 1: 377 (1867) p. p., non Stev. (1812).
Icon.: Clavis p. 5 et 15.

Perennis, interdum suffrutescens, caulibus 20—70 cm altis erectis multiramosis. Indumentum ± densum, interdum deficiens. Folia inferiora oblongo-lanceolata vel obovata, petiolo longo vel brevi basi cuneata, integra vel leviter dentata; folia caulina oblonga, oblongo-linearia vel oblongo-lanceolata, integra, amplexicaulia, auriculis acutis vel obtusis. Petala 4—5 mm longa, flava. Pedicelli fructiferi 8—18 mm longi, tenues superne leviter incrassati. Silicula 10—30×5—20 mm, forma valde variabilis, pubescens vel interdum glabra; ala loculo latior, plana vel undulata; loculus non transverse corrugatus.

An exceptionally variable species with a baffling range of variation. The rarity of complete herbarium specimens which ideally should have basal and cauline leaves and completely mature fruits greatly hampers a proper understanding of the infra-specific variation. In the available material, the specimens are often immature and in such cases the shape of juvenile fruits often gives little idea of what the mature silicule will look like. On the other hand, if the fruit is mature the basal leaves have usually withered.

Much field work is needed before a satisfactory picture of such a complex species can be presented. In this provisional treatment, Davis' account in Flora of Turkey 1: 290—294 has been used as a basis. The recognition of many subspecies stresses the remarkable polymorphism of the complex but the apparently innumerable facets of variation in our area are not all covered by them and I prefer to regard these subspecies as useful reference points and not as more or less discrete entities, with regular characters and distinct distributions. Many of the subspecies are probably only worthy of varietal recognition. Intermediates throughout are most frequent.

1a. Silicula 10—14×5—10 mm, ovato-rhomboidea vel ovato-orbicularis. Caulis plerumque usque ad 30 cm altus. Folia basalia ± obovata ..... a) subsp. *cappadocica*

b. Silicula 13—30 × 8—20 mm, ovata, elliptica vel ± orbicularis. Caulis plerumque ultra 30 cm altus. Folia basalia oblongo-lanceolata 2
2a. Ala siliculae manifeste undulata 3
b. Ala siliculae ± plana 4
3a. Silicula 25 × 15—20 mm, late ovata vel elliptica, saepe purpurea ..... f) subsp. *macrocarpa* (JAUB. & SPACH) DAVIS
b. Silicula 15 × 10—17 mm, suborbicularis ..... b) subsp. *Steveniana* (TRAUTV.) DAVIS
4a. Silicula basi cordata vel truncata, apice acuta ..... e) subsp. *Besseri* (TRAUTV.) HEDGE & LAMOND
b. Silicula basi cuneata vel rotundata, apice obtusa vel emarginata 5
5a. Silicula 25 × 15—20 mm, late ovata vel elliptica, saepe purpurea ..... f) subsp. *macrocarpa* (JAUB. & SPACH) DAVIS
b. Silicula 14—25 × 10—20 mm, elliptica vel late elliptica 6
6a. Silicula latitudine duplo longior, elliptica ..... d) subsp. *stenophylla* (BORNM. & GAUBA) HEDGE & LAMOND
b. Silicula longitudine minus quam duplo longior, late elliptica ..... c) subsp. *subradiata* (RUPR.) DAVIS

a) — — subsp. ***cappadocica***
Syn.: *I. atropatana* GROSSH., Not. Syst. Leningrad 13: 13 (1950).
Typus: Turkey, Cappadocia, TOURNEFORT, P.

Persia: W: Azerb.: Distr. Baradost, circa pagum Iczke-su, 3 vi. 1916, SCHELKOWNIKOW & SCHIPZINSKY (Typus *I. atropatanae* GROSSH.-photo!).

Distr. gen.: Anatolia, Armenia, Persia boreo-occidentalis.

b) — — subsp. ***Steveniana*** (TRAUTV.) DAVIS, Notes Roy. Bot. Gard. Edinb. 26: 17 (1964).
Syn.: *I. Steveniana* TRAUTV., Mem. Acad. Sci. Petersb. 4: 309 (1845). *Sameraria Litwinowii* BUSCH, Fl. URSS. 8: 642 (1939).
Typus: Talish, in montibus prope Swant, C. A. MEY., LE.

Iraq: Kurd.: Sul.: In ditione pagi Penjwin, 1600 m, RECH. 12267-a!, 12267-b! Kamarspa, 1840-2000 m, RAWI 22173!
Talish: Swant, HOHEN.!, C. A. MEY.
Persia: C: Qazv.: Ravandeh prope Karaj, GAUBA & SAB. 252! In montibus Halkedar ad Murdabad, 1300 m, RECH. 1037-b!

Distr. gen.: Iraq borealis, Caucasia, Persia.

c) — — subsp. ***subradiata*** (RUPR.) DAVIS, Notes Roy. Bot. Gard. Edinb. 26: 18 (1964).
Syn.: *I. subradiata* RUPR., Fl. Cauc. 131 (1869).
Typus: Caucasus ad fl. Wjera prope Tiflis, LE.

Iraq: Kurd.: Mosul: Ser Amadiyah, HAINES 2073!
Persia: W: Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 214!, 215! — C: Elburz: M. Hasarband, 2500 m, GAUBA & SAB. 239!

Distr. gen.: Anatolia, Caucasia, Iraq borealis, Persia.

d) — — subsp. ***stenophylla*** (BORNM. & GAUBA) HEDGE & LAMOND, comb. nov.
Syn.: *I. stenophylla* BORNM. & GAUBA, Feddes Repert. 36: 339 (1934). *I. teheranica* BORNM. & GAUBA, Feddes Repert. 39: 87 (1935), syn. nov. *I. cappadocica* DESV.

subsp. *subradiata* (RUPR.) DAVIS var. *gudrunensis* (BOISS.) DAVIS, Notes Roy. Bot. Gard. Edinb. 26: 18 (1964), syn. nov.
Typus: GAUBA & SAB. 238, W!

Iraq: Kurd.: Sul.: In rupestris calcareis M. Pira Magrun, 900—2100 m, HAUSSKN. (Typus *I. cappadocicae* subsp. *subradiatae* var. *gudrunensis*)! Pira Magrun, 1800—2400 m, THESIGER 1096!, 1104! Supra Qarachitan, 1300—1500 m, GILLETT 7764!, RAWI 12102!, 12134! Mosul: Kani Mazu Shirin prope Shirwan Mazin, HAINES 2142! M. Botin, AGNEW & al.!
Persia: N: Maz.: In valle fluvii Chalus, 2200—2400 m, RECH. 852-a!, 924-a! — W: Ham.: Kharakan, SAB. 96! Bakht.: Gardan-i Pamakar, 2400 m, KOELZ 17803!, 17802! — C: Tehr.: In ditione jugi Kandavan, GAUBA & SAB. 251! Shahrestanak, 2200 m, BORNM. 6292! Qazv.: Mardabad prope Karaj, GAUBA & SAB. 250! In collibus prope Khur et Fashand, RECH. 669-b! Baraghan, 1500 m, GAUBA (Typus *I. stenophyllae*)!, GAUBA & SAB. 238!

Distr. gen.: Iraq borealis, Anatolia, Persia.

Intergrading with subsp. *macrocarpa* and subsp. *subradiata*.

e) — — subsp. ***Besseri*** (TRAUTV.) HEDGE & LAMOND, comb. nov.
Syn.: *I. Besseri* TRAUTV., Comm. 313, tab. 11, fig. 116 (1841).
Typus: „Hab. circa Tiflin (Herb. BESS.); in montibus Talusch ad pagum Swant?", LE.

Iraq: Kurd.: Sul.: Pira Magrun supra Zewiya, RAWI 11528! Arbil: Algurd Dagh, 1700 m, RAWI 13724!, 13832!
Talish: Swant, TRAUTV.
Persia: N: Maz.: Distr. Nur, Kamarband, 2400—2600 m, RECH. 6427! — W: Kurd.: Dezh Shahpur, 1700—1900 m, JACOBS 6491! Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 222!, 223! — C: Qazv.: Karakhan, SAB. 99! In collibus prope Khur et Fashand, RECH. 669-a! In montibus Halkedar ad Marbadad, 1300 m, RECH. 1037-a!

Distr. gen.: Endem.

f) — — subsp. ***macrocarpa*** (JAUB. & SPACH) DAVIS, Notes Roy. Bot. Gard. Edinb. 26: 18 (1964).
Syn.: *I. platycarpa* JAUB. & SPACH var. *macrocarpa* JAUB. & SPACH, Ill. Pl. Or. 3 tab. 224, fig. 10 (1847).
Typus: Specimina e seminibus georgicis et persicis Lutetiis Parisiorum culta.

Iraq: Kurd.: Arbil: M. Qandil: In faucibus supra Pushtashan ad 2200 m, RECH. 11204! Qala Diza, THESIGER 1183! Algurd Dagh supra pagum Nowanda, 2000—2600 m, RECH. 11384! Ser-i Khazni, 2900 m, HALEY 246!

Distr. gen.: Anatolia, Iraq borealis.

The following taxon does not fit within the recognised subspecies. It may represent a separate taxon or may merely be a hybrid between some of the other subspecies.

Fructus c. 18×13 mm, late ovatus, basi anguste attenuatus, apice rotundatus vel acutus, ala 4—5 mm lata, glaber vel pubescens.
Iraq: Kurd.: Sul.: M. Avroman, 2100 m, RECH. 10353!, 10383! Inter Halabja et Tawilla, 1840—2000 m, RAWI 22224!

Sharing similarities with subsp. *subradiata*, *macrocarpa* and *Steveniana* but characterised by the narrow attenuate fruit bases.

4. ***I. latisiliqua*** STEV., Mem. Soc. Nat. Mosc. 3: 267 (1812); BOISS., Fl. Or. 1: 210 (1867) p. p.
Typus: Caucasus: Daghestan, BECKER, LE.

Habitu similis *I. cappadocicae* sed ab ea basi caulis hispida et loculo fructus transversaliter corrugato diversa.

Recorded by AVETISIAN l. c. from Soviet Azerbaijan and although no specimens have been seen, *I. latisiliqua* may grow on the Persian side of the frontier.

Sect. *Isatis*

Fructus latitudine plus quam duplo longior; loculus fungosus, ala fungosa loculo multo angustiore usque paulo latiore cinctus. Plantae perennes, biennes vel annuae.

5. ***I. Kotschyana*** BOISS. & HOHEN., Diagn. Pl. Or. Nov. Ser. 1, 8: 48 (1849).
Typus: KY. 333, G, W!

Perennis, interdum basi lignescens, caulibus usque ad 1 m altis, erectis, pubescentibus vel glabris. Folia ± crassa, glauca, basalia anguste oblongo-lanceolata, caulina oblonga vel lineari-oblonga, auriculis brevibus obtusis. Petala 3—4 mm longa. Pedicelli fructiferi 8—12 mm longi, tenues, superne incrassati. Siliqua oblongo-ovata, 14—20 (—24) × 4—5 (—6—10) mm, apice obtusa vel emarginata, basi cuneato-attenuata, glabra vel pubescens; ala ± tenuis vel crassa, loculo aequilata.

Persia: N: Maz.: In valle fluvii Chalus, 2200—2600 m, Pol-e Zanguleh, RECH. 6353! In jugo Kandavan, 3050 m, GILLI! — W: Azerb.: In montibus S Khvoy, 1670 m, FURSE & SYNGE 799/5! 33 km SE Rezaiyeh, 1200 m, GRANT 16121! Lur.: Dow Rud, 1500 m, KOELZ 18479! Arak: Ad stationem viae ferrae Fuzieh ad occidentem urbis Arak, RECH. 5742-a![1]), 5742-b! Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 216! — C: Tehr.: M. Damavand supra Polur, Ask et Reneh, 2100—2400 m, BORNM. 6294, GAUBA & ESFAND. 234! Ad radices M. Damavand, KY. 333! In valle Shahrestanak, 2200 m, BORNM. 6296. Qazy.: Prope Gach Sar, RECH. 6730!, BORNM. 6295. Prope Karaj, GAUBA & SAB. 236! W Firuzkuh, 2100 m, FURSE & SYNGE 607! Damgh.-Semn.: Inter Firuzkuh et jugum Bashm, 1900—2200 m, RECH. 1173! Chashmeh-i Ali SE Kuh-i Nizwa, BEHB. & AELL. 1002! — E: Khor.: M. Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, RECH. 4783-a!

Distr. gen.: Anatolia austro-orientalis, Persia.

Very closely related to *I. glauca* AUCH. ex BOISS. which is a common and polymorphic Turkish species, *I. Kotschyana* differs in the narrower, obtusely auricled cauline leaves and in the fruit shape (oblong, elliptic, or cuneate-oblong in *I. glauca*). The texture of the leaves varies from thick and leathery, which is the characteristic texture of *I. glauca*, to thin and herbaceous.

The herbarium material is at present inadequate to recognise sub-specific taxa but further investigation may show that more than one taxon should be recognised. Some specimens approach *I. glauca* but although that species has been recorded from NW Persia, no specimens examined from there agree with it.

An abnormal specimen with oblong fruits, c. 10 × 3 mm, truncate below and rounded above with densely pubescent loculi is: Persia: W: Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 218! In vegetative characters it is typically *I. Kotschyana*.

6. ***I. leuconeura*** BOISS. & BUHSE, Mem. Soc. Nat. Mosc. 28 (1860).
Typus: In valle Jolu montis Elburs, BUHSE.

Biennis vel perennis, 30—50 cm alta, glabra vel hirsuta, caulis albescens, costatus. Folia basalia oblonga, longe albo-pilosa in petiolum attenuata; caulina oblongo-lanceolata, amplexicaulia, auriculis brevibus obtusis. Pedicelli fructiferi tenues, superne ± incrassati. Siliqua 12—14 × 3—4 mm, lineari-oblonga, velutina, basi sensim attenuata, apice truncata vel leviter emarginata.

[1]) Form with exceptionally large fruits 20 × 10 mm.

Persia: E: Khor.: Inter Mashhad et Shahrud prope Sabzevar, Rech. 5264! Inter Gorgan et Shahrud, Bge. In collibus ad Torbat-e Heydariyeh, 1300 m, Rech. 4341! — C: Elburz: In valle Jolu, Buhse.
Turcomania: Kopet Dagh, Fedtsch. Kara Kala in valle Joldere, Sint. 1877.

Distr. gen.: Aralo-Caspia, Kara Kum, Persia, Turcomania.

The type gathering is rather inadequate for assessing its status and the Bunge specimen that Boissier in Flora Orientalis identified as *I. leuconeura* may differ from the Elburz plant. The Khorassan plant may, in fact, represent a species distinct from the type of *I. leuconeura* which may not be specifically different from *I. glauca*. More gatherings in the type locality are needed before this can be confirmed.

7. ***I. tinctoria*** L., Spec. Plant. 670 (1753).
Typus: „Hab. ad littora maris Balthici et oceani Europae".

Biennis vel ± perennis, caules erecti, 40—100 cm alti, ramosi, glabri vel pubescentes. Folia basalia integra vel leviter dentata, glabra vel pubescentia, caulina oblonga vel oblongo-lanceolata, auriculis triangulari-lanceolatis. Siliqua 10—20 × 2—5 mm, ab apice basin versus attenuata vel oblonga, glabra vel pubescens; ala crassa.

Iraq: Kurd.: Sul.: Pira Magrun, Haines 2080!

Distr. gen.: Europa, Peninsula Balcanicae, Anatolia, Iraq borealis (?)

A most polymorphic species centred in Europe. The identification of the N Iraq specimen as *I. tinctoria* is provisional as the specimen is inadequate. The closely allied *I. Takhtajanii* Avetisian differs from *I. tinctoria* in the strongly perennial habit and the subobtuse auricles. The following immature specimen may be referable to this species: Iraq: Kurd.: Qandil, 2100—2600 m, Rawi & Serhang 18291! More collections are needed.

8. ***I. Koelzii*** Rech. f., Phyton 3: 46 (1951).
Typus: Koelz 11642, W!, US.

Biennis vel perennis, glauca, praeter siliquas interdum pubescentes glabra. Caules erecti, valde ramosi, 30—100 cm alti. Folia basalia oblongo-lanceolata, integra, petiolata; caulina oblonga, integra, cordata, acute auriculata. Petala 3—4 mm longa, flava. Pedicelli fructiferi 5—8 mm longi, patule penduli, tenues, superne incrassati. Siliqua 15 × 2,5 (—5) mm, oblonga, utrinque truncato-rotundata, glabra vel pubescens; ala crassa.

Afghanistan: E: Kabul: Sarobi, Volk 1576! Inter Gulbahar et Sarobi, 2530 m, Gilli 1190-b! Gulbahar, Gilli 1190-a! Volk 237, Neub. 520! 2 km supra Gulbahar, 1700 m, Hdg. & Wdb. 2966! Panjshir, Neub. 3074. Tang-e Gharu, 1400—1500 m, Hdg. & Wdb. 4291!, Rech. 16941! In jugo Altimur inter Kabul et Gardez, 2700 m, Lamond 2172!, Rech. 31536. Gardez: Prope Gardez, Lindb. 95!, 96! In declivibus occidentalibus jugi Sata Kandao, 10—25 km a Gardez, 2900—3000 m, Lamond 2444!, Rech. 32119, 32120. Jaji: Inter Dre Kalla et Qasim Khel, Rech. 32284. Inter Said Karam et Ahmad Khel, 2200—2600 m, Rech. 32189. Nuristan: Chigha Sarai, 900 m, Neub. 4524. Inter Pronz et Eshtaway, Kitam. In valle Shuk supra Atershuker, 2300—2500 m, Kerst. 1005! Laghman: Daulat Shah, 2130 m, Koelz 11642!
Pakistan: Chitral: Chitral, Toppin 80. — Swat: Mingora, Ali 26016! Inter Mingora et Khwazakhiela 850—950 m, Rech. 30516. — Peshawar, Deane. — Kurram: Kurram versus Seratigah, 3300 m, Aitch. 78!

Distr. gen.: Endem.

The nearest relative of *I. Koelzii* is undoubtedly the very polymorphic *I. tinctoria* L. *I. Koelzii* is apparently different in the short oblong fruits rounded at both ends. Volk 1576 represents a form with unusually broad, 5 mm fruits.

9. ***I. Gaubae*** Bornm., Feddes Repert. 50: 374 (1941).
Typus: Gauba 1390—1392, B †.

Biennis, glauca, glabra vel pubescens; caulis 30—80 cm altus, erectus, ramosus. Folia inferiora oblongo-spathulata vel elliptica, petiolata, integra, caulina oblonga, integra, ± amplexicaulia, cordata, auriculata. Petala 4—5 mm longa, flava. Pedicelli fructiferi, 8—14 mm longi, filiformes, superne incrassati, penduli. Siliqua 20—27 × 2—4 mm, lineari-oblonga, inferne cuneata, glabra, pubescens vel lanata; loculus ± centralis.

Persia: N: Gorg.: In declivibus borealibus M. Shavhar prope Hajjilang, 2600—2800 m, Rech. 6078! Dimalu, 2600 m, Schmid 5973! Maz.: In valle Chalus, 2400—2800 m, Rech. 852-b, Rech. 924-b! Inter Gach Sar et Chalus, Schmid 5761! In silvis prope Pol-e Zanguleh, 2250—2400 m, Gauba 1390—1392. — C: Shahr.-Bust.: In jugo Khash Aylan, c. 70 km ab oppido Shahrud orientem versus, 2000—2200 m, Rech. 4566!, 5453!

Distr. gen.: Endem.

A distinct species restricted to N and NE Persia. Bornmüller, l. c. recognised three varieties based on the siliqua indumentum: var. *eriocarpa* Bornm. with floccose-lanate fruits; var. *intermedia* Bornm. with pubescent and var. *leiocarpa* Bornm. with glabrous fruits.

10. ***I. lusitanica*** L., Spec. Plant. 670 (1753).
Syn.: *I. aleppica* Scop., Del. Insub. 2: 31, tab. 16 (1786—88).
Icon.: Clavis p. 13 et 21.
Typus: „Hab. in Hispania et Oriente". (The Spanish reference is probably an error.)

Annua, glabra vel hirtella, caulis erectus, 10—60 cm altus, superne ramosus. Folia inferiora oblongo-spathulata, subintegra vel pinnatifida, glabra vel simpliciter pilosa, caulina oblonga, integra vel irregulariter dentata, amplexicaulia, auriculata. Petala 3—4 mm longa, flava. Pedicelli fructiferi 4—7 mm longi, tenues, superne incrassati, deflexi vel patuli. Siliqua 15—24 × 2—4 mm, lineari-oblonga, apice latissima, ibique obtusa vel emarginata, basi cuneata, subglabra vel pubescens; loculus supra medium siliquae situs.

Iraq: Kurd.: Arbil: Ad radices M. Baradost prope Shanidar, 900 m, Erdtman & Goedemans in Rech. 15666!, Arbil Radhi 3807!, Ankawa, Bornm. 922! In faucibus prope Rawandiz, Helbaek 808! Qosh Tepe, Guest 1469! Mosul: In montibus supra Al Qosh, 16 km SE Dihok, 900 m, Thesiger 768! 10 km N Ayn Sifni, Thesiger 632! Kirkuk: Kirkuk, Guest 548! Jarmo prope Chamchamal, Haines!, Helbaek 410! 9 km a Kirkuk versus Altin Köprü, Erdtman & Goedemans in Rech. 15505! Altin Köprü, Bornm. 921! Inter Kirkuk et Tauq, 400 m, Bornm. 920. Darbandikhan, 600 m, Haines! Sul.: Pira Magrun, 1100 m, Gillett 7744!
Persia: W: Azerb.: M. Sahand, Buhse. Kermansh.: Kuh Shahu, Str. Shahabad, 1100—1300 m, Jacobs 6215! Lur.: Dow Rud, Koelz 17219! — C: Qazv.: Kuh-e Nemar, 2000 m, Gauba 1393. Inter Rasht et Qazvin, 500—600 m, Bornm. 6282.

Distr. gen.: Graecia, Africa boreo-occidentalis, Anatolia australis, Syria, Palaestina, Iraq borealis, Persia.

Recorded from Turcomania but this is a doubtful determination.

11. ***I. cochlearis*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 202 (1842).
Syn.: *I. Guestii* Blakelock, Kew Bull. 186 (1939), syn. nov.
Icon.: Clavis p. 5 et 15.
Typus: Anatolia, Adiyaman, Besnie, Auch. 211, G, K.

Biennis (vel perennis?), glabra vel vario modo pilosa; caulis 30—70 cm altus, erectus, superne ramosus. Folia tenuia, glabra, subtus omnino vel secus costam medianam tantum pilosa; basalia plerumque irregulariter lobata vel dentata, oblongo-lanceolata basi attenuata; caulina oblongo-lanceolata, auriculis magnis rotundatis. Petala 3—4 mm longa, flava. Pedicelli fructiferi 5—13 mm longi, superne incrassati, demum penduli. Siliqua 8—15×3—5 mm, obovata usque oblonga, infra loculum cylindrica, superne oblongo- vel obovato-alata, apice acuta vel rotundata, glabra, tomentosa vel villosa; loculus prope basin fructus exalatus vel ala angusta crassa provisus.

Iraq: Kurd.: Mosul: Jabal Khantur prope Zakho, 1200 m, Rech. 10753!, Rawi 23351! Inter Dihok et Amadiyah, Zawita, 800 m, Rech. 11976! Sirsang, Haines 970!, 971!, 1821!, Rech. 11654! In faucibus prope Dihok, 500 m, Guest 2171! (Typus *I. Guestii* Blakelock), Rawi 8647-A! Jabal Bakhair, 1000 m, Rawi 8455-A! Aqrah, Rawi 11455!

Distr. gen.: Mesopotamia Turciae, Iraq borealis.

Most variable in indumentum and the size and shape of the fruits. Introgression with other species e. g. *I. Buschiana* Schischk. probably occurs in N Iraq.

12. ***I. trachycarpa*** Trautv., Acta Hort. Petrop. 9: 370 (1886).
Typus: Turcomania, Kizyl Arvat, Becker, LE.

Annua, alabastris, siliquis et pedicellis pubescentibus exceptis glabra. Caulis singulus, superne ramosus, 30—50 cm altus. Folia anguste oblonga, amplexicaulia, auriculata, integra, tenuia. Petala 4—5 mm longa, pallide flava. Pedicelli fructiferi 3—5 mm longi, deflexi, tenues, superne vix incrassati. Siliqua 9—12×2—2,5 mm lata, lineari-oblonga, basi cuneata, apice rotundata, curvata, juvenilis patule ascendens, demum pendula.

Turcomania: In montibus prope Ashkhabad, Litw. 617!, Chuli, Litw. 618! Kizyl Arvat, Becker. Kazandzhik, Sint. 1607!

Distr. gen.: Aralo-Caspia, Kara Kum, Kizyl Kum, Turcomania.

Recognised by the very large petals.

13. ***I. Boissieriana*** Reichenb. f., Journ. Bot. 14: 46 (1876).
Syn.: *I. heterocarpa* Regel & Schmalh. ex Regel, Descr. Pl. Nov. Fedtsch. 11 (1882).
Typus: Specimen e seminibus e Samarkand cultum, K, BM.

Annua, alabastris pubescentibus exceptis glabra, erecta, superne ramosa, 30—50 cm alta. Folia inferiora oblongo-lanceolata, mox marcescentia, caulina oblongo-elliptica usque oblongo-lanceolata, integra, amplexicaulia auriculata. Petala c. 6 mm longa, pallide flava. Pedicelli fructiferi 10—15 mm longi, deflexi, tenues, superne vix incrassati. Silicula 10—12×5—6 mm, ovata, basi rotundata, in apicem obtusum attenuata; silicula matura cymbiformis, c. 5 mm crassa, alis involutis, loculo incrustato.

Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 163 (1965).
Afghanistan: NW: Herat: Tirphul, Hari Rud, Aitch. 227. Maimana: 5 km a Maimana 500 m, Hdg. & Wdb. 3605!

Distr. gen.: Sir-Darya, Turcomania, Afghanistan boreo-occidentalis.

A very distinct species recognised by the crustaceous boat-shaped silicules with inrolled wings. Although the original description of the species and that of the cited synonym both mentioned that the infructescence consisted of heterocarpic fruits, it appears, from the material studied, that this is a false impression resulting from the great contrast in appearance between the young flat herbaceous fruits and the mature ovoid, crustaceous silicules. — Mapped by Grossheim, Fl. Kawk. ed. 2, 4, tab. 142 (1950), from near Baku — a record that needs confirmation.

14. ***I. pachycarpa*** Rech. f., Aell. & Esfand., Phyton 3: 47 (1951).
Typus: Rech. f. 3789-a, W!

Biennis vel perennis; caules erecti, ramosi, c. 60 cm alti. Folia crassa, pilis longis rigidis albis obsita; basalia oblongo-elliptica, crenata vel subserrata, basi cuneato-attenuata, apice ± acuta; caulina anguste oblonga, amplexicaulia, cauli ± appressa, auriculis acutis prominentibus. Flores ignoti. Pedicelli fructiferi c. 10 mm longi, inferne tenues, superne manifeste incrassati. Silicula obovato-elliptica, 12—14 × 8 mm, atroviolacea, basi attenuata-truncata, apice rotundata, dense albo-velutina; loculus anguste linearis crassus carinatus.

Persia: S: Korm.: M. Jebal Barez inter Bam et Jiroft in declivibus australibus, 1000 m, Rech. f. 3789-a!

Distr. gen.: Endem.

A distinct species with no close allies. The thick keeled velutinous obovate-elliptic silicules and the hirtulous leaves readily distinguish it from all other members of the genus.

Sect. *Apterolobus* Boiss.

Siliqua angusta, latitudine multo longior; loculus fungosus teres, ala terminali membranacea. Herbae annuae vel biennes.

15. ***I. minima*** Bge., Del. Sem. Hort. Dorpat. 7 (1843).
Typus: Persia, Kerman, Bge., LE.

Herba annua, inflorescentiae regione excepta glabra; caulis 10—30 cm altus, erectus, superne vel a basi ramosus. Folia inferiora oblongo-lanceolata, integra vel sinuato-dentata, basi cuneata; folia caulina integra, lineari-lanceolata, amplexicaulia auriculata. Petala 1,5 mm longa, quam sepala vix longiora, flava. Pedicelli fructiferi 3—5 mm longi, pubescentes, patuli vel deflexi, superne leviter incrassati. Siliqua 8—12 × 1,5—2 mm, pubescens, recta vel curvata, lineari-oblonga, apice latissima; ala plana, truncato-retusa, loculo latior.

Persia: S: Kerm.: Inter Sar Chah et Kerman, Bge. Kuh Tagh Ali, 2100 m, Bornm. 2233. Baghin, Bornm. 2230. Inter Kerman et Yazd, 1600—1800 m, Bornm. 2234. Inter Kerman et Mahan, 1800 m, Rech. 3552! Kerman, Bornm. Inter Nosratabad Sipi et Zahedan, 70 km E Nosratabad, Rech. 27220, Lamond 120! 30—40 km SE Zahedan versus Mirjaveh, Rech. 27234, Lamond 130! In deserto Kavir S Arasavan, 1060 m, Gabr. 68. Inter Saidabad et jugum Chah-e Chaghak, 1700 m, Rech. 3098!, 3167!, 3529! Inter Baghin, 1670 m, et jugum Sang Bur, 2200 m, Rech. 3080! Fars.: Inter Abadeh et Dowlatabad, Schmid 5288!, 5320!, 5322! Bal.: Inter Khash et Karevandar, Gauba & Sab. 266! Iranshahr, Shar. 208-E! Saravan, Salavatian 5657-E! — E: Khor.: Tabas, Shir Geshk, Ruttner 550!, 576! Inter Mashhad et Shahrud prope Sabzevar, Rech. 5270. — C: Yazd: Inter Rafsanjan et Kabutar Khan, Rech. 2898! Inter Anar et Rafsanjan, Rech. 2936! Prope Yazd, Buhse. In desertis prope Jandaq, Buhse. Tehr.: Inter Qazvin et Tehran, Bornm. 6287! Qom, Str. Shahr.-Bust.: Inter Mayamey et Shahrud, Rech. 5303!
Turcomania: Kizyl Arvat, Becker.

Afghanistan: SW: Farah, Jija, 1200 m, Koelz 4179! Herat: Herat, Koelz 3737! — SE: Kandahar: Inter Kandahar et Girishk, 1100 m, Kerst. 260! — Afghanistan-Pakistan: Griff.!
Pakistan: Quetta: Pishin, Lace 3471!, 3571! Quetta versus Chaman, Yaro prope Bostan, 1450 m, Lamond 997!, Rech. 28918. — Kalat: Kalat versus Quetta, 2000 m, Lamond 698! Khuzdar versus Wad, 30 km a Khuzdar, 1150 m, Lamond 203! 10 km S Khuzdar, Rech. 27397. Basima prope Jangal inter Panjgur et Surab, 1350 m, Rech. 28283. Bal.: Nushki, H.-B. 19207! Makran: 60 km S Panjgur, 850 m, Rech. 28102. Harbud E Panjgur, McCann 312. Panjgur, 1000 m, Lamond 589!, Rech. 28183. Baluchistan, Stocks. Chagai, Gaz. 238.

Distr. gen.: In regionibus inferioribus Asiae centralis, Persia, Afghanistan, Pakistan occidentalis.

Recognised by the very small petals scarcely exceeding the sepals, the short fruiting pedicels and small truncate-retuse fruits.

16. ***I. campylocarpa*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 202 (1842).
Typus: Auch. 204, G.

Herba annua; caulis erectus, glaber, 30—45 cm altus, ramosus; folia hirtella, inferiora oblongo-spathulata, lobata, basi attenuata; caulina lineari-oblonga, integra vel irregulariter dentata, amplexicaulia, auriculata. Petala 3 mm longa, flava. Pedicelli fructiferi c. 8 mm longi, deflexi, superne manifeste incrassati. Siliqua 8—12×3 mm, velutina, oblongo-cylindrica, curvata, parte infraloculari cuneato-cylindrica, parte supraloculari plana alata.

Persia: W: Esfahan, Bge. — Persia, Auch. 204.

Distr. gen.: Endem.

A little known species known only from the cited gatherings. Apparently related to *I. lusitanica* Bge. from which it differs in the cylindrical lower fruit portion and to *I. raphanifolia* which has smaller glabrous stems and shorter fruiting pedicels. More adequate material of *I. campylocarpa* is needed.

17. ***I. raphanifolia*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 19 (1845).
Typus: Ky. 67, E!

Herba annua tenuis; caulis 10—35 cm altus, singulus vel ramosus, indumento sparso e pilis brevibus patulis vel deflexis composito. Folia tenuia, glabra, basalia petiolata, lyrato-pinnatifida; caulina similia, sessilia. Petala 3×1,5 mm, aurea vel citrina. Pedicelli fructiferi 3—5 mm longi, reflexo-patentes, tenues, superne leviter incrassati. Siliqua lineari-oblonga, 15×3 mm, curvata, basi anguste cuneata, infra loculum incrassata, supra loculum ala truncata lineari provisa, pubescens.

Persia: W: Kurd.: Kuh-i Marab, Str. Arak: M. Kohrud, Str. Kermansh.: Zahab, Shar. 5658-E! Bakht.: Gatvand in valle Bazoft, Mart.-Escal. Taleh, Koelz 15139! Lur.: Khorramabad, Gauba & Sab. 249! Khorramabad versus Dezful, 900 m, Furse 1146! Dow Rud, Koelz 17104! Khuz.: Siachal, Koelz 15107! — S: Fars.: Inter Shiraz et Firuzabad, 1800 m, Gauba & Sab. 237! 15 km E Shiraz, 1600 m, Grant 15283. Takht-e Jamshid, Koelz 14462! Ad Dalaki et Gere, Ky. 67! — C: Yazd: Inter Anar et Rafsanjan, Rech. 2926-b! Qazv.: In montibus prope Kalak, Gauba.

Distr. gen.: Endem.

A distinct species recognised by the more or less deeply lyrate-pinnatifid leaves.

18. ***I. Koeiei*** RECH. f., Dansk Bot. Ark. 15, 4: 17 (1955).
Typus: KOEIE 393, W!

Herba annua, tenuis; caulis 20—35 cm altus, erectus, valde ramosus, glaber vel indumento tenui e pilis brevibus patulis consistente. Folia glabra, verosimiliter crassiuscula; inferiora oblongo-lanceolata, integra, basi attenuata; caulina oblonga, integra, sessilia. Petala 2,5 mm longa, flava. Pedicelli fructiferi 3—5 mm longi, reflexo-patuli, tenues, superne leviter incrassati. Siliqua 22 × 4 mm, lineari-oblonga, curvata, pubescens, infra loculum incrassata, supra loculum ala attenuata lineari obtusa provisa.

Persia: W: Lur.: Shah Bazan, 500 m, KOEIE 393!

Distr. gen.: Endem.

Only known from a single gathering, *I. Koeiei* is apparently a distinct species. Its closest relative is *I. raphanifolia* which clearly differs from *I. Koeiei* in the lyrate to pinnatifid leaves and the much smaller siliquae.

19. ***I. rugulosa*** BGE. ex BOISS., Fl. Or. 1: 384 (1867).
Typus: Persia: Inter Yazd et Esfahan, BGE., LE.

Herba annua glabra vel inflorescentia sparse pilosa, a basi et imprimis superne valde ramosa, 10—30 cm alta. Folia plurima basalia, oblonga, irregulariter lobata vel dentata, basi attenuata; caulina pauca, lineari-oblonga. Petala 2 mm longa, flava. Pedicelli fructiferi 3—5 mm longi, glabri vel pubescentes, patuli, ascendentes vel reflexi, superne incrassati. Siliqua 7 × 1,5 mm, lineari-oblonga, glabra vel pubescens, recta vel curvata; loculus crassus, tuberculato-rugosus; ala plana, truncato-retusa, loculo latior.

Persia: S: Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1700—1900 m, RECH. 3143! Kuh Seidin prope Kerman, 2200 m, BORNM. 2232. Inter Kerman et Yazd, BGE. Bambis et Hoseynabad, 1300—1400 m, BORNM. 2231 (?). — C: Yazd: Inter Yazd et Esfahan, BGE. Inter Anar et Rafsanjan, RECH. 2920!

Distr. gen.: Endem.

Distinct on account of the tuberculate-rugose loculus.

20. ***I. Buschiana*** SCHISCHK., Ber. Tomsk Staatsuniv. 80: 460 (1929).
Syn.: *I. glabrisiliqua* BLAKELOCK, Kew Bull. 187 (1939), syn. nov.
Lectotypus: Turkey, Dogubayazit, in declivitatibus prope Burnubulak, SCHISCHKIN, LE.

Herba biennis; caulis 30—60 cm altus, erectus, superne ramosus, glaber vel pilosus. Folia tenuia, glabra vel pilosa, basalia oblongo-lanceolata, integra vel lobata attenuata, caulina oblongo-lanceolata, integra vel dentata, auriculis acutis prominentibus. Petala 3—4 mm longa, flava. Pedicelli fructiferi 8—15 mm longi, demum penduli, superne manifeste incrassati. Siliqua 12—16 × 2 mm, linearis, infra loculum ± cylindrica, supra loculum oblongo-alata, apice acuta vel rotundata, glabra vel tomentosa; loculus in medio circiter siliquae situs, exalatus vel vix alatus.

Iraq: Kurd.: Arbil: Rawandiz, GUEST 2144! (Typus *I. glabrisiliquae* BLAKELOCK), EMBERGER & al. 15472! Shaqlawa, HAINES 386-A! Sul.: Pira Magrun, supra Qarachitan, 1050—1300 m, GILLETT 7725!
Persia: N: Maz.: Hazar Jerib, SHAR. 571! — W: Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 217! — C: Elburz, 36° N, 51° E, 1200 m, JACOBS 6159!

Distr. gen.: Anatolia, Iraq borealis, Persia austro-occidentalis et australis, Transcaucasia.

Apparently a very variable species in N Iraq but this is possibly a result of introgression with other species in the same area e. g. *I. cochlearis* Boiss. In some specimens (e. g. Emberger 15472 and Jacobs 6159 cited above) a short but distinct style is present.

21. ***I. iberica*** Stev., Mem. Soc. Nat. Mosc. 3: 267 (1812).
Typus: Caucasus, Tiflis, Stev., LE.

Habitu *I. Buschianae* Schischk. similis sed ab ea differt habitu annuo, basi caulis longe albo-pilosa, foliis basalibus pinnato-lobatis.

Talish: Lenkoran, Bge.!

Distr. gen.: Caucasus, Talish.

The cited specimen is the only record of *I. iberica* from our area.

Species imperfecte notae

I. biscutellifolia Boiss. & Buhse, Mem. Soc. Nat. Mosc. 28 (1860).
Typus: Buhse 1367 & 1430.

Herba perennis, 30 cm alta, foliis basalibus breviter hirtulis exceptis glabra. Folia caulina linearia vel lineari-lanceolata, amplexicaulia, auriculis brevibus ovato-obtusis. Pedicelli fructiferi tenues, superne manifeste incrassati. Silicula 17 mm longa, oblongo-lanceolata, contorta, glabra, basi attenuata, apice retusa; loculus oblongo-linearis, prominenter trinervius; ala loculo aequilata.

Persia: C: Yazd: In montibus prope Yazd, Deh Bala. Inter Esfahan et Kashan in montibus prope „Ssoffi", Buhse 1367, 1430.

Distr. gen.: Endem.

Without new and adequate material gathered from the type locality, it is impossible to assess either the status or the affinities of *I. biscutellifolia*. The type description stressed the hirtulous leaves, and the oblong-lanceolate and contorted fruits.

I. stenocarpa Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51: 305 (1886).
Typus: Qazvin, Polak, WU.

Herba annua, 35 cm alta. Folia lanceolata, dentata vel lobata, glabra vel imprimis margine pilosa. Petala 3 mm longa. Pedicelli fructiferi 12—15 mm longi, filiformes. Siliqua 20—23 × 8 mm, obovata, infra loculum attenuata, supra loculum ± dilatata.

Persia: C; Qazv.: In glareosis rivulorum prope Pachenar, Polak.

Distr. gen.: Endem.

The type specimen has not been seen. From the description *I. stenocarpa* apparently is distinct on account of the broad fruits. Stapf related it to *I. iberica* but said that it differed from it in the narrower fruits!

29. ***Pachypterygium***

Pachypterygium Bge., Del. Sem. Hort. Dorpat. 8 (1843).
Syn.: *Pachypteris* Kar. & Kir., Bull. Soc. Nat. Mosc. 15, 1: 159 (1842), non Brongn., Hist. Veg. Foss. 1: 168 (1828).

Herbae annuae tenues plerumque glabrae, glaucae, foliis integris, floribus flavis vel albis. Folia caulina amplexicaulia, auriculata. Sepala non saccata. Ovarium uniloculare, uniovulatum. Pedicelli fructiferi ascendentes vel deflexi. Silicula linearis vel ovata, valde compressa, margine incrassata, glabra vel papillosa, indehiscens, monosperma. Radicula incumbens.

Very closely allied to *Isatis* and differing consistently only in the thickened rim of the fruit.

1a. Silicula elliptica vel ovata, apice ± acuta, 2—3 mm longa ..... 3. *P. multicaule* (Kar. & Kir.) Bge.

b. Silicula oblonga usque lineari-oblonga, ultra 4 mm longa, saepe supra loculum constricta, rostro longo applanato, apice rotundata vel obtusa 2

2a. Petala 1—1,5 mm longa. Pedicelli fructiferi 1—4 mm longi. Silicula 4—5 mm longa ..... 1. *P. brevipes* Bge.

b. Petala 3—5 mm longa. Pedicelli fructiferi 2—7 mm longi. Silicula (4—) 7—9 mm longa ..... 2. *P. Stocksii* (Boiss.) Hedge

1. ***P. brevipes*** Bge., Del. Sem. Hort. Dorpat. 8 (1843).

Syn.: *P. heterotrichum* Bge. in Boiss., Fl. Or. 1: 374 (1867). *P. persicum* (Boiss.) Parsa, Fl. de l'Iran 1: 846 (1951).

Typus: E montibus Seravshan descriptum.

Icon.: Clavis p. 7 et 15.

Annuum, 5—10 (—25) cm altum, glaucum, glabrum vel pilis paucis simplicibus obsitum. Petala 1—1,5 × 0,5 mm, flava vel lilacino-albida. Pedicelli fructiferi 1—4 mm longi. Silicula 4—5 × 1,5—2 mm, retusa, glabra vel margine pubescens et loculo papillosa; stigma sessile.

Persia: S: Kerm.: Kuh-e Jupar, 3200 m, Bornm. 2247. — E: Khor.: Kuh-e Neyshabur, Darreh Abshahr supra Akhlamad, 1700 m, Rech. 4258-c! — C: Shar.-Bust.: Shahrud, Bge. (Typus *P. heterotrichi* Bge.)!

Turcomania: Kopet Dagh, Fedtsch. In montibus prope Ashkhabad, Kuntze, Litw. 607, 608!

Afghanistan: NW: M. Paropamisus inter Kotal Sang et Sinjiti, Aitch. 565! — E: Kabul: Sher Darwasa, 1800 m, Hdg. & Wdb. 2902!, Podlech 10838. In declivibus australibus jugi Salang, 2300—2600 m, Rech. 31362! Podlech 10782. In jugo Altimur, Kabul versus Gardez, 2600—2700 m, Lamond 2387!, Rech. 31532! Paghman, 2480 m, Gilli 1180!, Rech. 17111!, Chaw.-Must.! Parvan: In valle Panjshir, Mukeni, 2400 m, Hdg. & Wdb. 5301! In valle Dekhawak, 2600 m, Podlech 12510! Basarak, Neub. 554!, Volk 169! Jaji: Said Karam versus Ahmad Khel, 35—50 km a Gardez versus Ali Khel, 2200 m, Lamond 2472-A! Ali Khel, Aitch. 532! Inter Dre Kalla et Qasim Khel, Rech. 32301. Khost: In declivibus austro-orientalibus jugi Sata Kandao, 2200—2800 m, Rech. 32143. Gardez: In faucibus calc. W jugi Altimur, 2600 m, Rech. 31974. — NE: Badakhshan: SE Faizabad Furse 6314! Kataghan: In valle Andarab, Podlech 10961, 11108, 11267. — C: Bamian: Inter Bulola et jugum Shibar, 2700 m, Rech. 16757! Bulola, 2580 m, Gilli 1181! Inter Shibar et Doshi, Furse 5880! Prope Bamian, 2800 m, Gilli 1182! Kuh-e Josha, NW Panjao, 2900 m, Rech. 18757! Darreh-i Shikar, 1500 m, Hdg. & Wdb. 3398! In valle c. 16 km S Doab, 1600 m, Rech. 16690!

Pakistan: Quetta: Urak, Lace 3792! Sheilabagh, Lace 3539! Inter Khojak et Chaman, 1800 m, Koelz 3003! In jugo Khojak, 2300 m, Rech. 29066, Lamond 1067! Ziarat, 2100 m, Lamond 1205! Inter Bostan et Saran Tangai, 1800 m, Rech. 29175. — Bal.: Sorrange, Crookshank 308!

Distr. gen.: Persia, Afghanistan, Pakistan occidentalis, Turcomania.

2. ***P. Stocksii*** (Boiss.) Hedge, comb. nov.
Syn.: *Isatis Stocksii* Boiss., Fl. Or. 1: 376 (1867). *Pachypterygium macranthum* Rech. f., Phyton 3: 48 (1951).
Icon.: Clavis p. 5 et 15.
Typus: Stocks 964, K!

Habitu praecedenti simile sed petala majora, pedicelli fructiferi longiores, fructus major.

Persia: E: Khor.: Ozbagu, Shistu, Ruttner 294!
Afghanistan: SW: Herat, Amsel! Jija, 900 m, Koelz 3595! — SE: Kalat-i Ghilzai, Lindb. 370! — E: Kabul: Sher Darwasa, 1800 m, Gilli 1186!, Hdg. & Wdb. 3162!, Neub. 530! Panjeshah, Neub. 45!, Babur, Volk 2038! Tang-i Gharu, Mahi Parr, Hdg. & Wdb. 3075!, 3082!, Kerst. 505. Qaleh Islam, 1830 m, Hdg. & Wdb. 3203! Istalif, Gilli 1189! Koh-i Asmai, 1700 m, Kerst. 429. Kabul versus Ghazni, Hay 193! In valle Logar, 2300 m, Volk 2616. Puli-i Alam, Koelz 11866! (Typus *P. macranthi* Rech. f.). Ghazni: Behzud, Dahan-e Abdila, 2800 m, Rech. 17985! Distr. Malestan, inter jugum Kotal-e Kechru et pagum Miradina, 2700—3200 m, Rech. 17551! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17904! Panjshir: Tang-i Saidan, Lindb. 790! — C: Bamian: Panjao, 2700 m, Hdg. & Wdb. 4893!, 4982! Inter Kotal Deraz Kol et Panjao prope pagum Mandigak, 2800—3280 m, Rech. 18713! Farakulum, 2800 m, Koelz 2602! Orozgan: Garm-Ab, Lindb. 821!
Pakistan: Quetta: Ad radices M. Chiltan inter Dulai et Kanak, 1600 m, Rech. 29109! Quetta versus Ziarat, 2200 m, Lamond 1158! — In juniperetis jugi W Ziarat, 2200 m, Rech. 29310! Bal.: Doband, Stocks 964! Kharan, H.-B. 23147, 23187! — In valle Surkhab, Lace 3831! China Kula, Harsukh 18774.

Distr. gen.: Endem.

With the fairly abundant material of this species now available, it has been possible to reassess its correct generic position. There seems little doubt that, on the basis of the thickened fruit rim, the facies of the plant and the form of the fruit, it is better regarded as a *Pachypterygium* than as an *Isatis*. The position of the fruits vary from horizontally spreading to ascending-erect to pendant. In flower it can readily be confused with *Isatis minima* Bge.

3. ***P. multicaule*** (Kar. & Kir.) Bge., Del. Sem. Hort. Dorpat. 8 (1843).
Syn.: *Pachypteris multicaulis* Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 159 (1842). *Pachypterygium lamprocarpum* Bge., Del. Sem. Hort. Dorpat. 8 (1843). *P. densiflorum* Bge. in Boiss., Fl. Or. 1: 373 (1867) syn. nov. *P. microcarpum* Gilli, Feddes Repert. 57: 219 (1955) syn. nov.
Icon.: Clavis p. 5 et 15.
Typus: In salsis Songariae ad rivulum Ai inter fl. Ajagus et Lepsa, Kar. & Kir. 1260, K!, LE.

Speciebus praecedentibus simile. Petala 1—2 × 0,5 mm, flava. Pedicelli fructiferi 2—4 mm longi. Silicula 2—3 × 1,5—2 mm, elliptica, glabra vel margine ciliata et loculo papilloso.

Persia: W: Esf.: Esfahan, Bornm. 2248. — S: Kerm.: Inter Khabis et Kerman, Bge.! (*P. multicaule*, *P. lamprocarpum* et *P. densiflorum*).
Afghanistan: C: Bamian: Inter Bulola et Doab, Darreh-i Shikar, 2000 m, Rech. 16700!, Hdg. & Wdb. 4153! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16823! Bulola, 2700 m, Gilli 1184! (Typus *P. microcarpi* Gilli). In valle Ajar a Doab occidentem versus, 1400 m, Rech. 16595! Shibar, Meinertzhagen!

Distr. gen.: Asia centralis, Persia, Afghanistan.

Study of the available herbarium material and field observations showed no reason for recognising more than one species. *P. microcarpum* was described on the basis of smaller glabrous fruits but as fruit size varies and glabrous and pilose or pubescent forms occur within the same population, there is no justification for specific recognition. The only difference between *P. densiflorum* and *P. multicaule* is that in the former the inflorescence is condensed whereas in the latter it is looser. Transitions between the two forms are frequent in our area.

The absence of records from W Afghanistan and E Persia is probably due to undercollecting in these areas during the spring months.

Similar in fruit shape to *Isatis Harsukhii* O. E. SCHULZ.

30. *Sameraria*

Sameraria DESV., Journ. Bot. Appl. 3: 161 (1813).

Syn.: *Tetrapterygium* FISCH. & C. A. MEY., Ind. Sem. Hort. Petrop. 1: 39 (1835).

Herbae annuae glabrae (fructu interdum pilis simplicibus obsito) glaucae, erectae. Folia omnia simplicia, integra vel rarius dentata, amplexicaulia. Sepala non saccata. Petala pallide vel intense flava. Silicula lateraliter compressa, indehiscens, loculo ± ovoideo, late alata, monosperma, non septata; sutura in speciebus nonnullis carinata vel alata; pedicelli fructiferi tenues, deflexi. Stylus minutus, persistens. Radicula incumbens.

1a. Sutura siliculae alata 2
b. Sutura siliculae leviter carinata vel costata 3
2a. Silicula 17—24×15—20 mm. Petala 1—1,5 mm lata. Planta 10—40 cm alta, racemis fructiferis brevibus ..... 6. *S. stylophora* (JAUB. & SPACH) BOISS.
b. Silicula 9—12×8—10 mm. Petala 2,5—3 mm lata. Planta usque ad 60 cm alta, racemis fructiferis elongatis ..... 5. *S. nummularia* BORNM.
3a. Loculus siliculae valde induratus, crustaceus, prominenter costatus ..... 4. *S. bullata* (AITCH. & HEMSL.) B. FEDTSCH.
b. Loculus siliculae non crustaceus, leviter costatus 4
4a. Folia basi sagittata, apicem versus attenuata. Petala 6 mm longa ..... 3. *S. stenophylla* RECH. f. & KOEIE
b. Folia basi rotundato-auriculata, apice obtusa. Petala breviora 5
5a. Petala 2—2,5 mm longa ..... 1. *S. armena* (L.) DESV.
b. Petala 4 mm longa ..... 2. *S. elegans* BOISS.

Sect. *Sameraria*

Sutura siliculae leviter carinata.

1. ***S. armena*** (L.) DESV., Journ. Bot. Appl. 3: 161 (1814).

Syn.: *Isatis armena* L., Spec. Plant. 670 (1753).

Icon.: Clavis p. 5 et 15.

Typus: „Hab. in Armeniae pratis siccioribus ad rivulos" TOURNEFORT.

Herba annua, 20—30 cm alta, valde ramosa. Folia oblonga, cordato-amplexicaulia. Petala 2—2,5×1 mm. Pedicelli fructiferi 3—7—12 mm longi. Silicula ala 3—7 mm lata inclusa 12—15 (—19)×12—17 mm, basi profunde cordata, interdum ad basin suturae minute auriculata; loculus 6—11×4—5 mm, glaber (var. *leiocarpa* BUSCH) vel tomentosus. Stylus 0,5—1 mm longus.

Talish: Swant, C. A. MEY.

Persia: W: Azerb.: Tabriz, GILL.-SM. 1823! Bostanabad versus Ardabil, FURSE 2409! Esfahan, DEICKE. Ham.: M. Alvand, BAHAI 6697-E! — S: Fars.: Inter Abadeh et Dowlatabad, SCHMID 5306! Kerm.: Inter Kerman et Yazd, BGE. Inter Saidabad et

jugum Chah-e Chaghak, 1800 m, Rech. 3100! Kuh Tagh Ali, 2250 m, Bornm. 2235. — E: Khor.: Circa Sar Chah, Bge. — C: Qazv.: Mardabad prope Karaj, Gauba & Sab. 241! Soltanabad prope Qazvin, Linds. 186! Yazd: Ad pagum Maswar in montibus prope Yazd, Buhse.

Afghanistan: NW: Herat: Tirphul, Hari Rud, Aitch. 181! — SW: Farah versus Shin Dand, Jija, 900 m, Koeie 3896!

Pakistan: Quetta: Inter Bostan et Khanozai, 1600 m, Lamond 1100!, Rech. 29151!

Distr. gen.: Transcaucasia, Anatolia orientalis, Talish, Persia, Afghanistan, Pakistan occidentalis.

The Aitchison gathering from NW Afghanistan is a more delicate plant than the typical form of *S. armena*. The fruits are more widely spaced from each other and the pedicels longer than is general in the species variation.

A species very closely related to *S. armena* and doubtfully different from it is *S. cardiocarpa* Trautv., Acta Hort. Petrop. 1:31 (1871). Described from the S Caucasus it was distinguished from *S. armena* primarily on the almost orbicular silicules rounded at the apex. Nikitin, Flora Ashkhabad 164 (1965) records *S. cardiocarpa* from the Ashkhabad region. No authentic specimens have been seen.

2. ***S. elegans*** Boiss., Fl. Or. 1: 375 (1867).

Syn.: *S. leiocarpa* Boiss., Fl. Or. 1: 375 (1867), syn. nov.

Typus: Bge. 78, W!

Herba annua 20—30 cm alta. Folia oblonga, amplexicaulia. Petala 4×1 mm longa. Pedicelli fructiferi 6—10 mm longi. Silicula (8—) 12—14×(8—) 13—14 mm, basi profunde cordata, glabra vel lanata; alae 4—5 mm latae; sutura alis angustis provisa; stylus 0,5—1 (—1,5) mm longus.

Persia: W: Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 219!, 221! Daulatabad, Str. Nahavand, Str. Arak: Golpayegan, Str. Arak, Str. Esf.: Inter Esfahan et Damaneh, 2300 m, Wdb. 1797! — S: Fars.: S Deh Bid, Archibald 1226! Kerm.: Inter Kerman et Yazd, Bge. 78!, 79! (Typus *S. leiocarpae* Boiss.) Bal.: Karevandar, 1200 m, Popov 147! — E: Khor.: 70 km S Ozbagu, Garedu, Ruttner 22! Ozbagu, Ruttner 378! Tabas, Shir Geshk, Ruttner 565!

Distr. gen.: Endem.

With the limited available material, there are no apparent differences between *S. leiocarpa* and *S. elegans* other than the lanate fruits in the latter and glabrous in the former. As the occurrence of glabrous and pubescent fruited forms within the same population is a common occurrence in *Sameraria*, the two described species should be considered as one.

3. ***S. stenophylla*** Rech. f. & Koeie, Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 91: 61 (1954).

Typus: Koeie 4180, W!, C.

Herba annua, 15—30 cm alta, ramosa. Folia caulina inferiora (4—) 6—8 cm × (0,5—) 1—1,5 cm, basi cordata vel sagittata, ibique latissima, apicem acutam versus longe sensim attenuata. Petala 6×2 mm. Silicula submatura c. 15×15 mm, basi profunde emarginata, dense albo-floccoso-tomentosa; loculus c. 8×4 mm; stylus 1—2 mm longus.

Afghanistan: SW: Farah versus Shin Dand, Jija, 900 m, Koeie 4180!

Distr. gen.: Endem.

Although only known from one gathering, apparently a distinct species easily recognised by the narrow pointed leaves and the large petals.

4. ***S. bullata*** (AITCH. & HEMSL.) B. FEDTSCH. in Rast. Turkmen. 447 (1915).
Syn.: *Isatis bullata* AITCH. & HEMSL., Trans. Linn. Soc. 3: 37 (1888).
Icon.: Clavis p. 9.
Typus: AITCH. 1014, K!

Herba annua, 30—40 cm alta. Folia caulina usque ad 10 cm longa, oblonga, apice obtusa. Silicula 15—18×9—10 mm, basi rotundata, apice acuta, ad suturam costata, ad loculum elevato-nervosa.

Turcomania: sec. Fl. URSS. 8: 234 (1939).
Afghanistan: NW: Badghiz, Gulran, AITCH. 1014!

Distr. gen.: Kara Kum, Afghanistan boreo-occidentalis.

Very closely allied to *S. bullata* and doubtfully different from it is *S. Aitchisonii* (KORSH.) B. FEDTSCH., Rast. Turkmen. 447 (1915); Syn.: *Isatis Aitchisonii* KORSH., Mem. Acad. Sci. Petersb. 8, 4: 90 (1896). I have not seen authenticated material but the only difference given in the original description is the subcanescent silicule in *S. Aitchisonii* and the glabrous pod in *S. bullata*. The KORSHINSKY species was based on a gathering made by the author "in declivibus siccis arenosis montium Turcomaniae ad limitem Afghaniae prope Akar Geschme et Akrabad". The author remarked that his new species was growing with *S. bullata*.

Sect. *Tetrapterygium* BOISS.

Sutura siliculae manifeste alata.

5. ***S. nummularia*** BORNM., Bull. Herb. Boiss. 5: 53 (1905).
Typus: BORNM. 6284, 6285.

Herba annua, usque ad 60 cm alta, valde ramosa. Folia caulina inferiora oblonga, obtusa, c. 10×4—6 cm. Glandulae nectariferae prominentes. Petala 5×2,5—3 mm. Inflorescentia fructifera elongata, valde ramosa. Pedicelli fructiferi 5—10 mm longi. Silicula 9—12×8—10 mm, glabra vel tomentosa, loculus reticulato-nervosus; stylus 0,5—1 mm longus. Semina 4—5 mm longa.

Persia: N: Maz.: In valle fluvii Chalus, 2200—2600 m, Pol-e Zanguleh, RECH. 6385! — C: Qazv.: In valle Loura, 2000 m, BORNM. 6284 (var. *hebecarpa* BORNM.), 6285 (var. *lamprocarpa* BORNM.). Alangeh prope Karaj, GAUBA. In valle fluvii Karaj prope Siarah, 1800 m, RECH. 449! Gach Sar, 80 km NE Karaj, FURSE 2619! Asadbar, KY. 477!

Distr. gen.: Endem.

A taller species than the other representatives of the genus in our area.

6. ***S. stylophora*** (JAUB. & SPACH) BOISS., Fl. Or. 1: 375 (1867).
Syn.: *Tetrapterygium stylophorum* JAUB. & SPACH, Ill. Pl. Or. 1: 100, tab. 50 (1842).
S. macrocarpa BOISS. & HAUSSKN. in BOISS., Fl. Or. Suppl. 64 (1888), syn. nov.
Icon.: Clavis p. 5.
Typus: AUCH. 4146-A, G!

Herba annua, 10—40 cm alta. Folia basalia petiolata, spathulata vel ovata, integra vel minute dentata; folia caulina ovata, elliptica, integra vel irregulariter dentata. Petala flava, c. 5×1—1,5 mm. Pedicelli fructiferi 5—15 mm longi. Silicula 17—24×15—20 mm, apice integra, rotundata vel subretusa; alae principales 6—8 mm latae; alae suturales 7—10×4—6 mm; stylus 1—2—3 mm.

Iraq: Kurd.: Sul.: M. Avroman ad confines Persiae in ditione Tawilla, 1400—1600 m, RECH. 10306! Prope Penjwin in glareosis serpentinicis jugi Malakawa, 1400 m, RECH.

12318! Goizha, 1200 m, Gillett & Rawi 10618! Pira Magrun supra Qarachitan, 1000 m, Gillett 7722!, Haussкn. (Typus *S. macrocarpae* Boiss. & Haussкn.) Palegawra, 24 km SW Pira Magrun, 1000 m, Helbaek 666! Qara Dagh, Poore 649! Kamarspa, Rawi 22172! Arbil: Kew-a Rash, NE Ranya, 800 m, Rawi 28481! Hab as-Sultan Dagh, 850 m, Rawi 28147! Bekma, 500 m, Gillett 8258! In faucibus prope Rawandiz, 450—750 m, Guest 2093! Handiyan, M. Baradost, Thesiger 803! Kuh Safin, Shaqlawa, O. Polunin 5026! Shaqlawa, Haines! Kuh Safin, 1200 m, Bornm. 916. Barsarini, Haines! Mosul: Matina, 1700 m, Rawi 8726. Bakirma, 800 m, Rawi 8549!
Persia: W: Kermansh.: Rijab prope Qasr Shirin, 900—1800 m, Nab. 1288, 1289. Bisotun, Str., Jacobs 6230! Karand, Shar. 5680-E! Kuh-e Qalajeh, Behb. 102! In caverna Warwasis, 8 km NE Kermanshah, Bent & Wr. 405—103! Ham.: Kuh-e Garri, W Borujerd et Nahavand, Bornm. M. Alvand SE Hamadan, Str., Polak! Esf.: Takht-e Sanembert, Deicke 330. Esfahan, Auch. 4146-A! Arak: Girdu S Arak, Str. Arak, Str. Lur.: Khorramabad versus Dezful, Furse 1134! N Khorramabad, Cowan & Darlington 1032! Dow Rud, Koelz 17185!, 17206!, 17282! Oshtoran Kuh, Str. Azna versus Borujerd, 48 km W Borujerd, Furse 1841! Bisheh, 1200 m, Koelz 705! — S: Fars.: Persepolis, Ky. 256! Tang-i Abdui, Stapf 201!, 1234! Kuh Kable prope Kazerun, Stapf 200!, 940! Inter Shiraz et Firuzabad, Gauba & Sab. 254! Maharlu prope Shiraz, Gauba & Sab. 246! Inter Persepolis et Dowlatabad, 1000—2000 m, Schmid 5470! — C: Tehr.: M. Tuchal, Bruns; 1300—1500 m, Aell. 1084! Darband, 1200—2000 m, Schmid 5126! Prope Tehran, Trott 986! Qazv.: Prope Karaj, Gauba. 16 km N Karaj, Stutz 1087! In valle fluvii Karaj versus Vessieh, Rech. 413! In monte Elbursense Persiae borealis, Ky. 95. — Amrabad, Cowan & Darlington 578!

Distr. gen.: Endem.

The commonest species of *Sameraria* in our area, it is usually found in scrub and on limestone slopes. In living material, the leaves are often marbled white. The young developing fruits are acute at the apex and clearly stylose but as the fruit reaches maturity it becomes obtuse or subretuse at the apex and the style is less distinct. As with the other species of the genus, glabrous and pubescent fruited forms occur in the same population.

S. glastifolia (Fisch. & C. A. Mey.) Boiss. has been recorded from near Tabriz by Bornmüller on the basis of two Strauss gatherings. This Transcaucasian species is clearly very closely allied to *S. stylophora* but apparently differs from our species in the slightly longer broader petals and smaller styles. Field studies in Transcaucasia and Persian Azerbaijan are needed to establish whether or not they are conspecific.

Species imperfecte nota

S. platyptera Bornm., Beih. Bot. Centrbl. 27, 2: 308 (1910).

Bornmüller gave neither an adequate description of this taxon nor did he cite clearly a specimen. The entire description is "a *S. leiocarpa* valde aliena siliculis late alatis maximis 18—22 mm latis et longis, nec (4 lin.) c. 9 mm longis". Parsa, Fl. de l'Iran 1: 849 (1951) cites a *S. leiocarpa* Boiss. var. *platyptera* (Bornm.) Parsa but the two specimens he cites are *S. stylophora* (Jaub. & Spach) Boiss.

31. *Coluteocarpus*

Coluteocarpus Boiss., Ann. Scienc. Nat. Ser. 2, 16: 378 (1841).

Lit.: I. C. Hedge, Materials for a Flora of Turkey, Notes from the Royal Botanic Garden Edinburgh 26: 181 (1965).

Herba glabra perennis foliis simplicibus rosulatis, floribus albis. Sepala oblique patentia non saccata, membranaceo-marginata. Fructus inflatus, valvis tenuibus, seminibus 1—12. Genus monotypicum subspecibus duabus.

1. ***C. Vesicaria*** (L.) HOLMBOE, Bergens Mus. Aarb. 13, 6 (1907).
Syn.: *Alyssum Vesicaria* L., Spec. Plant. 651 (1753). *Vesicaria reticulata* LAM., Illustr. Gen. 8, tab. 559, fig. 2 (1808). *Coluteocarpus reticulatus* (LAM.) BOISS., Ann. Scienc. Nat. Ser. 2, 16: 378 (1841).
Icon.: Clavis p. 9.

Typus: „Hab. in Oriente", TOURNEFORT.

Caules 4—10 cm longi. Folia basalia linearia, oblongo-lanceolata vel rhomboideo-spathulata, utrinque minute 3—5-dentata; folia caulina sessilia, integra. Inflorescentia fructifera elongata. Petala 6—10 mm longa. Pedicelli fructiferi 4—10 mm longi. Fructus 14—30×15—20 mm; septum perfectum vel marginale, semina 1—2—4—12.

1a. Folia linearia vel oblongo-lanceolata. Septum marginale. Semina 4—12 ... subsp. *Vesicaria*
b. Folia rhomboidea usque ad spathulata. Septum perfectum. Semina 1—2 .. subsp. *Boissieri* (O. E. SCHULZ) HEDGE

In our area only represented by subsp. *Boissieri*.

— — subsp. ***Boissieri*** (O. E. SCHULZ) HEDGE, Notes Roy. Bot. Gard. Edinb. 26: 181 (1965).
Syn.: *C. Boissieri* O. E. SCHULZ in ENGLER & PRANTL, Natürl. Pflanzenfam. ed. 2, 176: 428 (1936).

Lit.: K. H. RECHINGER fil., Phyton 3: 49 (1951).

Typus: Kurdistan.

Iraq: Kurd.: Mosul: In ditione Sharanish in montibus calc. a Zakho septentriones versus, 2100 m, RECH. 12012! Sirsang, in declivibus Qara Dagh, 1200 m, CHAPMAN 26413! NE Zakho, RAWI 23599! Arbil: Algurd Dagh, KASS 27215! Prope Rawandiz, 3000 m, BORNM. 895.
Persia: W: Kurd.: Kuh Shahu, HAUSSKN. Dezh Shahpur, 2000—2100 m, JACOBS 6532! Kermansh.: Qasr Shirin, in montibus prope Rijab, NAB. 1295. Kuh-e Kahrgush-Chika, SE Kermanshah, STR. Kuh-e Tarikha, STR. Ham.: M. Alvand, STR. Hamadan, LINDB.! Lur.: Dow Rud, KOELZ 15649!, 17232!, 17330-a! Oshtoran Kuh SW Arak, STR., ARCHIBALD 1605! Bakht.: Gahar, KOELZ 17999!

Distr. gen.: Libanon, Anatolia, Iraq borealis, Persia occidentalis.

32. *Didymophysa*

Didymophysa BOISS., Ann. Scienc. Nat. Ser. 2, 16: 379 (1841).

Herbae perennes, glabrae, petalis albis vel lilacinis, foliis parvis lobatis vel integris. Sepala oblique patentia, non saccata, membranaceo-marginata, saepe violacea. Valvae fructiferae inflatae, tenues, loculis 1—2-spermis. Semina 2—4 testa crassa provisa. Radicula accumbens. — Species 2, in glareosis mobilibus regionis alpinae crescentes.

1a. Folia apice 3—5-loba ..... 1. *D. Aucheri* BOISS.
b. Folia integra, raro apice 1—3-loba ..... 2. *D. Fedtschenkoana* REGEL

1. ***D. Aucheri*** BOISS., Ann. Scienc. Nat. Ser. 2, 16: 379 (1841) et l. c. 17: 179 (1842).
Icon.: Clavis p. 9.
Typus (Syntypi): AUCH. 247, 4079 et 4080, G!, K!

Herba laxe caespitosa perennis prostrata; caules floriferi usque ad 5 cm longi, simplices. Folia petiolata glauca, in petiolum cuneato-attenuata, apice in lobos 3—5 lineares obtusos divisae. Petala 4—6 mm longa. Pedicelli fructiferi 4—9 mm longi. Fructus didymi, inflati, 7—10 mm longi, 9—13 mm lati, 4—6 mm lati, 4(—2)-spermi.

Iraq: Kurd.: Arbil: Algurd Dagh, 3300 m, Guest 3050!, 3000—3800 m, Rech. 11431! M. Qandil ad confines Persiae, 3500—3700 m, Rech. 11167!, Rawi 18252!, 18281!, 24447!, 24448!, 24506!, 24559!
Persia: N: Maz.: M. Alamut, Auch. 4080! — W: Azerb.: Kuhha-ye Sabalan, Harrington 293! Ham.: M. Alvand, SE Hamadan, Auch. 247! Lur.: Kuh-i Nur, Haussкn. — S: Fars.: Kūh-e Dinar, Ky. 781! — C: Tehr.: Damavand, 4000 m, Wdb. 1682!, Trott 76!, Schwingenschuss!, Auch. 4079!, Grant 16533. M. Tuchal, 2700—3800 m, Bornm. 6270!, 6269. Takht-i Suleiman, 4100 m, Bornm. 6272!; In jugo Hazarcham, Talaqan, Trott 380! Shahr.-Bust.: M. Shahvar, in glareosis calc., 3900 m, Rech. 6036!

Distr. gen.: Transcaucasia, Anatolia, Iraq borealis, Persia.

2. ***D. Fedtschenkoana*** Regel, Descr. Pl. Nov. Fedtsch. 8 (1882).
Typus: C. Asia. In Kokaniae tractu Dschiptick in regione glaciali Karakasuk, O. Fedtschenko, LE.

D. Aucheri arcte affinis, ab ea foliis integris vel parce leviter lobatis tantum diversa.

Afghanistan: NE: Wakhan: In valle Futur, 3750 m, Roemer 79!
Pakistan: Chitral: Shartarukh, 2800 m, Harriss. Nawasingh, Agram gaz, 4150 m, Harriss.

Distr. gen.: Tien Shan, Pamir Alaj, Afghanistan, Pakistan occidentalis.

33. *Iberis*

Iberis L., Spec. Plant. 649 (1753). Gen. Plant. ed. 5: 292 (1754).

Herbae annuae vel perennes, floribus albis vel purpurascentibus, glabrae vel simpliciter pilosae. Folia simplicia vel pinnatifida. Inflorescentia ± corymbosa. Sepala oblique patentia, non saccata. Petala omnia aequalia vel duo exteriora majora. Glandulae nectariferae laterales prominentes. Ovarium biovulatum. Fructus silicula valde compressa, dehiscens, ± ovata, apice profunde emarginata. Margo septi crassa. Radicula accumbens.

1. ***I. acutiloba*** Bertol., Misc. Bot. 2: 12, tab. 2, fig. 2 (1843).
Syn.: *I. odorata* Boiss., Fl. Or. 1: 335 (1867), non L.
Icon.: Clavis p. 15.
Typus: „Ex viciniis Bamboudseh", Chesney 89, BOLO.

Herba annua, papillosa, scabrida, 5—15 cm alta. Folia lineari-lanceolata, apice pinnatiloba lobis brevibus. Petala alba vel roseo-violacea, 2—4 mm longa, interdum omnia ± subaequalia. Inflorescentia fructifera non elongata. Pedicelli fructiferi c. 5 mm longi, patulo-ascendentes. Fructus ovatus, 6—8 × 6—7 mm, basi rotundatus, apice acute bialatus; emarginatura c. 2 mm; alae c. 3 mm; stylus 1—1,5 mm. Semina 2, humiditate mucilaginea.

Iraq: Kurd.: Mosul: Inter Zakho et Dihok, Guest 1306!, 2237! In valle Zakho, 600 m, Guest 2258! Mosul, Lazar 3327!, Hand.-Mzt. 1196, 1290. Jabal Maklub, N. Polunin & Abdul Wahab 51! Arbil: 17 km N Altin Kōprü, Barkley & Brahim 4570! Qosh Tepe prope Arbil, Guest 1472! Arbil versus Darband, 470 m, Shawani 25276! Arbil, Bornm.

900, Shawani 25123!, Radhi 3861. Sul.: Sulaymaniyah, Graham. Kirkuk: In collibus Kani Domlan prope Kirkuk, Guest 4319!, Kirkuk, Bornm. 901, Rogers 12! Fl. Zab. Grigg 59!

Distr. gen.: Africa borealis, Graecia, Syria, Cyprus, Anatolia, Iraq borealis.

The nomenclature of this species requires further investigation. — *Iberis amara* L. sometimes occurs in our area as an escape from cultivation. A west European native, it is a taller plant than *I. acutiloba* with clearly unequal petals.

34. *Heldreichia*

Heldreichia Boiss., Ann. Scienc. Nat. Ser. 2, 16: 381 (1841).

Herbae perennes, glabrae, foliis simplicibus, integris vel lobatis, floribus albis vel lilacinis. Sepala patentia, non saccata. Filamenta edentula vel dentata. Silicula compressa, dehiscens, obovata vel late ovata, 2-sperma. Radicula accumbens.

1. ***H. longifolia*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 187 (1842).
Syn.: *Stroganowia longifolia* (Boiss.) Botsch. & Vved., Not. Syst. Inst. Bot. & Zool. Sc. Uzbekistan 12: 11 (1948).
Typus: Auch. 320, G!

Perennis, erecta, usque ad 60 cm alta. Folia basalia lineari-lanceolata, usque ad 20 cm × 0,6 cm, petiolo longo incluso; residua petiolorum persistentia; folia caulina similia subsessilia. Flores in racemos paucifloros terminales vel axillares dispositi. Petala alba, sepalis c. duplo longiora. Filamenta edentata. Pedicelli fructiferi c. 5 mm longi. Siliqua (juvenilis) c. 7 × 5 mm, obovata, obtriangularis. Stylus c. 1,5 mm longus.

Persia: W: Bakht.: M. Zard Kuh, Auch. 320!

Distr. gen.: Endem.

Recorded by Bornmüller, Beih. Bot. Centrbl. 19, 2: 207—208, (1905) and l. c. 27, 2: 304 (1910), on the basis of Strauss gatherings, from around Arak, M. Rasvand and Oshtoran Kuh. They are, on Bornmüller's admission, doubtful identifications of immature specimens. — With the sole and very inadequate type gathering it is impossible to assess accurately the status of *H. longifolia*. It differs from the other 3 very closely inter-related species of the genus (all mountain scree plants in Turkey) in the erect habit, the very long, narrow, entire, not fleshy leaves and the edentate stamens. Further gatherings will probably show that it is generically different from *Heldreichia* and might even represent a new genus. In leaf characters, it is very similar to *Stroganowia affghana* (Boiss). Pavlov but differs from it and all other species of *Stroganowia* in the long style and the non-capitate stigma. *Stroganowia* may be its nearest generic affinity.

✓ 35. *Biscutella*

Biscutella L., Spec. Plant. 653 (1753). Gen. Plant. ed. 5: 294 (1754).

Lit.: E. Malinowski, Monographie du genre Biscutella, Bulletin International de l'Académie des Sciences de Cracovie, Classe des Sciences Mathématiques et Naturelles, ser. B. 2—3 (1910). B. Machatschki-Laurich, Die Arten der Gattung Biscutella sectio Thlaspidium, Botanisches Archiv Königsberg, 13: 1—115 (1926).

Herbae annuae (nostrae), foliis simplicibus, floribus flavis. Sepala non vel leviter saccata. Fructus silicula valde compressa didyma, longitudine latior; mericarpia monosperma orbicularia dehiscentia. Radicula accumbens.

1. ***B. didyma*** L., Spec. Plant. 653 (1753).
Syn.: *B. apula* L., Mantissa Alt. 254 (1771), nom. illeg. *B. ciliata* DC., Ann. Mus. Nat. 18, 9: 297 (1811). *B. Columnae* Ten., Prodr. Fl. Napolit. 38 (1811—1814).
Icon.: Clavis p. 15.
Typus: „Hab. in Germania, Gallia, Italia".

Annua, usque ad 40 cm alta, simplex vel valde ramosa, plerumque rosula foliorum basali. Folia inferiora cuneato-obovata, dentata vel subintegra, pilis rigidis simplicibus; caulina minora, semiamplexicaulia. Inflorescentia florifera et fructifera ± condensata. Petala c. 3 mm longa. Pedicelli fructiferi erecti, 4—10 mm longi. Fructus c. 5—7 × 9—14 mm, glaber, pubescens vel margine pilis brevibus clavatis obsitus.

Iraq: Kurd.: Mosul: In faucibus Zawita, 900 m, Guest 2187!, Guest & al. 15373! Mosul, Graham 669!, Shahwani 25202! In faucibus prope Dihok, Guest & al. 15413! Shaikh Adi 10 km NW Ayn Sifni, Thesiger 659! Jabal Khair supra Mirsida, 40 km W Aqrah, Thesiger 563! Arbil: Rawandiz, Guest 728!, Guest & al. 15462! Arbil versus Salah ad-Din, Haines! Kuh Safin, 1000 m, Bornm. 903. M. Baradost prope Shanidar, 900 m, Erdtman & Goedemans in Rech. 15677! Kirkuk: Jarmo, Helbaek 308!, 374! Tuni Baba Amera, 10 km S Darbandikhan, Barkley & Haddad 7446! Prope Kirkuk, Grigg 16! Diyala: Khanaqin, Haines! Kani Kirmaj, Poore 464! As Sadiyah, Sutherland 162.
Persia: W: Kermansh.: Bisotun, 1350—1650 m, Jacobs 6329! 8 km NE Kermanshah, Bent & Wr. 331—217! Qasr Shirin, Shar. 5630-E! Lur.: N Khorramabad, Cowan & Darlington 1033! Inter Khorramabad et Andimeshk, Bent & Wr. 416—207! Shah Bazan, Koelz 285! Khuz.: Kuh-e Asmari, 34 km SE Masjed Soleyman, Lee! Ad fluvium Chekab inter Shush et Dehloran, Nab. 1337. Prope Dez Dam, 400 m, Wdb. 53! Behbehan, Esfand.! Kuh-e Jariak, 15 km E Masjed Soleyman, Lee! — S: Fars.: Jahrom, Koelz 14601! Bushehr, Ky. 48. Dalaki, 800 m, Koelz 1420!, Haussk.! Takht-e Jamshid, Koelz 14434! Persepolis, Gauba & Sab. 181!, 212! Kuh-e Khormuj prope Bushehr, Nab. 1318. Inter Shiraz et Firuzabad, Gauba & Sab. 213! 15 km E Shiraz, 1600 m, Grant 15279. Firuzabad, Kashkouli 5631-E! Maharlu, Gauba & Sab. 180! Shah-e Ahmadur, Yazd-e Khvast, 1250 m, Merton 3647! Lar.: Inter Jahrom et Mansurabad, Gauba & Sab. 211! Tang-i Chir prope Konar Takhteh, Stapf 178!

Distr. gen.: Europa australis, Anatolia, Syria occidentalis, Iraq borealis, Persia occidentalis et australis.

A variable species in which, with more data, it may be possible to recognise subspecific taxa. Three varieties are often recognised: — var. *didyma* with thick fruit margins and without basal leaf rosettes; var. *Columnae* (Ten.) Mach.-Laur. with thick fruit margins and with basal leaf rosettes; var. *applanata* Mach.-Laur. with flattened fruit margins. The last named is the most common form in our area. It was treated by Rechinger, Dansk Bot. Ark. 15, 4: 16 (1954—1955) as *B. ciliata* DC. subsp. *applanata* (Mach.-Laur.) Rech. f.

36. *Moriera*

Moriera Boiss., Ann. Scienc. Nat. Ser. 2, 16: 380 (1841).

Frutices humiles ramosissimi spinosi, foliis simplicibus carnosis, floribus albis vel roseis odoratis. Sepala interiora non saccata. Filamenta neque dentata neque alata. Silicula valde compressa indehiscens, ambitu ovata, monosperma, utrinque emarginata, late alata, non septata. Radicula accumbens vel oblique incumbens.

1. ***M. spinosa*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 182 (1842).
Syn.: *Lepidium intricatum* Boiss. & Buhse, Nouv. Mem. Soc. Nat. Mosc. 12: 25 (1860). *Moriera cabulica* Boiss., Fl. Or. 1: 338 (1867). *M. stenoptera* Bornm., Beih. Bot. Centrbl. 27, 2: 306 (1910). *Aethionema micropterum* Bornm., Beih. Bot. Centrbl. 28, 2: 535 (1911). *Ae. spinosum* (Boiss.) Bornm., l.c. *Ae. cabulicum* (Boiss.) Bornm. l.c. *Moriera gracilis* Czern., Feddes Repert. 27: 269 (1930). *M. transhyrcana* Czern. l.c.: 270. *Aethionema transhyrcanum* (Czern.) Busch in Fl. URSS. 8: 557 (1939). *Moriera spinosa* Boiss. subsp. *cabulica* (Boiss.) Jafri, Notes Roy. Bot. Gard. Edinb. 22: 114 (1956).
Icon.: Clavis p. 5; tab. 7, fig. 1 et 2.
Typus: Auch. 347, G, LE.

Frutex ± 20 cm altus, spinosus, intricato-ramosissimus, caespites convexos vel applanatos usque ad 60 cm diametro formans. Folia linearia, cylindrica ± carnosa, integra, glauca, pauca, per ramos distributa. Racemi breves vel ± elongati. Petala 3—6,5×1—2,5 mm. Stigma capitatum. Ovula (2—) 4. Pedicelli fructiferi 1—4 mm longi, patuli. Silicula 3—6×3—4 mm, ala 1 mm lata, papyracea.

Persia: N: Gorg.: Karimsarai, Koelz 16496. — W: Kurd.: Kuh-e Emrullah prope Sonqor, Str. Kermansh.: Kuh-i Parrow NE Kermanshah, Str. In fauce Nojubaran Str. (Typus *M. stenopterae* Bornm.) Inter Bernaj et Kinisht in declivibus boreo-orientalibus M. Kuh-i Parrow, Str. Bisotun prope Kermanshah, Str., Jacobs 6357! M. Shahu, Deicke 356. Kuh-e Shiriz inter Nahavand et Kermanshah, Str. Kuh Milleh Michan, Gahvareh inter Karand et Kermanshah, Str. Ham.: Kuh-e Garri W Borujerd et Nahavand, Str. Arak: Kuh-e Shahsinde WNW Arak, Str. M. Rasvand SW Arak, Str. M. Dumbe-Kemer prope Khunsar SE Arak, Str. Kuh-e Sofeh prope Esfahan, Stapf 185! In montibus prope Soh N Esfahan, Buhse. Esfahan, Auch. 347. — S: Fars.: Kuh Abbas Ali, Stapf 186! Kerm.: Kuh-i Sirj, 2360 m, Bornm. 2208! Kuh-e Jupar, 2200—3400 m, Bornm. 2209, 2210. — E: Khor.: NE Kavir, Majra, 1100 m, Gabr. 50. Inter Robat-e Safid et Torbat-e Heydariyeh, 2000 m, Rech. 1564! Inter Mashhad et Torbat-e Heydariyeh, 2000 m, Gauba 206! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4670! — C: Kashan: Qamsar, Manuch. 5683-E! Shahr.-Bust.: Shahrud, Bge.! Yazd: Inter Yazd et Esfahan, Bge.!
Turcomania: Kopet Dagh ad pagum Firyuza, Androssov 279, 301, Czern. 52 (Typus *M. gracilis* Czern.). M. Dushak, Michelson 375, Lipsky 2017. Prope Chuli, Michelson 365. Chajek, Lipsky 2170, 2199.
Afghanistan: SW: Herat, Amsel! Farah versus Shind Dand, Jija, 900 m, Koelz 3182! Ghorat: In declivibus borealibus M. Cheling Safed-Daraq a Parjuman meridiem versus, 2700 m, Rech. 19071! — E: 50 km a Kabul versus Gardez, 1900 m, Lamond 2150!, Rech. 31477. Parvan: In valle Panjshir inter Dasht-i Rewat et Deh Khawak, 2300 m, Hdg. & Wdb. 5315! Inter Tang-i Saidan et Lalandar, 1870 m, Gilli 1113! Rewat, Lindb. 1035! Erak, Griff.! — NE: Kataghan: Inter jugum Shibar et Doshi, Furse 5843!, 5889! — C: Bamian: In faucibus Paimuri, 2700 m, Hdg. & Wdb. 4684! Darreh-i Shikar, Hdg. & Wdb. 3362!, Rech. 16721! Prope Bulola, Gilli 1114! NE Bamian, 3150 m, Gilli 1115! Gadar W Panjao, 2750 m, Hdg. & Wdb. 4969!

Distr. gen.: Persia, Turcomania, Afghanistan.

With the material now available for study, there are no good reasons for recognising more than one species in *Moriera*, at least in our area. Most of the species recognised in *Moriera* have been based on insubstantial vegetative differences but the variation in facies is often a result of different times of collecting and gathering different parts of the plant. The younger flowering shoots are not spiny and when collected apart from the older spiny parts of the plant they give the impression of a loose-growing, rather flaccid plant very different from the hard spiny branches of a fruiting specimen. It was this loose

type of specimen that Czerniakowska described as *M. gracilis*. Likewise plants from more or less shaded rock crevices tend to be loose in habit with more or less long straight branches in contrast to plants growing in more exposed habitats in full sun where they form compact and intricately branched tufts. With the fruiting material examined, I can find no reason for maintaining *M. cabulica* as a separate species or subspecies on the grounds of large broader fruits.

Although represented by a large number of herbarium specimens there are still few good fruiting specimens of *M. spinosa*.

M. spinosa is a characteristic member of the Irano-Turanian element of our area. The genus is clearly very closely allied to *Aethionema* and is sometimes regarded (e. g. Fl. URSS. 8: 556 (1939)) as synonymous with it. In the absence of any clearly allied species in *Aethionema* and because of the regularly broadly winged and indehiscent fruit, together with the spiny habit, I prefer to regard *Moriera* as a separate genus.

37. *Aethionema*

Aethionema R. Br. in Aiton, Hort. Kew. ed. 2, 4: 80 (1812).
Syn.: *Eunomia* DC., Syst. 2: 255 (1821). *Crenularia* Boiss., Ann. Scienc. Nat. Ser. 2, 16: 380 (1841). *Iberidella* Boiss., Ann. Scienc. Nat. Ser. 2, 16: 381 (1841). *Campyloptera* Boiss., Ann. Scienc. Nat. Ser. 2, 16: 381 (1841).

Lit.: I. C. Hedge in Materials for a Flora of Turkey X, Notes from the Royal Botanic Garden Edinburgh 26: 182—184 (1965) et in P. H. Davis, Flora of Turkey 1: 314—330 (1965).

Herbae vel suffrutices annui vel perennes, glabri saepe glauci. Folia simplicia integra saepe carnosa, sessilia vel breviter petiolata. Sepala erecta, interiora saccata. Petala rosea, alba vel flava, ungue plerumque trinervia. Filamenta plerumque alata, dentata vel edentata. Fructus silicula dehiscens valde compressa plerumque biloculari, loculis semina 1—4 proferentibus, interdum unilocularis monosperma indehiscens. Radicula incumbens obliqua vel accumbens. In speciebus nonnullis annuis racemi fructiferi e siliculis bilocularibus dehiscentibus et unilocularibus indehiscentibus compositi observantur.

A genus centred in the Turkey-Caucasus-Persia region with few species outside this area. Some species e. g. *Ae. grandiflorum* Boiss. & Hohen., are frequent in our area.

Taxonomically a difficult genus, it is almost impossible to name many gatherings because of the absence of mature fruit.

1a. Annuae 2
b. Perennes 4
2a. Siliculae margine dentato-laceratae. Filamenta non dentata ..... 1. *Ae. carneum* (Banks & Soland.) B. Fedtsch.
b. Siliculae margine integrae. Filamenta dentata 3
3a. Inflorescentia fructifera compacta, non vel vix heterocarpa. Siliculae ± appressae ..... 2. *Ae. arabicum* (L.) Andrz. ex DC.
b. Inflorescentia fructifera ± laxa evidenter heterocarpa. Siliculae ± horizontaliter patentes ..... 3. *Ae. syriacum* (Boiss.) Bornm.
4a. Siliculae uniloculares, monospermi 5
b. Siliculae biloculares, 1—4-spermi 8
5a. Plantae erectae, longiramosae, 30—50 cm altae 7
b. Plantae humiles, 3—8 cm alti 6
6a. Folia subopposita, rotundato-ovata. Inflorescentia multiflora, dense capitata ..... 6. *Ae. cephalanthum* (Bornm.) Bornm.

6b. Folia alterna, lineari-elliptica. Inflorescentia pauciflora, corymbosa ..... 7. *Ae. umbellatum* (Boiss.) Bornm.
7a. Stylus sinu fructus inclusus ..... 4. *Ae. elongatum* Boiss.
b. Stylus e sinu fructus exsertus ..... 5. *Ae. stenopterum* Boiss.
8a. Folia ovato-lanceolata 9
b. Folia linearia 11
9a. Siliculae margine serratae vel irregulariter laceratae 10
b. Siliculae margine integrae ..... 8. *Ae. trinervium* (DC.) Boiss.
10a. Folia ± cordata, deltoidea, subamplexicaulia, apiculata. Petala lilacina, alba, rosea vel flava ..... 9. *Ae. cordatum* (Desf.) Boiss.
b. Folia ovato-lanceolata, sessilia vel subpetiolata. Petala rosea ..... 10. *Ae. fimbriatum* Boiss.
11a. Racemi fructiferi capitati ..... 11. *Ae. membranaceum* DC.
b. Racemi fructiferi elongati 12
12a. Siliculae usque ad dimidiam vel totam latitudinem alarum laciniato-dentatae ..... 12. *Ae. diastrophis* Bge.
b. Siliculae margine irregulariter crenatae vel integrae ..... 13. *Ae. grandiflorum* Boiss. & Hohen.

1. ***Ae. carneum*** (Banks & Soland.) B. Fedtsch. in Flora Zap. Tian Shan: 176 (1905).

Syn.: *Thlaspi carneum* Banks & Soland. in Russell, Nat. Hist. Aleppo ed. 2: 257 (1794). *Aethionema cristatum* DC., Reg. Veg. Syst. Nat. 2: 560 (1821). *Ae. cristatum* DC. var. *spinulosum* Bornm., Bull. Herb. Boiss. Ser. 2, 5: 52 (1904).

Typus: Syria, Aleppo, Russell.

Herba annua multiramosa, c. 10 cm alta. Folia basalia oblonga vel ovata, breviter petiolata, caulina oblonga amplexicaulia cordata. Petala pallide rosea, 2—3 mm longa. Filamenta staminum longiorum laxe connata, non dentata. Inflorescentia fructifera aliquantum elongata, heterocarpa. Siliculae majores 7—8×6—8 mm, pedicellis erectis, alis dentato-laceratis. Stylus c. 1 mm. Semina 4—6. Siliculae minores stellatae, monospermi.

Iraq: Kurd.: Mosul: Inter Dihok et Amadiyah in quercetis saxosis supra Sirsang, 1200 m, Rech. 11655! Amadiyah, Guest 1271! Arbil: Arbil versus Salah ad-Din, Bastura Chai, Haines 1392!, Gillett & Rawi 10495! Salah ad-Din, 900 m, Gillett 10432! M. Handren, 1200 m, Nab. 1298. Kirkuk: Jarmo prope Chamchamal, Haines!, Helbaek 309!, 450! Sul.: Goizha, 1200 m, Gillett & Rawi 10611!, Mooney 4334! Diyala: Khanaqin, Rech. 14122! Jabal Hamrin, Nab. 1320. As Sadiyah, Evans, Sutherland 161.
Persia: N: Gil.: Inter Rudbar et Kaluraz, Bornm. 6199. In montibus prope Kalak, Gauba, Rech. 146! — W: Azerb. Khvoy, Knapp. Chahriq inter Shahpur et Rezaiyeh, Knapp. In M. Karnaru, Knapp. Gatvand, Mart.-Escal. Rezaiyeh, Gill.-Sm. 1566. Einal-Zeinal prope Tabriz, Grossh. Zanjireh inter Tabriz et Khvoy, Knapp. Tabriz, Gill.-Sm. 1805, Knapp. Azerbaijan, Auch. 4130. Ham.: 3 km SW Borujerd, Cowan & Darlington. M. Alvand SE Hamadan, Stapf. Hamadan, Stapf. Bahar, Bahai 6664-E! Daulatabad, Stapf. Aq Bolagh-e Aqdaq, c. 100 km N Hamadan, Rioux & Golv.! Kermansh.: Kuh-e Parrow, 20 km E Kermanshah, Bent & Wr. 406—108! Shahabad, 1100—1300 m, Jacobs 6210! Qasr Shirin, Evans. Arak: M. Rasvand SW Arak, Str. Arak, Str. Golpayegan, Furse 1469! Esf.: 32 km W Esfahan, Stutz 821! Lur.: Oshtoran Kuh, Azna, Furse 1797! Dow Rud, Koelz 17306! 57 km NE Khorramabad, Bent & Wr. 508—102! 24 km N Azna, Furse 1514! Khuz.: Cher-e Saucha inter Dehloran et Shush, Nab. 1322. — S: Fars.: Shiraz. Esfand. 995-E!, Grant 15628!, Stapf 180!, 181! 56 km W Shiraz, Furse 1280! Takht-e Jamshid, Koelz 14504! Kerm.: Kuh Tagh

Ali, 2300 m, Bornm. 2215. Inter Saidabad et jugum Chah-e Chaghak, 1900 m, Rech. 3515! — E: Khor.: M. Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, Rech. 7207! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 4941! Ad deserti margines prope Gonabad inter Qayen et Torbat-e Heydariyeh, 900 m, Rech. 4303! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4539! In collibus ad Torbat-e Heydariyeh, 1300 m, Rech. 4355! In montibus serpentinicis ditionis Robat-i Safid, 1800—2000 m, Rech. 7337 Sar Chah, Bge. — C: Tehr.: Ad pagum Kamranieh in M. Tuchal, Bruns. Tehran, Bge.; 1200 m, Schmid 5093!, Bornm. 2218! Mahmudiyeh prope Shimran, 1300 m, Rech. 2828! Qazv.: In jugo inter Qazvin et Zereshk, Stapf. Fashand, Gauba 1371. Inter Khur et Fashand, Gauba 172! Qazvin, Schmid 5026!; 1400 m, Bornm. 6100, 6101; 1500 m, Jacobs 6187! Pachenar, 600 m, Bornm. 6198. Qom, Bornm. 2216, 2217. Str.

Turcomania: Kizyl Arvat, Becker. Firyuza, Litw. 593! M. Tangeri-Gorgan supra Nephton, Sint. 215!, 216.

Afghanistan: NW: Badghiz E Kamchao, Aitch. 280! — SW: Herat: In valle Hari Rud, Tirphul, Aitch. Herat, 900 m, Koeie 4178. 96 km S Herat, Furse 5466!; 48 km S Herat, Furse 5415! — SE: Kandahar: N Girishk in faucibus prope Garmao, Kerst. 409-e. Baba Wali, 1250 m, Koeie. Kalat-i Ghilzai et Kandahar W Kalat-i Ghilzai, Kerst. 183. — E: Kabul: 12—15 km W Sarobi, 1100 m, Hdg. & Wdb. 2790! Inter Sarobi et Lataband, Volk 1853! Kabul versus Lataband, 1800—1900 m, Lamond 1943! Gholrondi, 2 km W Charikar, Podlech 10872! Istalif, 1840 m, Gilli 1135!, 1137!, Furse 5740! Paghman, 2500 m, Neub. 4326. In valle Logar, Kerst. 41. Aliabad prope Kabul, Neub. 3122! Pul-i Alam, Koelz 11865. Sher Darwasa, 1820 m, Gilli 1138!, 1139! Band-e Kargha, 2050 m, Rech. 31245! — NE: Kataghan: In valle Andarab, 1100 m, Rech. 31791!

Pakistan: Quetta: Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29006! Spin Karez prope Quetta, 1800—1900 m, Lamond 1140! Yaro prope Bostan, 40 km NE Quetta, 1450 m, Rech. 28915! Quetta versus Chaman, 1500 m, Lamond 951! — Wazir.: Inzar Narai. Lowndes 655! — Baluchistan, Murdar, Lace 3595! Baluchistan, Stocks 962!

Distr. gen.: Per totam Asiam austro-occidentalem et Turcomaniam.

2. ***Ae. arabicum*** (L.) Andrz. ex DC., Reg. Veg. Syst. Nat. 2: 560 (1821).

Syn.: *Iberis arabica* L., Cent. Plant. 1: 17 (1755). *Thlaspi arabicum* (L.) M. B., Fl. Taur.-Cauc. 3: 430 (1819). *T. Buxbaumii* Fisch. ex Hornem., Suppl. Hort. Hafn. 71 (1819). *Aethionema Buxbaumii* (Fisch.) DC., Reg. Veg. Syst. Nat. 2: 560 (1821).

Typus: „Hab. in Cappadocia, Arabia", Hasselquist.

Herba annua 10—15 cm alta, multiramosa, glabra. Folia basalia oblonga vel late ovata, petiolata; folia caulina similia sed amplexicaulia. Petala 2—3 mm longa, alba vel rosea. Filamenta staminum longiorum laxe connata, dentata. Inflorescentia florifera et fructifera condensata, raro heterocarpa. Silicula ovata, 6—12 × 6—12 mm; alae 1—3 mm latae; stylus quam 1 mm brevior. Semina 3—4.

Iraq: Kurd.: Sul.: Prope Penjwin, 1600 m, Rech. 12241! In glareosis serpentinicis jugi Malakawa, 1400 m, Rech. 12300! M. Kajan, 1590 m, Rawi 22744! Arbil: M. Handren prope Rawandiz, 1300 m, Bornm. 905.

Talish: Swant, Tatuni, Hohen.; Swant, C. A. Mey.

Persia: N: Maz.: In valle Haraz, 1500 m, Wdb. 659! Gil.: Ispili, Linds. 1225! Rudbar, Bornm. 6193, Stapf. Inter Manjil et Pachenar, 300—600 m, Bornm. 6195, 6196. Kaluraz, Bornm. 6194. — W: Azerb.: Shahr Chay prope Rezaiyeh, Knapp. Kuh-e Aq Kan Dagh, 64 km N Rezaiyeh, Furse 2232! Khosrava, Knapp. Kuh-e Sahand prope Liqvan, Buhse. Tabriz, Grossh. Prope Tabriz, Gill.-Sm. 1806. S Tabriz, Gill.-Sm. 1460. 35°30′ N, 46°31′ E, Jacobs 6589! Ham.: M. Alvand SE Hamadan supra Ganjnameh, Stapf! M. Alvand, Bahai 6663-E! Haydere, Stapf! Arak: M. Tafresh inter Arak et Qom, Str. Tshal, Str. Bakht.: Keshvar, 800 m, Koeie 527! — C: Tehr.: Ab-i Garm, Bruns.

M. Tuchal, Aell. 1098! Qasr-e Qajar prope Tehran, Bruns. Shahrestanak, 2200 m, Bornm. 6197! Qazv.: Prope Karaj, Rech. 174! Inter Karaj et Gach Sar, Schmid 5682! Prope Siarah, 1800 m, Rech. 455! Gach Sar, Furse 2645!

Distr. gen.: Graecia, Syria, Anatolia, Transcaucasia, Talish, Iraq borealis, Persia.

Closely related to *Ae. arabicum* is *Ae. Froedinii* Rech. f. from Turkish Kurdistan and Mesopotamia. It differs from *Ae. arabicum* in several small characters the most obvious being its much longer (2—4 mm) style.

3. ***Ae. syriacum*** (Boiss.) Bornm., Beih. Bot. Centrbl. 28, 2: 120 (1911).
Syn.: *Campyloptera syriaca* Boiss., Ann. Scienc. Nat. Ser. 2, 16: 381 (1841). *Aethionema campylopterum* Boiss., Fl. Or. 1: 353 (1867). *Ae. syriacum* var. *heteromorphum* Bornm., Beih. Bot. Centrbl. 28, 2: 120 (1911).
Icon.: Clavis p. 7.
Typus: „In agris Syriae", Auch. 339, G!, K!

Herba annua, ramosa, glabra, glauca. Folia basalia oblonga, sessilia, cordata; caulina similia. Petala rosea vel albido-rosea, 4—7 mm longa. Filamenta staminum longiorum per majorem partem longitudinis connata. Inflorescentia fructifera ± laxa, heterocarpa. Siliculae majores, ± orbiculares, 6—8×6—8 mm; pedicelli 3—4 mm longi, appressi, apice manifeste curvati; alae integrae; stylus 2—3 mm; semina 3—4—6. Siliculae minores ± 2 mm longae, laeves.

Iraq: Kurd.: Arbil: Kuh Safin prope Shaqlawa, 1000 m, Bornm. 906. Salah-ad Din, 900 m, Gillett 10435!; 1080 m, Helbaek 723! In faucibus Bekma, 500 m, Gillett 8217! Harir, Haines! Mosul: In jugo prope Zakho, 750 m, Guest 2250! Mosul distr., Low 33!

Distr. gen.: In deserto Syriae, Mesopotamia, Iraq.

4. ***Ae. elongatum*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 17 (1845).
Syn.: *Moriera virgata* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 183 (1842). *Aethionema Szowitsii* Boiss., Fl. Or. 1: 345 (1867). *Ae. Lipskyi* Busch., Fl. Cauc. Crit. 3, 4: 131 (1907). *Ae. Schelkovnikowii* Bordzil., Bull. Gard. Bot. Kiew 12—13: 112 (1931). *Ae. Woronowii* Schischk. in Sched. Herb. Fl. Cauc. fasc. 10 (1931).
Icon.: Clavis p. 7.
Typus: Ky. 583, G.

Perenne, 30—50 cm altum, caulibus simplicibus vel ramosis, laxe foliatis. Folia lineari-oblonga, 20×3 mm, basi in petiolum brevem attenuata vel subsessilia. Petala pallide lilacina vel alba, 5—7 mm longa. Filamenta dilatata, non connata, non vel minute dentata. Inflorescentia laxe capitata, fructifera elongata. Ovarium uniloculare, biovulatum. Siliculae ovatae vel ovato-orbiculares, 6—9×5—7 mm; pedicelli 3—5 mm longi, erecto-ascendentes; alae 1,5—2 mm latae, integrae; stylus sinu apicali inclusus. Semen 1.

Persia: W: Azerb.: NW Khvoy, Furse & Synge 201! Einal Zeinal prope Tabriz, 1500 m, Grossh. — Badalan, Szov. Esf.: Kuh-i Damaneh inter Arak et Esfahan, Str. Esfahan, Auch. 4165 (Typus *Morierae virgatae*). Ham.: Kuh Gerru prope Nahavand S Hamadan, Str. Prope Nahavand, Str. Arak: Kuh-e Safid Khaneh, Str. Golpayegan, Str. Inter Girdu et Nazmabad, Str. Mowdar, Str. Kuh Gasavand, Str. Kuh Kohrud, Str. Lur.: Kuh-e Saverz, Haussk. Bakht.: Kuh-e Safid, Mart.-Escal. Gahar, Koelz 17998!, 17876! Zard Kuh, 4200 m, Archibald 2988. — S: Fars.: Kuh-e Dinar, Ky. 583. Prope Shiraz, Stapf 182! Kuh-e Bul, Stapf 183! NW Ardakan, Archibald 2890. — C: Qazv.: Kuh Jarub S Karaj, Gauba 207!

Distr. gen.: Armenica turcica, Caucasia, Persia.

A variable species with many local forms. Most of the W Persian plants have long simple stems and loose inflorescences whereas at the northern end of the species range, in Turkey and the Caucasus, forms with branched stems and denser inflorescences occur. The fruit is either emarginate or not. Further gatherings may show that subspecific taxa can be recognised but at present it is best regarded as one polymorphic species.

5. ***Ae. stenopterum*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 192 (1842).
Typus: Auch. 4129, G.

Valde affine *Ae. elongato*, sed stylus e sinu fructus manifeste exsertus.

Persia: N: Maz.: Supra Ileka, Furse 2799! In declivibus borealibus jugi Kandavan, 2970 m, Gilli! — W: Esfahan, Auch. 4129! — C: Tehr.: N Tehran, Furse & Synge 332! NNE Tehran, 2700 m, Furse 3203! Shahrestanak, Bornm. 6202!, Linds. 553! Qazv.: Kuh Dashteh prope Karaj, Rech. 299!

Distr. gen.: Endem.

Only examined specimens have been cited but the species has been recorded from other localities in SW Persia by Bornmüller (Hamadan, Sultanabad, Luristan). Further gatherings may show that *Ae. stenopterum* is not specifically separate from *A. elongatum*.

Although Auch. 341 from "Ak Dag" is cited in the original description together with Auch. 4129, the former is presumably an error, Ak Dag being a Turkish locality. The specimen is not cited by Boissier in Fl. Or.

6. ***Ae. cephalanthum*** (Bornm.) Bornm., Beih. Bot. Centrbl. 28, 2: 535 (1911).
Syn.: *Crenularia cephalantha* Bornm., Beih. Bot. Centrbl. 27, 2: 305 (1910).
Typus: „In monte Schuturunkuh, SW Sultanabad", Str., JE.

Planta perennis, nana c. 3 cm alta, caulibus procumbentibus densissime foliatis. Folia glabra, glauca, carnosa, opposita vel subopposita, rotundato-ovata, c. 1×1 cm, integra, brevissime petiolata. Inflorescentia densa, florifera et fructifera capitata, multiflora. Petala rosea, 4—9×1,5—2,5 mm, basi trinervia. Pedicelli fructiferi 3—4 mm longi. Siliculae rotundato-ovatae, c. 10×10 mm, late alatae, alis plicatis. Stylus c. 3,5 mm longus. Semina 1 vel 2.

Persia: W: Bakht.: Gahar, 2700 m, Koelz 17875!, 17979-b! Lur.: M. Oshtoran Kuh SW Arak, Str.

Distr. gen.: Endem.

Like the following species, a very interesting and little known plant. With no allies in Persia, it is most closely related to the Turkish endemic *Ae. eunomioides* (Boiss.) Bornm.

7. ***Ae. umbellatum*** (Boiss.) Bornm., Beih. Bot. Centrbl. 28, 2: 535 (1911).
Syn.: *Crenularia umbellata* Boiss., Fl. Or. 1: 338 (1867).
Icon.: Tab. 1, fig. 2.
Typus: Ky. 780, E!

Planta perennis, nana, 3—8 cm alta, caulibus repentibus, paucifoliatis. Folia alterna, lineari-elliptica, obtusa, carnosa. Inflorescentia florifera et fructifera corymbosa, pauciflora. Petala pallide violacea, 2—4×0,5 mm, basi trinervia. Ovarium uniloculare, biovulatum. Pedicelli fructiferi 1,5—2 mm longi. Siliculae suborbiculares 3—3,5×3—3,5 mm, alis integris aequilatis, loculum cingentibus; sinus perangustus, stylum includens. Semen 1. Radicula accumbens.

Persia: W: Bakht.: Kuh-e Kukular, Haussk. Zard Kuh, 4200 m, Archibald 2968! — S: Fars.: Kuh-e Dinar, Ky. 780!; 3900 m, Remaudière 5846-E!

Distr. gen.: Endem.

A very interesting and little known species more closely allied to the Aegean and W Turkish *Ae. polygaloides* DC. than to any other Persian species.

8. ***Ae. trinervium*** (DC.) Boiss., Fl. Or. 1: 342 (1867).
Syn.: *Hutchinsia trinervia* DC., Reg. Veg. Syst. Nat. 2: 387 (1821). *Iberidella ovalifolia* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 189 (1842). *I. sagittata* Boiss., l.c. 188. *Aethionema salmasium* Boiss., Fl. Or. 1: 350 (1867). *Eunomia trinervia* (DC.) Prantl in Engler & Prantl, Natürl. Pflanzenfam. ed. 1, 3, 2: 165 (1891). *E. sagittata* (Boiss.) O. E. Schulz, Bot. Jahrb. 66: 95 (1933).
Typus: M. Alvand, Michaux, Olivier, P.

Perenne, basi lignescens, 15—20 cm altum. Folia oblongo-lanceolata, firma, manifeste trinervia, sessilia vel amplexicaulia, basi cordato-hastata vel attenuata, apice acuta. Petala alba, basi uninervia, 6—10 mm longa. Filamenta nec connata nec dentata. Inflorescentia fructifera elongata. Ovarium biloculare, loculis biovulatis. Siliculae obcordatae vel oblongae, 5—9×3—4 mm; pedicelli 5—8 mm longi; alae integrae, interdum deficientes; stylus 2—3 mm longus e sinu exsertus. Semina 1—2—3.

Iraq: Kurd.: Arbil: Kudu prope Hajji Omran, 2700 m, Rawi 9211! NE M. Qandil, 3000 m, Rawi 2442!
Persia: N: Maz.: In jugo Kandavan, 2970 m, Gilli! Supra Ileka, Furse 2799-a! — W: Azerb.: In jugo Mishu Dagh prope stationem viae ferrae Yam, 2100—2200 m, Grossh. Mishu Dagh, Gill.-Sm. 1793! Ser, Cowan & Darlington 2182! Isperechan prope Tabriz, Knapp. Marand inter Tabriz et Khvoy, Knapp. Ham.: M. Alvand, Auch. 338, Michaux, Olivier, Str., Balls 112! Aq Bolagh-e Aqdaq, Rioux & Golv.! Ganjnameh, Stapf. Esf.: Prope Sof inter Esfahan et Tehran, Bge. Esfahan, Auch. 4126! (Typus *Iberidellae sagittatae* Boiss.) Arak: Arak prope Tshal, Str. In montibus Tafresh inter Arak et Qom, Str. Lur.: 40 km S Arak, SE Azna, Furse 1498! — S: Fars.: M. Delu et Kuh-e Sabz Pushan prope Shiraz, Ky. 476! Inter Abadeh et Dowlatabad, Schmid 5324! — C: Tehr.: In valle Loura ditionis M. Damavand, 2500 m, Bornm. S Damavand, W Emamzadeh Hashem, 2900 m, Wdb. 729!, 1421! Supra Ferosad, 1800—2000 m, Bornm. 6209!, 6210-b. In valle Shahrestanak, 2200 m, Bornm. 6210! M. Tuchal in regione alpina jugi Ladd 3000—3100 m, Bornm. 6208! M. Tuchal, Ky. 231! Supra Ab Ali 64 km E Tehran, Furse 2559! Qazv.: Gach Sar, 2600 m, Gauba; 50 km NE Kochisar, Furse 2713! Kashan: N Qohrud, Kuh-i Gurau, Furse 1580!
Turcomania: M. Kopet Dagh, Fedtsch. In monte Ludsch prope Ashkhabad, Litw. 593.
Afghanistan: NW: Sauzak, 2400 m, Koelz 3908! „Kotal Sabshak", Lindb. 638!

Distr. gen.: Iraq borealis, Anatolia, Transcaucasia, Persia, Afghanistan, Turcomania, Syr Darya, Pamir-Alaj.

The variation in this species is discussed in Materials for a Flora of Turkey X in Notes Roy. Bot. Gard. Edinb. 26: 184 (1965). One variety is worthy of recognition:

— — var. ***apterocarpum*** (Rech. f. & Aell.) Hedge, comb. nov.
Syn.: *Ae. apterocarpum* Rech. f. & Aell., Phyton 3: 49 (1951).
Differt a planta typica sepalis persistentibus.
Typus: Rech. 5063, W!

Persia: E: Khor.: Kuh-e Hazar Masjed, 2000—2500 m, Rech. 5063! M. Kopet Dagh in jugo Alam Ali, 2000 m, Rech. 4824!

Distr. gen.: Endem.

Apparently only occuring in Khorasan.

9. ***Ae. cordatum*** (Desf.) Boiss., Fl. Or. 1: 350 (1867).
Syn.: *Thlaspi cordatum* Desf., Choix Pl. Coroll. Tournef., tab. 52 (1808). *Aethionema cardiophyllum* Boiss. & Heldr. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 43 (1849). *Ae. Moricandianum* (Boiss.) Boiss., Fl. Or. 1: 351 (1867). *Ae. Koenigii* Woron., Not. Syst. Herb. Hort. Petrop. 5: 63 (1924). *Ae. cardiophylloides* Bornm. & Gauba, Feddes Repert. 39: 84 (1935), syn. nov.
Typus: Non indicatus.

Planta perennis, basi lignosa, 10—25 cm alta. Folia ovato- vel deltoideo-cordata, amplexicaulia, apice acuta. Petala rosea, alba vel lacteo-flavescentia, 5—9×2—4 mm. Filamenta laxe connata vel libera. Inflorescentia fructifera elongata. Ovarium biloculare, loculis uni- vel biovulatis. Siliculae 5—7×4—6 mm; alae irregulariter dentatae; sinus 1—2 mm; stylus 2—4 mm. Semina 1—2.

Persia: C: Qazv.: In valle Garmab prope Gach Sar, 2400 m, Gauba 7312! (Typus *Ae. cardiophylloidis* Bornm. & Gauba).

Distr. gen.: Anatolia, Transcaucasia, Persia borealis.

A very variable species in Turkey, only known in Persia from the cited gathering but probably more widespread in NW and C Persia than the record suggests.

10. ***Ae. fimbriatum*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 193 (1842).
Syn.: *Ae. schizopterum* Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 60 (1888).
Icon.: Clavis p. 7.
Typus: Aucн. 4128, G!, K!

Planta perennis basi lignosa, c. 30 cm alta, glabra, glauca; caules floriferi simplices. Folia ovato-lanceolata, crassiuscula, sessilia vel subpetiolata, margine integra. Petala rosea, 7 mm longa. Filamenta nec connata nec dentata. Ovarium biloculare, loculis biovulatis. Pedicelli fructiferi recurvi, 6—11 mm longi. Siliculae ovatae vel suborbiculares, basi cordatae vel attenuatae, 9—12×6—10 mm; alae saepe purpurascentes, profunde fimbriatae; stylus 3—4 mm. Semina 2.

Iraq: Kurd.: Arbil: Kudu prope Hajji Omran, 2700 m, Rawi 9206! Ser-i Khazni, 2700 m, Haley 251!, 252! Har Rost, Haley 177! Chiya-i Mandau, Guest 2791! — Sul.: Avroman Dagh supra Daramar, 2000 m, Gillett 11880!
Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2900 m, Gauba & Sab.! — W: Azerb.: M. Gelosa inter Shahpur et Rezaiyeh, Knapp. Ser prope Rezaiyeh, Knapp, Cowan & Darlington 2269! Rezaiyeh, Gill.-Sm. 1540. Inter Tehran et Tabriz, Boe. Azerbaijan, Aucн. 4128! Ham.: M. Alvand, SE Hamadan, Str. M. Karaghan, Str. Arak: Kuh-e Safid Khaneh SW Arak, Mart.-Escal. — C: Qazv.: In valle Garmab prope Gach Sar, 2500 m, Gauba.

Distr. gen.: Anatolia, Iraq borealis, Persia.

Closely allied to the Turkish species *Ae. stylosum* DC. and *Ae. speciosum* Boiss. & Huet but apparently specifically different in the sturdier habit, and the larger more deeply lacerate fruit margins.

11. ***Ae. membranaceum*** DC., Reg. Veg. Syst. Nat. 2: 561 (1821).
Typus: Persia: M. Alvand, Michaux, P.

Planta perennis, basi lignosa, 10—20 cm alta, caulibus floriferis simplicibus. Folia oblongo-linearia, sessilia vel subpetiolata, per caulem aequaliter distributa. Petala rosea 5—6 mm longa. Filamenta non connata, basi dilatata, dentata vel edentata. Inflorescentia florifera et fructifera compacta. Ovarium biloculare, loculis uniovulatis.

Pedicelli fructiferi erecti vel appressi, 3—5 mm longi. Siliculae planae, orbiculares, cordatae, 6—10×6—11 mm; alae 2—4 mm latae, integra; stylus 0,5 mm longus.

Persia: W: Azerb.: Einal Zeinal prope Tabriz, GROSSH. Ham.: M. Alvand, MICHAUX, STR. Lur.: Kharon, 1200 m, KOELE 1421!

Distr. gen.: Anatolia, Transcaucasia, Persia.

Characterised by the broad flat fruits in compact heads. The Caucasian *Ae. edentulum* BUSCH. which is recorded in Fl. URSS. 8: 562 (1939) from "N. Persia" was separated from *Ae. membranaceum* by having edentate filaments. As this character is very variable within *Aethionema* and no other qualitative differences were given in the description of *Ae. edentulum* it is probably synonymous with *Ae. membranaceum* although I have not seen any specimens of it.

12. ***Ae. diastrophis*** BGE., Del. Sem. Hort. Dorpat. 7 (1841).
Typus: Armenia rossica.

Habitu *Ae. grandifloro* simile et ab eo in statu fructifero tantum discernendum. Siliculae cymbiformes, ovatae, basi cordatae, 6—7×5 mm, alae 1—2 mm latae, usque ad dimidiam vel totam latitudinem alae irregulariter laciniato-dentatae; sinus 1—1,5 mm profundus; stylus 0,5 mm longus. Pedicelli fructiferi 3—4 mm longi.

Distr. gen.: Armenia rossica, turcica et Transcaucasia.

Recorded by GROSSHEIM, Fl. Kawkaza ed. 2, 4: map 154 (1950) from the Soviet side of the Persian frontier. Not yet recorded from our area.

13. ***Ae. grandiflorum*** BOISS. & HOHEN. in BOISS., Diagn. Pl. Or. Nov. Ser. 1, 8: 24 (1849).
Syn.: *Ae. pulchellum* BOISS. & HUET in BOISS., Diagn. Pl. Or. Nov. Ser. 2, 5: 43 (1856).
Icon.: Clavis p. 7.
Typus: KY 181, G, W!

Planta perennis, inferne lignosa, 15—30 cm alta. Folia lineari-oblonga, sessilia. Petala rosea vel lilacina, (5—) 8—11 mm longa. Filamenta vix vel non connata, non dentata. Inflorescentia laxa, fructifera elongata. Ovarium biloculare, loculis uniovulatis. Siliculae ovato-orbiculares, planae vel leviter cymbiformes, 8—10×10—12 mm; pedicelli 3—4 mm longi; alae integrae vel ± eroso-dentatae; stylus subsessilis, sinu inclusus. Semina 1—2.

Iraq: Kurd.: Arbil: M. Safin prope Shaqlawa, 1600—1800 m, BORNM. 908!, 908-b, 909; 1300 m, GILLETT 8145, RAWI 9106. Shaqlawa, HAINES 391! Hajji Omran, 1800 m, CHAPMAN 11950. M. Qandil, in faucibus supra Pushtashan, 1500—2000 m, RECH. 11198! M. Sakri Sakran, 1700 m, BORNM 910. Rayat, THESIGER! Algird Dagh E Rost, THESIGER! M. Baradost, THESIGER! Mosul: Matina, 1700 m, RAWI 8663. In ditione Sharanish in saxosis cacuminis Zawita, 2100 m, RECH. 10973! Sirsang, HAINES 1250! Sul.: Pira Magrun, HAUSSKN. — Zeiba, HAINES!
Persia: N: Gorg.: Tappeh-ye Moraveh, SHAR. 5663-E! Maz.: Nur, Kamarband 2400—2600 m, RECH. 6425! In jugo Kandaran, FURSE & SYNGE 393! Gil.: Manjil, STAPF, BORNM. 6204. — W: Azerb.: 32 km NW Khvoy, FURSE & SYNGE 52! Kuh-e Aqkan Dagh, 64 km N Rezaiyeh, FURSE 2263! Distr. Rezaiyeh, GILL.-SM. 1551, 1554. M. Karnaru prope Shahpur, KNAPP. Marand, KNAPP. In montibus prope Zanjan, COWAN & DARLINGTON 712. In jugo Mishu Dagh prope stationem viae ferrae Yam, 2100—2200 m, GROSSH. 259! Kurd.: Sanandaj, 2000 m, JACOBS 6705! Sanandaj in valle fluvii Qishlaq Rud, 1500 m, STR. Kermansh.: Karand, STR. Kuh-e Shahu, STR. Kuh-e Nevoh SSE Karand, STR. Kuh Parrow, STR. Arak: In montibus ad Khomeyn, STR. Bakht.: Gahar,

Koelz 17845-a!, 17915!, 18031!, 18032! Lur.: Ti, Koelz 15932! Oshtoran Kuh, Str. Inter Dow Rud et Azna, Bent & Wr. 530—602! Dow Rud, Koelz 15663!, 17652! In montibus prope Borujerd, Str. Kharon, 1200 m, Koelz 1421. — C: Tehr.: M. Tuchal, 2200—2600 m, Bornm. 6206. Inter Lashkarak ad fluvium Jaji Rud et Ushan Pasha, Bruns. In valle Ushan N Tehran, 2000 m, Wdb. 1805! Qazv.: Kharzan, 1800—2000 m, Bornm. 6207! In valle Talaqan supra Joistan prope Parachan, 2500 m, Bornm. 6203. Kuh Dashteh prope Karaj, Rech. 272! Karaj, Gauba. In montibus ad pagum Kalak, Rech. 205! Inter Karaj et Gach Sar, 1200—2500 m, Schmid 5681! Gach Sar, 80 km NE Karaj, Furse 2640! Elburz: In fauce Schirdere, Ky. 181.

Distr. gen.: Transcaucasia, Anatolia, Iraq borealis, Persia.

Species imperfecte notae

Ae. armenum Boiss., Ann. Scienc. Nat. Ser. 2, 17: 191 (1842).

This low-growing species from Turkey and the Transcaucasus was recorded by Bornmüller, Verh. Zool.-Bot. Ges. Wien 60: 76 (1910) from near Diliman (Shahpur) in Azerbaijan, on the basis of a Strauss gathering. *Ae. armenum* Boiss. and *Ae. grandiflorum* Boiss. & Hohen. can be confused when the former is represented by a tall-growing form or the latter by a dwarf or cropped specimen, and it is probable that the Strauss specimens are low-growing forms of *Ae. grandiflorum*.

Ae. heterophyllum (Boiss. & Buhse) Boiss., Fl. Or. 1: 343 (1867).
Syn.: *Iberidella heterophylla* Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 25 (1860).

The type specimen was collected by Buhse in the Talish mountains. It consists of inadequate flowering material which is similar in facies to the Turkish *Ae. caespitosum* (Boiss.) Boiss. It differs from the Turkish species and most other species of *Aethionema* in the stipitate, suborbicular ovary. With this material, it is impossible to assess its status. Although recorded by Grossheim, Fl. Kawk., from prov. Kars in eastern Turkey and by Komarov, Fl. URSS. from the Transcaucasus, these records must be viewed with some doubt.

Ae. Levandowskyi N. Busch, Acta Horti Bot. Univ. Jurjev. 8, 4: 222 (1907). Fl. Cauc. Crit. 3, 4: 133 (1907).
Typus: In montibus prov. Talish, Levandowsky.

Only known from one gathering, the species was related to *Ae. Sintenisii* Hausskn. and *Ae. armenum* Boiss. No authentic material has been seen but from the description, *Ae. Levandowskyi* may be a form of *Ae. grandiflorum* Boiss. & Hohen.

38. *Brossardia*

Brossardia Boiss., Ann. Scienc. Nat. Ser. 2, 16: 380 (1841).

Herba glabra, perennis, foliis integris, floribus roseo-purpureis, in racemos densos terminales dispositi. Calyx bisaccatus. Ovarium oblongum compressum; stylus ovario aequilongus. Silicula magna, late ovata vel ± orbicularis, valde compressa, papyracea, late alata, bilocularis, non vel vix dehiscens. Semina 1—3. Radicula accumbens. — Genus monotypicum.

1. ***B. papyracea*** Boiss., Ann. Scienc. Nat. Ser. 2, 16: 380 (1841).
Syn.: *B. papyracea* Boiss. var. *Kotschyi* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 41 (1849). *B. retusa* Boiss., Fl. Or. 1: 336 (1867), syn. nov.!
Icon.: Clavis p. 5; tab. 8, fig. 1 et 2.
Typus: Auch. 4127, G!

Caespitoso-pluricaulis, basi lignescens. Caules erecti, plerumque simplices, floriferi 10—30 cm longi, fructiferi paulo elongati. Folia basalia petiolata, ovato-spathulata; residua petiolorum saepe persistentia; folia caulina ovato-lanceolata, cordata, amplexicaulia, auriculata, apice acuta. Petala 8—10×2,5—3,5 mm. Pedicelli fructiferi 4—10 mm longi, deflexi. Silicula 16—30×13—31 mm, ala 3—7 mm lata inclusa, reticulato-venosa; sinus 0—2 mm; stylus 0—1,5 (—3) mm; septum 1,5 mm latum. Semina c. 4×3 mm.

Iraq: Kurd.: Sul.: M. Avroman in ditione pagi Tawilla, 1800—2000 m, Rech. 10246!, 10350!. Supra Daramar, 2000 m, Gillett 11851! N Halabja, Rawi 22105 ! Kamarspa inter Halabja et Tawilla, Rawi 22171!, 22221! Penjwin, Rech. 10518!, Rawi 8807!, 12261! M. Kajan prope Penjwin, Rawi 22716! In montibus N Sulaymaniyah, Thesiger 442! M. Pira Magrun, Haussкn.!, Haines!; 1500 m, Gillett 7787! Kirkuk: Kuh Safin, 1600 m, Bornm. 902! Shaqlawa, O. Polunin 5021!, Gillett 8148! Arbil: In montibus prope Rost, Thesiger 930! M. Handren, 1700—2000 m, Nab. 1282.
Persia: W: Azerb.: Prope Sanadaj, 1700 m, Wdb. 1983! 35°30′ N, 46°38′ E, Jacobs 6572! Ham.: Kuh-e Garri, W Nahavand, Str. M. Karaghan, Pichler! Shah Bolagh supra Mahmanian versus Karaghan, Stapf. Kermansh.: Kuh-e Richab prope Karand, Str. Kuh-e Nevoh, SSE Karand, Str. Kuh-e Khargush Chika SE Kermanshah, Str. Kuh-e Tarikha, SE Kermanshah, Str. Esf.: Kuh-e Daranshah supra Damaneh, Furse 1442! Esfahan, Auch. 4127! Arak: M. Rasvand, Str. Prope Abbasabad, Str. Kuh-e Besri prope Arak, Str. Lur.: Oshtoran Kuh, SW Arak, Str. S Arak, 24 km SE Azna, Furse 1499! Oshtoran Kuh, Archibald 1601! Dow Rud, Koelz 17379! Bakht.: Kuhrang, 2400 m, Wdb. 942! — S: Fars.: Kuh-e Barf prope Shiraz, Ky. 523! (syntypus *B. retusae* Boiss.) Stapf! Kuh Delu prope Shiraz, Ky. 327! (syntypus *B. retusae* Boiss.) Neyriz, Koelz 14702! Shiraz, Trott 928! Kalat 35 km NW Shiraz, 2300 m, Grant 17710.

Distr. gen.: Endem.

With the comprehensive material now available, it is clear that *B. retusa* is quite untenable as a separate species. It was recognised on the retuse fruit apices in contrast to the rounded fruits of *B. papyracea*. All transitions occur.

39. *Thlaspi*

Thlaspi L., Spec. Plant. 645 (1753). Gen. Plant. ed. 5: 292 (1754).
Syn.: *Carpoceras* (DC.) Boiss., Diagn. Pl. Or. Nov. Ser. 2, 8: 36 (1849). *Thlaspi* Sect. *Carpoceras* DC., Prodr. 2: 374 (1821).

Herbae annuae glabrae (nostrae), biennes vel perennes, foliis caulinis simplicibus, amplexicaulibus. Sepala membranaceo-marginata, erecta vel obliqua. Petala alba vel rosea. Glandulae nectariferae medianae deficientes. Filamenta exappendiculata. Silicula dehiscens, angustisepta, valde vel leviter compressa, alata vel exalata, sinu apicali conspicuo vel nullo. Semina (1—) 2—6 in utroque loculo. Septum saepe undulatum. Semina humiditate mucilaginosa vel immutata. Radicula accumbens vel incumbens.

1a. Herbae annuae. Siliculae late alatae, valde compressae 2
b. Herbae annuae vel perennes. Siliculae supra medium vel apice tantum alatae vel exalatae, saepe non valde compressae 6
2a. Semina concentrice annulata ..... 1. *T. arvense* L.
b. Semina laevia 3
3a. Silicula 4—7 mm longa. Pedicelli horizontaliter patentes 4
b. Silicula 10—12 mm longa. Pedicelli erecto-ascendentes 5

4a. Herba usque ad 20 cm alta. Petala quam sepala manifeste longiora, 2—4 mm longa. Alae siliculae ± enervosae ..... 2. *T. perfoliatum* L.
b. Herba plerumque 4—15 cm alta. Petala quam sepala paulo tantum longiora, c. 1,5 mm longa. Alae siliculae parallele nervosae ... 3. *T. umbellatum* Stev.
5a. Petala 3—4 mm longa. Alae siliculae parallele nervosae. Planta annua usque ad 50 cm alta ..... 4. *T. Szovitsianum* Boiss.
b. Petala 1—2 mm longa. Alae siliculae reticulato-nervosae. Planta annua 10—20 cm alta ..... 5. *T. Kotschyanum* Boiss. & Hohen.
6a. Silicula non alata, oblongo-elliptica, utrinque attenuata, lateraliter non valde compressa 7
b. Silicula apicem versus alata vel apice acute corniculata, obtriangularis 10
7a. Petala rosea. Silicula 9—18 mm longa, stylo 5 mm longo ..... 9. *T. rostratum* N. Busch
b. Petala alba. Silicula ad summum 8 mm longa, stylo 1—2 mm longo 8
8a. Planta glauca. Folia basalia lineari-oblonga vel anguste oblonga ..... 10. *T. kurdicum* Hedge
b. Planta non glauca. Folia basalia ovata vel late oblonga 9
9a. Petala 6—8 mm longa. Silicula 6—8 (—10) mm longa. Folia ± carnosa ... 11. *T. pumilum* (Stev.) Ledeb.
b. Petala 5 mm longa. Silicula 6—7 mm longa. Folia tenuia ..... 12. *T. tenue* (Boiss. & Buhse) Hedge
10a. Silicula apice acute corniculata 11
b. Silicula apice rotundato-lobata ..... 6. *T. Griffithianum* (Boiss.) Boiss.
11a. Herba annua floribus roseis. Petala inaequalia. Cornua siliculae late divergentia ..... 7. *T. hastulatum* Stev.
b. Herba perennis floribus albis. Petala aequalia. Cornua siliculae leviter divergentia ..... 8. *T. stenocarpum* (Boiss.) Hedge

1. ***T. arvense*** L., Spec. Plant. 646 (1753).
Typus: „Hab. in Europae agris".

Herba annua, 10—70 cm alta, erecta, glabra. Folia basalia longe petiolata, oblanceolata vel spathulata, dentata, mox marcescentia, caulina oblonga vel lanceolata, amplexicaulia, dentata. Petala 3—5 mm longa, alba. Inflorescentia fructifera valde elongata. Silicula 10—15 mm longa, subcircularis; sinus apicalis 2—4 mm; stigma ± sessile; pedicelli fructiferi sursum curvati, 7—12 mm longi. Semina in utroque loculo 5—6.

Talish: Swant, Lenkoran, Buhse. Talish, Buhse.
Persia: N: Maz.: Ileka, 3000 m, Furse 2773! Gil.: Yehlah, Ispili, Linds. 1202-a! — W: Azerb.: Qareh Dagh, Buhse. Maraghch, Shar. 6351-E. Ad lacum Rezaiyeh, Knapp. Khvoy, Knapp. Senjanab prope Tabriz, Knapp. Tabriz, Gill.-Sm. 1500. In declivibus borealibus Kuh-e Sahand supra Liqvan, Furse 2353! Azerbaijan, Szov. — C: Qazv.: Supra Pachenar in jugo Kharzan, 1800 m, Bornm. 6273. In valle fluvii Karaj, Gauba. Qazvin, Sarkissian 5644-E! Damgh.-Semn.: Jashm, Gaduk, Behb. 5645-E! Kuh-i Nizwa, in valle Sar-lash, Aell. 1013! Shahr.-Bust.: Sefid Khok, 2400 m, Schmid 5939! Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 178 (1965).
Afghanistan: NW: Obeh, Koelz 4176. — E: Kabul: Qala-e Wazir inter Sar-i Chashma et jugum Unai, 2900 m, Rech. 18057! In jugo Unai, 3100 m, Gilli 1112-b! Darulaman, Kerst. 450. Paghman, 2500 m, Hdg. & Wdb. 4348!, Koelz 12082! In declivibus australibus jugi Salang, 2400 m, Lamond 2090!, Rech. 31371! Lorinj, Koelz 13708. — NE:

Kataghan: In declivibus borealibus jugi Salang, 2200 m, Rech. 31637! In valle Andarab, 1850 m, Podlech 11001.
Pakistan: Chitral: Laspur, Toppin 733! — Kurram: Parachinar, Afendi 95. Inter Kurram et Shalozan, Aitch. 139. — S. Wazir.: Razmak, Stewart.

Distr. gen.: Per Europam, Asiam et Americam borealem late dispersum.

2. ***T. perfoliatum*** L., Spec. Plant. 646 (1753).
Typus: „Hab. in Germaniae, Helvetiae, Galliae apricis, agris".

Herba annua, 5—20 cm alta, glabra, saepe ramosa. Folia basalia pauca, laxe rosulata, petiolata, lanceolata. Folia caulina lanceolata, amplexicaulia, integra vel dentata. Petala 2—4 mm longa. Silicula obcordata 5—7 × 4,5 mm; sinus apicalis latus, non profundus; stylus sessilis vel brevissimus; pedicelli fructiferi 4—8 mm longi, horizontaliter patentes. Semina in utroque loculo 2—3.

Iraq: Kurd.: Arbil: In faucibus prope Rawandiz, Guest 599! 27 km NE Arbil, 600 m, Shahwani 25129! Inter Arbil et Shaqlawa, 1080 m, Helbaek 724! Shaqlawa, Haines! Kirkuk: In collibus Kani Domlan, 390 m, Guest 4316! Jarmo, Helbaek 396! Mosul: Zawita, N. Polunin & Naib 50! Amadiyah, Guest 1300! Dihok, Guest 1326! Sul:. Sulaimaniyah, Barkley 4474!, Graham. — Diyala: Jabal Hamrin, Guest 500-b.
Talish: Lenkoran, Hohen. Swant, Hohen.
Persia: N: Maz.: Zardman prope Pol-e Zanguleh, Gauba & Sab. 182! Zardman, 600 m, Wdb. 124! Persia borealis, Szov. — W: Azerb.: Marand, Knapp. Inter Shahpur et Rezaiyeh, Knapp. Var prope Khvoy, Knapp. Chahriq, Knapp. M. Karnaru, Knapp. Prope Dizeh Siamek, Knapp. Kermansh.: Kuh-i Parrow prope Kinisht, Str. Pa-ye Tagh, Furse 1007! Tepe Serab, Bent & Wr. 331—101! Warwasid cave, Bent & Wr. 331—210! Qalapain, 22 km E Kermanshah, Bent & Wr. 401—107! Arak: Arak, Str., Bornm. 2207. Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 179! Lur.: Ilam, 1550 m, Jacobs 6325! Dow Rud, Koelz 17107! 16 km W Khorramabad, Furse 1129! — S: Fars.: Takht-e Jamshid, Koelz 14411! Shiraz, Koeie 1451!, 1600 m, Grant 15247!, 15543, 17148! Prope Bushehr, Horner 162! Inter Kazerun et Shiraz, Furse 1254! Lar.: 20 km SW Saadatabad, 1800 m, Grant 15434! Kerm.: M. Jebal Barez inter Bam et Jiroft, Deh Bakri, 2400 m, Rech. 3765-A! — E: Khor.: 64 km ENE Gonbad-e Kavus, Gulestan Forest, Furse 5108! 87 km E Gonbad-e Kavus, 1250 m, Grant 17210! — C: Tehr.: in declivibus australibus M. Tuchal inter Darband et Pas Qaleh, 1400—1600 m, Rech. 2625! Mahmudiyeh prope Shimran, 1300 m, Rech. 2826-b! Tehran, Bornm. 2206! Inter Tehran et Abbasabad, Bruns. 56 km E Tehran, Furse 1669! Niyaveran, 1700 m, Wdb. 108! Qazv.: In ditione oppidi Karaj, Rech. 530!, 411! Karaj, Gauba. Inter Qazvin et Hamadan, Furse 1106! Qazvin, 1200 m, Schmid 5004!, 5010!, 5051!, 5054!
Turcomania: In montibus prope Ashkhabad, Litw. 590, Sint. 80!
Afghanistan: NW: Inter Obeh et Khwajachisht, 1700 m, Koeie 4177! Qala Nau, 700 m, Koeie 3524! — E: In confines Afghaniae, Griff. — NE: Kataghan: Farkhar, 1250 m, Podlech 10472. 7 km SE Ishkamish, Podlech 10594.

Distr. gen.: Europa, Africa borealis et Asia austro-occidentalis et centralis.

3. ***T. umbellatum*** (Stev. ex) DC., Reg. Veg. Syst. Nat. 2: 377 (1821).
Typus: Gilan, Steven.

Herba annua tenella, 4—15 (—25) cm alta, plerumque a basi ramosa, ascendens vel erecta. Folia basalia saepe rosulata, c. 6 mm longa, ovata, dentata, petiolata, caulina oblongo-elliptica, auriculata, amplexicaulia. Petala minutissima, quam sepala longiora. Silicula obcordata, 4—6 mm longa, apice c. 4 mm lata, basi attenuata; ala ± parallele nervosa; stigma sessile. Semina in utroque loculo 2—4.

Talish: Massula, Buhse. In arenosis maritimis prope Lenkoran, C. A. Mey., Hohen. Persia: N: Inter Gorgan et Ziarat, Gauba 214!, Gauba 179! Gorgan, Buhse 1141. Maz.: In valle Haraz, Karehsang, 100 m, Wdb. 170! 32 km S Shahi, Furse 5043! Gil.: Rasht, Buhse, Bornm. 6276! Lahijan, Linds. 760! Bandar-e Pahlavi, Buhse, Bornm. 6275, Pichler! Provincia Gilan, Stev. Inter Kohdom et Kaluraz, Bornm. 6277. 37°15′ N, 49°30′ E, Jacobs 6165! — Tal, Grossh.

Distr. gen.: Azerbaijan rossica, Talish, Persia borealis.

Superficially very similar to, and easily confused with, *T. perfoliatum*.

4. ***T. Szovitsianum*** Boiss., Fl. Or. 1: 324 (1867).

Typus: „Hab. in humidis montis Karagiol prov. Karabagh", Szov.

Herba annua usque ad 50 cm alta, caule plerumque singulo. Folia basalia non rosulata, late ovata, non vel brevissime tantum petiolata, integra; caulina ovato-oblonga, amplexicaulia, auriculis distinctis. Petala 3—4 mm longa. Silicula late obcordata, 10—12×12—13 mm; sinus apicalis angustus, stigma ± sessile; pedicelli fructiferi 5—12 mm longi, erecto-ascendentes. Semina in utroque loculo c. 6.

Only known from a few gatherings in southern Transcaucasia near the Persian frontier and not yet recorded from our area.

T. Szovitsianum is very closely allied to the Turkish and Caucasian *T. orbiculatum* Stev. (Syn. *T. platycarpum* Fisch. & C. A. Mey.) and *T. armenum* N. Busch. These three species may be identical but so little material is available for study that their status is uncertain. *T. platycarpum* and *T. armenum* are both recorded in Grossh., Fl. Kawk. ed. 2, 4: Tab. 164 and 165 (1950) from the Soviet side of the Persian frontier.

5. ***T. Kotschyanum*** Boiss. & Hohen. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 39 (1849).

Syn.: *T. cardiocarpum* Hook. & Thoms., Journ. Linn. Soc. Bot. 5: 176 (1861), syn. nov.

Icon.: Clavis p. 7.

Typus: Ky. 102, G!, K!

Herba annua erecta, 10—20 cm alta, caule plerumque singulo. Folia basalia ovato-oblonga, mox marcescentia, caulina ovata, amplexicaulia. Petala 1—2 (—3) mm longa. Silicula orbicularis, 10—12×10—15 mm; alae reticulato-nervosae; sinus apicalis angustus, stigma ± sessile; pedicelli fructiferi ascendentes, 4—10 mm longi. Semina in utroque loculo 6.

Iraq: Kurd.: Arbil: Hajji Omran, Mooney 4260! Algurd Dagh E Rawandiz, 2700 m, Bornm. 899! In valle supra pagum Nowanda, 2000—2600 m, Rech. 11866! Sul.: M. Avroman ad confines Persiae in ditione pagi Tawilla, Rech. 12355! Penjwin, 1700 m, Rawi 12265!

Persia: N: Maz.: 37°15′ N, 49°30′ E, Jacobs 6165! In declivibus borealibus jugi Kandavan, 2700 m, Rech. 466! — W: Kurd.: Dezh Shahpur, Jacobs 6556! Bakht.: Kuh Rang, 2400 m, Wdb. 932! Gahar, Koelz 18004! Lur.: Oshtoran Kuh, 2400 m, Archibald 1604! — C: Tehr.: M. Elburz prope Pas Qaleh, Ky. 102! Shahrestanak, 2200—2300 m, Bornm. 6274! Qazv.: Gach Sar, 2400 m, Gauba.

Afghanistan: E: Nuristan: Gusalak, Edelb. 181! Chetras, Edelb. 861! — C: Bamian: Kharzar, Griff.!

Pakistan: Chitral: Darn Gol, Toppin 418! — Swat: Utror, 2200 m, Rech. 30827! Ushu, Lamond 1814! In valle fluvii Jabba E Kolalai, 1900—2200 m, Lamond 1775!, Rech. 30718! — Kurram: Peiwar Kotal, Aitch. 454!

Distr. gen.: Anatolia australis, Iraq borealis, Persia, Afghanistan, Pakistan occidentalis, Pamir-Alaj, Tien Shan.

Other than the slightly larger petals, there are no morphological differences between *T. cardiocarpum* and *T. Kotschyanum*.

6. ***T. Griffithianum*** (BOISS.) BOISS., Fl. Or. 1: 329 (1867).
Syn.: *Carpoceras Griffithianum* BOISS., Diagn. Pl. Or. Nov. Ser. 2, 1: 40 (1853). *T. cochleariforme* DC. subsp. *Griffithianum* (BOISS.) JAFRI, Notes Roy. Bot. Gard. Edinb. 22: 118 (1956), syn. nov. *T. Wendelboi* RECH. f., Dansk Biol. Skr. 10: 3 (1958), syn. nov.
Typus: Afghanistan, Bharowul, GRIFF., K!

Herba glabra perennis, 2—30 cm alta. Folia basalia ± carnosa, obovato-spathulata, integra, apice rotundata, petiolata; caulina amplexicaulia, hastata vel sagittata. Racemi pauci- vel multiflori, fructiferi ± elongati. Petala alba, 3—5 × 1,5—2,5 mm, obovata, antice rotundata. Pedicelli fructiferi 2—4 (—6) mm longi, ± horizontaliter patentes. Silicula anguste triangulari-obcordata, 4—5, 6 (—8) × 2—3 mm, emarginata, carinata; stylus c. 1 mm longus, e sinu exsertus. Semina 3 usque numerosa. Radicula accumbens vel oblique accumbens.

Afghanistan: E: Jaji: Inter Dre Kalla et Qasim Khel, RECH. 32274! In jugo Peiwar Kotal, 2700—2800 m, LAMOND 2488!, RECH. 32221! Gardez: In jugo Sata Kandao, inter Gardez et Khost, 2900 m, RECH. 32117! Nuristan: In jugo Urura, NEUB. 582!, 3900 m, NEUB. 598! Chetras, 3150 m, EDELB. 839!, 892! — Bharowul, GRIFF.!
Pakistan: Chitral: Och Anzog, 3600 m, WDB. s. n.! Barum Gol, 4500 m, WDB. s. n.! Ojor Gol, 2900 m, BOWES LYON 817! Ghutbar Gol, 4000 m, BOWES LYON 45! In jugo Chumarkhan E Mastuj, 4000 m, STAINTON 2919! — Swat: In montibus E Kalam, 3000 m, LAMOND in RECH. 30855!, LAMOND 1835! — Kurram: Inter Shalozan et Ali Khel, AITCH. 116. — S. Wazir.: Pre Ghal, DUTHIE 15609. Razmak, M. Shindar, Fz. 1617.

Distr. gen.: Himalaya (?), Afghanistan orientalis, Chitral, Swat, Waziristan.

A species varying greatly in size and facies according to habitat. Represented when growing in fields by tall growing plants with elongated fruiting racemes and at high altitudes by dwarf plants with compact fruiting heads. The records of *T. praecox* WULF. from Waziristan probably refer to this species (O. E. SCHULZ in Feddes Repert. 31: 168 (1933). Although closely related to *T. cochleariforme* DC. and regarded by JAFRI as a subspecies of it, I prefer to regard *T. Griffithianum* as a separate species. The floral dimensions of *T. cochleariforme* (petals 5—7,5 mm) and the silicule size (7—10 mm) do not agree with our species. The status of both species can only be settled by a detailed study of the complex throughout its range.

7. ***T. hastulatum*** (STEV. ex) DC., Reg. Veg. Syst. Nat. 2: 388 (1821).
Syn.: *Hutchinsia hastulata* DC., Reg. Veg. Syst. Nat. 2: 388 (1821). *Carpoceras hastulatum* (STEV.) BOISS., Diagn. Pl. Or. Nov. Ser. 1, 8: 38 (1849).
Typus: In Hyrcania, STEV., FISCH., LE.

Herba annua erecta, 30—70 cm alta, glabra, saepe a basi ramosa. Folia basalia petiolata, ovata, mox marcescentia; folia plurima caulina, oblongo-ovata, subintegra vel dentata, basi breviter auriculata. Petala rosea, inaequalia: exteriora 5—9 × c. 3—6,5 mm; interiora 4—8 × 1,5—4,5 mm. Inflorescentia fructifera valde elongata. Pedicelli fructiferi 4—13 mm longi, ± horizontaliter patentes. Silicula lineari-obtriangularis, 7—13 mm longa, centro 2—3 mm lata, ad cornua late divergentia 4—6 mm lata; stylus c. 1 mm longus.

Talish: Lenkoran, C. A. Mey., Fisch. Ad pagum Achewlar, Buhse 840. Swant, Hohen. Persia: N: Gorg.: In jugo Ziarat, 2300 m, Gauba & Mird. 175! 209! Maz.: In valle fluvii Talar, Starm. 299! In valle fluvii Chalus, in silvis, Esfand. 210! Gil.: In valle Denya Chal, 1600 m, Gauba & Sab. 178! Prope Lahijan, in silvis, Starm. 274! Inter Rasht et Kaluraz, Bornm. 2246. Prope Astara, Starm. 273! Yehlah, Linds. 1396! Manjil, Gauba 176! — C: Damgh.-Semn.: Kuh-e Nizwa inter Orim et Taru, 2000 m, Wdb. 1138!
Distr. gen.: Endem.

Sharing with many species of *Iberis* the character of unequal petals.

8. ***T. stenocarpum*** (Boiss.) Hedge, comb. nov.
Syn.: *Carpoceras stenocarpum* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 38 (1849).
Typus: Ky. 165, G!

Herba perennis, florifera 4—10 cm, fructifera usque ad 35 cm alta, caulibus singulis vel paucis. Folia basalia petiolata ovata, subintegra; caulina oblonga, amplexicaulia auriculis rotundatis, integra. Petala alba, 4×2 mm. Pedicelli fructiferi 2—6 mm longi, erecto-ascendentes. Silicula lineari-obtriangularis, 10—12×2,5—3,5 mm; cornua 1—2 mm longa, divergentia; stylus c. 0,5 mm longus, sinu inclusus.

Persia: N: Gorg.: Inter Gorgan et Shahrud, Bge.! Maz.: In valle Chalus, 2400 m, Rech. 956! In declivibus borealibus jugi Kandavan, 2800 m, Gauba 177! In jugo Kandavan, 2400 m, Gauba 1336. — C: Tehr.: In excelsis M. Damavand, 3600 m, Bornm. 6187. In declivibus australibus M. Damavand, Furse & Synge 464! In jugo Damavand, Buhse. M. Tuchal in declivibus borealibus 2900—3200 m, Bornm. 6185. Prope nives in M. Tuchal prope Tehran, Ky. 165! Qazv.: In valle superiore Talaqan, supra Gerab, Gardaneh Bary, 2700 m, Bornm. 6186.
Turcomania: In montibus Kopet Dagh, in monte Resarash, Czern.

Distr. gen.: Endem.

9. ***T. rostratum*** N. Busch, Monit, Jard. Bot. Tiflis 3, 3: 10 (1927).
Typus: Transcaucasus distr. Nachitshevan prope oppidum Ordubad, Grossh., LE.

Herba perennis caespitosa, 5—10 cm alta. Folia basalia subrosulata, spathulata, petiolata, caulina obovata. Petala rosea, 6,5×2—3 mm. Pedicelli fructiferi 3 mm longi. Silicula oblongo-elliptica, 9—18×4—5 mm, utrinque attenuata; stylus 5 mm longus. Semina 2—2,5 mm longa.
Distr. gen.: Transcaucasia australis.

Not yet recorded from Persian Azerbaijan but its occurrence very close to the Persian frontier suggests that it should also grow there (cf. Grossh., Fl. Kawk. ed. 2 tab.169 [1950]).

10. ***T. kurdicum*** Hedge, Notes Roy. Bot. Gard. Edinb. 23: 547 (1961).
Icon.: Clavis p. 7.
Typus: Anatolia: Prov. Van, Artos Dagh, 3600 m, Davis 22806, E!, K!

Herba perennis glauca caudice lignescente, surculis sterilibus diffusis, caulibus floriferis erecto-ascendentibus, 4—10 cm longis. Folia basalia lineari-oblonga, c. 10×2,5 mm, ± rosulata, caulina pauca, oblonga, amplexicaulia, auriculata vel exauriculata, omnia crassa. Petala alba, 5—8×2,5 mm. Inflorescentia ± corymbosa, fructifera paulo elongata. Silicula oblongo-elliptica, c. 5—7×3—5 mm, acuta vel leviter emarginata; stylus 1,5 mm longus. Semina in utraque loculo 2—3.

Iraq: Kurd.: Mosul: NE M. Qandil, 2850—3100 m, Rawi 24440!
Arbil: Algurd Dagh, 2800—3000 m, Rawi 24755!

Distr. gen.: Kurdistan turcica et Iraq.

11. ***T. pumilum*** (Stev.) Ledeb., Fl. Ross. 1: 164 (1842).
Syn.: *Iberis pumila* Stev., Mem. Soc. Nat. Mosc. 3: 269 (1812).
Typus: In Caucasi orientalis alpe Schadagh, Stev., LE.

Herba glauca perennis caudice lignoso, surculis sterilibus diffusis, caulibus floriferis erectis, 2,5—6 cm altis. Folia basalia ovato-oblonga, ± rosulata; caulina pauca ovato-oblonga, sagittato-amplexicaulia, omnia ± carnosa. Petala 6—8 mm longa, alba. Inflorescentia ± corymbosa, fructifera vix elongata. Silicula anguste elliptica, 6—8 (—10) × 3,5 mm, acuta; stylus 1—2 mm longus. Semina in utroque loculo 3—4.

Persia: N: Maz.: Distr. Kojur, in M. Uloj, 3200—3400 m, Rech. 6522!

Distr. gen.: Caucasus, Persia borealis.

The identification of the Rechinger gathering is provisional as little material of *T. pumilum* has been available for study.

12. ***T. tenue*** (Boiss. & Buhse) Hedge, comb. nov.
Syn.: *Iberidella tenuis* Boiss. & Buhse, Nouv. Mem. Soc. Nat. Mosc. 12: 25 (1860). *Aethionema tenue* (Boiss. & Buhse) Boiss., Fl. Or. 1: 343 (1867).
Icon.: Tab. 9, fig. 1.
Typus: Damirdagh, Sahand, 3000 m, Buhse, G!

Herba glabra perennis, caulibus floriferis erecto-ascendentibus, 6—9 cm longis. Folia basalia petiolata, ovato-oblonga; caulina ovato-oblonga, amplexicaulia, ± auriculata, omnia consistentia tenui (?). Petala alba, 5 × 2 mm. Inflorescentia ± corymbosa. Silicula cuneato-oblonga, 6—7 × 2 mm; stylus quam 2 mm brevior.

Persia: W: Azerb.: In declivibus borealibus Kuh-e Sahand supra Liqvan, 3000 m, Furse 2350! Kuh-e Sahand, Damirdagh, 3000 m, Buhse! Prope Isperechan, Knapp. Kuh-i Bilqis ad nives liquescentes, Knapp.

Distr. gen.: Endem.

With the recent material collected by Furse, there is no doubt that this species belongs to *Thlaspi* and not *Aethionema*. It is most closely allied to *T. pumilum*.

40. *Capsella*

Capsella Medicus, Pflanzengatt. 85 (1792).

Lit.: E. Almquist, Studien über Capsella bursa-pastoris, Acta Horti Bergiani 4, 6: 1—92 (1907); 7, 2: 41—95 (1921—23); 9, 2: 37—76 (1929). G. H. Shull, The species concept from the point of view of a geneticist, American Journal of Botany 10: 221—228 (1923).

Herbae annuae vel biennes, pilis simplicibus furcatis et substellatis. Sepala non saccata. Folia integra, dentata vel pinnatifida. Petala alba vel rosea. Filamenta non appendiculata. Glandula nectarifera mediana evoluta. Silicula dehiscens, valde compressa, obcordato-triangularis, carinata, polysperma. Radicula incumbens.

1. ***C. bursa-pastoris*** (L.) Medicus, Pflanzengatt. 85 (1792).
Syn.: *Thlaspi bursa-pastoris* L., Spec. Plant. 647 (1753). *Capsella hyrcana* Grossh., Journ. Soc. Bot. Russe 14: 306 (1930).
Icon.: Clavis p. 23.
Typus: „Hab. in Europae cultis ruderatis".

Herba annua vel biennis, 4—50 cm alta. Folia basalia rosulata, in petiolum attenuata; folia caulina semiamplexicaulia, auriculis acutis. Petala 2—2,5 × 0,5—

1 mm. Pedicelli fructiferi 5—12 mm longi, patulo-ascendentes. Silicula (3—) 7—9 × 2,5—6 mm, exalata; lobi apicales subacuti. Semina usque ad 30, humiditate mucilaginea.

Iraq: Kurd.: Kirkuk: Kuh Safin prope Shaqlawa, Bornm. 904. Jarmo, Helbaek 695! Sul.: Palegawra W Sagirma Dagh, 1000 m, Helbaek 654! Diyala: Jalula prope fluvium Diyala, Guest 1871. Khanaqin, Rech. 9033! — Kut al Amarah: 16 km SE Badrah, Rech. 9210, Rech. 13972!
Talish: In montibus Talish, Buhse.
Persia: **N**: Gorg.: Gorgan, Buhse. Bandar-i Gaz, Sint. 1482. Maz.: In valle Haraz: Karehsang, Wdb. 173. Gil.: Inter Bandar-e Pahlavi et Rasht, Rech. 12! — **W**: Azerb.: Khvoy, Knapp. Tabriz, Gill.-Sm. 1347, 1348, 1349. Kermansh.: Bisotun, 1350 m, Jacobs 6243! Nojubaran, 8 km NW Bisotun, Bent & Wr. 406—301! Hamadan, Sab. 173! Arak: Golpayegan ad viam versus Esfahan, Str. Arak, Str. Esf.: Esfahan, Bornm. 2212. Kuh-e Darabshah supra Damaneh, Furse 1454! Bakht.: Chashmehghirin, Koelz 15331! Lur.: Dow Rud, Koelz 15737! Bisheh, 1200 m, Koelz 1438! Khuz.: Ad pagum Sellelat ditionis Shushtar, Nab. 1305. — **S**: Kerm.: Tomagoa, Koelz 14324! Kuh-e Laleh Zar, 3000 m, Bornm. 2211. Fars.: Hawize in Kuh-e Khormuj ditionis Bushehr, Nab. 1375. Shiraz, Koelz 14523!, Esfand. 997-E. — **E**: Khor.: Mashhad, Rech. 7518! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1700 m, Rech. 4506! In silva Golestan, 72 km ENE Gonbad-e Kavus, 914 m, Furse 5129! — **C**: Tehr.: Shahr Rey Bruns. Qazv.: Ad pagum Sultanabad prope Qazvin, Linds. 25/117. Karaj, Rech. 529! Qazvin, 1200 m, Schmid 5003! Shahr.-Bust.: M. Shahvar ad Nokarman, 2000 m, Rech. 6260!; Dihi supra Nokarman, 2500 m, Rech. 5935!
Turcomania: Ashkhabad, Sint. 291; Litw. 591.
Afghanistan: **NW**: Bala Murghab, 500 m, Koelz 3512. — **SW**: Herat: Herat, Amsel! — **SE**: Kandahar: Kandahar, 1020 m, Gilli 1117! — **E**: Kabul: In planitie Darulfanun, Manger 20, 80. Kabul, 1800 m, Hdg. & Wdb. 2893!, Gilli 1118!, 1119! Charikar, Neub. 525! Istalif, Neub. 4056! Sarobi, Volk 2467. Hauz-i Mahiha versus Farakulum, 2700 m, Koelz 3012. Nuristan: Barikot, 850 m, Gilli 1116! Gusalak, 1000 m, Edelb. 28! Inter Kushitaki et Pronz, Kitam. Kushtos, 1850 m, Neub. 4623. **NE**: Badakhshan: Mashhad versus Faizabad, 1524 m, Furse 6076! Kataghan: Taliqan, 720 m, Podlech 10261. Infra Shamar, 12 km E Taliqan, 1400 m, Podlech 10362. 5 km S Ishkamish, 1200 m, Podlech 10742. — **C**: Bamian: Behzud, 2800 m, Rech. 18620!
Pakistan: Swat: Inter Kalam et Paloza, 2150 m, Honda 59. — Peshawar: In jugo Khyber, Halcro-Johnston 30! — Kurram: In valle Zeran, 2000 m, Afendi 174. In valle Kurram, Aitch. 129! — Quetta: Mastung, H.-B. 17176. Quetta, 1700 m, Lamond 940! Sariab S Quetta, 1700 m, Rech. 28845! Kalat: In collibus Harboi, H.-B. 19516. — Bal.: Makran: In alveo fluvii Rakhshan prope Panjgur, Hotson 115-A.

Distr. gen.: Per regiones temperatas late dispersa.

Some of the smaller flowered forms of this variable species approach *C. rubella* Reut. but this chiefly Mediterranean species is apparently not in our area.

41. *Hymenolobus*

Hymenolobus Nutt. ex Torrey & A. Gray, Fl. N. Amer. 1: 117 (1838).

Syn.: *Hutchinsiella* O. E. Schulz, Bot. Jahrb. 66: 92 (1933).
Lit.: R. Pampanini, La Hutchinsia procumbens Desv. e le sue varieta rupestri, Nuovo Gior. Bot. Ital. 16: 23—62 (1909).

Herba annua gracilis, glabra vel pilis paucis furcatis obsita. Folia integra vel pinnatifida. Sepala patula, interiora non saccata. Petala alba. Fructus silicula dehiscens, angustisepta, compressa, ovata vel ovato-elliptica. Semina numerosa, humiditate mucilaginea. Radicula incumbens.

1a. Caules erecti vel procumbentes. Folia nunnulla quidem pinnatifida. Inflorescentia multiflora ..... 1. *H. procumbens* (L.) Hedge & Lamond
b. Caules flaccidi tortuosi. Folia omnia integra, membranacea. Inflorescentia 3—6-flora ..... 2. *H. pauciflorus* (Koch) Schinz & Thell.

1. ***H. procumbens*** (L.) Hedge & Lamond, comb. nov.
Syn.: *Lepidium procumbens* L., Spec. Plant. 643 (1753). *Capsella elliptica* C. A. Mey. in Ledeb., Fl. Alt. 3: 199 (1831) et Verz. Pflanz. Cauc. 194 (1831). *Capsella procumbens* (L.) Fries, Nov. Fl. Suec. 1: 14 (1832). *Hutchinsia perpusilla* Hemsl. in Hook., Icon. Pl. 16, tab. 1599 (1887), syn. nov. *Hutchinsiella perpusilla* (Hemsl.) O. E. Schulz, Bot. Jahrb. 66: 92 (1933), syn. nov. *Hymenolobus perpusillus* (Hemsl.) Jafri, Notes Roy. Bot. Gard. Edinb. 22, 1: 109 (1956), syn. nov.
Icon.: Clavis p. 7 et 25.
Typus: „Hab. Monspelii".

Herba annua ad summum 20 cm alta. Folia inferiora lyrato-pinnatifida raro integra; superiora integra, linearia. Inflorescentia condensata, fructifera elongata. Petala c. 1 mm longa. Pedicelli fructiferi erecto-ascendentes, 4—7 mm longi. Silicula 3—4 × 1,5—2 mm.

Iraq: Kurd.: Arbil: Rawandiz, Guest 613! Diyala: Jabal Hamrin, Sutherland 157. Talish: sec. Fl. URSS. 8: 549 (1939).
Persia: W: Azerb.: Prope Rezaiyeh, Knapp. M. Karnaru prope Shahpur, Knapp. Tabriz, Knapp. Esf.: Golunabad prope Esfahan, 1600 m, Bornm. 2213. Esfahan, Bornm. 2213-b. 96 km SW Esfahan, Cowan & Darlington 2643! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 181! — S: Fars.: Shiraz, Gauba & Sab. 190! Kerm.: In limosis salsis ad Nabid inter Kerman et Bam, 2250 m, Rech. 3563! — C: Damgh.-Semn.: Semnan, 1200 m, Rech. 2820! Qazv.: Karaj, 1400 m, Gauba 1364. Qom, S Tehran, Bornm. 2214! Yazd: In montibus prope Yazd, Buhse 1298.
Turcomania: Ashkhabad, Litw. 223!
Afghanistan: SW: Herat, 1000 m, Koelz 3975!, Amsel! — SE: Kandahar, 1200 m, Gilli 1125! Girishk, Gilli 1124!, 1130! — E: Kabul: Guzar Gah, Neub. 27!, 29!, 521!, Gilli 1128! Botkhah, 1740 m, Gilli 1121!, 1126!, 1131! Chaman Wazirabad, 1750 m, Gilli 1127! Kabul, Gilli 1129!, 1132!, 1133!, Kitam. Fl. Kabul, 1800 m, Hdg. & Wdb. 2947!, Gilli 1122! Morghab infra Bala Hissar, 1780 m, Hdg. & Wdb. 3220!, Rech. 16005! Jalalabad, Gilli 1120!, 1123! Ghazni: Okak NE altoplanitiei Dasht-i Nawar, Rech. 17755! In valle Panjshir: Anjuman, 3400 m, Hdg. & Wdb. 5468! — NE: Wakhan: Wakhan, 2700 m, Giles 102! — C: Bamian: Band-e Amir, Gilli 1134!, Rech. 18310!, Rech. 18373! Kuh-e Josha NW Panjao, Rech. 18738!
Pakistan: Quetta: Quetta versus Chaman, 70 km a Quetta, 1400 m, Lamond 1029! Ad viam versus Sariab, 1700 m, Lamond 895!, Rech. 28850! — Baluchistan, Stocks 1121! Naru Karez, Lace 3454!

Distr. gen.: Europa et Asia temperatae, America temperata, totae regiones temperatae hemisphaerae australis.

Varying considerably in stature and characters according to habitat.

2. ***H. pauciflorus*** (Koch) Schinz & Thell., Viert. Naturf. Ges. Zürich 66: 285 (1921).
Syn.: *Capsella pauciflora* Koch in Mert. & Koch in Röhling, Deutschl. Fl. 4: 523 (1833).
Typus: S. Tirol, Udai im Fassathal, Elsmann.

H. procumbenti similis sed differt habitu flaccido, inflorescentia pauciflora et foliis integris.

Afghanistan: NW: Maimana: Darreh Zang prope Belchiragh, 1400 m, Hdg. & Wdb. 3741!

Distr. gen.: Europa australis, Afghanistan boreo-occidentalis, Himalaya (?).

Morphologically indistinguishable from the European plants of this name. *H. pauciflorus* has not been previously recorded from SW or C Asia but apparently comparable specimens occur in the Himalayan region. Very closely related to *H. procumbens* and although of different facies (possibly a result of its cave habitat), it may not be specifically different. In Europe, but not in our area, the two species are connected by a wide range of intermediates.

42. *Stroganowia*

Stroganowia Kar. & Kir., Bull. Soc. Nat. Mosc. 14: 386 (1841).

Herbae perennes rigide erectae caudice lignoso, residuis petiolorum comoso, glabrae vel pilis simplicibus obsitae. Folia crassa, nervatura utrinque prominente. Folia basalia in petiolos longos sensim attenuata. Sepala non saccata, membranaceo-marginata. Petala alba vel pallide flava vel rosea. Ovarium biovulatum. Silicula dehiscens, obovata vel subsphaerica, vix compressa. Stigma compresso-capitatum, ± bilobum. Semina 2, in funiculis brevibus crassis pendula, humiditate mucilaginosa. Radicula incumbens.

About 12 closely allied species in C. Asia. — The genus is closely related to *Lepidium* but differs in habit and the scarcely compressed fruits. Little mature-fruited material of the species in our area is available for study.

1a. Pedicelli fructiferi 15—23 mm longi. Planta humilis, ad summum 40 cm alta ..... 1. *S. Litwinowii* Lipsky
b. Pedicelli fructiferi 3—12 mm longi. Plantae elatae, usque ad 1 m altae 2
2a. Folia omnia fere basalia, linearia vel lineari-lanceolata ..... 2. *S. affghana* (Boiss.) N. Pavl.
b. Caulis foliatus. Folia lanceolata 3
3a. Folia glabra ..... 3. *S. persica* Busch
b. Folia puberula ..... 4. *S. puberula* Kitam.

1. ***S. Litwinowii*** Lipsky, Acta Hort. Petrop. 26: 121 (1910).
Icon.: Clavis p. 9 et 17.
Typus: Transcaspia, Lipsky (?), LE.

Herba erecta, perennis, 8—40 cm alta, glabra vel puberula. Folia basalia lanceolata 6×1,8 cm, petiolata, integra, in petiolum 4 cm longum sensim attenuata, prominenter nervosa; caulina amplexicaulia, auriculata. Inflorescentia multiramosa, multiflora, fructifera elongata. Sepala saepe violacea. Petala 4×1,5—2 mm, alba. Pedicelli fructiferi patentes vel erecto ascendentes, 15—23 mm longi. Silicula 3—4 mm longa, ovata; stylus c. 1 mm longus. Stigma capitatum.

Persia: E: Khor.: M. Kopet Dagh in jugo Alam Ali, 2000 m, Rech. 4830!
Turcomania: M. Kopet Dagh, Litw. Inter Cheirabad et Chajek, Czern. 290. Gaudan prope Ashkhabad, Litw. 625.

Distr. gen.: In montibus Turcomaniae, Persiae boreo-orientalis.

Easily recognised among our species by the long fruiting pedicels and styles.

2. ***S. affghana*** (Boiss.) Pavlov, Fl. URSS. 8: 529 (1939).
Syn.: *Lepidium affghanum* Boiss., Fl. Or. 1: 358 (1867). *Lepidium bupleuroides* Rech. f., Feddes Repert. 48: 36 (1940) syn. nov.
Typus: Persia: Kuh-i Karat inter Herat et Tabas, Bge., G.

Herba erecta perennis basi lignosa, caulibus numerosis 60—100 cm altis, glabra vel raro parce puberula. Folia plurima basalia, lamina 80—150×4—8 (—17) mm, rigida, anguste lanceolata vel ± linearia, integra vel raro prope apicem dentata, utrinque prominenter nervosa, in petiolum sensim attenuata; folia caulina pauca, subpetiolata. Racemi pauciflori. Petala 2—3×1,5 mm, alba vel pallide flava. Pedicelli fructiferi suberecti, 3—10 mm longi. Silicula 3—5×2—2,5 mm, leviter inflata, orbiculari-elliptica; stigma sessile. Semina 2.

Persia: E: Khor.: Inter Shirvan et Bojnurd in valle fluvii Atrak, Rech. 1833 (Typus *L. bupleuroidis* Rech. f.)! M. Kopet Dagh inter Quchan et Lotfabad, 1800 m, Rech. 1742! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 5029! Prope Mughan et N Kuh-e Binalud, 1900—2300 m, Schmid 6190! Kuh-i Karat inter Herat et Tabas, Bge.
Turcomania: Prope Ashkhabad, Litw. 818!
Afghanistan: NW: Herat: Kuh-i Doshakh, Aitch. 516! — SW: S Herat, 1300—1600 m Koelz 2243!

Distr. gen.: In montibus Turcomaniae, Khorasan, Afghanistan occidentalis.

Very little material has been collected with mature fruit.

3. ***S. persica*** Busch, Journ. Soc. Bot. Russe 11: 225 (1926).
Typus: Persia; locus non designatus.

Herba erecta perennis, usque ad 1 m alta. Folia basalia lanceolata; lamina 12×3 cm, integra reticulato-nervosa; petiolus usque ad 15 cm longus; folia caulina petiolata. Inflorescentia crebre ramosa. Petala 4—5×2—3 mm. Fructus ignotus.

Persia: W: Lur.: Dow Rud, Koelz 15776! Bakhtiari: Galli Sur, Koelz 18101!

Distr. gen.: Endem.

A doubtful determination. Neither type material nor the type description has been seen, but from the description in Fl. URSS. 8: 528 (1939) the two Persian gatherings appear to be this species. Until more complete and fruiting material is available, the identification must be provisional.

4. ***S. puberula*** Kitam., Act. Phytotax. Geobot. 17: 139 (1958).
Syn.: *Lepidium altissimum* Rech. f., Dansk Biol. Skr. 10, 3: 14 (1958).
Typus: Afghanistan: Nuristan, Kitam., KYO.

Herba erecta perennis, usque ad 1 m alta. Folia basalia oblanceolata, 15—20 cm longa, integra, reticulata-nervosa, puberula, petiolata; caulina sessilia vel subamplexicaulia. Inflorescentia condensata, multiflora. Petala 3×2 mm, pallide flava. Pedicelli fructiferi 5—12 mm longi. Silicula c. 4,5×2,5 mm; stylus 2 mm longus. Semina 2, sulcata.

Afghanistan: E: Nuristan: Eshtaway, 3800 m, Kitam. Inter vallem Parun et vallem Bashgul, Edelb. 1166. Shtive, Edelb. 1040! In jugo Papruk, in declivibus occidentalibus versus Shtive, 3000—4200 m, Kerst. 1410 (Typus *L. altissimi* Rech. f.)! — NE: Munjan: Darrah-i Parshui, 3700 m, Frey 268: 137.

Distr. gen.: Endem.

43. *Cyphocardamum*

Cyphocardamum Hedge, gen. nov.

Cruciferae-Lepidieae. Lignoso-caespitosum pulvinare. Caudices numerosi lignosi residuis petiolorum comosi. Indumentum e pilis simplicibus consistens. Folia minuta simplicia, petiolata. Scapi subaphylli pauciflori. Sepala non saccata, membranaceo-marginata. Petala oblongo-obovata, apice integra. Ovarium biovulatum. Fructus silicula dehiscens, obovata, vix compressa; semina pendula, in loculis singula; stylus prominens; stigma et stylus aequa crassitudine. Radicula incumbens (?). — Genus novum inter *Lepidieas Stroganowiae* Kar. & Kir. proximum sed ab eo habitu pumilo pulvinari, foliis ovatis minutis, scapis paucifloris, stylis longis, indumento manifesto diversum — Species singula in Afghania orientali indigena.

1. ***C. aretioides*** Hedge, sp. nov.

Typus: Kasy 28, holotypus W!, isotypus E!

Icon.: Tab. 10, fig. 1.

Dense pulvinato-caespitosum caudicibus ramosis numerosis lignosis, petiolarum residuis dense comosis. Folia omnia fere basalia, c. 5×4 mm, ovata, integra vel apice dentata, indumento e pilis brevibus simplicibus consistente breviter petiolata; costa mediana prominens, nervi laterales minus prominentes. Scapi usque ad 25 mm alti, aphylli vel foliis perpaucis basi proximis, puberuli. Racemi pauriflori. Flores pedicellati. Sepala non saccata, ovata, violacea c. 1,5 mm longi, oblongo-obovata, margine membranacea. Petala alba (?) c. 3 mm longa, oblongo-obovata. Pedicelli fructiferi 3—4 mm longi, erecti vel recurvi. Silicula (juvenilis) 5×2 mm, stylo 1 mm longo incluso, leviter compressa; semina 2.

Afghanistan: E: Ghazni: Dasht-i Nawar NW Ghazni, 3000 m, 8.-10.VI. 1965, Kasy 28!

Distr. gen.: Endem.

This interesting plant is only known from one gathering and is not a mature-fruited specimen. Despite this, it is clearly a distinct species and apparently a distinct genus. The absence of mature fruit and seeds is a drawback in determining its correct affinity but there seems little doubt that *Stroganowia* is the closest ally of *Cyphocardamum*. In both genera, the sepals and petals are similar and apparently they share the character of only slightly compressed 2-seeded silicules. But, in facies, they are totally different. Most *Stroganowia* species are up to 1 m in height with long-petiolate, lanceolate or linear leaves, glabrous or slightly puberulous and the inflorescence is a many-flowered, widely branched panicle. In contrast the leaves in *Cyphocardamum* are ovate and short-petiolate with a prominent indumentum and the inflorescence is a scape, few-flowered and up to 25 mm high. The curious habit of *Cyphocardamum*, illustrated in tab. 10 fig. 1, is unlike anything else among SW Asiatic *Cruciferae*.

Tribus Euclidieae

auctore I. Hedge, Edinburgh

Pili simplices vel ramosi vel deficientes. Fructus indehiscens interdum corniculatus, spinosus vel appendiculatus. Radicula incumbens vel accumbens; cotyledones vario modo plicatae. — Genera 44—54.

44. *Anastatica*

Anastatica L., Spec. Plant. 641 (1753). Gen. Plant. ed. 5: 290 (1754).

Herba annua humilis indumento stellato appresso. Folia simplicia. Flores minuti albi. Sepala non saccata. Fructus axi appressi, ± indehiscentes; valvae apice auriculo ± transversali provisae; stylus subulatus. Semina 4. Radicula accumbens. — Genus monotypicum.

1. ***A. hierochuntica*** L., Spec. Plant. 641 (1753).
Icon.: Clavis p. 23; O. E. Schulz in Engler, Natürl. Pflanzenfam. ed. 2, 17 B, fig. 280 (1936).

Typus: „Hab. in littoribus maris rubri".

Herba annua, a basi ramosa ± 5 cm alta, sub fructu omnino in globum induratum contorta. Folia basalia obovata, in petiolum attenuata. Flores axillares subsessiles. Fructus ovato-globosus, induratus, siccus indehiscens vel humiditate ± aegre dehiscens.

Persia: S: Lar.: In ins. Qeshm, Bornm. 60! Inter Hajjiabad prope Tarom et Bandar Abbas, inter Genu et Sarzeh, 250 m, Rech. 3399! — Persia australis, Auch. 4169-E! Pakistan: Makran: Suntsar, Rech. 32995!, Lamond 500!

Distr. gen.: Aegyptus, Arabia, Jordania, Iraq, Persia australis, Africa borealis.

The fruits are indehiscent when dry but readily dehisce when wet. The hygroscopic character of the plant — inrolled when dry and opening out when whet — is well illustrated by O. E. Schulz, l. c.

45. *Lachnoloma*

Lachnoloma Bge., Del. Sem. Hort. Dorpat. 8 (1843), Linnaea 18: 154 (1844).

Herba annua, indumento denso e pilis simplicibus et furcatis consistente. Folia simplicia, breviter petiolata. Sepala erecta, saccata, membranaceo-marginata. Petala rosea. Glandulae nectariferae medianae non evolutae. Ovarium biovulatum. Fructus nuciforme, ± quadrangulus, indumento denso gossypino, e pilis longissimis albis vel flavis consistente, indehiscens. Radicula incumbens. — Genus monotypicum.

1. ***L. Lehmannii*** Bge., Del. Sem. Hort. Dorpat. 8 (1843), Linnaea 18: 154 (1844).
Icon.: Tab. 10, fig. 2.
Typus: „In limoso-sabulosis deserti Kisil-kum", Lehmann, LE.

Herba annua, erecta, caule simplici vel ramoso 10—20 cm alto. Folia linearioblonga, in petiolum attenuata, margine subintegra vel lobata. Sepala saepe roseosuffusa. Petala linearia, 9×1 mm, ± persistentia. Pedicelli fructiferi erecti, leviter incrassati. Fructus c. 10 mm longus, rostro c. 5 mm incluso, indumento crassitudinem fructus aequante omnino obtectus; pilis 5 mm longi vel longiores; stigma bilobum. Semina 2. Cotyledones ± horizontaliter plicati.

Persia: **E**: Khor.: Tabas, Shir Geshk, Ruttner 578! Ozbagu, Ruttner 385!

Distr. gen.: Asia centralis, Persia boreo-orientalis.

The recently collected Persian specimens are a most interesting southward extension of the species range. Widespread in the lowlands of Central Asia, usually on sandy or stony soil, *Lachnoloma* occupies an isolated position in the *Cruciferae* without any clear generic affinity. It can be recognised at a glance by the *Gossypium*-like wool on the fruits.

46. *Octoceras*

Octoceras Bge., Arb. Naturf. Ver. Riga 1: 172 (1847).

Herba annua, pilis ramosis vel stellatis, floribus minutissimis albis, foliis lobatis. Sepala oblique patentia, non saccata. Fructus breviter pedicellatus, indehiscens, irregulariter quadrangulus et spinosus. Radicula incumbens. — Genus monotypicum.

1. ***O. Lehmannianum*** Bge., Arb. Naturf. Ver. Riga 1: 172 (1847).
Icon.: Clavis p. 23.
Typus: Kizyl Kum, Bge., LE.

Herba annua (vel interdum perennis?), 3—20 cm alta, plerumque multiramosa. Folia saepe plurima basalia, oblongo-spathulata, lobata vel pinnatifida. Inflorescentia fructifera valde elongata, tota planta demum valde indurata. Fructus 2—3 × 2—3 mm, durissimus, spinis magnitudine et forma diversis obsitus.

Persia: **S**: Kerm.: Kuh Tagh Ali, 1900 m, Boenm. 4995. Inter Saidabad et jugum Chah-e Chaghak, 1800 m, Rech. 3102! — **E**: Sistan: Inter Zahedan et Khash, 1300—1600 m, Rech. 4270! Khor.: Inter Mayamey et Shahrud, Rech. 5330-d! — **C**: Shahr.-Bust.: Shahrud, Bge.
Turcomania: Kizyl Arvat, Becker. Ashkhabad, Sint. 292!, Litw. 10!
Afghanistan: **SW**: Herat: Shind Dand, 1300 m, Koelz 3578! 48 km S Herat, 1220 m, Furse 5431! — **SE**: Kandahar: Inter Kandahar et Kushk-i Nahod, 1000 m, Kerst. 297! Jussuf Khel, Neub. 76!
Pakistan: Quetta: Inter Bostan et Khanozai, 1600 m, Rech. 29153. Quetta versus Chaman, Yaro prope Bostan, 1450 m, Lamond 1016! Quetta, Griff. 427!, Lace 3391! — Kalat: 40 km N Kalat versus Mastung, 2000 m, Rech. 28381. In montibus Harboi, H.-B. 19540. Kalat versus Khuzdar, 1700 m, Lamond 187! Panjgur versus Surab, Basima prope Jangal, 1350 m, Lamond 657! Rech. 28306! Kalat versus Quetta, 2000 m, Lamond 693! Bal.: Kharan, H.-B. 23194. Nichara, Stocks 805!

Distr. gen.: Aralo-Caspia, Kara Kum, Kizyl Kum, Amu Darya,Turcomania, Syr Darya, Persia austro- et boreo-orientalis, Afghanistan, Pakistan occidentalis.

A more or less desert species, variable in the shape and size of the fruit spines. Var. *Stocksianum* Boiss., Fl. Or. 1: 370 (1867) has straight spines as long as or longer than the diameter of the silicule. It is common in Baluchistan.

47. *Spirorrhynchus*

Spirorrhynchus Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 159 (1842).

Lit.: S. M. H. Jafri, Notes Roy. Bot. Gard. Edinb. 22: 117—118 (1956).

Herbae annuae, tenues, glabrae vel parce papillosae, foliis anguste linearibus, floribus minutis flavescenti-albis. Sepala erecta, vix saccata, anguste hyaline marginata. Inflorescentia pauciflora. Fructus indehiscens, quadrangularis vel quadrialatus, longissime rostratus; pedicelli fructiferi longi, vario modo curvati. Radicula incumbens. — Genus monotypicum.

1. ***S. sabulosus*** Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 159 (1842).
Syn.: *Anguillicarpus Bulleri* Burkill, Proc. Asiat. Soc. Bengal. 3, 8: 559 (1907). *Spirorrhynchus Bulleri* (Burkill) O. E. Schulz in Engler, Bot. Jahrb. 66: 98 (1933).
Icon.: Clavis p. 11.
Typus: „In collibus sabulosis Songoriae inter fontem Sassykpastau et montes Arganaty, Kar. & Kir. 1262", LE!

Herba annua, valde ramosa, usque ad 30 cm alta, tenuiter ramosa. Folia linearia, integra vel breviter triangulari-dentata. Petala 6—8 mm longa, angustissime linearia. Pedicelli usque ad 1 cm longi. Fructus ellipticus, segmento inferiore longo pedunculiformi, rostro usque ad 2 cm longo recto vel vario modo curvato.

Persia: S: Kerm.: Inter Kerman et Yazd, Bge.! Inter Kerman et Mahan, 1800 m, Rech. 3550! — E: Khor.: Ad meridiem oppidi Torbat-e Heydariyeh, Gauba & Sab. 270! Turcomania: Ashkhabad inter Annaju et Gyaurs, Sint. 166! Prope Repetek, Litw. 619-a!
Pakistan: Quetta, Kharan, H.-B. 23193. Makran: Panjgur, 1000 m, Lamond 595! Bal.: Chagai, 35 km E Dalbandin, Lamond 146!, Rech. 27279!

Distr. gen.: Aralo-Caspia, Kizyl Kum, Kara Kum, Turcomania, Amu Darya, Persia, Pakistan occidentalis.

Variable in all characters.

48. *Myagrum*

Myagrum L., Spec. Plant. 640 (1753). Gen. Plant. ed. 5: 289 (1754).

Herba annua, glabra, glauca floribus pallide flavis vel lacteis, foliis simplicibus. Sepala suberecta, interiora leviter saccata. Ovarium 2-ovulatum. Pedicelli fructiferi axi arcte appressi, validi. Fructus indehiscens, 1—2-spermus, obcordatus, rostro lateraliter compresso. Radicula incumbens. — Genus monotypicum.

1. ***M. perfoliatum*** L., Spec. Plant. 640 (1753).
Icon.: Clavis p. 9.
Typus: „Hab. inter Galliae segetes".

Herba annua, 20—60 cm alta, superne laxe rigide ramosa. Folia integra, oblonga vel lanceolata, amplexicaulia, auriculata vel sagittata. Petala 4—5 mm longa. Pedicelli fructiferi 3—5 mm longi, 2 mm crassi. Fructus c. 8×5 mm, 3-locularis; loculi 2 superiores vacui, inferior semen singulum (raro 2) continens.

Iraq: Kurd.: Arbil: Shaqlawa, Haines 377!
Persia: N: Persia borealis, Szov., Bge. — W: Azerb.: Khvoy, Knapp. Gök-Tappeh, Knapp. Tabriz, Gill.-Sm. 1609! Dizeh Siamek, Knapp. Lur.: Dow Rud, Koelz 18125!, 18201! Khorramabad, Gauba & Sab. 263! Kermansh.: Kermanshah versus Karand, 1100 m, Furse 1922!

Distr. gen.: Europa, Anatolia, Syria occidentalis, Caucasus, Iraq borealis, Persia occidentalis.

49. *Tauscheria*

Tauscheria Fisch. ex DC., Reg. Veg. Syst. Nat. 2: 563 (1821).

Herbae annuae foliis simplicibus integris, praeter fructus glabrae, floribus flavis. Inflorescentia crebre ramosa, multiflora. Sepala patula, non saccata. Ovarium uniovulatum. Silicula indehiscens, monosperma, subtus convexa, supra concava, rostro prominente curvato; pedicelli tenues, recurvato-horizontales. Radicula incumbens.

1. ***T. lasiocarpa*** Fisch. ex DC., Reg. Veg. Syst. Nat. 2: 563 (1821).
Syn.: *T. gymnocarpa* Fisch., l.c.
Icon.: Clavis p. 8 et 17.
Typus: „Ad lacum Inderskoe deserti Kirghisorum", Tauscher.

Herba annua glauca, 15—40 cm alta. Folia oblonga-lanceolata, cordato-amplexicaulia, integra. Petala 2 mm longa. Pedicelli fructiferi c. 3 mm longi. Silicula c. 3—5×3—4 mm, dense pubescens vel glabra, horizontaliter patens, marginibus sursum incurvis.

Persia: W: Esfahan, Buhse. — S: Kerm.: Inter Khabis et Kerman, Bge.! — E: Khor.: Kuh-e Nevshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4528-a!, 4528-b! Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, Rech. 4784! Gifan, Gauba & Sab. 245! — C: Yazd: Inter Yazd et Esfahan, Bge. Inter Deh Bala et Mesvar Buhse 1332.
Turcomania: In montibus prope Ashkhabad, Litw. 605! Ad pagum Gaudan prope Ashkhabad, Litw. 606.
Afghanistan: NW: Hari Rud, Aitch. 1013! — E: Ghazni: Ad lacum Sabzab inter Okak et Behzud, Rech. 17939! — C: Bamian: In declivibus occidentalibus jugi Shibar, 2800 m, Hdg. & Wdb. 4231! Band-i Amir, 2900 m, Hdg. & Wdb. 4765!, Rech. 18232!, 18387!, Volk 2766, Gilli 1177!, Podlech 12112. NE Bamian, 3140 m, Gilli 1178! In valle Kamard W Doab, 1630 m, Gilli 1179!
Pakistan: Quetta: Ziarat, Lace 3358!, Jafri & Akhar 2087!, Crookshank 203!, Lamond 1204!

Distr. gen.: Rossia europaea austro-orientalis, Tien Shan, Amu Darya, Syr Darya, Pamir-Alaj, Aralo-Caspia, Turcomania, Cashmir, Persia, Afghanistan, Pakistan occidentalis.

Occurring sporadically with the typical plant is a glabrous-fruited form with straight, not inrolled, margins and a more or less straight beak. It is sometimes recognised as var. *gymnocarpa* (Fisch.) Boiss. Syn.: *T. gymnocarpa* Fisch. ex DC., Reg. Veg. Syst. Nat. 2: 564 (1821). Probably not essentially differing from this is *T. oblonga* Vassilcz., Fl. URSS. 8: 643 (1939) which was described from near Samarkand and separated from *T. lasiocarpa* on account of the larger oblong fruits with a straight beak.

50. *Schimpera*

Schimpera Hochst. & Steud. in Schimper, Pl. Arab. Exsicc. no. 244 (1835) cum diagn. et ex Endl., Gen. Plant. 889 (1839).

Herbae annuae pilis simplicibus, foliis lanceolatis pinnatifidis, floribus parvis flavis. Sepala non saccata. Fructus durus, indehiscens, ovoideus, tuberculatus, exalatus, monospermus, cauli appressus, rostro prominente plano horizontaliter divergente. Radicula incumbens.

1. ***S. arabica*** Hochst. & Steud. in Schimper, Pl. Arab. Exsicc. no. 244 (1835) cum diagn. et ex Steud., Nomencl. Bot., ed. 2, 2: 530 (1841).
Syn.: *S. persica* Boiss., Diagn. Pl. Or. Ser. 1, 6: 18 (1845).
Icon.: Clavis p. 17.
Typus: Arabia Petraea, Schimper 244!

Herba annua, multiramosa, florifera 5—10 cm alta, fructifera indurata, usque ad 30 cm elongata. Folia plurima basalia, subcarnosa, subsessilia; caulina oblongo-linearia, sagittato-auriculata. Petala c. 1 mm longa. Pedicelli fructiferi crassi, 2—3 mm longi. Fructus 2—5 mm longus; rostrum 3—5 (—10) mm longum, primum plerumque rectum, demum a fructu rectangulariter divergens.

Iraq: Diyala: Jabal Hamrin, Graham. Prope Injana, Guest 674! Inter Shahraban et Jalula, Rech. 14234! 10 km N Sheikh Mohammed 40—50 km E Samarra, Rech. 13446! Amarah: Shatt at-Tib, 70 km N Amarah, Rech. 8874!
Persia: W: Khuz.: Inter Dehloran et fl. Tib, Nab. 1331. Inter Shush et Dehloran, Nab. 1371. — S: Fars.: Dalaki, Ky. 7! In insula Khark, sinus Persici, Ky. 1009. Bushehr, Bornm. 71!, Nab. 1360. Koelz 1432! Lar.: Dasht-e Tasht Khvord, Popov 50! NE Bandar Abbas, Merton 3570!

Distr. gen.: In desertis Arabiae, Syriae, Mesopotamiae et Persiae australis.

Variable in fruit characters:
var. *persica* (Boiss.) Bornm. was recognised on the lower fruits of the infructescence having short straight beaks and the upper with longer spreading beaks.
var. *lasiocarpa* Boiss. on the densely papillose, lanate fruits. Both are probably local forms that occur sporadically throughout the species range.

51. *Euclidium*

Euclidium R. Br. in Aiton, Hort. Kew. ed. 2, 4: 74 (1812).
Syn.: *Litwinowia* Woron., Acta Hort. Bot. Petrop. 43: 452 (1931).

Lit.: O. E. Schulz, Bot. Jahrb. 66: 95 (1933).

Herbae annuae albiflorae, foliis simplicibus, indumento laxo e pilis ramosis et simplicibus eglandulosis vel simplicibus tantum consistente. Sepala obliqua, interiora leviter vel non saccata. Ovarium biovulatum. Pedicelli fructiferi axi arcte appressi. Fructus indehiscens 2-spermus, ovoideus, rostratus. Radicula accumbens.

1a. Rostrum fructus curvatum, 2 mm longum. Indumentum e pilis ramosis et simplicibus consistens ..... 1. *E. syriacum* (L.) R. Br.
b. Rostrum fructus rectum, 3 mm longum. Indumentum e pilis simplicibus consistens ..... 2. *E. tenuissimum* (Pall.) B. Fedtsch.

1. ***E. syriacum*** (L.) R. Br. in Aiton, Hort. Kew. ed. 2, 4: 74 (1812).
Syn.: *Anastatica syriaca* L., Spec. Plant. ed. 2: 895 (1763).
Icon.: Clavis p. 23.
Typus: „Hab. in Syriae tectis, ruderibus".

Herba annua, 10—40 cm alta, a basi crasse ramosa; inflorescentia foliata. Folia basalia petiolata, oblongo-lanceolata, integra, dentata vel pinnatifida; folia superiora petiolata. Petala 1 mm longa. Pedicelli fructiferi 1,5 mm longi, 1 mm crassi. Fructus dense ramoso-pilosus.

Iraq: Kurd.: Arbil: Kuh Safin, 1000 m, Bornm. 913!, 914. Salah ad-Din, 900 m, Chapman 11975! Hajji Omran, 1750 m, Chapman 12294! Inter Arbil et Shaqlawa, 1080 m, Helbaek 721! Sul.: In ditione Penjwin, 1200 m, Rech. 10438!, 1300 m, Rawi 22756! Mosul: Amadiyah, Haines 141-a! Mosul, Rogers 542-a! Diyala: Jabal Hamrin, Sutherland. Khanaqin, Rech. 9016!
Talish: Swant, 1200 m, Hohen.
Persia: N: Gorg.: Gorgan, Shar. 572! Persia borealis, Bge., Auch. 4033. — W: Azerb.: Tabriz, Gill.-Sm. 1375!, 1426!, 1501!, 1502!, 1700! Ad lacum Rezaiyeh, 1300 m, Jacobs 6622! Khosrava prope Tabriz, Knapp. In M. Sahand, Buhse. 16 km W Jolfa, Cowan & Darlington 2033! Azerbaijan, Auch. 4133. Arak: Inter Arak et Qom, Str. Azna, Koelz 1419. Ham.: In agro Ecbatanensi, Pichler! Zamanabad, Stapf. Lur.: Dow Rud, 1800 m, Koelz 15699! Khuz.: Ruinae Shush et Tell, Nab. 1374. — S: Fars.: Prope Gere inter Bushehr et Shiraz, Ky. 72. Shiraz, Koelz 14510!, Grant 15472. Persepolis, Schmid 5431! Kerm.: Kerman, 2000 m, Bornm. 2227! — E: Sistan: Mian Tangi, Shar. 5654-E! Khor.:

Inter Mashhad et Chanaran, 1100 m, Rech. 4682! Inter Chanaran et Quchan, 1200—1300 m, Rech. 4756! — C: Qazv.: Soltanabad prope Qazvin, Linds. 270! Karaj, Rech. 245!, Gauba. Prope Asadbar, Ky. 453! Yazd: In montibus prope Yazd, Buhse 1411. Taft, Bornm. 2226.

Turcomania: Ashkhabad, Sint. 127!, Litw. 599. Gaudan prope Ashkhabad, Litw. 600. Kizyl Arvat, Becker.

Afghanistan: NW: Maimana, 500 m, Hdg. & Wdb. 3607! Herat: Prope Qala Nau, 1200 m, Koelz 3867! Hari Rud, Aitch. 188! — SW: Farah versus Shindand, Jija, 1000 m, Koelz 4173! — SE: Kandahar, Otipore, Dair Haj, Griff. 631! — E: Kabul: Bala Hissar, 1800 m, Rech. 16011!, Sher Darwasa, 1800 m, Neub. 534! Kabul, Hdg. & Wdb. 2829!, Volk 281, 314-A, 326, 1817, Kerst. 134, Neub. 21!, 26!, 527!, 3003. Gilli 1162!, 1163!, 1164!, 1165!, 1166! In jugo Unai, 3120 m, Gilli 1168! Ghorband, Neub. 526! Gardez, Koelz 11900! Hauz-i Mahiha versus Farakulum, 2900 m, Koelz 2509! Jaji: In jugo Peiwar Kotal, 2650 m, Rech. 32228! — NE: Kataghan: Taliqan, 720 m, Podlech 10292. Mughul, 20 km NW Taliqan, 740 m, Podlech 10346. Badam Darreh S Taliqan, 900 m, Podlech 10392. Farkhar, 1250 m, Podlech 10478. Ishkamiah, 1150 m, Podlech 10663. Banu in valle Andarab, 1550 m, Podlech 10928. — C: Bamian: In valle c. 16 km S Doab, 1600 m, Rech. 16658! In jugo Shibar, 2600 m, Koelz 3011! Koh-i Baba, 2800 m, Gilli 1167! — Griff. 1505!, 1541!

Pakistan: Chitral: Toppin! Swat: Inter Mingora et Barikot, 1000 m, Stewart 27461. — Peshawar: In jugo Khyber, 1100 m, Halcro-Johnston 53! Peshawar, Stewart! — Kurram, Aitch. 280! — N. Wazir.: Datta Khel, Fz. 1234. — Quetta: Spin Karez prope Quetta, 1900 m, Rech. 29255. In jugo W Ziarat, 2200 m, Rech. 29319. 20 km W Quetta, Rech. 29086. Quetta, Lace 3635!, Jafri & Akhar 2385!, Duthie 8604! — Baluchistan, Stocks.

Distr. gen.: Rossia australis, Asia austro-occidentalis et centralis.

2. ***E. tenuissimum*** (Pall.) B. Fedtsch., Bull. Herb. Boiss. 2, 4: 915 (1904).

Syn.: *Vella tenuissima* Pall., Reise 5: 506 (1793). *Bunias tatarica* Willd., Spec. Plant. 3: 43 (1800). *Euclidium tataricum* (Willd.) DC., Reg. Veg. Syst. Nat. 2: 422 (1821). *Litwinowia tenuissima* (Pall.) Woron. ex Pavlov, Fl. Centr. Kazakhstana 2: 302 (1935); Busch in Fl. URSS. 8: 327 (1939).

Icon.: Clavis p. 17.

Typus: Inderia et Jaikum australe, Pall.

Herba annua, 25—50 cm alta, stricte erecta, in parte superiore tantum tenuiter ramosa. Differt a specie praecedente foliis angustioribus, inflorescentia paucifoliata, fructibus glabris, rostris rectis.

Persia: W: Azerb.: Tabriz, Gill.-Sm. 1406!, 1446!, 1457!, 1807! Ham.: Aq Bolagh-e Aqdaq c. 100 km N Hamadan, Rioux & Golv. 185! M. Alvand, Str. Arak, Str. Lur.: Oshtoran Kuh, Azna, Furse 1781! — S: Fars.: Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5321! — E: Khor.: Mashhad, 1500 m, Furse 5273! — C: Tehr.: In regione subalpina prope Shahrestanak, 2200 m, Bornm. 6278! M. Tuchal, Bruns. Damavand, Furse 2552! Qazv.: Karaj, Gauba. Kuh Dashteh, Rech. 270!

Turcomania: Gaudan prope Ashkhabad, Litw. 601.

Afghanistan: NW: Obeh, 1700 m, Koelz 3769! — SE: Kandahar: In regione Kandahar, 1000 m, Kerst. 2231! — E: Kabul: Sher Darwasa, 1800 m, Hdg. & Wdb. 2896!, Neub. 552!, Gilli 1171! Darulfanun, Neub. 20! Kabul, Hdg. & Wdb. 3248!, Neub. 3035. Istalif, Gilli 1170!, Neub. 4054. Charikar, Neub. 546!, 551! Inter Charikar et Gulbahar, Podlech 10217-b. Qala-e Wazir inter Sar-i Chashma et jugum Unai, 2900 m, Rech. 18084! Jaji: Ali Khel, Aitch. 190! Jabal Seraj, Hdg. & Wdb. 2961!, Gilli 1169! Ghazni: 32 km NE Ghazni, 3040 m, Furse 5668! — Choky, Griff. 340! — NE: Badakhshan: In valle Warduj, Barak distr. E Faizabad, 1360 m, Furse 6278! In parte superiore vallis Zebak,

Warduj fl., 2100 m, Furse 6336! Kataghan: Infra Shamar, 12 km E Taliqan, 1400 m, Podlech 10361. Farkhar, 1250 m, Podlech 10462.
Pakistan: Quetta: Sheilabagh, 1800 m, Lace 3540!, In jugo Khojak, Duthie 8597! Quetta versus Ziarat, 2200 m, Lamond 1164! Spin Karez, 1800—1900 m, Lamond 1135!

Distr. gen.: In regione Maris Caspici, Persia, Afghanistan, Asia centralis.

52. *Neslia*

Neslia Desv., Journ. Bot. Appl. 3: 162 (1814).
Syn.: *Vogelia* Medicus, Pflanzengatt. 32, tab. 1, fig. 6 (1792).

Lit.: F. Vierhapper, Österreichische Botanische Zeitschrift 70: 167—172 (1921). P. W. Ball, Feddes Repertorium 64: 11—13 (1961).

Herbae annuae floribus flavis, foliis simplicibus indumento e pilis simplicibus et ramosis consistente. Sepala suberecta, interiora leviter saccata. Ovarium 4-ovulatum. Pedicelli fructiferi tenues, erecto-patentes. Fructus indehiscens, monospermus, ± sphaericus, corrugatus, maturitate facile deciduus. Radicula incumbens.

1. ***N. apiculata*** Fisch., C. A. Mey. & Avé-Lall., Ind. Sem. Hort. Petrop. 8: 68 (1842).
Syn.: *N. thracica* Velen., Österr. Bot. Zeitschr. 41: 122 (1891). *Vogelia apiculata* (Fisch., C. A. Mey. & Avé-Lall.) Vierh., Österr. Bot. Zeitschr. 70: 168 (1921).
Icon.: Clavis p. 25.
Typus: E Caucaso descripta.

Annua, 30—70 cm alta, simplex vel ramosa. Folia inferiora oblonga, amplexicaulia, sagittata, integra vel dentata, apice acuta; superiora lanceolata, sagittata. Petala 3 mm longa. Pedicelli fructiferi 6—8 mm longi. Fructus 2—2,5×2—2,5 mm.

Iraq: Kurd.: Mosul: Al Qosh, 16 km SE Dihok, 900 m, Thesiger 722! Dihok, 450 m, Guest 1310! Kirkuk: Jarmo, Helbaek 458! Qara Anjir, 700 m, Gillett & Rawi 7542! 9 km versus Altin Köprü, Erdtman & Goedemans in Rech. 15504! Arbil: Shanidar, Erdtman & Goedemans in Rech. 15815! Shaqlawa, Haines 385! Serizor, Hadrian-dar, supra Rawandiz, Nab. 1281. Sul.: In ditione Penjwin, 1400 m, Rech. 12241! Pira Magrun supra Qarachitan, 1000 m, Gillett 7748! Supra Dokan, Barkley & Haddad 7596! Goizha, 1100 m, Gillett & Rawi 11680! Diyala: Khanaqin, Cowan & Darlington 228! Talish: Swant, C. A. Mey.
Persia: N: Gorg.: Gorgan, Shar. 563! Gil.: Ispili, Yehlah, Linds. 1206! Manjil, Bornm. 6281. — W: Azerb.: Inter Tabriz et Marand, Gill.-Sm.1514! Dezh Shahpur, 1350 m, Jacobs 6509! Qareh Dagh, Shahjan, Buhse. Kermansh.: Kermanshah versus Karand, Furse 1921! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 178! Prope Hamadan, Stapf! Esfahan, Bornm. 2228. Lur.: Dow Rud, Koelz 17354!, 15473!, 18204! Khorramabad, Bent & Wr. 410—122! Ilam, Jacobs 6304! 2 km SW Khorramabad, Cowan & Darlington 479! Shah Bazan, 500 m, Koeie 332! Arak: Arak — Golpayegan — Daulatabad, Str. — S: Fars.: Jahrom, Koelz 14556! Gere inter Bushehr et Shiraz, Ky. 64! 20 km N Shiraz, 1600 m, Grant 17566. Khafr inter Jahrom et Shiraz, Gauba & Sab. 243! Shiraz, 1600 m, Grant 15454. Firuzabad, Kashkouli 5638-E! Insula Khark, Ky. 6! Kerm.: Kerman, Bornm. 2229! M. Jebal Barez in declivibus borealibus Deh Bakri, 2100 m, Rech. 3682-a! — E: Khor.: In collibus ad Torbat-e Heydariyeh, 1300 m, Rech. 4316! 48 km E Soltanabad, Furse 5233! — C: Tehr.: Abbasabad prope Tehran, Bruns. Tehran, Schmid 5089!, Trott 806! Qazv.: Karaj, Gauba. Soltanabad prope Qazvin, Linds. 71, 335. Shahr.-Bust.: In declivibus australibus M. Shahvar ad Nokarman, 2000 m, Rech. 6266! Elburz: Ardineh, Bruns.

Turcomania: Nephton prope Ashkhabad, Sint. 82-a. Aktepe, Litw. 604! In montibus prope Ashkhabad, Sint 82-b.
Afghanistan: SW: Hari Rud, Aitch. 219! — SE: Kandahar, 1000 m, Kerst. 335! — E: Kabul: Paghman, 2000—2800 m, Koelz 12091!, Rech. 17179! Kabul, 1780 m, Gilli 1174!, 1175!, 1176! Istalif, Gilli 1173! Inter Kabul et Ghazni, 5 km S Arghandeh, Rech. 17213! Shashgao, Kitam. Hauz-i-Mahiha, 2500 m, Koelz 2369! Parvan: 22 km supra Gulbahar in valle Panjshir, 1750 m, Hdg. & Wdb. 3004! Inter Charikar et Gulbahar, Podlech 10217-a. In jugo Shibar, Kitam. — NE: Badakhshan: Mashhad versus Faizabad, in valle Kokcha, Furse 6087! E Faizabad in valle Warduj, 1350 m, Furse 6280! Kataghan: In declivibus borealibus jugi Salang, 2200 m, Rech. 31630. In valle Andarab supra Sarab, 2600 m, Podlech 11213. 5 km S Ishkamish, 1200 m, Podlech 10740. Farkhar, 1250 m, Podlech 10475. Infra Shamar, 12 km E Taliqan, 1400 m, Podlech 10360. — C: Bamian: Farakulum, 2700 m, Koelz 3010!
Pakistan: Chitral: Drosh, Toppin 216! — Peshawar: In jugo Khyber, Halcro-Johnston 144! — Kurram: Parachinar, Afendi 57, 171. In valle Kurram, Aitch. 181! — N. Wazir.: Datta Khel, Fz. 1226, 1499. Razani, Fz. 21, 29, 2155. — S. Wazir.: Tank, Williams. — Quetta: Sanjawi, 1500 m, Rech. 29582. Quetta, Stocks 1063!, Lamond 902! — Kalat: Mastung, H.-B. 17163.

Distr. gen.: Africa boreo-occidentalis, Europa australis, Asia austro-occidentalis et centralis.

Closely allied to *N. paniculata* (L.) Desv. and sometimes treated as a subspecies of it: *N. paniculata* subsp. *thracica* (Velen.) Bornm., Österr. Bot. Zeitschr. 44: 125 (1894). *N. apiculata* at the eastern end of its range is a fairly constant taxon. *N. paniculata* is not known from our area although many literature records refer to it.

53. *Glastaria*

Glastaria Boiss., Ann. Scienc. Nat. Ser. 2, 16: 382 (1841) and l.c. 17: 203 (1842).
Syn.: *Texiera* Jaub. & Spach, Ill. Pl. Or. 1, tab. 1 (1842).

Herba annua, glabra, glauca, floribus albis vel flavis, foliis simplicibus. Sepala oblique patentia, interiora non saccata. Ovarium 2-ovulatum. Pedicelli fructiferi tenues, deflexi. Fructus indehiscens, ± globularis, laevis. Radicula incumbens. — Genus monotypicum.

1. ***G. glastifolia*** (DC.) O. Kuntze, Revis. Gen. 1: 30 (1891).
Syn.: *Peltaria glastifolia* DC., Reg. Veg. Syst. Nat. 2: 330 (1821). *Glastaria deflexa* Boiss., Ann. Scienc. Nat. Ser. 2, 16: 382 (1841). *Texiera glastifolia* (DC.) Jaub. & Spach, Ill. Pl. Or. 1, tab. 1 (1842).
Icon.: Clavis p. 9; tab. 9, fig. 2.
Typus: „In Oriente in Alep et Mossul", Olivier, P.

Herba annua, 15—30 cm alta, a basi vel in parte superiore ramosa. Folia basalia petiolata, oblongo-lanceolata, integra vel dentata; superiora oblonga, auriculata, amplexicaulia. Petala 4—7 mm longa. Pedicelli fructiferi c. 10 mm longi. Fructus c. 6×5 mm.

Iraq: Kurd.: Mosul, Guest 1489! Arbil: Inter Kirkuk et Arbil, Thesiger 474! Arbil, Guest 1464!, Haines! Kirkuk: 9 km a Kirkuk versus Altin Köprü, Erdtman & Goedemans in Rech. 15507! Kirkuk, 400 m, Bornm. 915. Jarmo, Helbaek 411! 45 km SE Kirkuk, Barkley & Haddad 7601! Fl. Zab, 300 m, Grigg 65! 5 km SW Chamchamal, 750 m, Gillett & Rawi, 7579! Urshieh 20 km S Kirkuk, 300 m, Gillett & Rawi 10350!

Distr. gen.: Syria occidentalis et desertis Syriae, Anatolia, Iraq.

A frequent and sometimes abundant weed in parts of N Iraq.

54. *Bunias*

Bunias L., Spec. Plant. 670 (1753). Gen. Plant. ed. 5: 300 (1754).

Herbae annuae vel perennes, floribus flavis, foliis ± divisis, indumento e tuberculis glandularibus et e pilis eglandulosis consistente. Sepala leviter sagittata. Ovarium 2- vel 4-ovulatum; stigma capitatum. Pedicelli fructiferi longi, tenues erecto-patuli. Fructus durissimus indehiscens, ovoideus, 1—4-spermus, alatus vel exalatus. Cotyledones spiraliter involutae.

1. ***B. orientalis*** L., Spec. Plant. 670 (1753).
Icon.: Clavis p. 17.
Typus: „Hab. in Russia".

Perennis, 30—80 cm alta, subsimplex vel valde ramosa. Folia basalia petiolata, laevia, lanceolata, ± pinnatifida; superiora sessilia. Inflorescentia fructifera valde elongata. Petala 8×4 mm. Pedicelli fructiferi 10—20 mm longi. Fructus 7—8×4 mm, verrucosi; rostrum 1 mm longum, monospermum.

Iraq: Kurd.: Mosul: Dihok, Eig & Zohary.
Talish: Swant, Hohen., C. A. Mey.
Persia: W: Azerb.: Kuh-e Sahand prope Nematabad, Buhse. Oshnoviyeh, Cowan & Darlington 1441! M. Gelosa inter Shahpur et Rezaiyeh, Knapp.

Distr. gen.: Europa austro-orientalis, Anatolia, Caucasus, Iraq borealis, Talish, Persia boreo-occidentalis, Sibiria.

Tribus ***Lunarieae***

auctore K. H. Rechinger, Wien

Pili plerumque deficientes, si evoluti bifidi vel simplices. Fructus silicula lata applanata latisepta. Radicula accumbens. — Genera 55—56.

55. ***Peltariopsis***

Peltariopsis (Boiss.) N. Busch, Monit. Jard. Bot. Tiflis N. Ser. 3—4: 8 (1927).
Syn.: *Cochlearia* Sect. *Peltariopsis* Boiss., Fl. Or. 1: 247 (1867).

Plantae biennes humiles glaberrimae glaucae. Folia carnosa. Sepala erecto-patula, non saccata. Petala alba. Filamenta edentula, basin versus saepe dilatata. Silicula a dorso compressa, oblique elliptica. Valvae planae, reticulato-nervosae, nervo mediano interdum indistincto. Loculi 4—5-spermi. Embryo pleurorrhizus. Cellulae epidermidis septi elongatae numerosae parallelae.

1a. Pedicellus silicula quadruplo longior. Silicula stigmate subsessili apiculata ..... 1. *P. drabaecarpa* (Boiss.) N. Busch
b. Pedicellus silicula aequilongus usque sesquilongior. Stigma sessile ..... 2. *P. planisiliqua* (Boiss.) N. Busch

1. ***P. drabicarpa*** (Boiss.) N. Busch, Monit. Jard. Bot. Tiflis N. Ser. 3—4: 8 (1927).
Syn.: *Cochlearia drabaecarpa* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 169 (1842).
Typus: Auch. 4152, G, W!

Pluricaulis glaucescens, a basi in caules vel ramos stricte erectos simplices crassiusculos in dimidio inferiore polyphyllos divisa. Folia omnia crassiuscula, basalia orbiculari-spathulata, petiolo lato lamina longiore, lamina usque ad 8×8 mm; folia caulina numerosa minuta, spathulata, petiolata, recurva et plicata. Pedicelli fructiferi erecto-patentes, usque ad 17 mm longi. Axis inflorescentiae recta. Calyx pallidus membranaceus, 2 mm longus. Petala alba 3 mm longa. Siliquae juniores 4×0,8 mm. Stylus brevissimus.

Persia: W: Azerb.: In montibus „Seid Khodji", Auch. 4152!

Distr. gen.: Endem.

2. ***P. planisiliqua*** (Boiss.) N. Busch apud Grossh. & Schischk., Pl. Or. Exs. 1928 No. 282 (schedula impressa).
Syn.: *Cochlearia planisiliqua* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 169 (1842).
Icon.: Clavis p. 5.
Typus: Auch. 4169-I, G!

Perennis pluricaulis vel a basi in ramos plures superne nudos ascendentes flexuosos divisa. Folia carnosula, basalia non visa, caulina inferiora, usque ad 10×8 mm, oblongo-elliptica vel rotundata obtusa breviter petiolata. Axis inflorescentiae recta nec flexuosa. Pedicelli fructiferi saepe subhorizontaliter patentes, 10—15 mm longi. Calyx vix 2 mm longus. Siliquae usque ad 10×4 mm sursum curvatae, elliptico-lanceolatae, applanatae. Stylus subnullus. Petala alba, 3,5 mm longa.

Persia: W: Azerb.: „Seid Khodji", Auch. 4169! Kuh-e Mishu Dagh prope stationem viae ferrae Yam, in schistosis calc., 2200 m, Grossh. 282!

Distr. gen.: Endem.

56. *Peltaria*

Peltaria Jacq., Enum Stirp. Vindob. 117 (1762).

Herbae. Caules foliaque glabri vel pilis bifidis sparsissime obsiti. Sepala non saccata. Petala alba (in nostris). Filamenta exappendiculata. Ovarium 2—4-ovulatum. Siliculae orbiculares, applanatae, indehiscentes. Pedicelli deflexi. Semina 1—3.

1a. Siliculae suborbiculares, nervo marginali distincto ..... 1. *P. angustifolia* DC.

b. Siliculae obovatae subobliquae, nervo marginali indistincto ..... 2. *P. turkmena* Lipsky

1. ***P. angustifolia*** DC., Reg. Veg. Syst. Nat. 2: 329 (1821).

Icon.: Clavis p. 5 et 23.

Typus: Syria: Circa Damascum in monte Djebel Cher, Labillardière.

Herba annua, *Allium sativum* redolens. Caules erecti, 40—60 cm alti, glabri. Folia caulina inferiora elliptica vel anguste elliptica usque oblonga, serrata, petiolata; folia caulina superiora similia sed sessilia, omnia subtus secus nervos pilis bifidis sparse obsita. Siliculae valde applanatae, papyraceae, late alatae.

Persia: W: Azerb.: 24 km SE Mahabad, 1500 m, Furse 2186! Kermansh.: Kuh-e Safid, Str. Esf.: 48 km W Esfahan, Stutz 851! Ham.: Kuh-e Garri, Str. Distr. Silakhor, Str. Lur.: Oshtoran Kuh, Str. Dow Rud, 1650 m, Koelz 15632!, 17447! Chamchid, 1500 m, Koelz 15846! Bisheh, 1200 m, Koelz 619! 25 km E Khorramabad, 1900 m, Koelz 1436! Inter Khorramabad et Dezful, 1050 m, Furse 1136! Bakht.: Damaver, Koelz 15152! Zard Kuh, Hakimi 5668-E! — S: Fars.: Shiraz, Ky. 569, Pravitz 600! Inter Kazerun et Shiraz, 2100 m, Furse 1272! 58 km W Shiraz, 1600 m, Grant 15537! Dasht-e Arzhan, Stapf 191! Kuh-e Dasht prope Kazerun, Stapf 190! — E: Khor.: Bar, 1800—2500 m, Schmid 6257!

Distr. gen.: Anatolia australis, Syria, Persia.

Über die Variabilität der *P. angustifolia* und die Unmöglichkeit einer schärferen Abgrenzung der var. *affinis* Hausskn. apud Bornm. vgl. Rechinger fil., Dansk Bot. Arkiv 15, 4: 15 (1953).

2. ***P. turkmena*** Lipsky, Acta Horti Petrop. 18: 8 (1901).

Typus (Syntypi): Turcomania: Germaub, Radde 521; Chodscha Kala etc., Radde 244; Aschabad, Litw. 585, LE.

Differt a specie praecedente foliis caulinis majoribus et siliculae characteribus in clavi indicatis.

Persia: E: Khor.: Kopet Dagh: Allah Akbar, Rech. 1704!

Turcomania: Suluklü, Sint. 835. Kara Kala, Sundsodagh, Sint. 1797. Garmab, Radde 521. Khodzhakala, Radde 244. Prope Gaudan, 1800 m, Litw. 586. Ashkhabad, Garmab, Litw. 585, Radde 521. In angustiis montium prope Ashkhabad, Litw. 525-a!

Distr. gen.: Endem.

Tribus ***Alysseae***

auctore K. H. Rechinger, Wien

Pili plerumque stellati vel dendroidei vel furcati vel bifidi, raro simplices. Filamenta saepe appendiculata. Cellulae repli parietibus parallelis. Radicula accumbens. — Genera 57—65.

57. ***Farsetia***

Farsetia Turra, Diss. Farsetia 1 tab. 1 (1765).

Lit.: B. L. Burtt, Kew Bull. 1948: 469 (1949). S. M. H. Jafri, Notes from the Royal Botanic Garden Edinburgh 22: 209—216 (1957).

Herbae vel suffrutices. Folia angusta integra. Indumentum e pilis appressis bifidis consistens. Flores maiusculi, breviter pedicellati, laxe racemosi. Sepala erecta, obtusiuscula, non saccata. Petala angusta; lamina oblongo-elliptica, antice rotundata, in unguem longum contracta. Filamenta libera, anguste linearia, interiora sublatiora. Nectaria lateralia, hypocrepica. Ovarium 10—40-ovulatum; stylus brevis, crassus; stigma magnum bilobum, lobis decurrentibus. Siliqua plana, linearis usque ovata, bivalvis; septum tenue, pellucidum, nitidum; valvae tenues, nervi mediano tenui percursae. Semina magna, valde compressa, suborbicularia, late alata, valde mucilaginosa.

1a. Sepala 3—4 mm longa 2
b. Sepala 5—9 mm longa 3
2a. Herba annua. Siliqua (7—) 12—15×4—5 mm ..... 5. *F. ramosissima* Hochst. ex Boiss.
b. Suffrutex. Siliqua (10—) 25×2,5—3 mm ..... 3. *F. Hamiltonii* Royle
3a. Suffrutex ramis induratis rigidis divaricatis. Siliqua 2—2,8 mm lata ..... 2. *F. heliophila* Bge. ex Cosson
b. Suffrutices basi lignescentes ramis herbaceis. Siliqua latior 4
4a. Siliqua (10—) 15—20×(4—) 5 (—6) mm 4. *F. Edgeworthii* Hook. f. & Thoms.
b. Siliqua 25—36×3—4 mm ..... 1. *F. Jacquemontii* Hook. f. & Thoms.

1. ***F. Jacquemontii*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 148 (1861).
Syn.: *Heliophila incana* Burm. fil., Fl. Ind. 140, tab. 46 (1768) non *Farsetia incana* (L.) R. Br. (1811). *F. macrantha* Blatt. & Hallb., Journ. Bomb. Nat. Hist. Soc. 26: 220 (1918) fide Jafri.
Icon.: Clavis p. 27 et 29.
Typus: Punjab, Pind Dad Khan, Jacquem.

Suffrutescens (an interdum jam primo anno florens?), saepe valde ramosa, ramis 15—45 cm longis, ± divaricatis; indumentum totius plantae e pilis bipartis albidis appressis consistens. Folia lineari-lanceolata vel linearia, 1—6×0,1—0,7 (—1,2) cm, sessilia, acuta vel subobtusa. Racemi laxi, fructiferi usque ad 20 cm elongati. Sepala 5—7 mm longa. Petala 10—15 (—20)×1,5—2,5 mm, quam sepala multo usque ad duplo longiora. Siliqua 25—36×3—4 mm, late linearis, compressa. Stylus 0,5—1 mm longus. Semina anguste (0,6—0,9 mm) alata.

Afghanistan: Griff.
Pakistan: S.-Wazir.: Prope Tank, Williams 7767. — Bannu: In collibus 30 km N Bannu versus Kohat, 500 m, Rech. 30045!, Rahman in R. R. Stewart 25890! Tutaki, 50 km N Bannu, 700 m, Rech. 30073! — Quetta: Harnai, Lace. W Duki, 1150 m, Rech.

29614!, Lamond 1332! In jugo Bolan, Griff. 38 km E Gumbaz, 1050 m, Rech. 29674!, Lamond 1374-a! — Kalat: 30—50 km W Bela, 300 m, Rech. 27636!, Lamond 315! Infra Mach, Lamond 877! — Dera Ismail Khan: M. Suleiman, 60 km E Fort Munro, in saxosis calc., Rech. 29942! — Sind: In collibus calc. 10—15 km S Sehwan, Lamond 868!, Rech. 28691! Bal.: Baluchistan, Lace 3504, Stocks 432. Makran: Panjgur, Hotson M 336. — Karachi: Drigh Road, Jafri s.n.! — Kachhi, H.-B. 23307.

Distr. gen.: Afghanistan?, Pakistan occidentalis, India.

Die Art ist selbst in der hier angenommenen engeren Fassung, d. h. nach Ausschluß der *F. heliophila*, noch ziemlich variabel. Durch offenbar einjährigen Wuchs fallen vor allem Rech. 30045 und Jafri s. n. auf; wahrscheinlich handelt es sich um winterannuelle bzw. ausnahmsweise bereits in der ersten Vegetationsperiode zur Blüte gelangte Exemplare. Rech. 28691 fällt durch dicke, brüchige Stengel auf. Rech. 29674 und Lamond 1374-a vom selben Fundort stellen eine dünnstengelige und zartblättrige Schattenform mit stark zurücktretender Behaarung dar. Rech. 29942 ist durch ungewöhnliche Länge der Schoten — bis zu 46 cm Länge bei nur 3 mm Breite — ausgezeichnet und fällt in dieser Hinsicht aus dem Rahmen der sonst für *F. Jacquemontii* angenommenen Variabilität.

2. ***F. heliophila*** Bge. ex Cosson, Comp. Fl. Atl. 2: 227 (1884); Bornm., Beih. Bot. Centrbl. 28: 104 (1911); id. 59 B: 289 (1939); Rech. f., Phyton 3: 52 (1951), descr. compl.

Typus: Persia, Kerman, Bge.

Suffrutex ramossimus hemisphaericus, ramis rigidis divaricatis induratis 10—30 cm longis, pilis appressissimis bifidis dense dispositis albidus. Folia raro ultra 20×2 mm, plerumque valde reducta, non numerosa, linearia vel lineari-lanceolata, basi attenuata, apice saepe rotundata vel obtusiuscula, superiora valde diminuta, omnia fere fructificationis tempore decidua. Racemi pauciflori, ab initio laxi. Sepala 5—6 mm longa. Petala brunnescentia, calyce duplo longiora. Siliqua 25—30 (—61) ×2—2,8 mm, anguste linearis, utrinque breviter attenuata. Stylus 1—1,5 mm longus. Semina ± 2,5 mm, ala basi et apice quam in lateribus plerumque latiore.

Persia: S: Kerm.: Ad marginem australem deserti Lut prope Fahraj, Rech. 27160! Khabis, Bge. Kuh-e Jebal Barez prope Bam inter Darzin et Deh Bakri, 1500 m, Rech. 3701! Inter Abareq et Darzin, 1200 m, Rech. 3579! Ad limites austro-orientalis deserti Lut prope Nosratabad Sipi, 1400 m, Rech. 3913! Lar.: Bandar Abbas, Rech. 3455!, Bornm. 89! Minab, Behb. 200-E! Tang-e Dalan inter Lar et Bandar Abbas, 400 m, Gauba & Sab. 167! Qeshm, Bornm. 90. Bal.: Karevandar inter Khash et Iranshahr, 1500—1600 m, Rech. 3994! Sarbaz, Salavatian 202-E! Narmashir, 600 m, Gabr. 11. — E: Khor.: Tabas, Bge.

Pakistan: Bal.: Chagai, in desertis 20—30 km E Mirjaveh, Lamond 133! Baluchistan, Stocks. Makran: 20—30 km S Panjgur, Rech. 30100!, Lamond 584! Inter Gwadar et Suntsar, Rech. 27962! W Awaran versus Hoshab, Rech. 27694!

Distr. gen.: Endem.

F. heliophila hat mit *F. Jacquemontii* die relativ großen Kelche und Korollen und die relativ schmalen Früchte gemeinsam. *F. heliophila* ist jedoch durch den sparrigen Wuchs, die stark verholzenden Zweige, die meist stark reduzierten, frühzeitig abfallenden Blätter und durch längere und schmälere Früchte verschieden. Von Jafri, Notes Roy. Bot. Gard. Edinb. 22: 213 (1957) wurden die beiden Arten nicht unterschieden.

In ihrer Verbreitung und Ökologie schließen sich die Arten offenbar weitgehend aus, indem *F. heliophila* ihr Verbreitungszentrum in den südlichen Wüstengebieten des iranischen Hochlands hat, während *F. Jacquemontii* eine felsbewohnende Pflanze der östlichen iranischen Gebirgsumrahmung und des westlichen Himalaya-Vorlandes ist. Der Name

F. heliophila wird hier als eindeutig auf die südiranische Pflanze bezüglich verwendet, die Boissier, Fl. Or. 1: 158 (1807) als *F. linearis* Decne. bezeichnet. Die Antwort auf die Frage nach den Beziehungen zu den beiden offenbar nah mit *F. heliophila* und *F. Jacquemontii* verwandten arabischen Arten *F. longisiliqua* Decne. und *F. linearis* Decne. bleibt monographischen Studien vorbehalten.

3. ***F. Hamiltonii*** Royle, Ill. Bot. Himal. Mount. 71 (1834).
Syn.: *Erysimum remotiflorum* O. E. Schulz, Notizbl. Bot. Gart. Berlin 11: 226 (1931), fide Jafri.
Typus: „Western bank of Jumna from Delhi to Agra", Royle.

Basi ± lignescens, 10—90 cm alta, valde ramosa; indumentum e pilis bifidis appressis consistens densum albidum. Rami tenues virgati ± divaricati. Folia oblongo-linearia, magnitudine valde variabilia, 1—4 × 0,1—0,3 (0,5) cm, rarius maiora, sessilia, integra. Racemi laxi ebracteati, fructiferi usque ad 40 cm elongati. Sepala 3,5 (—4) mm. Petala 4,5—5 × 0,8—1,2 mm, quam sepala paulo longiora. Siliqua 10—25 × 2,5—3 mm, utrinque rotundato-attenuata; stylus 1—1,5 mm longus, filiformis. Semina latiuscule alata, ala ± 1 mm lata.

Pakistan: N. Wazir.: Infra Spinwam Fort, Blatt. & Fz. 753. — Quetta, Lace 3400. Sibi, 90 m, Lace 3426!

Distr. gen.: Pakistan, India.

4. ***F. Edgeworthii*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 147 (1861).
Syn.: *F. Jacquemontii* Hook. f. & Thoms. subsp. *Edgeworthii* (Hook. f. & Thoms.) Jafri, Notes Roy. Bot. Gard. Edinb. 22: 213 (1957). *F. aegyptiaca* Turra var. *gracilior* Boiss., Fl. Or. 1: 159 (1867).
Icon.: Clavis p. 25.
Typus: Punjab, Salt Range, Edgew. 1012, K.

Suffrutex ramosissimus 30—50 cm altus, ramis tenuibus virgatis saepe arcuatis, indumento e pilis bifidis appressis consistente canescenti-virens. Folia numerosa, integra, angustissime linearia, acuta. Pedicelli 4—7 mm longi, fructiferi erecto-patentes. Sepala 8—10 mm longa. Petala purpurascentia, sepalis plus quam sesquilongiora. Siliquae (1—) 1,5—2 cm longa, (4—) 5 (—6) mm lata, utrinque breviter subrotundato-attenuata. Stylus ± 1 mm longus.

Afghanistan: E: Kabul: Sarobi, 1050 m, Gilli 902!, Volk 2418!, Volk 1904!, Kitam. Jalalabad, 700 m, Koelz 2959!, Kerst. 644! Nangarhar: In valle Kunar 40—60 km NE Jalalabad, 800 m, Rech. 32406!
Pakistan: Malakand: Malakand versus Dargai, Rech. 30872! — Peshawar: Landi Kotal, 1000 m, Rech. 30322!, In jugo Khyber, Halcro Johnston 109!, 131!, Rech. 30322!; 650—900 m, Lamond 1598!

Distr. gen.: Pakistan occidentalis, Afghanistan orientalis.

Die Unterordnung *F. Edgeworthii* als Subspecies unter *F. Jacquemontii* durch Jafri l.c. ist nicht gerechtfertigt. Vielmehr sehe ich die nächste Verwandte der *F. Edgeworthii* in *F. aegyptiaca* Turra, Diss. Farsetia 1, tab. 1 (1765), die sich im allgemeinen durch längere Kelche von meist über 10 mm Länge und größere, breitere, beiderseits mehr abgerundete Früchte von *F. Edgeworthii* unterscheiden läßt. Auch in der Blütenfarbe dürften Unterschiede bestehen, die an lebenden Pflanzen zu überprüfen bleiben. Die östlichsten mir bekannten Fundorte der *F. aegyptiaca*, einer in den Wüsten von Iraq weitverbreiteten Art, liegen östlich des Wadi Tharthar: Rech. 9518, Barkley 7255!, knapp westlich der Grenze des in der Flora Iranica behandelten Gebietes.

5. ***F. ramosissima*** Hochst. ex Boiss., Fl. Or. Suppl. 30 (1888).
Typus (Syntypi): In littore aegyptiaco Maris Rubri inter Kasseir et Ras Benass, Schweinf., G. In collibus arenosis prope pagum Cordofanum Abu Gerad, Ky 26, W!

Herba annua; radix tenuis. Tota planta pilis bifidis appressis omnino canescens. Caulis a basi in ramos tenues graciles divaricatos decumbentes vel ascendentes 10—40 cm longos divisus. Folia anguste linearia, ad summum 30×3 mm, saepe angustiora. Racemi ab initio laxi. Pedicelli breves, axi ± appressi vel erecto-patuli, floriferi 1—2 mm, fructiferi usque ad 3 mm longi. Sepala 3—3,5 mm longa. Petala pallide lilacina „mauve", calyce tertia circiter parte longiora. Siliquae (sino stylo) (7—) 12—15×4—5 mm, utrinque rotundatae; stylus 1,5—2 mm longus. Semina orbicularia ± 3 mm diametro, ala aequilata hyalina ± 0,7 mm lata.

Pakistan: Bal.: Makran: Prope Turbat, in arenosis, 250 m, Popov 111! 90—100 km S Turbat, in arenosis mobilibus versus Pasni, Rech. 27846! Inter Gwadar et Suntsar, Rech. 27961! 8—25 km W Awaran versus Turbat, Rech. 27720! Inter Pasni et Kappar, Rech. 27873!, Lamond 461! 20—30 km S Panjgur, Rech. 28141! W Hoshab, Lamond 357! Panjgur, 1000 m, Lamond 597!; 900 m, Popov 190!

Distr. gen.: Aegyptus, Nubia, Pakistan, Makran.

Die Art war bisher meines Wissens nur aus Afrika bekannt. Die Übereinstimmung der makranischen Belege mit den im Herbar W vorliegenden ostafrikanischen ist gut. Neben dem einjährigen Wuchs und den zarten, dünnen Zweigen ist die Art durch den im Vergleich zur relativ kurzen, breiten Frucht langen Griffel und die kurzen Petalen gut gekennzeichnet. — Der lange Griffel fällt übrigens schon im Blütenzustand auf. Die Art ist offenbar in ihrem Vorkommen an tiefen, lockeren Sand gebunden.

Hierher gehört wohl auch die Angabe aus Garmkan, NE Panjgur, 910 m, Hotson 165 nach Blatt., Hallb., McCann, Journ. Ind. Bot. 1: 56 (1919) unter *F. aegyptiaca*.

58. *Straussiella*

Straussiella Hausskn., Mitt. Thür. Bot. Ver. N.F. 11: 69 (1897).

Lit.: J. Bornmüller, Feddes Repertorium specierum novarum regni vegetabilis 3: 114—116 (1907).

Caespitosa. Folia lineari-spathulata. Sepala 5—7 mm longa, decidua, lateralia haud saccata. Filamenta exteriora tenuiora, supra medium dente minuto provisa, interiora latiora, interdum dente indistincto provisa; antherae oblongae, obtusiusculae. Ovarium 8-ovulare; stylus tenuis. Semina pleurorhiza, magna. — Genus monotypicum.

1. ***St. purpurea*** (Bge.) Hausskn., Mitt. Thür. Bot. Ver. N.F. 11: 69 (1897).
Syn.: *Clastopus purpureus* Bge. ex Boiss., Fl. Or. 1: 261 (1867). *C. bicolor* Stapf, Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 51: 33 (1886). *Straussiella iranica* Hausskn., Mitt. Thür. Bot. Ver. N.F. 11: 79 (1897). *St. bicolor* (Stapf) Hausskn., Mitt. Thür. Bot. Ver. N.F. 12: 18 (1898).
Icon.: Clavis p. 23.
Typus: Inter Ssof et Kohrud, Bge.

Suffruticosa, caespitosa, humilis, pilis stellatis brevibus irregularibus incana. Folia basalia et caulina inferiora lineari-spathulata, cum petiolo 1—2 cm longa, 1—3 mm lata. Pedicelli fructiferi ± 2 cm longi, rigidi, rectangulariter patentes. Caules floriferi 6—12 cm alti. Sepala 5—7 mm longa, erecta, decidua, lateralia haud

saccata. Petala purpurea vel flava; lamina obovata leviter emarginata, in unguem longum sensim attenuata. Filamenta exteriora tenuiora, supra medium dente minuto provisa, interiora latiora, interdum dente indistincto provisa; antherae oblongae, obtusiusculae. Ovarium 8-ovulare, dense stellato-pilosum; stylus 6—9 mm longus tenuis, rigidus, stigma bilobum. Silicula ovata, inflata, bilocularis; septum tenue. Semina pleurorhiza, magna, suborbicularia, compressa, margine anguste alata, humiditate valde mucilaginosa.

Persia: W: Ham.: Tafresh, Str. Arak: M. Latetar, Str.!, Pichler. M. Alvand prope Golpayegan, Str.!, Pichler. Kuh Kohrud, Str.! Inter Soh et Kohrud, Str. Shurab in M. Karaghan, 2000 m, Str. Kuh Gasavand, Str.! — In districtu „Oschapelakh", Str.!

Distr. gen.: Endem.

O. E. Schulz anerkennt nur eine Art, *St. purpurea* (Bge.) Haussk. mit drei Farbvarietäten: *genuina* Bornm., *bicolor* (Stapf) Bornm., *perflava* Bornm.; vgl. Bornmüller, Beih. Bot. Centrbl. 19, 2: 208 (1905) et 27, 2: 302 (1910).

59. *Clastopus*

Clastopus Bge. ex Boiss., Fl. Or. 1: 261 (1867).

Lit.: J. Bornmüller, Feddes Repertorium specierum novarum regni vegetabilis 3: 114—116 (1906).

Dense caespitosa, pilis inaequalibus ramosis mollibus tomentosa. Folia basalia et caulina inferiora angusta. Sepala erecta, lateralia non saccata, persistentia et cohaerentia, maturitate accrescentia fructum involucrantia. Petala aut flava concoloria aut basin versus aut omnino purpurea; lamina obovata, margine undulata, apice rotundata, in unguem longum tenuem subito contracta. Filamenta exteriora angusta, prope medium denticulo provisa, interiora subrecurva, latiora. Antherae oblongae, obtusae. Ovarium 5—8-ovulatum, ± glabrum; stylus sat longus, persistens; stigma fissum, lobis deflexis. Silicula ovata, bilocularis; septum tenue, rugosum. Semina parva, suborbicularia, compressa, non alata, granulosa, humiditate non mucilaginosa.

1a. Flores magni flavi. Calyx 9—12 mm longus, fructifer valde auctus. Siliculae glabrae. Stylus brevis ..... 1. *C. vestitus* (Desv.) Boiss.
b. Flores minores saepe purpurascentes vel bicolores. Calyx fructifer minus auctus. Siliculae saepe ± pilosae. Stylus elongatus 2. *C. erubescens* Haussk.

1. ***C. vestitus*** (Desv.) Boiss., Fl. Or. 1: 261 (1867).
Syn.: *Vesicaria vestita* Desv., Journ. Bot. 3: 171 (1814).
Icon.: Clavis p. 25.
Typus: Hamadan, Olivier, P.

Suffruticosus caespitosus. Caudices abbreviati foliorum residuis comosi. Folia usque ad 40×3 mm, indumento stellato dense canescenti-tomentosa, oblongo-linearia. Caules floriferi usque ad 15 cm alti (fructiferi non visi). Pedicelli floriferi erecti 15—25 mm longi. Sepala 9—12 mm longa. Silicula matura non visa, quam in specie sequente major dicitur, glabra. Stylus 2 mm longus.

Persia: N: Maz.: Kojur: Namasgar, Gauba & Sab. — W: Ham.: Prope Hamadan, Oliv. In valle Yander prope Hamadan, Stapf. Nahavand, Str. In montibus supra Asadabad, Str. Shurab, Pichler! Arak: Golpayegan, Str. M. Alvand, Auch. 249, Str.!, Pichler!, Balls 94!, Stapf. — C: Tehr.: M. Tuchal, Bornm. 6211!, 6212!, 6213! In

valle Shahrestanak, 3200 m, Bornm. 6214. In jugo Kandavan, 3200 m, Bornm. 6215, Gauba.

Distr. gen.: Endem.

2. ***C. erubescens*** Haussk., Mitt. Thür. Bot. Ver. N.F. 15: 6 (1900).
Syn.: *C. erubescens* var. *stenophyllus* Bornm., Feddes Repert. 3: 114—115 (1906).
Icon.: Tab. 11, fig. 1.
Typus: Kuh-i Garri prope Nahavand, Str., JE.

Suffruticoso-caespitosus, caudicibus elongatis residuis foliorum persistentibus dense obsitis columnaribus. Folia usque ad 30×2 mm indumento stellato dense canescentia, anguste linearia. Caules fructiferi usque ad 8 cm alti. Pedicelli fructiferi erecto-patuli, rigidi, 5—7 mm longi. Sepala 8 mm longa. Silicula 7 mm longa. Stylus 3 mm longus.

Iraq: Kurd.: Sul.: Penjwin, in montibus denudatis, substr. Tonschiefer, 1600 m, Rech. 10467!
Persia: W: Ham.: Kuh-i Garri prope Nahavand, Str. — C: Qazv.: In montibus Kharzan prope Qazvin, 2200 m, Bornm. 6216.

Distr. gen.: Endem.

60. *Physoptychis*

Physoptychis Boiss., Fl. Or. 1: 260 (1867).

Caespitosa, humilis, pilis stellatis incano-tomentosa. Folia anguste spathulata vel linearia, integra. Sepala erecta, lateralia paulo saccata, omnia acutiuscula, late scarioso-marginata. Petala flava; lamina obovata, leviter emarginata, sensim in unguem aequilongum attenuata. Filamenta exteriora tenuiora, infra medium dento minuto provisa vel interdum edentula, interiora latiora. Antherae oblongae, obtusae. Ovarium 4—12-ovulatum, dense pilosum; stigma capitatum leviter emarginatum. Silicula globosa, inflata, maiuscula, bilocularis; septum tenerrimum. Semen suborbiculare, atro-brunneum, planum, anguste alatum, humiditate non mucilaginosum.

1. ***Ph. gnaphalodes*** (DC.) Boiss., Fl. Or. 1: 260 (1867).
Syn.: *Alyssum gnaphalodes* DC., Reg. Veg. Syst. Nat. 2: 311 (1821). *Vesicaria gnaphalodes* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 161 (1842).
Icon.: Clavis p. 23; tab. 12, fig. 1 et 2.
Typus: M. Alvand S Hamadan, Olivier, P.

Folia emortua diu persistentia. Caules floriferi 5 cm alti, dense foliati. Folia inferiora oblongo-spathulata, usque ad 1—2×0,5 cm, in petiolum latum sensim attenuata, apice rotundata; caulina oblongo-lanceolata, basi ± attenuata, sessilia. Calyx ± 6 mm longus. Petala calyce circiter duplo longiora. Silicula 8—12 mm diametro.

Iraq: Arbil: Algurd Dagh, 3000—3600 m, Ludlow-Hewitt 1506, Guest & Ludlow-Hewitt 2888, Guest 3053, Rech. 11459! Chiya-i Mandau, 2400—2700 m, Guest & Ludlow-Hewitt 2721. M. Qandil, Rech. 11159!
Persia: N: Gorg.: M. Shahvar supra Ostamaidan, 3500 m, Rech. 6038! Maz.: In jugo Kandavan, 3000 m, Furse & Synge 370! Kuh-e Nizwa, in cacumine occidentali, 3200 m, Wdb. 1246! In declivibus borealibus Kuh-e Nizwa, 2900—3000 m, Wdb. 1246!, Behb. 5634-E! Gil.: Gilan, Auch. 4087. In regione alpina Persiae borealis, in montibus Elburz, Auch. 4078, Ky. 198. — W: Azerb.: Kuh-i Bilqis, Knapp. Ham.: M. Alvand S Hamadan, Olivier, Str., Balls 95! Bakht.: Zard Kuh, Auch. 248. Lur.: Oshtoran Kuh, 4000 m, Str. — S: Fars.: Kuh-e Dinar, Ky. 722. — C: Tehr.: N. Tuchal supra Emamzadeh

Dawud, Bornm. 6189! In jugo Kandavan, 3000 m, Furse & Synge 370. In jugo Ser Chilan, 3800 m, Bornm. 6192. Shahrestanak, 2300—2500 m, Bornm. 6191. Supra jugum Ladd, 3200 m, Bornm. 6190.

Distr. gen.: Transcaucasia, Anatolia, Iraq borealis, Persia.

61. *Fibigia*

Fibigia Medicus, Pflanzengatt. 1: 90 (1792).

Suffrutices vel herbae, indumento asperulo e pilis stellatis minutis composito, pilis longioribus interdum immixtis. Folia integra, rarius dentata. Sepala interiora saccata. Petala flava vel violacea. Filamenta non alata. Fructus silicula ± applanata valvis rigidis. Stigma capitatum. Semina numerosa, late alata.

1a. Calyx bisaccatus. Filamenta minora dente aucta rarissime edentula. Semina late alata. Pedicelli fructiferi rigidi. (Sect. *Fibigia*) 2
b. Calyx aequalis. Filamenta omnia edentula. Semina aptera. Pedicelli fructiferi flexuosi ± recurvi. (Sect. *Edmondia*) 5
2a. Flores purpureo-violacei. Pedicelli siliculi diametrum aequantes, patuli .... 4. *F. suffruticosa* (Vent.) Sweet
b. Flores flavi. Pedicelli siliculae diametro multo breviores, erecti 3
3a. Planta humilis caespitosa, caulibus floriferis 5—6 cm altis .... 3. *F. Thesigeri* Rech. f.
b. Plantae elatae non caespitosae, caulibus floriferis 30—80 cm altis 4
4a. Pedicelli brevissimi crassi usque subnulli. Bracteae inferiores quidem partim diu persistentes. Siliculae ellipticae, latitudine plus quam sesqui- usque subduplo longiores ..... 1. *F. clypeata* (L.) Medicus
b. Pedicelli distincti, inferiores quidem 3—5 mm longi. Bracteae omnes cito deciduae. Siliculae suborbiculares latitudine haud usque ad summum tertia parte longiores ..... 2. *F. macrocarpa* (Boiss.) Boiss.
5a. Racemi fructiferi quoque corymboso-congesti . 6. *F. umbellata* (Boiss.) Boiss.
b. Racemi iam fructiferi ± elongati 6
6a. Caules usque ad 30 cm alti. Silicula 10—12 mm longa .... 5. *F. multicaulis* (Boiss.) Boiss.
b. Caules 6—15 (—20) cm alti 7
7a. Caules 6—8 (—10) cm alti. Folia basalia minuta spathulata; surculi non columnares ..... 7. *F. pendula* (Boiss.) Boiss.
b. Caules 10—15 (—20) cm alti. Folia omnia lineari-lanceolata; surculi residuis foliorum emarcidorum conferti columnares ..... 8. *F. membranacea* Rech. f.

Sect. *Fibigia*.

Syn.: Sect. *Eufibigia* Boiss., Fl. Or. 1: 257 (1807).

Calyx bisaccatus. Filamenta minora dente aucta, rarissime edentula. Siliculae crasse coriaceae; pedicelli rigidi. Semina late alata.

1. ***F. clypeata*** (L.) Medicus, Pflanzengatt. 1: 90 (1792).

Syn.: *Alyssum clypeatum* L., Spec. Plant. 651 (1753). *Farsetia clypeata* R. Br. in Aiton, Hort. Kew, ed. 2, 4: 96 (1812).

Typus: „Habitat in Europa australi".

Basi breviter lignescens, caulem strictum plerumque singulum simplicem usque ad 80 cm altum vel caules paucos proferens. Folia basalia oblonga, caulina oblongo-

linearia, stricta. Pedicelli brevissimi, stricti; bracteae inferiores in statu fructifero persistentes. Stylus brevissimus, vix quintam partem siliculae latitudinis aequans. Loculi hexaspermi. Semina alata, ala semine angustiore.

Iraq: Kurd.: Mosul: Jabal Khantur porpe Sharanish a Zakho septentriones versus, 1480 m, Rech. 1203! Sul.: Qara Dagh, Makki in Barkley 451!
Persia: W: Kurd.: Dezh Shahpur, 2000 m, Furse 3402! Kermansh.: Bisotun, Jacobs 6234. Bakht.: Kuh Rang, Wdb. 959.

Distr. gen.: Europa austro-orientalis, Syria, Iraq, Tauria, Transcaucasia, Persia occidentalis.

Der Formenkreis der *F. clypeata* ist, soweit ich sehe, im Bereich der Flora Iranica sonst nur noch durch die im Gebiet viel häufigere *F. macrocarpa* (Boiss.) Boiss. vertreten. Nach meiner Auffassung gehören Auch. 4084 und Ky. 254 zu dieser Art und nicht zu *F. clypeata*. Der ganze Formenkreis (siehe Boissier 1: 257—258) bedarf einer Untersuchung.

2. ***F. macrocarpa*** (Boiss.) Boiss., Fl. Or. 1: 258 (1867).
Syn.: *Farsetia macrocarpa* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 89 (1842). *F. macroptera* Ky. & Boiss. ex Fourn., Bull. Soc. Bot. Fr. 11: 60 (1864). *Fibigia macroptera* (Ky. & Boiss. ex Fourn.) Boiss., Fl. Or. 1: 257 (1867). *F. clypeata* (L.) Medicus subsp. *macroptera* Bornm., Beih. Bot. Centrbl. 28/2: 112 (1911).
Icon.: Clavis p. 25.
Typus: Anatolia: Prov. Malatya: Ak Dagh, Auch. 236, K.

Suffrutescens, pluricaulis, caules 17—40 cm alti. Folia caulina lanceolato-linearia. Pedicelli fructiferi non bracteati. Siliculae (10—12—) 18—22 × 15—20 mm, late ovatae vel orbiculatae. Stylus silicula latitudine 4—6-plo brevior. Alae semini aequilatae vel latiores.

Iraq: Kurd.: Arbil: Chiya-i Mandau, 1800 m, Guest 2655. Kuh Safin, 1200 m, Bornm. 886. M. Sakri Sakran, 1400 m, Bornm. 885. M. Handren, 1300 m, Bornm. 884. M. Baradost, 2200 m, Thesiger 871. M. Qandil supra Pushtashan, 2000 m, Rech. 11810! Sul.: Palegawra W Sagirma Dagh, 24 km SW Pira Magrun, 1000 m, Helbaek 664! M. Avroman, Haussk. Tawilla, 1400—1600 m, Rech. 10279! Pira Magrun, Haussk. Mosul: Sirsang, Barkley 9049!, 9085! Jabal Khantur prope Sharanish N Zakho, 1480 m, Rech. 10841! Sawara Tuka inter Dihok et Amadiyah, 1500 m, Rech. 11566! Jabal Khair supra Mirsida, 40 km W Aqrah, Thesiger 573. Kirkuk: Darband-i Bazian prope Chamchamal, Rech. 10579!
Persia: W: Azerb.: Shahpur ad radices M. Gelosa, Knapp. Kurd.: M. Shahu, Haussk. Kermansh.: 40 km W Kermanshah, Mahi Dasht, Bent & Wr. 514—112. Ilam, Kuh Reno, Mirzayan 5632-E!, Behb. 5841-E! Bisotun, Jacobs 6234! Kuh-i Parrow, Str. Bernaj, Str. Ham.: Borujerd, Str. Kuh-e Garri, Str. Arak: Girdu, Str. M. Rasvand, Str. M. Shahsinde, Str. M. Latetar, Str. Arak versus Hamadan, Str. Bakht.: Gatvand in valle Bazoft, Mart.-Escal. Lur.: Kuh-e Saverz, Haussk. Kuh-e Eshger, Haussk. Oshtoran Kuh, Str. Dow Rud, Koelz 15558, 17148. 25 km E Khorramabad, 1900 m, Koeie 587. Khorramabad, Gauba 149, 231. — S: Fars.: 58 km W Shiraz, 1600 m, Grant 15536! Dasht-e Arzhan, Koelz 14771. Kalat, 35 km NW Shiraz, 2300 m, Grant 17713! Inter Tal-e Khosravi et Sisakht, Behb. 989-E! Inter Persepolis et Dowlatabad, Schmid 5460. Inter Shiraz et Tal-e Khosravi, Kakun, Behb. 991-E. Inter Sisakht et Deh Now, Behb. 990-E. Inter Shiraz et Firuzabad, Gauba 230. Kuh-e Dasht W Kazerun, Stapf 257. Kuh Bil prope Dasht-e Arzhan, Stapf 259. Kuh Charmakan, Stapf 258. In valle „Tscha Mana" prope Persepolis, Ky. 254.

Distr. gen.: Syria borealis, Anatolia orientalis, Armenia rossica, Persia occidentalis.

Der Typus der *F. macroptera*, Prov. Musch, ad radices australes montis Bingoell et in valle Goschkar, Ky. 380, W, stellt in der Größe der Siliculae 20—27 (!!)×17—20 mm, Samen mit Flügel ± 10 mm Durchmesser, Flügel breiter als der Saum, ein Extrem dar, das in den Ausmaßen von keinem der persischen Belege erreicht wird; die größten Siliculae erreichen 22 mm Länge und etwa 6—7 mm Durchmesser des Samens. Viele Belege nähern sich der von Boissier, Fl. Or. Suppl. als dem anderen Extrem beschriebenen var. *microcarpa*. Im übrigen zeigen sie ein ziemlich einheitliches Gepräge.

— — var. ***microcarpa*** Boiss., Fl. Or. Suppl. 48 (1888).
Siliculae 10—12 mm diametro.

Typus varietatis: Persia: W: Kuh-e Saverz et Kuh-e Eshger, Haussk.!

Distr. gen. varietatis: Endem.

3. ***F. Thesigeri*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 15: 426 (1964).
Typus: Thesiger 1194, BM!

Caespitosa humilis ± suffrutescens, surculos steriles basi partim ± elongatos et ramos floriferos emittens, pilis stellatis tomentosa, canescens. Caules floriferi 5—6 cm alti, ascendentes vel erecti, dense foliati. Folia omnia utrinque dense stellato-tomentella, subconcoloria, apice obtusiuscula usque acutiuscula, costa mediana subtus leviter prominente; folia surculorum sterilium et basalia caulium floriferorum numerosa, oblongo- vel obovato-spathulata, in petiolum latiusculum laminam subaequantem sensim attenuata, petiolo incluso ± 15 mm longa, ± 5 mm lata; folia caulina subangustiora, basi longius attenuata. Inflorescentia anthesi fere peracta conferta. Pedicelli floriferi breves, fructiferi inferiores elongati ± 5 mm longi, tomentosi. Sepala 5—6 mm longa, oblonga, erecta, basi saccata, anguste membranaceo-marginata, apice rotundato-attenuata. Petala ungue sepala subsuperante, limbo flavo oblongo-cuneato, ± 2 mm lato, margine undulata, apice rotundata. Silicula (junior) suborbicularis, 9 mm diametro, valde applanata, dense stellato-tomentosa; stylus filiformis, ± 3 mm longus; stigma minute capitatum.

Iraq: Kurd.: Arbil: M. Qandil, E Qala Diza, 2000—3300 m, Thesiger 1194!

Distr. gen.: Endem.

4. ***F. suffruticosa*** (Vent.) Sweet, Hort. Brit., ed. 4: 407 (1823).
Syn.: *Lunaria suffruticosa* Vent., Descr. Pl. Jard. Cels., tab. 19 (1800). *Farsetia suffruticosa* (Vent.) DC., Reg. Veg. Syst. Nat. 2: 286 (1821.) *Brachypus asper* Ledeb., Fl. Ross. 1: 133 (1842).
Typus: Planta quaedam culta.

Suffruticosa, pluricaulis, 35—60 cm alti, collo residuis petiolorum copiose comoso; caules (10—) 30—60 cm alti, arcuati vel erecti, simplices vel superne pauciramosi. Folia lanceolata acuta. Racemi fructiferi congesti, fructiferi valde elongati laxi. Pedicelli patuli siliculae diametrum saepe superantes. Calyx 7—9 mm longus. Petala purpureo-violacea speciosa. Silicula ± orbicularis, 12—17×9—14 mm diametro, glabra, loculis 2—4-spermis. Stylus 5—7 mm longus, caducus.

Iraq: Kurd.: Arbil: Algurd Dagh E Rost, 2600—3100 m, Haley 180! Schmid 5315, Thesiger 987! M. Baradost, 2200 m, Thesiger 872! M. Qandil E Qala Diza, 2600—3000 m, Thesiger 1193! Chiya-i Mandau, 2400 m, Guest 2793. Mosul: Zawita prope Sharanish, 2100 m, Rech. 10978! Sul.: M. Avroman, Haussk. Supra Tawilla, 2100 m, Rech. 10381!
Persia: N: Maz.: In jugo Kandavan Wdb. 2081!; 2700 m, Rech. 893!; 3100 m, Gilli. Supra Valiabad, Furse & Synge. Supra Ileka, 2500 m, Furse 2797. 64 km NE Damavand,

2000 m, Stutz 1266! — W: Azerb.: Lacus Rezaiyeh, Furse & Synge 786! Kuh-e Sahand, Buhse. Khvoy, Knapp. M. Gelosa prope Shahpur, Knapp. Var, Knapp. Einal Zeinal prope Tabriz, 1500 m, Grossh. Kuh-e Mishu Dagh prope Yam, Grossh. In collibus S Tabriz, Gill.-Sm. 1738, 2246. Ser, Gill.-Sm. 1552, 1587. Azerbaijan, Szov. Kurd.: 20 km W Sanandaj, 2300 m, Bent & Wr. 520—105! Areman, Shar. 5653-E! M. Shahu, Haussk. Str.! Sanandaj, 1800 m, Jacobs 6927! Kermansh.: 100 km N Kermanshah versus Sanandaj, Wdb. 1970. Kuh-i Karand, Str. Kangavar, Str. Kuh-e Kinisht, Str. Ham.: Borujerd, Str. Kuh-e Garri, Str. Supra Tafresh, Str. Kuh-e Vafs, Str. Inter Sahneh et Hamadan in jugo Elias, Str. M. Karaghan, Str. Ganjnameh, Stapf. Shurab, Stapf. M. Alvand, Oliv., Auch., Stapf, Str. Aq Bolagh-e Aqdaq, Rioux & Golv. 195-a, 197! Inter Hamadan et Qazvin, Michaux. Arak: Girdu prope Nazmabad, Str. Khomeyn, Str. M. Rasvand, Str. Latetar, Str. Kuh Kohrud, Str. Gasavand, Str. Kuh-e Safid Khaneh, Str. Esf.: Esfahan, Auch. 1631, 4084. Bakht.: Gahar, Koelz 17997! Kuh-e Safid, Mart.-Escal. Chehel Dokhtaran Kuh, Wdb. 1756. Lur.: Borj prope Nurabad, 2000 m, Koelz 1426. Oshtoran Kuh, Str. Dow Rud, 2000 m, Koelz 15668, 17407! Kuh-e Saverz, Haussk. Khorramabad, 2200 m, Koelz 558! — S: Fars.: Kuh-e Barfi prope Shiraz, Stapf 260! Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5315! Sabz Pushan prope Shiraz, Ky. 415! — E: Khor.: Bar, 1780—2530 m, Schmid 6298! Kopet Dagh: Alam Ali, 2000 m, Rech. 4828! — C: Tehr.: Darvand, Ky. 155. M. Tuchal prope Sharestanak, Bornm. 6221, 6222, 6223. Inter Emamzadeh Dawud et jugum Ladd, 3000 m, Bornm. 6224. Ab Ali, 3000 m, Furse 2560! Supra Ab Ali, Wdb. 751! In montibus a Tehran septentriones versus, 2300 m, Furse 1709! Qazv.: In jugo Kharzan, 1800 m, Bornm. 6226. In valle Loura, Buhse. Pich Kuh prope Karaj, 1600—2200 m, Rech. 568! Kuh Dashteh prope Karaj, Rech. 315! Inter Karaj et Gach Sar, 1200—2500 m, Schmid 5687! Karaj, Gauba. Shar.-Bust.: Inter Naudeh et Shahrud, 1000—2000 m, Schmid 6156! Khash Aylan, 2200 m, Rech. 5444! In jugo Shah, Assadabad, 2500 m, Furse 1952! — Khamseh, in faucibus Mizneh, Furse & Synge 314.
Turcomania: Ashkhabad, in montibus, Litw. 566. Suluklü ad fines Persiae, Sint. 1007. M. Messinew, Sint. 1007.

Distr. gen.: Iraq, Persia, Transcaucasia australis, Kurdistan, Turcomania (Kopet Dagh).

Die Art ist in der Höhe des Wuchses und in der Größe und im Umriß der Schötchen ziemlich variabel. Trotz ihrer weiten Verbreitung zeigt sie keinerlei Andeutung einer geographischen Gliederung.

Sect. *Edmondia* Bge. ex Boiss., Fl. Or. 1: 259 (1867).

Calyx aequalis. Filamenta omnia edentula. Siliculae tenues subpapyraceae. Semina aptera. Pedicelli tenues flexuosi, demum plerumque recurvi.

5. ***F. multicaulis*** (Boiss. & Hohen.) Boiss., Fl. Or. 1: 259 (1867).
Syn.: *Farsetia multicaulis* Boiss. & Hohen., Diagn. Pl. Or. Nov. Ser. 1, 8: 31 (1849).
Typus: Ky. 203, W!

Suffruticosa, multicaulis. Caules 15—30 cm alti, simplices, inferne tantum foliati. Folia oblongo-lanceolata vel lanceolata, apice rotundata, inferiora in petiolum longe attenuata, superiora basi attenuata, sessilia. Racemi floriferi subumbellato-conferti, fructiferi breviusculi sed laxi. Pedicelli ± 5 mm longi, capillares, tandem recurvi. Siliculae 10—12 mm longae, 9—12 mm latae, orbiculatae vel late ellipticae, pilis brevibus stellatis canescentes; stylus elongatus caducus; loculi 3—4-ovulati, 1—2-spermi.

Iraq: Kurd.: Sul.: M. Avroman, Haussk.!
Persia: N: Maz.: In valle Chalus, 2400 m, Rech. 937! In jugo Kandavan, Wdb. 2099; 2970 m, Gilli s. n.! — W: Kurd.: M. Shahu, 2700—3000 m, Haussk. s. n.! Lur.: Kebara, 1800 m, Koelz 18238! — S: Kerm.: Kuh-e Jupar, 3400 m, Bornm. 2143! —

C: Tehr.: Sharestanak, 2600 m, Bornm. 6226. Emamzadeh Hashem S Damavand, Wdb. 1414. Pas Qaleh, Ky. 203! In valle Ushan N Tehran, Wdb. 1815. Qazv.: Asadbar, Ky. 527!, 528! Asadbar versus Gach Sar, 2500—2700 m, Bornm. 6229. Gach Sar, 2400 m, Furse 2658! M. Hazarband, Darbandak, Gauba 232! Karaj, Alangeh, Gauba 233! In valle Loura, Bornm. 6227. In valle Talaqan supra Garab, 2700 m, Bornm. 6228. Kuh Dashteh, 2000 m, Gauba.

Distr. gen.: Endem.

Die Exemplare aus Kerman, Bornm. 2143, fallen durch dichtes, weißes Indument und schmal-lineale Blätter auf, stimmen aber im übrigen mit dem Typus überein.

6. ***F. umbellata*** (Boiss.) Boiss., Fl. Or. 1: 259 (1867).
Syn.: *Farsetia umbellata* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 13 (1845).
Typus: Ky. 576, W!

Suffruticosa, multicaulis, ± 30 cm alta, caules subsimplices stricti erecti. Folia oblongo-lanceolata obtusa, superiora anguste linearia. Racemi fructiferi quoque corymbosi conferti. Pedicelli tenues reflexi, silicula breviores. Petala flava, calyce plus quam sesquilongiora. Calyx ± 6 mm longus. Silicula 10—12×5—6 mm, elliptica, obtusa, unilocularis; stylus cito deciduus; loculi 4-ovulati, 1—2-spermi.

Iraq: Kurd.: Sul.: M. Avroman, 3000 m, Haussk. s. n.
Persia: N: Maz.: In valle fluvii Chalus, 2400 m, Rech. 937! In jugo Kandavan, 2970 m, Gilli s. n. — W: Kurd.: M. Shahu, Haussk. s. n. Kermansh.: Kuh-i Parrow, in faucibus prope Nojubaran, Str. Ad fontem Gamasiab, Str. Ham.: Kuh-e Garri, Str. Arak: Girdu, Str. Kuh Kohrud, Str. Yekab, Str. Prope Arak, Str. M. Alvand prope Golpayegan, 2200 m, Furse 1473, Str. Esf.: Kuh-i Damaneh, Str. Lur.: Kebara, 2000 m, Koelz 18238. — S: Fars.: Kuh-e Bul, 4000 m, Stapf 261. Kuh-e Dinar, Ky. 576. Kerm.: Kuh-e Laleh Zar, 3500 m, Bornm. 2140. Kuh-i Nasr, 2700 m, Bornm. 2142. Kuh-e Jupar, 3400 m, Bornm. 2143, 2144, 2145. — C: Tehr.: Inter Esfahan et Tehran, Bge. Qazv.: Gach Sar, 2300 m, Furse 2658. Alangeh prope Karaj, Gauba 233. M. Hasarband, Darbandak, Gauba 232. Yazd: In montibus prope Yazd, Buhse. Taft, 1900 m, Bornm.

Distr. gen.: Endem.

7. ***F. pendula*** (Boiss.) Boiss., Fl. Or. 1: 259 (1867).
Syn.: *Farsetia pendula* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 90 (1842).
Typus: Auch. 4086, isotypus W!

Suffrutescens caespitosa multicaulis, caules fructiferi ad 6—8 cm longi, omnino pilis valde appressis argentea. Folia basalia spathulata usque oblongo-spathulata, apice rotundata, lamina 2—3 mm lata, in petiolum eam aequantem vel paulo longiorem attenuata; folia caulina non numerosa, magis elongata, angustiora. Racemus fructifer brevis laxus oligocarpus; pedicellus tenuis flexuosus, fructifer recurvus ± 5 mm longus. Silicula obovata obtusa, 14—16×9—11 mm, pilis brevibus stellatis cana; stylus cito deciduus; loculi dispermi.

Persia: „Loco non notato", Auch. 4086!

Distr. gen.: Endem.

8. ***F. membranacea*** Rech. f., Phyton 3: 53 (1951).
Syn.: *F. afghanica* Rech. f. & Koeie, Anz. Österr. Akad. Wiss. Math.-Nat. Kl. 1954, 7: 3 (1954); Dan. Biol. Skr. 10, 3: 30, fig. 9 (1958).
Icon.: Clavis p. 23.
Typus: Koelz 12690, W!

Valde affinis *F. pendulae* (Boiss.) Boiss. a qua differt: surculis elongatis, residuis foliorum persistentibus dense confertis columnaribus; caulibus fructiferis saepe longioribus 10—15 (—20) cm altis crebrius foliosis, foliis omnibus multo longioribus angustioribus acutis, racemis plurifloribus fructiferis elongatis laxis, siliculis quamquam forma et magnitudine variabilibus plerumque minoribus angustioribus, apice saepe ± acutiusculis vel apiculatis.

Afghanistan: E: Kabul: Farakulum, 2500 m, Koelz 2523!, 3000! Unai: Kuh-i Qhalandaran, 3800 m, Hdg. & Wdb. 4507! Parvan: In valle Panjshir: In declivibus occidentalibus jugi Anjuman, 3900 m, Hdg. & Wdb. 5427-a! Dasht-i Rewat, Lindb. 1029! Ghazni: Dahan-e Abdila, 35 km E Sar-i Chasma, 2800 m, Rech. 18603! Inter Miradina et jugum Ghoutch Kol, N Sang-i Masha, 3300 m, Rech. 17591! — NE: Nuristan: In jugo Munjan, 4000 m, Koelz 12690! Auz Anjuman, 3400 m, Hdg. & Wdb. 5473! — C: Deh Kundi, 3000 m, Edelb. 1948! Bamian: Inter Bulola et jugum Shibar, 2800 m, Rech. 16774! In declivibus occidentalibus jugi Shibar, 3000 m, Hdg. & Wdb. 4211! Behzud, 3000 m, Hdg. & Wdb. 5025! In jugo Hajigak, 3500 m, Hdg. & Wdb. 4616! Bareki Cheidan ad viam versus Band-i Amir, 2800 m, Hdg. & Wdb. 4711! Band-i Amir, 2800 m, Rech. 18211!, 18229!, Volk 2765!, Podlech 12133. Ad lacum Band-i Zolfikar, ca. 2900 m, Rech. 18415! Kuh-i Baba prope Bamian, 3780 m, Gilli 1063!

Distr. gen.: Endem.

Naturbeobachtungen und neue, reichliche Aufsammlungen haben ergeben, daß die beiden von mir beschriebenen Arten vollkommen ineinander übergehen. Es besteht weder eine Korrelation der Merkmale, noch sind irgendwelche geographische Bindungen erkennbar. Die Unterscheidung von der persischen *F. pendula* beruht übrigens auch auf variablen Merkmalen. Da aber die Variationsbreite von *F. pendula* noch nicht bekannt ist, da sie seit ihrer Entdeckung nicht wieder gefunden wurde, und angesichts der großen Disjunktion konnte ich mich vorläufig zu keiner Zusammenziehung entschließen. Charakteristisch für *F. membranacea* ist der Farbwechsel der Petalen; sie sind leuchtend gelb, verfärben sich aber beim Abblühen in purpurn. Freilich läßt sich nicht feststellen, ob darin ein Unterschied gegenüber *F. pendula* besteht, deren Blüten noch unbekannt sind. Die Schötchen der *F. membranacea* sind im Leben etwas aufgeblasen und erinnern dadurch etwas an *Physoptychis*.

62. *Alyssum*[1])

Alyssum L., Spec. Plant. 650 (1753); Gen. Plant. ed. 5: 722 (1754).

Lit.: J. Baumgartner, Die ausdauernden Arten der Sectio Eualyssum aus der Gattung Alyssum, Beilage zum Jahresbericht des niederösterreichischen Landes-Lehrerseminars in Wiener Neustadt 34 (1907); 35: 1—58 (1908); 36: 1—38 (1909) & Jahresbuch des Kaiser-Franz-Josef-Landes-Gymnasiums und der Oberrealschule Baden bei Wien 48: 1—18 (1911). E. J. Nyárády, Vorstudium über einige Arten der Sectio Odontarrhena der Gattung Alyssum, Buletinul Gradinii botanice si al Muzeului botanic de la Universitaea din Cluj 7: 1—51, 65—160 (1927); 8: 152—156 (1928); 9: 1—68 (1929). Synopsis specierum variationum et formatum sectionis Odontarrhenae Generis Alyssum, Analele Academiei Romane (Sect. Geol., Geog., Biol.) ser. A, 1 (3): 1—133 (1949). T. R. Dudley, Studies in Alyssum I, Journal of the Arnold Arboretum, Harvard University 45 (1): 57—100 (1964); Synopsis of the Genus Alyssum, l. c. 45: 358—373 (1964). T. R. Dudley, Alyssum in P. H. Davis, Flora of Turkey 1: 362—409 (1965).

Herbae annuae, biennes, perennes vel suffrutescentes. Indumentum e pilis stellatis saepe lepidotis vel sublepidotis compositum, setis simplicibus raro immixtis. Folia

[1]) Bearbeitung der Arten 1—7 und Bestimmung sämtlicher mit Ausrufungszeichen versehener Belege von T. R. Dudley, Washington, DC., USA.

simplicia, integra. Inflorescentia racemosa, corymbosa, paniculata vel rarius subumbellata. Sepala erecta, libera, monomorpha vel raro dimorpha indumento contexta, numquam saccata nec cupuliformia. Petala flava vel interdum albida. Filamenta longiora unilateraliter vel bilateraliter alata vel exalata. Nectarium unum in utroque latere cuiusque filamenti brevioris. Siliculae dehiscentes vel indehiscentes; loculi 1—8-ovulati placentatione subapicali vel manifeste laterali; valvae compressae vel inflatae. Semina humiditate saepe mucilaginosa.

1a. Plantae annuae 2
b. Plantae perennes 19
2a. Siliculae compressae, loculis 2—4 (—8)-ovulatis; placentatio lateralis (Sect. *Meniocus*) 3
b. Siliculae inflatae, loculis 2-ovulatis; placentatio subapicalis 6
3a. Siliculae glabrae, laeves 4
b. Siliculae pilosae ..... 4. *A. heterotrichum* BOISS.
4a. Semina non alata. Stylus 0,1—0,5 mm longus. Petala 1—2 (—2,4) × 0,5 mm, pallide flava ..... 1. *A. linifolium* STEPH. ex WILLD.
b. Semina alata. Stylus 0,5—1,8 mm longus. Petala (1,5—) 2—6,5 × 1,5—2 mm, aurea 5
5a. Stylus 0,5—1 mm longus. Petala integra, (1,5—) 2—3,5 mm longa. Folia c. 1,5 mm lata, ± conduplicata ..... 2. *A. meniocoides* BOISS.
b. Stylus 1—1,8 mm longus. Petala retusa vel biloba 4—6,5 mm longa. Folia plerumque 2—4 mm lata, semper plana ..... 3. *A. aureum* (FENZL) BOISS.
6a. Filamenta nec alata, nec dentata nec appendiculata. Petala quam sepala vix longiora (Sect. *Psilonema*) 7
b. Filamenta aut alata aut dentata aut appendiculata. Petala quam sepala manifeste longiora (Sect. *Alyssum* p. p.) 9
7a. Siliculae orbiculares vel ovatae, emarginatae vel obtusae, pilosae sed margine laeves. Sepala persistentia. Folia integra 8
b. Siliculae late obovatae, truncatae, glabrae, margine papillosae. Sepala decidua. Folia apice minute denticulata ..... 7. *A. homalocarpum* (FISCH. & C. A. MEY.) BOISS.
8a. Indumentum siliculae homomorphum, e pilis stellatis appressis compositum. Semina alata. Stylus 0,5—1 mm longus ..... 5. *A. alyssoides* (L.) L.
b. Indumentum siliculae dimorphum, e pilis stellatis appressis et e pilis stellatis patulis inaequaliter radiatis compositum. Semina non alata. Stylus (1—) 1,5—2 mm longus ..... 6. *A. dasycarpum* STEPH. ex WILLD.
9a. Siliculae glabrae 10
b. Siliculae pilosae 11
10a. Sepala decidua. Indumentum [illegible] e pilis stellatis sublepidotis compositum. Folia linearia vel oblanceolata, in petiolum sensim attenuata ..... 8. *A. desertorum* STAPF
b. Sepala persistentia. Indumentum [illegible] e pilis stellatis compositum. Folia obovata-spathulata, in petiolum abrupte attenuata ..... 9. *A. minutum* SCHLECHT. ex DC.
11a. Indumentum siliculae monomorphum, e pilis stellatis consistens 12
b. Indumentum siliculae dimorphum, e pilis tuberculatis simplicibus vel furcatis et e pilis stellatis compositum 18
12a. Pedicelli basi inflati, axi inflorescentiae appressi 13

12b. Pedicelli basi non inflati, patuli 16
13a. Siliculae virescentes, pilis stellatis inaequaliter pauciradiatis 14
b. Siliculae canescentes, pilis stellatis numerosis aequiradiis 15
14a. Racemi elongati. Petala integra, glabra, 1,5—2 mm longa .....
..... 10. *A. strictum* Willd.
b. Racemi abbreviati. Petala retusa, pilosa, 2,5—3,5 mm longa .....
..... 11. *A. contemptum* Schott & Ky.
15a. Racemi elongati. Siliculae integrae. Stylus (0,3—) 0,5(—1)mm longus. Semina marginata ..... 12. *A. Szowitsianum* Fisch. & C. A. Mey.
b. Racemi abbreviati. Siliculae retusae. Stigma subcessile. Semina non marginata ..... 13. *A. marginatum* Steud. ex Boiss.
16a. Stylus 1—2 mm longus. Petala (2,5—) 3—5 mm × (1—) 1,5—4 mm .....
..... 17. *A. Stapfii* Vierh.
b. Stylus 0,5—1 (—1,6) mm longus. Petala minora 17
17a. Siliculae ± 5 mm diametro, indumento semper manifesto. Stylus 0,5—1 mm longus ..... 14. *A. minus* (L.) Rothm.
b. Siliculae ± 3 mm diametro, indumento e pilis minutissimis appressissimis saepe vix visibilibus consistente. Stylus 0,5 mm longus .....
..... 15. *A. turkestanicum* Regel & Schmalh.
18a. Pili tuberculati siliculae aequaliter radiati, 0,2—1 (—1,5) mm longi; tuberculi 0,5 mm crassi ..... 16. *A. strigosum* Banks & Soland.
b. Pili tuberculati siliculae simplices 1—3 mm longi, vel si furcati, inaequaliter radiati. Tuberculi 0,7—3 mm crassi ..... 18. *A. hirsutum* M.B.
19a. (1.) Siliculae loculi 1-ovulati (Sect. *Odontarrhena*) 25
b. Siliculae loculi 2-ovulati 20
20a. Sepala dimorpha, indumento contexta, intus pilosa. Filamenta longiora semper alata, interdum alis sese tegentibus vel connatis (Sect. *Gamosepalum*) ..
..... 24. *A. Baumgartnerianum* Bornm.
b. Sepala homomorpha, indumento non contexta. Filamenta longiora semper libera, raro alis sese tegentibus provisa (Sect. *Alyssum* p. p.) 21
21a. Filamenta longiora ala superne dentata vel truncata provisa .....
..... 19. *A. repens* Baumg.
b. Filamenta longiora ala superne attenuata edentula provisa 22
22a. Filamenta breviora in basi vel supra basin appendiculata .....
..... 21. *A. lanceolatum* Baumg.
b. Filamenta breviora in basi breviter alata, ala superne sensim vel abrupte contracta 23
23a. Caules humiles, simplices. Racemus brevis 24
b. Caules elatiores, usque ad 30 cm alti, interdum ramosi. Racemi elongatus
..... 23. *A. persicum* Boiss.
24a. Caules usque ad 5 cm longi. Petala longissime unguiculata .....
..... 22. *A. Mülleri* Boiss. & Buhse
b. Caules usque ad 10 cm longi. Petala oblongo-cuneata vel sublyrata .....
..... 20. *A. iranicum* Hausskn. ex Baumg.
25a. Plantae 3—20 (—30) cm altae, parvifoliae. Siliculae ± convexae sectione transversali plerumque sigmoidea 26
b. Plantae elatiores, 20—60 cm altae, foliis majusculis. Siliculae planae 34
26a. Siliculae vesiculoso-turgidae ..... 25. *A. turgidum* Dudley
b. Siliculae ± planae vel ± convexae nec autem vesiculoso-turgidae 27

27a. Folia obovato-spathulata vel ± orbiculata; bracteae quam folia caulina majores ..... 26. *A. bracteatum* Boiss. & Buhse
b. Folia proportione longiora numquam ± orbiculata; bracteae quam folia caulina minores 28
28a. Plantae basi haud lignescentes 29
b. Plantae suffruticosae 30
29a. Siliculae 3,5×2,5 mm, late ellipticae, subvesiculosae, indumento albido e pilis stellatis 15—17-radiatis composito ..... 27. *A. inflatum* Nyárády
b. Siliculae (3—) 3,5—6×2—3 mm, anguste ellipticae, valvis ± inaequaliter inflatis, indumento e pilis 16—30-radiatis composito ..... 28. *A. condensatum* Boiss. & Haussk.
30a. Silicularum indumentum albidum, e pilis ± contiguis consistens 31
b. Siliculae virescentes vel canescentes, indumento e pilis non contiguis consistente 32
31a. Siliculae ad summum 4×2 mm. Caules floriferi 20—25 (—40) cm alti ..... 29. *A. singarense* Boiss. & Haussk.
b. Silicula (4—) 4,5—4,9×2—2,5 mm. Caules floriferi 10—20 cm alti ..... 30. *A. kurdicum* (Boiss.) Nyárády
32a. Siliculae ad summum 3,5—4×1,5—1,8 mm, indumento demum ± evanescente ..... 31. *A. lanigerum* DC.
b. Siliculae majores, usque ad 4—4,5×3 mm, indumento persistente 33
33a. Indumentum silicularum e pilis pauci- (4—8)-radiatis punctiformibus consistens. Caules floriferi 18—25 cm alti ..... 32. *A. penjwinense* Dudley
b. Indumentum silicularum e pilis multiradiatis majoribus consistens. Caules floriferi usque ad 10 cm longi ..... 33. *A. polycladum* Rech. f.
34a. Semina exalata vel angustissime alata. Stylus 1,5—3 mm longus. Indumentum foliorum surculorum sterilium sublepidotum ..... 34. *A. longistylum* (Sommier & Levier) Grossh. & Schischk.
b. Semina alata. Stylus plerumque brevior. Indumentum foliorum non sublepidotum 35
35a. Siliculae 4—4,5 (—6)×2—4 mm. Indumentum foliorum bicolor, argenteum. Semina anguste alata ..... 35. *A. constellatum* Boiss.
b. Siliculae 2,5—5×1—4 mm. Indumentum foliorum concolor, canescens vel virescens. Ala seminum 0,2—1 mm lata ..... 36. *A. murale* Waldst. & Kit.

Sect. *Meniocus* (Desv.) Hook.

Plantae annuae. Filamenta longiora unilateraliter alata et dentata. Filamenta breviora appendicibus liberis vel basi connatis praedita. Nectaria globosa. Siliculae dehiscentes, glabrae vel setis simplicibus raro furcatis obsitae, saepe papillosae. Loculi 2—4 (—8)-ovulati, placentatione manifeste laterali. Semina humiditate mucilaginosa.

1. ***A. linifolium*** Steph. ex Willd. in L., Spec. Plant. ed. 4, 3 (1): 467 (1800). Typus (Syntypi): „Tauria, Caucasus, Armenia", Steph., B.

Annuum, caulibus pluribus erectis vel ascendentibus rarius prostratis. Folia (5—) 8—10 (—25)×0,5—1—2,5 mm; inferiora sensim attenuata, superiora breviter petiolata. Sepala 1,2—2 mm longa. Petala sepalis paulo longiora 1,2—2,4 mm longa, emarginata, pallide flava vel albida. Filamenta longiora unidentata, 1—1,5 mm longa; filamenta breviora 0,8—1,5 mm longa; appendices 0,3—0,4 mm longae.

Siliculae 3,5—7×2—4,5 mm, obovatae vel late ellipticae, obtusae, glabrae; loculi 4—6 (—8)-ovulati. Stylus 0,1—0,5 mm longus.

Distr. gen. speciei: Regio Mediterranea, Asia austro-occidentalis usque ad Turcomaniam et Pakistan.

— — var. ***linifolium***

Syn.: *Meniocus serpyllifolius* Desv., Journ. Bot. Appl. 3: 173 (1814) nom. nud. non *Alyssum serpyllifolium* Desf. (1800). *Meniocus linifolius* (Steph. ex Willd.) DC., Reg. Veg. Syst. Nat. 2: 325 (1821). *Alyssum minimum* sensu Zohary, Palest. Journ. Bot. Ser. 3 (2/3): 162 (1941) non L. (1753).

Typus: Tauria et Armenia, Steph., B; lectotypus: Tauria, B, G-DC!

Planta erecta, caulibus ± validis, virescentibus. Indumentum e pilis stellatis longi- et pauciradiatis consistens. Racemi fructiferi elongati, multiramosi, 3—7 cm longi. Folia 10—25×1—2,5 mm.

Iraq: Kurd.: Kirkuk: Inter Mosul et Kirkuk, Guest 625! Kirkuk, Bornm. 894! Yarmo, Helbaek 306! — Diyala: Jabal Hamrin inter Shahraban et Jalula, Rech. 14212!
Talish: 1200 m, Hohen.
Persia: N: Maz.: In valle Haraz W Zardman, 700 m, Wdb. 428-b! Gil.: Inter Rudbar et Manjil, 300—400 m, Bornm. 6243! — W: Azerb.: Khvoy, Knapp! Rezaiyeh: Ad ripam fluvii Shahr Chay, Knapp. Tabriz, 1300 m, Jacobs 6137. Azerbaijan, Pichler 150! Ham.: M. Karaghan, Sab. 94!, Str. Faghire prope Hamadan, Sab. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 210!, 213! Esf.: Kuh Damaneh, 2300 m, Wdb. 1727! — S: Kerm.: Kuh-i Sirj, 3200 m, Bornm. 2150. Kuh-e Laleh Zar prope Shirinak, 2900 m, Bornm. 1892. Inter Kerman et Saidabad, inter Mashiz et Khan-e Sorkh, 2000 m, Rech. 3051! Jebal Barez, Deh Bakri, 2100 m, Rech. 3805! Fars.: Inter Shiraz et Kumaraj, 200—600 m, Hausskn.! 58 km W Shiraz, 1600 m, Grant 15612! — E: Sistan: Kuh-e Chah Rui, 700—1000 m, Gabr. 140. Khor.: Inter Mashhad et Torbat-e Heydariyeh, Czern. Torbat-e Heydariyeh, 1300 m, Rech. 4346! 30 km S Mashhad, Rech. 1502! Inter Chanaran et Quchan, Rech. 7519 p. p.! M. Kopet Dagh prope Alam Ali, 2000 m, Rech. 4760 p. p.! — C: Tehr.: Tehran, Bagh-i Shah, Bruns. M. Damavand, 2640 m, Gilli!, Deicke. Qazv.: Pachenar, Bornm. 6244. Soltanabad prope Qazvin, 1524 m, Linds. 29!, 32! Karaj, Rech. 526!, Gauba! Damgh. - Semn.: Bashm Kuh N Bashm, 2700 m, Wdb. 1341! Yazd: Inter Yazd et Esfahan, Feyzabad, Bornm. 2152! Yazd, Buhse.
Turcomania: Ashkhabad, Sint. 165!, Litw. 19! Kizyl Arvat, Becker.
Afghanistan: SW: Tirphul in valle fluvii Hari Rud, Aitch. 160!, 430! — E: Kabul: Kuh-i Asmai, Sharenau, 1800—2000 m, Neub. 3018!, Wdb. 2733! Khord Kabul, 2280 m, Gilli 1090! Top Darrah, Neub. 4036! Paghman, 2500 m, Neub. 4324! Istalif, 1800—1840 m, Gilli 1087 p. p.!, 1088! Sarobi, Volk 2454! 15 km W Sarobi, 1100 m, Wdb. 2791! 20 km E Lataband, 1800 m, Wdb. 3022! Qaleh Eslam, 25 km S Kabul, 1830 m, Wdb. 3204! — NE: Kataghan: Doshi, Meinertzhagen. In valle Andarab, 15 km E Doshi, 1000 m, Podlech 10230. Godarrah, 1850 m, Podlech 10998. — C: In valle Kamard W Doab, 1630 m, Gilli 1078! Afghanistan, Griff 1415!
Pakistan: Kurram: Parachinar, 2134 m, Stewart 28117!, 14738! — Quetta: Inter Bostan et Khanozai, 1600 m, Rech. 29135! Spin Karez prope Quetta, 1800—1900 m, Rech. 29214! Sariab, 1700 m, Lamond 943! In jugo Tak, 30 km S Quetta, 2100 m, Rech. 28410! In jugo W Ziarat, 2200 m, Lamond 1159! 30 km NNE Quetta versus Pishin, 1500 m, Rech. 28903!, Lamond 953! Pishin, 1550 m, Lace 3308! — Kalat: 40 km N Kalat versus Mastung, 2000 m, Rech. 28378!, Lamond 699! Inter Surab et Kalat, 1700—1800 m, Rech. 28322!, Lamond 677! Inter Kolpur et Mach, Rech. 28473!

Distr. gen. varietatis: Regio Mediterranea ab Hispania et Africa septentrionali usque ad Anatoliam; Syria, Palestina, Iraq, Persia, Caucasia, Turcomania, Afghanistan, Pakistan, Rossia australis, Sibiria; in Australiam introductum.

— — var. ***teheranicum*** Bornm., Bull. Herb. Boiss. Ser. 2, 4: 1269 (1904).
Syn.: *A. cupreum* Freyn & Sint., Bull. Herb. Boiss. Ser. 2, 3: 695 (1903). *A. linifolium* var. *cupreum* (Freyn & Sint.) Dudley in Hedge, Acta Univ. Bergensis Ser. Math.-Nat. No. 13: 6 (1963).
Typus varietatis: Bornm. 2155; holotypus B; isotypus BM!, E!, K!, W!

Planta humilis. Caules tenues, canescentes, indumentum e pilis stellatis paucivel multiradiatis sed semper breviradiatis consistens. Racemi fructiferi condensati, raro ramosi, 1—3 cm longi. Folia 5—8 × 0,5—1,3 mm.

Iraq: Diyala: Khanaqin, Rech. 14128!
Persia: N: Maz.: In valle Haraz supra Panjab, 1300 m, Wdb. 303! — W: Azerb.: S Tabriz, Gill.-Sm. 1351!, 1352!, 1336!, 1338! Kermansh.: Karand, Evans 37! 39 km W Kermanshah, 1372 m, Cowan & Darlington 2618! Esf.: Khunsar, Bornm. 2151!, 2156! Kuhpayeh, 1700 m, Rech. 2714! — S: Fars.: Inter Abadeh et Dowlatatabad, 1500—2000 m, Schmid 5313!, 5318! Takht-e Jamshid, Koelz 14420! Persepolis, Ky. 1053! 5 km NW Shiraz, 1600 m, Grant 17152! Bal.: Inter Khash et Iranshahr, M. Karevandar, 1500—1600 m, Rech. 3958! — E: Khor.: Robat-i Safid, 1800—2000 m, Rech. 7335 p. p.! Sar Chah, Bge.! — C: Tehr.: Hashemabad prope Tehran, Bruns. Tehran, 1220 m, Bornm. 2154!, 2155!, Schmid 5102!, Ky. 855! Inter Tehran et Davudiyeh, 1400 m, Wdb. 97-a! Inter Semnan et Tehran, 900 m, Rech. 27773-b! Hashemabad prope Tehran, Bruns. Qazv.: Karaj prope Kalak, 1600 m, Rech. 143!, 2745! Yazd: Taft prope Yazd, Bornm. 3149. Qom, Bornm. 2153!

Afghanistan: SE: Kandahar: Jamal Baba S Kandahar, 1000 m, Gilli 1077! — E: Kabul: Sher Darwasa, 1790—1840 m, Gilli 1081!, 1082!, 1083!, 1085!; Neub. 537! Kuh-e Chelsotun, 1810 m, Gilli 1084! In montibus NW Aliabad, 1800 m, Gilli 1086!; Collett 12. Botkhah E Kabul, 1770 m, Gilli 1080! Kabul, Gilli 1091! Inter Kabul et Paghman, 1880—1910 m, Gilli 1089-a!, 1089-b! Inter planitiem Koh-e Daman et Istalif, 1750 m, Gilli 1079! Istalif, 1800 m, Gilli 1087 p. p.! Sarobi, Volk 2455 p. p.! Pul-e Sorkh prope Charikar, Neub. 542!
Pakistan: Quetta: Qila Abdullah, Duthie 8577!, 8578!

Distr. gen. varietatis: Anatolia, Syria, Iraq, Persia, Caucasia, Turcomania, Afghanistan et Pakistan.

Plantae inter varietates *linifolium* et *teheranicum* intermediae: Pakistan, inter Otipore et Korobat, Griff. 1519 ex hb. Lehmann!, Griff. 1415!

2. ***A. meniocoides*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 148 (1842).
Syn.: *Meniocus filifolius* Jaub. & Spach, Ill. Pl. Or. 1: 107 tab. 53-B (1843) non *Alyssum filifolium* Wahlenb. *Alyssum tetraspermum* Bertol., Misc. Bot. 2: 12 (1843). *A. kermanshahense* Cowan ex Parsa, Fl. de l'Iran 1: 733, fig. 607 (1951).
Icon.: Clavis p. 25.
Typus: Mesopotamia, Auch. 281, holotypus G!; isotypus: BM!, K!, OXF!

Annuum. Caules tenues, 3—10 cm alti. Folia (5,5—) 10—18 mm longa, ± conduplicata. Petala obovata, integra, (1,5—) 2—3,5 mm longa. Filamenta longiora 1,5—2 mm longa, apicibus bifidis 0,3—0,4 (—0,5) mm longis terminati; filamenta breviora 1—1,5 mm longa, appendicibus semper bifidis 0,5—1 mm longis terminatis. Siliculae ± 5 × ± 3 mm, ellipticae, glabrae. Stylus 0,5—1 mm longus. Semina alata, alis 0,1—0,2 mm latis.

Iraq: Kurd.: Mosul: Zawita, Polunin at al. in Univ. Baghdad 47! Arbil: Salah ad-Din, 1000 m, Gillett & Rawi 10423! Kirkuk: Tuz Khormatu, Rogers 349! Kirkuk, Rogers 74! Sul.: Distr. Sulaymaniyah, Gillett & Rawi 6967!
Persia: N: Maz.: Farahabad, Sab. 182! — W: Azerb.: Tabriz, 1200—1300 m, Jacobs

6137! Kermansh.: 39 km E Kermanshah, 1372 m, Cowan & Darlington 256!, 354! Qalapain, 22 km E Kermanshah, Bent & Wr. 401—112 p. p.!, 401—125 p. p.! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 213 p. p.! Lur.: Dow Rud, Koelz 17103! 16 km W Khorramabad, 1200 m, Furse 1124! — E: Khor.: Sabzevar, Kuh-e Mish prope Doroueh, Ruttner 613! — C: Tehr.: Davudiyeh, 1400 m, Wdb. 97-a! Qazv.: Prope Qazvin, Mazraeh, 1200 m, Schmid 5045!, 5050!, 5055!; Stutz 711! Qazvin, 1500—1550 m, Jacobs 6196! Pichler!
Afghanistan: NW: Herat: Obeh, 1700 m, Koelz 3782 p. p.! — E: Kabul: „Sang Novichtah", Lindb. 244! — C: Bamian: Darreh-i Shikar prope Doab, Wdb. 3418!

Distr. gen.: Anatolia australis, Mesopotamia, Syria, Libanon, Palaestina, Iraq, Persia et Afghanistan.

3. ***A. aureum*** (Fenzl) Boiss., Fl. Or. 1: 286 (1867).
Syn.: *Meniocus aureus* Fenzl, Pugillus 1: 13 (1842). *M. grandiflorus* Jaub. & Spach, Ill. Pl. Or. 1: 105, tab. 53-A (1843). *Alyssum pleiospermum* Fenzl, Ill. et Descr. Pl. Nov. Syr. et Taur. Occid. 54 (1843). *A. meniocoides* Boiss. var. *aureum* (Fenzl) Zohary, Palest. Journ. Bot. Ser. 2 (2/3): 162 (1941).
Typus: Syria circa Aleppo, Ky. 27, W!

Herba annua caulibus validis (3—) 5—20 cm altis. Folia (8,5—) 12—30 mm longa, semper plana. Petala 4—6,5 mm longa, aurea, spathulata, retusa vel biloba. Filamenta longiora 2—4 mm longa, alis apice lanceolato vel bifido 0,5—1 mm longo. Filamenta breviora 2—3 mm longa, appendicibus lanceolatis vel bifidis 1—1,5 mm longis. Siliculae glabrae. Stylus 1—1,8 mm longus. Semina 0,2—0,4 mm diametro, alata.

Iraq: Kurd.: Mosul, Guest. Kirkuk, Guest.

Distr. gen.: Anatolia, Palaestina, Syria, Iraq.

4. ***A. heterotrichum*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 15 (1845).
Syn.: *A. Bungei* Boiss., Fl. Or. 1: 274 (1867).
Typus: Ky. 224, holotypus G!; isotypus: BM!, E!, K!, OXF!, W!

Annuum, saepe humile, decumbens, raro ultra 10 cm altum. Folia 7—25×1—4 mm, oblanceolato-spathulata, plana, sursum decrescentia. Inflorescentia usque ad 5 cm longa, densa, saepe copiose ramosa. Pedicelli ascendentes, 1,5—3 mm longi. Sepala 1—1,5 mm longa, ± persistentia, obtusa, indumento laxo. Petala 0,7—1 (—1,5) mm longa, obovata, emarginata, flavescenti-virentia. Filamenta longiora 1—1,5 mm longa, dente unilaterali 0,5 mm longo. Filamenta breviora 0,7—1 (—1,5) mm longa, appendicibus profunde bifidis basi connatis dimidium filamenti longitudinis attingentibus. Siliculae 3—4,5 (—5)×1,5—3 mm, anguste elliptico-ovata vel obovata, acuta vel attenuata, dense papillosa. Styli 0,4—0,7 mm longi, tenues, glabri.

Persia: W: Ham.: Bahar, Babai 6695-E! Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 211! Esf.: Inter Esfahan et Tehrán, Bge.! — S: Fars.: 20 km SW Saadatabad, 1800 m, Grant 15441-a! Fars, 1600 m, Grant 15478! Inter Neyriz et Fars, Koelz 14728! Prope Shiraz, Haussкn.! 5 km W Shiraz, 1600 m, Grant 15248 p. p.! Shiraz, 1425 m, Pravitz 507! Ad muros hortorum prope ruinas Persepolis, Ky. 224! — E: Khor.: In jugo Alam Ali, Rech. 4760 p. p.! Inter Chanaran et Quchan, Rech. 7519 p. p.! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 5047!
Afghanistan: E: Panjshir: 22 km supra Gulbahar, 1700 m, Hdg. & Wdb. 3005! — C: Bamian: 20 km E lacuum Band-i Amir, 3300 m, Podlech 12157!
Pakistan: Bal.: Chaman, H.-B. 19265-a.

Distr. gen.: Persia, Afghanistan, Turcomania, Kazakhstan, Pakistan.

Sect. *Psilonema* (C. A. Mey.) Hooker

Plantae annuae. Filamenta nec alata nec dentata nec appendiculata. Nectaria erecta conica vel globosa. Siliculae dehiscentes, glabrae vel pilosae. Semina humiditate mucilaginosa.

5. ***A. alyssoides*** (L.) L., Amoen. Acad. 4: 487 (1759).

In regione nostra tantum crescit var. *alyssoides*.

— — var. ***alyssoides***

Syn.: *Clypeola alyssoides* L., Spec. Plant. 2: 652 (1753). *C. campestris* L., Spec. Plant. 2: 652 et 1231 (1753). *Alyssum calycinum* L., Spec. Plant. ed. 2, 2: 908 (1763). *A. campestre* L., Spec. Plant. ed. 2, 2: 908 (1763) p.p. *Psilonema calycinum* (L.) C. A. Mey., Bull. Acad. Sci. Petersb. 7: 132 (1840).

Lit.: T. R. Dudley, Journal of the Arnold Arboretum 45 (1): 63—65 (1964).

Typus: Europa in Austria et Gallia; „2 Clypeola siliculis bilocularibus tetraspermis". (*Clypeola* No. 2, sub „Alysson incanum luteum serpilli folia") BM, Hort. Clifford!

Annuum vel bienne, usque ad 50 cm altum, pluricaule, erectum vel decumbens. Indumentum canescenti-virens, e pilis stellatis pauci- et breviter radiatis compositum. Folia usque ad 4 cm longa, obovata vel lineari-oblanceolata. Racemi usque ad 15 cm longi, saepe elongati. Pedicelli 2—6 mm longi, erecto- vel horizontaliter patentes. Sepala (1,5—) 2—3 mm longa, persistentia. Petala 2—3 (—4) mm longa, emarginata, sepalis saepe vix longiora et cum eis persistentia. Filamenta 1—1,5 mm longa, edentata, exappendiculata. Siliculae (2—) 3—4 (—5) mm longae et latae, orbiculares, emarginatae vel truncatae, marginibus applanatis, centro aequaliter inflatae, indumento e pilis minutis stellatis consistente. Styli 0,3—0,6 (—1) mm longi.

Afghanistan: E: Kabul: Inter Kabul et Paghman, Hdg. & Wdb. 3146!

Distr. gen.: Europa centralis, occidentalis et meridionalis usque ad Rossiam sed rarissimum in Asia: Afghanistan, Persia et Anatolia. In Britanniam, Europam septentrionalem et Americam meridionalem introductum.

The nomenclatural confusion between *A. alyssoides* (L.) L. and *A. minus* (L.) Rothmaler (= *A.* „*campestre*" sensu multorum auctorum pro pte. maiore) has been discussed by Dudley, Journ. Arnold Arb. 45 (1): 63—65 (1964). The fact that *A. alyssoides* is very rare throughout the Near East and the area included in Flora Iranica is discussed by Bornmüller, Beih. Bot. Centrbl. 38: 479 (1921). A discussion of the variability of this species is provided by Dudley, l. c. 4-b: 202 (1965).

6. ***A. dasycarpum*** Steph. ex Willd. in L., Spec. Plant. ed. 4, 3 (1): 469 (1800). Typus: Russia, in Sibiria, ad Kamam et Volgam fluvium, Steph., holotypus LE; isotypus BM!, G-DC!, K!

Annuum, caulibus pluribus usque ad 25 cm longis, raro prostratum. Indumentum ± densum, e pilis rudis stellatis longi- et pauciradiatis sed ramosis consistens. Folia sursum decrescentia, superiora obovata usque oblongo-oblanceolata, attenuata, 7—11 (—25) × (2,5—) 4—9 mm, inferiora late spathulata, breviter petiolata, 20—35 × 12—15 mm. Inflorescentia usque ad 15 cm longa, saepe ramosa. Pedicelli (1,2—) 1,5—2 mm longi, divergentes vel ascendentes, saepe axi subappressi, indumento dimorpho dense strigoso. Sepala 2—3 mm longa, ± persistentia. Petala 2,5—3 (3,8) mm longa, obovato-spathulata, incisa vel retusa. Filamenta 2—2,5 mm

longa. Siliculae 2,5—3 (—4) × 2,5—3 mm, elliptico-ovatae vel orbiculares; valvae aequaliter inflatae, marginibus crassis applanatis 1,5—2 mm latis, indumento denso dimorpho. Stylus (1—) 1,5—2 mm longus, validus, basi valde dilatatus. Semina non alata.

Distr. gen. speciei: Asia austro-occidentalis ab Anatolia usque ad Pakistan.

— — var. ***dasycarpum***

Syn.: *Psilonema dasycarpum* (Steph. ex Willd.) C. A. Mey. in Ledeb., Fl. Ross. 1: 137 (1831). *Alyssum calycinoides* Hausskn. in Bornm., Feddes Repert. Beih. 89 (1): 58 (1936), pro syn. *A. dasycarpum* var. *pterospermum* Bordzil., Bull. Jard. Bot. Kiew 7—8: 17 (1928).

Inflorescentia elongata multiflora. Planta erecta. Folia oblanceolata vel ovata.

Iraq: Kurd.: Sul.: 18 km W Sulaymaniyah, 825 m, Eig & Zohary.
Talish: Swant, Hohen., C. A. Mey.
Persia: W: Azerb.: Tabriz, Gill.-Sm. 1773!, 1782! Ham.: Aq Bolagh-e Aqdaq 100 km N Hamadan, Rioux & Golv. 212! M. Alvand, Str. Babai 6345-E! Bahar, Babai 6696-E! Esf.: Kuh-e Damaneh, 2300 m, Wdb. 1726! Najafabad, Bornm. 2171. Esfahan, Auch. 4091-a! Arak: Amirabad prope Ebrahimabad, 1829 m, Cowan & Darlington 588! Mowdar, Str. — S: Fars.: Inter Shiraz et Kazerun, Gauba & Sab. 197! Shiraz, Auch. 4091! Inter Shiraz et Persepolis, 800—1000 m, Schmid 5518! Inter Saidabad et Chah-e Chaghak, 1900 m, Rech. 3194 p. p.! 58 km W Shiraz, Grant 15541! Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5323! 5 km N Dowlatabad, 1372 m, Cowan & Darlington 1096! Kerm.: Inter Mashiz et Khan-e Sorkh, 2000—2500 m, Rech. 3006! — E: Khor.: Robat-i Safid, 1800—2000 m, Rech. 7336! Torbat-e Heydariyeh, 1300 m, Rech. 4329!, Rech. 4362! — C: Tehr.: Khaniabad, Bruns. Jaji Rud, Bruns. Shahabad, Bge. M. Tuchal, Bruns. Qazv.: Injugo Kharzan, 1500 m, Bornm. 6232. Qazvin, Bornm. 6233! Prope Qazvin, Pichler!, Schmid 5044!; 1200—1300 m, Bornm. 6233!, 1500—1550 m, Jacobs 6197!, Jacobs 6188! Karaj, Rech. 244!, Gauba! Soltanabad prope Qazvin, 1524 m, Linds. 31! Qom: Inter Tehran et Qom, Bornm. 2172. Yazd, Buhse. Shahr.-Bust.: Khash-Aylan 73 km E Shahrud, 200—2000 m, Rech. 5442! — Persia, Bélanger; Ky. 183! 16 km E Zorab, Cowan & Darlington 1775! 32 km W Zorab, Cowan & Darlington 1734!
Turcomania: Ashkhabad inter Annaju et Gyaurs, Sint. 51! Ashkhabad, Litw. 85! Kizyl Arvat, Becker! Distr. Kizyl Arvat, Androssov 2565!
Afghanistan: NW: In valle fluvii Hari Rud, Aitch. 194! Herat, 1100 m, Koelz 4163! Obeh, 1600 m, Koelz 4164! — E: Kabul: Inter Kabul et Ghazni prope Chakewardak, 2280 m, Neub. 3033! Inter Kabul et Tang-i Gharu, 1700 m, Gilli 1076! Botkhab, 1770 m, Gilli 1075! — C: Bamian: Band-i Amir, Band-i Panir, 2800 m, Rech. 18394!; 2800—2900 m, Rech. 18226!, Wdb. 4783!; 2900 m, Wdb. 4761!; 3200 m, Volk 2767! — Afghanistan, Griff. 1366/1!
Pakistan: Quetta: Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29014! Spin Karez prope Quetta, 1800 m, Rech. 27350!, Rech. 29231! Inter Bostan et Khanozai, 1600 m, Lamond 1105! Pishin, 1525 m, Lace 3574!; 1600 m, Lace! Ziarat, 2338 m, Stewart 28087! — Kalat: 40 km W Kalat versus Mastung, 2000 m, Rech. 28382! — Bal.: Nichara, Stocks 910!

Distr. gen. varietatis: Anatolia, Tauria, Caucasia, Syria, Palaestina, Iraq, Persia, Turcomania, Afghanistan, Turcomania et Pakistan, Sibiria, Sina.

— — var. ***minus*** Bornm. ex Dudley, Notes Roy. Bot. Gard. Edinb. 24 (2): 157, fig. 1-A (1962).

Typus: Bornm. 2174!, holotypus: E!; isotypus BM!, G!, K!, OXF!, W!

Inflorescentia condensata, pauciflora. Plantae prostratae. Folia late spathulata.

Persia: W: S Tabriz, Gill.-Sm. 1356!, 1381!, 1783! Esf.: Inter Esfahan et Hamadan ad pagum Mohammedi, 1800 m, Bornm. 2174! — S: Fars.: Prope Dalaki, Ky. 181! Kerm.: Inter Mashiz et Khan-e Sorkh, 2000—2580 m, Rech. 3006! (ad var. *dasycarpum* transiens). — C: Tehr.: Prope Tehran, Ky. 64! Qazv.: Prope Qazvin, Mazraeh, 1200 m, Schmid 5007!, 5048! Qazvin, Pichler! Yazd: Inter Esfahan et Yazd prope Bambis, 1900 m, Bornm. 2173! Prope Qom, Bornm. 2175!

Distr. gen. varietatis: Endem.? (Sed unicum specimen e Syria notum.)

Although *A. dasycarpum* is frequently confused with *A. strigosum* of Section *Alyssum* because of its similar dimorphic fruit indumentum, the fruits of *A. dasycarpum* are smaller and differently shaped, and the furcate hairs are shorter. In addition, the filaments of *A. strigosum* are always furnished with teeth or appendages, its floral parts are larger, its seeds are winged, and its pedicels are widely divergent.

7. ***A. homalocarpum*** (Fisch. & C. A. Mey.), Boiss., Fl. Or. 1: 285 (1867).
Syn.: *Psilonema homalocarpum* Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 6: 63 (1840). *Alyssum horebicum* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 156 (1842). *A. Musili* Velen., Sitz.-Ber. Böhm. Ges. Wiss. 11: 13 (1911). *A. nomismocarpum* Rech. f., Aell. & Esfand., Phyton 3: 56 (1951). *A. homalocarpum* f. *nomismocarpum* (Rech. f., Aell. & Esfand.) Parsa, Fl. de l'Iran 8: 231 et 274 (1960).
Typus: Cult. e seminibus in Arabia Petraea lectis, Schimper! Holotypus LE, isotypi G!, GH! and K!

Annuum, 5—20 cm altum, caulibus numerosis erectis, fragilibus. Folia 1—4 (—5) × (0,5) 1—3 cm, oblongo-spathulata, acuta, supra medium minutissime denticulata; indumentum densum cinereum, e pilis stellatis longiradiatis consistens. Inflorescentia 4—10 cm longa, corymbosa, ramis numerosis fragilibus. Pedicelli 1,3—2 mm longi, horizontaliter patentes. Sepala 0,8—1 mm longa. Petala 0,5—1 × 0,2—0,5 mm, lineari-cuneata, subemarginata vel integra. Filamenta c. 1 mm longa, subulata. Siliculae 3—7 mm longae et latae, late obovatae, truncatae, glabrae, margine manifeste papillosae, in sicco rubescentes; valvae aequaliter inflatae, conspicue venosae. Styli 0,5—0,7 (—1) mm longi, basi dilatati. Semina anguste alata.

Persia: S: Lar.: Hajjiabad prope Tarom, in declivibus siccis saxosis, 900 m, Rech. 3272! (Typus *A. nomismocarpi*). Kerm.: Zahedan, 600 m, Gauba & Sab. 196! 30—40 km SE Zahedan versus Mirjaveh, Rech. 27250! Bal.: Karevandar inter Khash et Iranshahr, 1500—1600 m, Rech. 3958! — E: Sistan: Kuh-e Khajeh, Shar. 5649-E! Khor.: Sar Chah, Bge.!
Pakistan: Baluchistan, Landon!

Distr. gen.: Aegyptus, Arabia, Palaestina, Iraq, Persia et Pakistan.

Sect. *Alyssum*

Plantae annuae vel perennes. Sepala monomorpha, libera, facie interiore glabra. Petala plerumque flava. Filamenta libera, unilateraliter vel bilateraliter alata, dentata vel appendiculata. Nectaria globosa vel triangularia. Siliculae dehiscentes, glabrae vel indumento monomorpho vel dimorpho provisae. Loculi biovulati. Semina humiditate mucilaginosa.

8. ***A. desertorum*** Stapf, Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 51: 302 (1886).
Syn.: *A. minimum* Willd., Spec. Plant. 3, 1: 464 (1800) p.p. non L. (1753). *Psilonema minutum* Schur, Enum. Pl. Transs. 62 (1866).
Typus (Lectotypus): Azerbaijan: In deserto prope Jelizabethpol, Pichler s. n., W!

Annuum, usque ad 20 cm altum. Indumentum e pilis sublepidoto-stellatis breviter multiradiatis consistens. Racemi elongati cylindrici. Pedicelli suberecti vel ± horizontaliter patuli, indumento strigoso. Petala (1,5—) 2—3 (—3,5) × 0,5—1 mm, integra vel emarginata, pallide flava. Siliculae (2—) 2,5—4 mm longae et latae, ovatae vel orbiculares, emarginatae, glabrae; valvae centro aequaliter inflatae, margine ± applanatae. Stylus glaber, 0,4—1 mm longus. Semina anguste alata.

Distr. gen. speciei: Europa austro-orientalis, Asia austro-occidentalis et centralis.

1a. Planta erecta vel decumbens. Racemi elongati, (3—) 4—10 cm longi, multiflori. Folia lineari-lanceolata vel oblanceolata ..... var. *desertorum*

b. Planta prostrata, humilis. Racemi condensati, 1—2 cm longi, pauciflori. Folia oblanceolata vel spathulata ..... var. *prostratum* Dudley

— — var. ***desertorum***

Iraq: Diyala: Jabal Hamrin, Sutherland 139 p. p.!
Talish: Buhse, C. A. Mey.
Persia: N: Gorg.: Ad fluvium Atrak, Shar. 569! Maz.: In valle fluvii Talar E Gaduk prope Kahud Chashmeh, 2300 m, Aell. 998! Persia borealis, C. A. Mey., Bge. — W: Azerb.: Gök Tappeh, Radde 12. Tabriz, Gill.-Sm. 1337, 1353, 1354, 1423, 1777, 1787. Kermansh.: Qalapain, 22 km E Kermanshah, 1270 m, Bent & Wr. 401—124! Ham.: Faghire, Sab. in Gauba 227! Lur.: Dow Rud, 1500 m, Koelz 15697-a! Arak: Golpayegan, 2300 m, Bornm. s. n. — S: Fars.: Shiraz, Pravitz 510! 5 km W Shiraz, 1600 m, Grant 15248 p. p.! — E: Khor.: Inter Chanaran et Quchan, Rech. 4735-b p. p.! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4653 p. p.! M. Hazar Masjed inter Ardak et Talqur, 1600 m, Rech. 4995! Inter Gush et Talqur, Rech. 5215! — C: Tehr.: In valle fluvii Jaji Rud, Bruns. Ad Rudkhaneh-ye Delichay, 100 km E Tehran, 1700 m, Aell. 1056! Tehran, Deicke 442. Qazv.: Karaj, 1400 m, Rech. 221!, 260!, Stutz 675!, Gauba. Kalak, 1400 m, Rech. 2744! Inter Khur et Fashand, Rech. 659! Qazvin, 1200 m, Schmid 5009! Pachenar, 600 m, Bornm. 6241. Sultanabad prope Qazvin, Linds. 19, 30. In jugo Kharzan, Bornm. 6240. — Bagir, Radde. 942.
Turcomania: Kopet Dagh: Inter Chandyr et vallem Sumbar, Boriss. Ashkhabad, Litw. 572!, Eilandt, Korsh., Sint. 52-a!, 52-c. Kizyl Arvat, Becker.
Afghanistan: N: Mazar-i Sharif, Akupruk, 800 m, Rech. 16325! — NW: Bala Murghab, 470 m, Jakeš s. n.! Qala Nau, 700 m, Koelz 4166! — E: Kabul: Band-i Kargha, 2000, Rech. 31441! Jebal Seraj, 1650 m, Gilli 1066! Sher Darwasa, 1900 m, Podlech 10191! Istalif, Neub. 4055!, Gilli 1067! Sarobi, 1100 m, Gilli 1065!, Volk 2455 p. p.! Prope Jalalabad, Akhbar! Nuristan: Inter Asmar et Barikot, 840 m, Gilli 1064! — NE: Kataghan: Prope Farkhar, 1250 m, Podlech 10490! In valle Andarab, 2250 m, Podlech 11044! 15 km E Doshi, 1000 m, Podlech 10232! 22 km E Khanabad, 720 m, Podlech 10247! In valle Khinjan, 2200 m, Podlech 10902! Badakhshan: Kuh-i Ishkamish, 1350 m, Podlech 10585! Taliqan: Aq Bolagh Queslaq, 14 km SE Taliqan, 900 m, Podlech 10321! — Afghanistan, Griff. 1366!
Pakistan: Kurram: Parachinar, 1700 m, Rech. 30912! Inter Thal et Habib Kala, Aitch. 142. — N. Wazir.: Fort Miram Shah, 950 m, Blatt. & Fz. 153, 478. Ad fluvium Chasmai, 950 m, Blatt. & Fz. 252. Ad fluvium Tochi, Boya Fort, Blatt. & Fz. 1043, 1118, 1121, 1123, 1131. Datta Khel, 1400 m, Blatt. & Fz. — Quetta: Pishin, 1500 m, Lace 3309!, Rech. 28882! Spin Karez, 1900 m, Rech. 29212! 26 km N Fort Sandeman versus Wana, 1500 m, Rech. 29825!, Lamond 1457! — Kalat: Inter Kalat et Mastung, 2000 m, Rech. 28380! — Bal.: In collibus prope Harboi, H.-B. 19514. Baluchistan, Stocks.

Distr. gen. varietatis: In tota area speciei.

— — var. ***prostratum*** Dudley, Notes Roy. Bot. Gard. Edinb. 24: 159, fig. 2A (1962).
Typus: Bornmüller 2170, W!

Persia: N: Gorg.: Gonbad-e Kavus, 1200 m, Grant 17317! — C: Tehr.: Tehran, 1200 m, Bornm. 2170! Elburz centralis, 36° N, 51° E, 1600 m, Jacobs 6147! Qazv.: Mazraeh, 1200 m, Schmid 5042!
Afghanistan: E: Kabul: Sorkh Rud W Jalalabad, Lindb. 1958/198! Top Darrah Neub. 4036! 5 km W jugi Khyber, Podlech 10172! Sarobi, Volk 2455 p. p.!

Distr. gen. varietatis: Anatolia, Syria, Armenia, Persia, Afghanistan.

9. ***A. minutum*** Schlecht. ex DC., Reg. Veg. Syst. Nat. 2: 316 (1821).
Icon.: Dudley in P. H. Davis, Fl. Turkey 1: 373, fig. 18 (1965).
Typus: „Sibiria".

Annuum, usque ad 12 cm altum. Folia subacuta vel acuta, raro obtusa, spathulato-obovata, indumento dimorpho ± strigoso. Racemi simplices raro ramosi. Sepala persistentia. Petala (2—) 3—3,5 (—4) mm longa, limbus quam unguis expansus angustior, indumento e pilis densis longiradiatis compositum. Siliculae 3—4 (—6,5) × 3—4 mm, orbiculares vel ovatae, emarginatae, glabrae; valvae aequaliter inflatae, margine applanatae, in statu juvenili indumento sparso ad marginem superiorem provisae. Stylus 0,5—1 mm longus, basi pilosus. Semina anguste alata.

Persia: W: Ham.: Ganjnameh, Lindb. 73!
Afghanistan: NW: Murghab, 600 m, Koelz 3514 p. p.!

Distr. gen.: Europa centralis et orientalis, Africa borealis, Regio Mediterranea orientalis, Anatolia, Cyprus, Syria, Persia, Afghanistan.

10. ***A. strictum*** Willd., Spec. Plant. 3, 1: 464 (1800).
Typus: Armenia, Tournefort, BM.

Annuum, erectum, usque ad 30 cm altum. Folia sursum increscentia, lanceolata vel oblanceolata. Racemi 5—15 cm longi, stricti, fructiferi quoque densi. Pedicelli 2—4 mm longi, basi intumescentes, axi arcte appressi. Petala 1,5—2 mm longa, obovata, integra, glabra. Siliculae maturitate imbricatae (3—) 3,5—4,5 × 2—3 mm, elliptico-obovatae, truncatae; indumentum e pilis stellatis inaequaliter radiatis compositum; valvae inaequaliter inflatae, ventro concavae, dorso convexae. Stylus (0,4—) 0,5—1 mm longus, pilis minutis stellatis appressis dense obsitus. Semina anguste alata.

Iraq: Sul.: Penjwin, 1400 m, Rech. 10542! Arbil: Hajji Omran, 1700 m, Rech. 11847! M. Baradost, 2000 m, Thesiger 874! M. Handren, 1500—2000 m, Nab. 1280-a, 1297. Kuh Safin prope Shaqlawa, 1200—1600 m, Bornm. 890.
Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2400 m, Gauba 1375. — W: Azerb.: Tabriz, 1200—1300 m, Jacobs 6139! Ham.: M. Alvand, Str.

Distr. gen.: Asia austro-occidentalis.

11. ***A. contemptum*** Schott & Ky., Österr. Bot. Wochenbl. 4: 177 (1854).
Syn.: *A. campestre* L. var. *compactum* Turrill, Kew Bull. 1930: 297 (1930). *A. Davi* Cowan ex Parsa, Fl. de l'Iran 1: 749 (1951).
Icon.: Rech. f., Ark. Bot. Ser. 2, 5 (1): tab. 11 (1959).
Typus: In Tauro Ciliciae, Ky., W!

Differt ab *A. stricto* Willd. statura humiliore, petalis retusis 2,5—3,5 mm longis, indumento sparso e pilis stellatis composito, racemis fructiferis crasse cylindricis, silicularum valvis ± aequaliter inflatis, stylo 0,5—0,8 mm longo.

Iraq: Arbil: 3 km W Salah ad-Din, 700 m, Erdtman & Goedemans in Rech. 15551!, 15557! M. Qandil, Pushtashan, 1500 m, Rech. 11828! Sul.: M. Avroman, Tawilla, 1400—2000 m, Rech. 12363!
Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2800 m, Gilli s. n.! Gaduk, Chashm, Behb. 5650-E! — S: Fars.: Maharlu prope Shiraz, Gauba 221! — C: Tehr.: Reneh, 2600 m, Gilli s. n.!

Distr. gen.: Asia austro-occidentalis.

12. ***A. Szowitsianum*** Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 4: 31 (1837). Syn.: *A. pyramidatulum* Bornm., Beih. Bot. Centrbl. 38, 2: 481 (1921). *A. stenostachyum* Botsch. & Vved., Not. Syst. Leningrad 3: 181 (1941).
Typus (Syntypi): Talish, in montibus altioribus, C. A. Mey., LE; in monte Ararat, Hohen., K.

Differt ab *A. stricto* indumento partium inferiorum e pilis sublepidotis consistente, petalis profunde emarginatis vel bifidis lobis parallelis, siliculis pilis stellatis aequaliter radiatis densis canescentibus.

Iraq: Kurd.: Mosul: Jabal Khantur prope Sharanish, 1400 m, Rech. 12035! Aqrah, N. Polunin et al. in Exsic. Univ. Baghdad 46! Arbil: Salah ad-Din, 1000 m, Helbaek 719! M. Algurd, 2900 m, Bornm. 889! Kuh Safin, 1100—1700 m, Bornm. 888. — Diyala: Jabal Hamrin, Sutherland 138 p. p.!
Talish: Swant, C. A. Mey. Prope Tatuni, 1200 m, Hohen.
Persia: N: Gorg.: M. Shahvar prope Hajjilang, 2400 m, Rech. 6141-b! Persia borealis, Szov., Bge. — W:: Azerb.: Einal Zeinal prope Tabriz, Grossh. Tabriz, Gill.-Sm. 1780. Ad lacum Rezaiyeh, Gill.-Sm. 2248. Kermansh.: Warwasid Cave, 8 km NE Kermanshah, 1350 m, Bent & Wr. 331—212 p. p.! Ham.: Karaghan, Sab. 92! Aq Bolagh-e Aqdaq, Rioux & Golv. 290-b! Esf.: Inter Arak et Esfahan, Bornm. 2159. Khunsar, Bornm. 2160. Lur.: 25 km E Khorramabad, 1900 m, Koeie 1408! Dow Rud, 1500 m, Koelz 15697-b!, 17171! Khuz.: 16 km W Abarqu, 1600 m, Grant 15405! — S: Fars.: 58 km W Shiraz, 1600 m, Grant 15613! Shiraz, Pravitz 601. Dalaki, Ky. 181!, 183! Kuh Bil, Stapf 253! Kerm.: M. Jebal Barez, Bobek 177!; Deh Bakri, 2400 m, Rech. 3802! Inter Saidabad et jugum Chah-e Chaghak, 1900 m, Rech. 3194 p. p.! Bal.: 14 km SW Nosratabad Sipi, 1300 m, Grant 15316! — E: Khor.: Kuh-e Neyshabur, Akhlamad, 1800 m, Rech. 4537! Torbat-e Heydariyeh, 1300 m, Rech. 4349! Hazar Masjed, 1600 m, Rech. 5202! Kopet Dagh: Inter Quchan et Alam Ali, 1600 m, Rech. 4790! Bojnurd, Mirzayan 5850-E! — C: Tehr.: Evin, Mirzayan 6410-E! Mahmudiyeh, 1300 m, Rech. 2829 p. p.! Damavand, 2640 m, Gilli. Prope Reneh et Polur, 1800—2200 m, Bornm. 6238. In jugo Kandavan, 2800 m, Gilli. Qazv.: Karaj, 1400 m, Rech. 7513!, Stutz 676!, Gauba 1379! Kalak, Rech. 135!, Gauba. Kuh-e Nemar, 2000 m, Rech. 650-a! Prope Pachenar, 500 m, Bornm. 6234. In jugo Kharzan, 1600 m, Bornm. 6236. In valle Loura prope Gach Sar, 2200 m, Bornm. 6237. Qazvin, 1200—1500 m, Schmid 5008!, Jacobs 6197! Yazd: Taft, Bornm. 2162.
Turcomania: Ashkhabad, Freyn 52-b. Prope Firyuza, Litw. 573.
Afghanistan: NW: Herat, 1100 m, Koeie 4162! — E: Kabul: 2 km W Charikar, Gholrondi, Podlech 10213-a! Istalif, 1800 m, Gilli 1070!, 1074! Tang-i Gharu, 1400 m, Rech. 16945! In declivibus occidentalibus jugi Lataband, 1800—2100 m, Rech. 31124! Prope Jalalabad, Akhbar! Band-i Kargha, 2050 m, Rech. 31261! Sher Darwasa, 1840 m, Gilli 1069!, 1071!, 1073! — Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Rech. 32037! NE: Kataghan: In valle Andarab, 15 km E Doshi, 1000 m, Podlech 10233!

Pakistan: Quetta: Inter Kalat et Mastung, 2000 m, Rech. 28379! Spin Karez, 1900 m, Rech. 29224! In jugo W Ziarat, 2200 m, Rech. 29312! Pishin, 1500 m, Lace 3383! Harnai, Lace 3742! Urak, 2100 m, Lace!

Distr. gen.: Asia austro-occidentalis.

13. ***A. marginatum*** Steud. ex Boiss., Ann. Scienc. Nat. Ser. 2, 17: 157 (1842). Typus (Syntypi): Arabia: M. Horeb, Auch. 228, G; Persia, Esfahan, Auch. 4101-B, G.

Annuum, pumilum (—1) 2—5 (—10) cm altum, a collo ramosum, omnino pilis stellatis multiradiatis appressissimis canescens, ramis diffusis vel ascendentibus crassiusculis saepe a collo fere fructiferis. Folia oblongo-spathulata obtusa, summa racemum involucrantia primum superantia. Petala minima pallide flava linearicuneata. Racemus fructifer brevis crassiusculus siliculis imbricatis densus. Siliculae (3—) 4×(2,5—) 3—3,5 mm, ovatae, retusae, utrinque, subtus magis convexae, appressissime lepidoto-stellatae; stylus brevissimus ± 0,2 mm longus; semina aptera.

Iraq: Kurd.: Arbil: Kurrak Dagh prope Rawandiz, 1900 m, Nab. 1278. M. Handren, 1800—1900 m, Nab. 1280.
Persia: W: Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 209-a! Arak: M. Rasvand, Str. Esf.: Prope Esfahan, Auch. 4101-B. Inter Esfahan et Kuhpayeh, 1600 m, Rech. 2713-b! — S: Fars.: 48 km S Abadeh, 2100 m, Stutz 795! Maharlu prope Shiraz, Gauba 191! Persepolis, Ky. 989! Pasargadae, 2000 m, Grant 15805! Aminabad, Stapf 252! Kerm.: Inter Baghin et Sang Bur, 1600—2200 m, Rech. 2971! Nabid inter Kerman et Bam, Rech. 7360! Inter Chah-e Chaghak et Tarom, 1400 m, Rech. 7512! In jugo Khaneh Sorkh inter Kerman et Saidabad, 2500 m, Rech. 3540! Kuh Tagh Ali, Bornm. 2164. — E: Khor.: Ozbagu, Ruttner 58!, 268!, 474! Garedu 70 km S Ozbagu, Ruttner 213! — C: Tehr.: Inter Tehran et Delijan, 1000 m, Schmid 5153! Shahrud, Bge. Yazd: Bambis, Bornm. 2166. Taft, Bornm. 2163. Prope Qom, Bornm. 2165. Jandaq, Buhse. Deh Bala prope Yazd, Buhse 1305. Inter Anar et Bahramabad, Rech. 2881! Damgh.-Semn.: Rashm, Buhse.
Turcomania: Kizyl Arvat, Becker.
Afghanistan: SE: Kandahar: Kalat-i Ghilzai, Kerst. 182! Prope „Dschamal Baba" S Kandahar, 1000 m, Gilli 1068! — E: Kabul: Inter Kabul et Tang-i Gharu, 1770 m, Gilli 1072! 10 km N Kabul, Rech. 17025!, 31126! Momandi Shekan, Kerst. 40 p. p.! Ghazni: Sang-i Masha, 2500 m, Rech. 17435! — C: Ghorat: Inter Daulat Yar et Qala Qansi, 2200 m, Rech. 18829!
Pakistan: Kurram: Parachinar, 1700 m, Rech. 30924!, Lamond 1883! — N. Wazir.: W et E Datta Khel Fort, 1400 m, Blatt. & Fz. 617, 1350, 1357. Boya Fort, Blatt. & Fz. 906, 937. — Quetta: Urak, Lace! Inter Dulai et Kanak, 1600 m, Rech. 29129! Shingar, 50 km N Fort Sandeman, 2000 m, Rech. 29899! Quetta, Lace 3747 p. p.! Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29015!, Lamond 1034! — Kalat: Inter Surab et Kalat, 1800 m, Rech. 28320!, Lamond 680! — Baluchistan, Stocks!

Distr. gen.: Asia austro-occidentalis.

14. ***A. minus*** (L.) Rothm., Feddes Repert. 50: 77 (1941).
Typus: Montpellier.

Annuum usque ad 25 cm altum. Folia oblanceolata vel obovato-spathulata. Racemi usque ad 15 cm longi, ramis si evolutis divergentibus vel ascendentibus. Sepala decidua. Petala 0,4—0,9 mm lata, sensim attenuata, emarginata vel integra. Pedicelli ± horizontaliter patentes, siliquae diametro plerumque breviores. Siliculae ± 5 mm diametro, orbiculares vel interdum latitudine sublatiores, apice subtruncatae; indumentum monomorphum e pilis majusculis vel parvis stellatis aequaliter

vel inaequaliter radiatis compositum; valvae ± inaequaliter inflatae. Stylus 0,5—1 (—1,6) mm longus, rigidus, pilosus. Seminum ala (0,2—) 0,3—0,4 mm lata.

Distr. gen. speciei: Europa australis, Regio Mediterranea, Asia austro-occidentalis.

1a. Styli 0,7—1,3 mm longi. Pilis silicularum aequaliter radiati ..... var. *minus*
b. Styli 1—2 mm longi. Pili silicularum inaequaliter radiati .....
..... var. *micranthum* (C. A. Mey.) Dudley

— — var. ***minus***
Syn.: *Clypeola minor* L., Fl. Monsp. (Nathorst, Dissert. no. 70: 21 [1756]), non Amoen. Acad. 4 (1759). *Alyssum campestre* L., Spec. Plant. ed. 2: 909 (1763) p. p. *A. parviflorum* M. B., Fl. Taur.-Cauc. 3: 434 (1819). *A. campestre* var. *micropetalum* sensu Boiss., Fl. Or. 1: 284 (1867) p. p. *A. campestre* auct. mult. pro max. parte.
Distr. gen. varietatis: In tota area speciei, ut videtur in Asia interiore minus frequens.

Ich habe aus dem Gebiet der Flora Iranica keine Belege gesehen.

— — var. ***micranthum*** (C. A. Mey.) Dudley, Acta Univ. Bergensis Ser. Math.-Nat. 13: 6 (1963).
Syn.: *A. micranthum* C. A. Mey., Ind. Sem. Hort. Petrop. 1: 22 (1835). *A. campestre* var. *micranthum* et *genuinum* sensu Boiss., Fl. Or. 1: 284 (1867).
Typus (Lectotypus): Lenkoran, C. A. Mey., G, W!

Iraq: Kurd.: Mosul: 5 km S Zakho, Rech. 12130!
Persia: N: Gorg.: In declivibus borealibus M. Shahvar prope Hajjilang, 2400 m, Rech. 6141-a! — W: Azerb.: In jugo inter Sufian et Marand, 56 km NW Tabriz, Rech. 14910! Ham.: Ganjnameh, Lindb. 68! Faghireh, Sab. in Gauba 202!, 228! — S: Fars.: Khaneh-ye Zenyan, 50 km W Shiraz, 1800 m, Pravitz 547! — E: Khor.: M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 4994! M. Hazar Masjed, 2000 m, Rech. 5118! Kopet Dagh, inter Quchan et Alam Ali, 1600 m, Rech. 4777! — C: Tehr.: Mahmudiyeh, 1200 m, Aell. 1076! Darband, 1200—2000 m, Esfand. 94-E!, Schmid 5124! M. Tuchal, Hafthauz, 1500 m, Aell. 1090! 100 km E Tehran ad fluv. Delichay, 1700 m, Aell. 1054! Qazv.: Kalak prope Karaj, 1400 m, Rech. 155! Kuh-e Nemar, 1600—2200 m, Rech. 560-b p. p.! Shahr.-Bust.: In jugo Khash Aylan 70 km E Shahrud, 2200 m, Rech. 5433! Turcomania: Keltenczinar, Litw. 576!

Distr. gen. varietatis: Graecia, Africa borealis, Asia austro-occidentalis.

15. ***A. turkestanicum*** Regel & Schmalh. ex Regel, Descr. Pl. Nov. Fedtsch. 6 (1882) in Izv. imp. Obshch. Lyub. Estest. Antrop. Etnogr. 34, 2 (1882).
Syn.: A. *afghanicum* Rech. f., Phyton 3: 55 (1951), fide Dudley.
Typus: E Turcestania.

Annuum, multicaule, 6—15 cm altum; caules crassiusculi, arcuato-ascendentes, pilis breviter multiradiatis canescentes. Folia sursum increscentia, 5—15×2—3 mm, anguste oblongo-linearia ± acuta. Sepala decidua. Petala ± 1,5 mm longa, albida, oblongo-cuneata, antice truncata vel emarginata. Pedicelli fructiferi 2—3 mm longi, crassiusculi, angulum 60—70° cum axi formantes. Siliculae ± 3 mm diametro, suborbiculares, valvis subaequaliter inflatis, pilis stellatis appressissimis, breviter ± 7-radiatis, sese in statu maturo numquam tangentibus obsitae. Stylus 0,5 mm longus, rigidulus. Semina late marginata.

Persia: E: Khor.: Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, Rech. 4796! Inter Chanaran et Quchan, Rech. 4735-b p. p.! — C: Qazv.: Karaj, Kuh-e Nemar, 1600—2000 m, Rech. 650-b p. p.!

Afghanistan: E: Kabul: 2 km W Charikar, Podlech 10236! Paghman, 2300 m, Chaw.-Must. s. n.!, Rech. 17204! Istalif, 1800 m, Gilli s. n.!, Neub. 4028! Top Darrah, Neub. 4009! Chandao, 2400 m, Koelz 11758 (Typus *A. afghanici* Rech. f.)! Ghazni: Ad jugum Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 17375! — NE: Kataghan: Taliqan, 780 m, Podlech 10286! 18 km W Taliqan versus Khanabad, 680 m, Podlech 10240!
Pakistan: Kurram: Parachinar, 1800 m, Afendi 154!

Distr. gen.: Persia, Afghanistan, Pakistan, Asia centralis.

16. ***A. strigosum*** Banks & Soland. in A. Russell, Nat. Hist. Aleppo 2: 257 (1794). Syn.: *A. micropetalum* Fisch. ex DC., Reg. Veg. Syst. Nat. 2: 313 (1821). *A. campestre* L. var. *micropetalum* sensu Boiss., Fl. Or. 1: 284 (1867).
Typus: Aleppo, Russell, BM.

Annuum, usque ad 25 cm altum. Folia oblanceolata vel obovato-spathulata, sursum increscentia. Racemi 2—10 (—15) cm longi, simplices vel ramosi, ramis divergentibus vel ascendentibus. Sepala decidua. Petala 2—3 (—3,5) × 0,4—0,9 (—1,4) mm, sensim attenuata, integra vel emarginata. Pedicelli fructiferi 3—5 mm longi. Siliculae 3—5,5 mm longae et latae; indumentum dimorphum, e pilis inaequaliter bifurcatis leviter tuberculatis et e pilis appressis stellatis consistens; valvae ± inaequaliter inflatae. Styli rigidi, 0,5—1 mm longi, glabri vel sparse pilosi. Ala seminarum 0,2—0,3 (—0,4) mm lata.

Iraq: Kurd.: Kirkuk: Jarmo, 800 m, Helbaek 305! Sul.: Dukan, Barkley 7595! M. Avroman, Susakan prope Tawilla, 1000 m, Rech. 10192! Mosul: Inter Sharanish et montem Zawita, 1100—1400 m, Rech. 10895! Arbil: Ad radices M. Baradost prope Shanidar, 900 m, Erdtman & Goedemans in Rech. 15685! — Diyala: Jabal Hamrin, Haines W-839!, Sutherland 138 p. p.!, 139 p. p.! Khanaqin, Rech. 14129! Kut-al Imara distr.: Badrah, Rech. 13998!
Talish: C. A. Mey.
Persia: N: Maz.: Hazar Jerib, Shar. 570! Persia borealis, Auch. 4097! — W: Kermansh.: Qasr Shirin, Shar. 5648-E! Esf.: Inter Esfahan et Tehran, Bge. Bakht.: In valle Bazoft, Mart.-Escal. Lur.: Shah Bazan, 500 m, Koelz 294! Inter Kani-ye Karazan et Zangevan prope Shirvan, Behb. 90! Inter Amarah et Dehloran, Nab. 1824. — S: Fars.: Prope Shiraz, Ky. — C: Tehr.: M. Damavand, 2640 m, Gilli. Qazv.: Mazraeh, 1200 m, Schmid 5039! Karaj, Bornm. & Gauba.

Distr. gen.: Europa australis, Africa borealis, Asia austro-occidentalis.

Im Gebiet der Flora Iranica kommt ausschließlich subsp. *strigosum* vor, die im Gesamtareal der Art vorherrscht. Die durch persistierende Sepalen, längere Griffel und größere Früchte gekennzeichnete subsp. *cedrorum* (Schott & Ky.) Dudley bewohnt Süd-Anatolien, Cypern und wahrscheinlich Nord-Syrien.

17. ***A. Stapfii*** Vierh., Verh. Zool.-Bot. Ges. Wien 64: 261, tab. 7, fig. 1 (1914). Syn.: *A. campestre* L. var. *genuinum* Boiss., Fl. Or. 1: 284 (1867) p. p. *A. Buschianum* Grossh., Journ. Soc. Bot. Russe 14, 3: 307 (1929).
Typus: Stapf 250, WU!

Annuum, usque ad 20 cm altum, erectum, ramis ascendentibus. Folia obovata vel spathulata. Racemi usque ad 10 cm longi, fructiferi laxi, ramis divaricatis. Pedicelli validi, saepe fere horizontaliter patentes, quam siliculae sesqui- usque ad subduplo longiores, indumento appresso. Sepala persistentia. Petala (2,5—) 3—5 × 1—2 mm, infra limbum constricta, biloba. Siliculae ± orbiculares, 4—5 mm diametro, indumento monomorpho, e pilis ± longis pauciradiatis stellatis compositum;

valvae aequaliter inflatae. Styli 1—2 mm longi, basi quam apice duplo fere crassiores, indumento sparso. Semina anguste alata.

Iraq: Kurd.: Kirkuk: Jarmo, Helbaek 467! Sul.: Penjwin, 1600 m, Rech. 12269!; in jugo Malakawa, 1400 m, Rech. 12312! M. Avroman prope Tawilla, 1400—1600 m, Rech. 10304!
Talish: sec. Grossh., Fl. Kawk. 4 tab. 264 (1950).
Persia: N: Maz.: Kojur, M. Uloj, 3000 m, Rech. 6541! In declivibus borealibus jugi Kandavan, 2600 m, Wdb. 2101! — W: Kermansh.: Kuh-i Parrow, 1330 m, Bent & Wr. 406—111! Kuh-e Qalajeh, Behb. 115! Bisotun, 1650—1950 m, Jacobs 6360! Warwasid Cave, 8 km NE Kermanshah, 1350 m, Bent & Wr. 331-212 p. p.! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 208! Arak: Inter Girdu et Nazmabad, Str. Arak. Str. Lur.: Bisheh, 1200 m, Koelz 1407!, Rech. 5750! Dow Rud, 1650 m, Koelz 15770!, 17294-a! — S: Fars.: Prope Kazerun, 1500—1650 m, Stapf! Kuh Bil, Stapf 250! Dasht-e Arzhan, Stapf! — E: Khor.: Kuh-e Neyshabur: Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4497!, 4653 p. p.! Torbat-e Heydariyeh, 1300 m, Rech. 4339! Robat-i Safid, 1800 m, Rech. 7334! Mashhad, 900 m, Rech. 4893! M. Hazar Masjed inter Gush et Talqur, 1600 m, Rech. 5201! — C: Tehr.: Mahmudiyeh, 1250 m, Aell. 1005! Damavand, Reneh, 2600 m, Gilli s. n.! Qazv.: Karaj: Kuh-e Nemar, 1600—2000 m, Rech. 650-b p. p.! Inter Karaj et Gach Sar, Schmid 5686!, Gauba 229! 10 km W Karaj, Stutz 679!
Afghanistan: NW: Herat: M. Paropamisus, Chashmeh Obeh, 1800 m, Rech. 19323! Obeh, 1700 m, Koelz 3772! — E: Kabul: In declivibus occidentalibus jugi Lataband, 1900 m, Lamond 1968! Gardez: Sirotai, 3000 m, Koelz 11965! — NE: Kataghan: In declivibus borealibus jugi Salang, 2700 m, Rech. 31612! Andarab, in valle prope Sarab, 2400 m, Podlech 11144! Prope Taganak, 2250 m, Podlech 11027!

Distr. gen.: Asia austro-occidentalis.

18. ***A. hirsutum*** M. B., Fl. Taur.-Cauc. 2: 106 (1808).
Syn.: *A. hirsutum* sensu Boiss., Fl. Or. 1: 284 (1867) excl. syn. *A. campestre* L. var. *micropetalum* Boiss., l. c. p. p. incl. syn.
Icon.: Dudley in P. H. Davis, Fl. Turkey 1: 371, 373, fig. 17, 18 (1965).
Typus: „In Tauriae et Iberiae campis apricis, M. B., LE.
Annuum, usque ad 40 cm altum. Folia oblanceolata vel obovata. Racemi usque ad 20 cm longi, elongati, stricti, ramis divergentibus vel ascendentibus. Sepala decidua. Petala (2,5—) 3—4,5 × 1—1,5 mm, biloba, infra limbum constricta. Siliculae 5—6 mm longae et latae, indumento dimorpho e pilis simplicibus et inaequaliter bifurcatis valde tuberculatis et e pilis stellatis appressis pauciradiatis consistens. Seminum ala 0,3—0,5 mm lata.

Persia: N: Maz.: Pol-e Zanguleh in valle fluvii Chalus, 2200—2600 m, Rech. 6305! — W: Ham.: Aqbolagh-e Morshed E Bijar, Misonne in Schmid 6700! — C: Tehr.: Inter Darband et Pas Qaleh, 1400—1600 m, Rech. 2615!
Turcomania: Ashkhabad, Litw. 574!

Distr. gen.: Peninsula Balcanica, Tauria, Anatolia, Persia, Turcomania.

19. ***A. repens*** Baumg., Enum. Stirp. Transs. 2: 237 (1816).
In regione Florae Iranicae tantum crescit:

— — subsp. ***trichostachyum*** (Rupr.) Hayek, Prodr. Fl. Penins. Balcan. 1: 436 (1925).
Syn.: *A. trichostachyum* Rupr., Fl. Cauc., 101 et 290 (1869).
Typus: Caucasus, Stev., G.

Perenne, usque ad 60 cm altum. Folia surculorum sterilium obovato-spathulata, caulina lanceolata acuta, sursum decrescentia. Indumentum ± dimorphum, strigosum, e pilis pauciradiatis ± ramosis stellatis compositum. Racemi usque ad 30 cm longi. Pedicelli patuli, strigosi. Sepala decidua. Petala 4—7×1—3 mm, retusa vel biloba, sparse pilosa. Siliculae 3—6 mm diametro, ovatae, obovatae vel orbiculares, pilis stellatis pauciradiatis minutis appressis canescentes; valvae ± aequaliter inflatae. Stylus (1,5—) 3—4 mm longus, basi dense pilosus. Semina anguste alata.

Talish: Swant, 750—900 m, Hohen. In montibus Talish, Buhse, C. A. Mey.
Persia: W: Azerbaijan, Auch. 4090.

Distr. gen. subspeciei: Peninsula Balcanica, Syria, Tauria, Anatolia, Caucasus, Talish, Persia borealis, Transcaspia.

20. ***A. iranicum*** Haussk. ex Baumg., Jahresber. Kais.-Franz-Jos.-Oberrealschule Baden b. Wien 48: 9 (1911).
Typus (Syntypus): Kuh Tarikha, Str. s. n., W!

Dense suffruticoso-caespitosum multicaule; caules floriferi ascendentes vel erecti, (3—) 5—8 (—10) cm longi, dense foliati. Tota planta subargenteo-lepidota, in foliis superioribus, pedicellis, sepalis etiam pili stellati radiis subpatulis obvii. Folia 8—16×1—2 mm, sursum increscentia, apice acutiuscula, basi sensim attenuata. Racemus plerumque abbreviatus. Pedicelli erecto-patuli, flores aequantes. Sepala membranaceo-marginata. Petala 6×2 mm, oblongo-cuneata vel sublyrata, obtusa. Filamenta breviora basi breviter alata, ala superne contracta. Siliculae ± 5×3,5 mm, ellipticae, apice obtusae, pilis stellatis minutis dense obsitae. Stylus ± 2 mm longus.

Persia: W: Ham.: M. Tafresh, Str. M. Nagreh Kemer, Str. Kuh-i Guliawa, Str. Inter Nahavand et Borujerd, Str. Kermansh.: Bisotun, Str. Kuh-i Tarikha, Str.!

Distr. gen.: Syria, Transjordania, Persia (fide Dudley in hb. E).

Der einzige mir vorliegende Beleg ist blühend und in diesem Zustand gewissen Formen des äußerst polymorphen *A. lanceolatum* Baumg. sehr ähnlich. Als Unterschied kommt nach Baumgartner hauptsächlich die Ausbildung der Filamente in Frage.

21. ***A. lanceolatum*** Baumg., Jahresber. Kais.-Franz-Jos.-Oberrealschule Baden b. Wien 48: 11 (1911).
Syn.: *A. Müller*i Boiss., Fl. Or. 1: 279 (1867) p. p. quoad pl. Khoras. nec Boiss. (1842). *A. persicum* auct. fl. Turcoman. et Afghan. nec Boiss. & Buhse (1860). *A. iranicum* Czernjak., Not. Syst. Herb. Hort. Bot. Rep. Ross. 5: 34 (1924) et Feddes Repert. 27: 272 (1930) nec Haussk. ex Baumg. (1907). *A. Czernjakowskae* Rech. f., Phyton 3: 54 (1951).
Icon.: Clavis p. 25.
Typus: Litw. 569, W!

Suffrutescens, caespitosum, surculos steriles et caules floriferos numerosos emittens; caules floriferi ascendentes vel erecti, (5—) 8—15 cm alti, foliati. Tota planta pilis stellatis multiradiatis argenteo-lepidota. Folia surculorum sterilium oblongo-linearia aut longe aut breviter lanceolata rarius lineari- vel oblongo-spathulata, acuta vel obtusiuscula, forma ac magnitudine eximie variabilia; folia caulium floriferorum saepe proportione longiora et angustiora, mox decidua. Racemus fructifer ± elongatus laxiusculus. Pedicelli erecto-patuli, stellato-pilosi, longitudine variabiles. Sepala stellato-pilosa. Petala ± 6×1,5—2 mm, sublyrato-cuneata, emarginata, in vivo rosea. Filamenta breviora basi appendiculata. Siliculae 4—7 mm diametro,

orbiculares vel rarius ellipticae, biconvexae, apice truncatae vel subemarginatae, pilis breviter multiradiatis valde appressis obsitae. Stylus 2,5—5 mm longus.

Persia: E: Khor.: M. Hazar Masjed, 2000—2800 m, Rech. 5124! Inter Shahrud et Neyshabur, Bge. Bezg, 1500 m, Aitch. 680. Robat Safid inter Mashhad et Torbat-e Heydariyeh, in montibus serpentinicis, 1700—2000 m, Rech. 1521!, 4421!, Gauba 224! Kopet Dagh: Allah Akbar, 1800 m, Gauba 198!, 223! et in Rech. 2498! — C: Shahr.-Bust.: In glareosis calc. M. Shahvar, 3500—3900 m, Rech. 5978!
Turcomania: In monte Kular prope Gaudan, 2100 m, Litw. 569! In montibus ad confines Persiae, Litw. 570. M. Bosikjam, 2100 m, Litw. 571. Kopet Dagh, Walter. Garmab, Antonow. Messinou, Antonow. Cheirabad, Lipsky. In faucibus Firyuza prope Ashkhabad, Androssov 291. Prope Ashkhabad, 2000 m, Litw. Risarash, Czern. 140, 172.
Afghanistan: NW: Herat: Sauzak, 2500 m, Koelz 4169! M. Paropamisus: In jugo Chashmeh-Sabz, 1500 m, Aitch. 394. — E: Kabul: In jugo Unai, 3630 m, Meinertzhagen s. n.! Gardez: In jugo Altimur, 2800—3200 m, Rech. 31898!, Lamond 2341! Jaji: Inter Dre Kalla et Qazim Khel, Rech. 32319! Ghazni: Dasht-i Nawar, 3000 m, Kasy 27! Okak, 3000 m, Rech. 17695! In faucibus Nawar Kotal inter Okak et Behzud, 3150 m, Rech. 17824! — C: Bamian: Farakulum, 3000 m, Koelz 2542! Band-i Amir, 2900 m, Rech. 18428!, Volk 2259!, 2764! Deh Kundi, 3000 m, Edelb. 1939!
Pakistan: Kurram: Seratigah, Aitch. 826.

Distr. gen.: Endem.

Die Art ist in fast allen Merkmalen äußerst variabel. Da aber weder eine Korrelation der Merkmale noch eine geographische Bindung gewisser Merkmalskombinationen bemerkbar ist, vielmehr Blattform, Schötchengröße und Griffellänge innerhalb einer Population stark variieren können, wird von einer Unterscheidung von Abarten abgesehen.

22. ***A. Mülleri*** Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 16 (1860).
Typus: Buhse 1358.

Suffruticoso-caespitosum, pilis stellatis multiradiatis omnino cano-lepidotum. Caules floriferi 4—8 cm longi, erecti, foliati. Folia 10×2—3 mm obovato-linearia, acuta. Racemus brevis. Pedicelli erecto-patuli, siliculis ± aequilongi. Sepala membranaceo-marginata, pilis stellatis non appressis obsita. Petala 6×2 mm longe unguiculata, obovato-cuneata, obtusa. Siliculae ± 4,5 mm diametro ovato-orbiculares obtusae, dense stellato-pilosae. Stylus ± 3 mm longus.

Persia: N: Persia borealis, Bge. — W: Azerb.: In collibus N Tabriz, Gill.-Sm. 1788, 2250. Einal Zeinal, Grossh. M. Sir, Gill.-Sm. 2249. Azerbaijan, Auch. 4090! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 207! — E: Provincia Khorasan, Bge. — C: In montibus prope Yazd, Buhse 1358.

Distr. gen.: Armenia rossica, Persia.

23. ***A. persicum*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 152 (1842).
Typus: Aucher 4089, W!

Suffruticosum multicaule, omnino pilis stellatis multiradiatis argenteo-lepidotum. Caules floriferi erecti, 15—30 cm alti, foliati. Folia usque ad 20—24 mm, oblongo-linearia, obtusa vel acutiuscula. Racemus fructifer elongatus, laxus. Pedicelli erecto-patentes, quam siliculae paulo longiores. Sepala apice pilis stellatis vel furcatis subpatulis subhirsuta. Siliculae ± 6 mm diametro, orbiculares, subretusae, pilis stellatis multiradiatis minutis obsitae. Stylus 4—5 mm longus.

Persia: W: Esf.: Esfahan, Auch. 4089! Bakht.: Galli Sur, 2440 m, Koelz 18104! Lur.: Oshtoran Kuh, 2100 m, Koelz 17808!

Distr. gen.: Endem.

Sect. *Gamosepalum* (Haussk.) Dudley, Journ. Arnold Arb. 45: 70 (1964).

Syn.: *Gamosepalum* Haussk., Mitt. Thür. Bot. Ver. 11: 73 (1897).

Plantae perennes. Sepala dimorpha, semper persistentia et saepe sub fructu inflata, indumento intertexta, facie interiore pilosa. Petala albida purpureo-venosa vel flava. Filamenta longiora bilateraliter alata, alis connatis vel liberis sed sese tegentibus. Filamenta breviora appendicibus basi connatis vel dentibus provisa. Siliculae dehiscentes, pilosae, loculis 2-ovulatis. Semina humiditate mucilaginosa.

24. ***A. Baumgartnerianum*** Bornm. in Baumg., Jahresber. Kais.-Franz-Jos.-Oberrealschule Baden b. Wien 48: 6 (1911).

Syn.: *A. tetrastemon* Boiss. var. *latifolium* Boiss., Fl. Or. 1: 278 (1867).

Typus (Lectotypus): Libanon, Dschebel Baruk, Bornm. 11405, W!

Suffrutescens, caulibus flexuosis usque ad 15 cm longis. Folia obovata vel spathulata, raro oblanceolata, obtusa, pilis stellatis densis canescentia. Indumentum in parte superiore plantae dimorphum. Petala flava, (5—) 6—8×1,5—2,5 (—3) mm, integra, infra limbum constricta, ungue piloso. Siliculae 4,5—6×3,5—4,5 mm, ellipticae, obtusae vel truncatae, pilis lepidotis densis canescenti-argenteae. Stylus (2—) 3—4,5 mm longus, basi valde dilatatus, in dimidio vel usque ad ¾ inferiores pilosus.

Distr. gen.: Anatolia australis, Syria borealis, Libanon, Persia.

Nach Dudley in Davis, Flora of Turkey 1: 393 (1965) in Iran vorkommend; der genaue Fundort ist mir nicht bekannt.

Sect. *Odontarrhena* (C. A. Mey.) Hooker.

Plantae perennes. Petala flava. Filamenta longiora libera, unilateraliter vel bilateraliter alata, dentata. Filamenta breviora appendicibus liberis vel connatis et dentibus provisa. Siliculae dehiscentes vel indehiscentes, loculis uniovulatis. Semina plerumque humiditate non mucilaginosa.

25. ***A. turgidum*** Dudley, The Great Basin Naturalist 24, 1: 7 (1964.)

Icon.: Clavis p. 23.

Typus: Stutz 1289, BRY, W!

Perenne, ima basi lignescens. Caules floriferi arcuato-ascendentes, tenues, flexuosi, 5—7 (—15) cm longi; surculi steriles basales, 2—4 cm longi, crebre foliati. Indumentum omnino lepidotum albidum. Folia 5—7×2,5—3 mm, omnia obovato-lanceolata vel oblongo-spathulata, obtusiuscula, in petiolum longe attenuata, indumento albido-lepidoto concoloria, ea caulium floriferorum cito decidua. Flores ignoti. Inflorescentia fructifera capitato-congesta. Pedicelli fructiferi subhorizontaliter patentes, usque ad 3 mm longi. Siliculae 3 (—4)×3 (—4) mm, tenuiter membranaceae, globoso-inflatae, pallide flavescentes vel aliquantum purpureo-suffusae; indumentum silicularum e pilis stellatis tenuiter multiradiatis subcontiguis consistens. Stylus 1 (—1,2) mm longus. — Species in sectione siliculis globoso-vesiculosis tenuiter membranaceis capitato-congestis insignis, haud cum specie alia comparanda.

Persia: W: Karaghan, Sab. 95! Japarabad, 1500 m, 17. V. 1961, Stutz 1289!

Distr. gen.: Endem.

26. ***A. bracteatum*** Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12 (1860).
Typus: „In Armeniae monte Ilanghlidagh prope Nackitschewan", Buhse, G.

Basi paulum induratum; caules floriferi pauci, arcuato-ascendentes, subflexuosi, tenues, in summa parte floriferi ramosi, ramis saepe subhorizontaliter divergentibus. Surculi steriles pauci, abbreviati vel nulli. Folia caulina obovato-spathulata vel interdum superiora ± orbiculata, 3 (—5) × 2,5—3 mm; bracteae quam folia inferiora majores. Indumentum omnium partium appressum canescens vel albidum. Inflorescentia initio capitato-congesta, demum paulo elongata, tamen densiuscula. Sepala 2 mm longa. Petala usque ad 2,5 mm longa, obovata, ungue laminam subaequante. Pedicelli fructiferi erecto-patuli rigiduli, crassiusculi, silicula subbreviores. Silicula ± 3 (—4) × 1,8 (—2,5) mm, obovata, antice truncata, unilateraliter saepe ± inflata, pilis stellatis minutis laxiuscule obsita, ± glabrescens. Stylus ± 1 mm longus.

Persia: W: Azerb.: 94 km N Khvoy inter Shahabad et Maku, 1000 m, Rech. 32738! 22 km N Khvoy, 1600 m, Grant 16190! Esf.: 32 km SW Esfahan, 1650 m, Furse 1367! Inter Esfahan et Abadeh, 2000 m, Schmid 5378! Inter Delijan et Esfahan, 2000 m, Schmid 5201! Esfahan, Auch. 4101! Jolfa, ad sepulcrum Aucheri, 1600 m, Rech. 2668! — C: Tehr.: In semidesertis lapidosis inter Tehran et Varamin, 1000 m, Rech. 2749! Inter Delijan et Tehran, 1000 m, Schmid 5181! Tehran, 1200 m, Schmid 5092!, Ky. 4! Qazv.: 16 km W Karaj, 1500 m, Stutz 665! Qom: 48 km W Qom, 1560 m, Stutz 1042!

Distr. gen.: Endem.

27. ***A. inflatum*** Nyárády, Bul. Grad. Bot. Cluj 9: 43 (1929).
Syn.: *A. Nyárádyi* Bornm. & Gauba, Feddes Repert. 49: 253 (1940), *A. Decandolleanum* Nyárády, Bull. Jard. Mus. Bot. Univ. Cluj 18: 89 (1938).
Typus (Syntypi): Gaudan, Litw. s. n., Sint. 841! (sphalm. 481).

Radix lignosa. Caules usque ad 10 (—15) cm alti, herbacei; surculi steriles pauci, parvifoliati, albido-lepidoti. Folia caulina usque ad 13 × 4 mm, cinerea, subtus albida. Petala 2,9—3,2 mm longa, oblanceolata, apice rotundata vel subemarginata. Siliculae 3,5 × 2,5 mm, late ellipticae, subvesiculosae; indumentum albidum, e pilis stellatis 15—17-radiatis compositum. Stylus 1—1,2 mm longus.

Persia: N: Maz.: Gaduk, Chashm, Behb. 5651-E! — W: Azerb.: In jugo 30 km NW Khvoy, 1800 m, Rech. 32704! Kurd.: Dezh Shahpur, 2200 m, Jacobs 6537! Ham.: M. Karaghan ditionis Siamagan, Str. Aq Bolagh-e Aqdaq, Rioux & Golv. 206! Arak: M. Rasvand, Str. Kuh-e Safid Khaneh prope Arak, Str. Esf.: Kuh-e Sofeh, Stapf 248! Inter Esfahan et Abadeh, 2000 m, Schmid 5393! Lur.: Kuh-e Saverz, Hausskn. Dow Rud, 2100 m, Koelz 16047! Borj prope Nurabad, 2200 m, Koelz 1415! — S: Fars.: Sabz Pushan prope Shiraz, Ky. 376 (Syntypus *A. Decandolleani* Nyárády)! Kuh Chah Siah prope Sivand, Stapf 245! Kuh-e Barfi, Str. — E: Khor.: Inter Quchan et Shirvan, Rech. 1847! In jugo Alam Ali inter Quchan et Lotfabad, 2000 m, Rech. 1680!, 4813! In montibus N Quchan, 1700 m, Gauba 199! M. Hazar Masjed inter Gush et Talqur, 1600 m, Rech. 5146! — C: Tehr.: Mahmudiyeh, 1200 m, Aell. 1004!, 1077! Inter Rudehen et fluvium Delichay, 1800 m, Aell. 1061! Inter Tehran et fluvium Jaji Rud, 1600 m, Aell. 1059! Inter Tehran et Karaj, 1200 m, Schmid 5662! Qazv.: Kuh Safid prope Karaj, Gauba 148 (Typus *A. Nyárádyi* Bornm. & Gauba)! Karaj, Kalak, Rech. 122! M. Halkedar prope Mardabad, 1300 m, Rech. 1004-b! Damgh.-Semn.: In jugo Bashm, 2400 m, Rech. 1193! Shahrud, 1400 m, Rech. 5382! — Supra Baradjin, Str. Turcomania: Kopet Dagh, Dushak, Kult. s.n.! Gaudan, Litw. s. n. Suluklü ad confines Persiae, Sint. 841!

Distr. gen.: Endem.

28. ***A. condensatum*** Boiss. & Haussk. in Boiss., Fl. Or. 1: 268 (1867) excl. syn.
Typus: Inter Aintab et Marasch, Haussk., G, JE, W!

Perenne; caules floriferi usque ad 20 cm longi. Folia plana, obovato-spathulata vel oblanceolata, ± acuta. Petala 2,5—3,5×1—1,5 (—2) mm, rotundata, glabra vel in limbo sparse pilosa. Siliculae (3—) 3,5—6×2—3 mm, oblongae, anguste ellipticae; indumentum cinereum, e pilis stellatis tenuiter 16—30-radiatis, 0,2—0,6 mm diametro compositum; valvae inaequaliter inflatae. Stylus 1—1,5 (—2) mm longus.

Iraq: Kurd.: Mosul: Suwara Tuka, 1500 m, Rech. 11555!

Distr. gen.: Anatolia, Syria, Libanon, Iraq.

Die im Gebiet der Flora Iranica vorkommende Rasse entspricht der typischen, subsp. *condensatum*. Die subsp. *flexibile* (Nyárády) Dudley unterscheidet sich durch abfallende Sepalen, spärliches Indument der grünlichen Schötchen und ± kahlen Griffel und kommt in Südanatolien und Syrien vor.

29. ***A. singarense*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 49 (1888).
Typus: „In cretaceis montis Sindjar inter Zamuche et Zakinia", Haussk., G.

Suffrutescens ± caespitans; caules floriferi (15—) 20—25 (—40) cm alti, flexuosi, basi arcuati, a medio vel a tertia parte superiore iteratim patule corymboso-ramosi. Surculi steriles prope basin caulium evoluti breves vel ± elongati, densiuscule foliati. Folia caulina oblonga vel oblongo-lanceolata, obtusiuscula vel acutiuscula, basi ± longe attenuata, summa diminuta, quam inferiora angustiora et acutiora. Indumentum totius plantae appressum stellatum primum canescens, demum virescens. Petala flava cuneata integra, calyce vix sesquilongiora. Pedicelli fructiferi 3—5 mm longi, erecto-patuli. Siliculae ad summum 4×2 mm, ellipticae, unilateraliter ± inflatae, apice latius basi angustius rotundatae. Indumentum albidum e pilis stellatis multiradiatis ± contiguis ± appressis consistens. Stylus ± 1,2 mm longus.

Iraq: Kurd.: Mosul: Jabal Khantur prope Sharanish, in saxosis calc., 1400 m, Rech. 10828!, 10844! M. Zawita N Zakho, 1800 m, Rech. 10930!

Distr. gen.: Iraq.

Die Art ist durch besonders stark entwickelte membranöse Flügel der längeren Filamente ausgezeichnet.

30. ***A. kurdicum*** (Boiss.) Nyárády, Anal. Acad. Republ. Popul. Rom. Ser. A, 1, 3: 45 (1949).
Syn.: *A. oxycarpum* Boiss. & Bal. var. *kurdicum* Boiss., Fl. Or. 1: 269 (1867).
Typus: Ky. 337, W!

Suffruticoso-caespitosum. Caules floriferi numerosi, arcuato-ascendentes, 10—20 cm alti. Surculi steriles basales numerosi, demum elongati. Indumentum totius plantae lepidoto-canum. Folia caulium floriferorum fructificationis tempore delapsa, ea surculorum sterilium 6—15×2—4 mm, lanceolata vel oblanceolata, acuta, indumento lepidoto albido-cana concoloria. Inflorescentia breviter corymbosa, ramis tenuibus erecto-patulis. Siliculae (4—) 4,5—4,9×2—2,5 mm, anguste ellipticae, utrinque subaequaliter attenuatae; indumentum e pilis stellatis multiradiatis contiguis compositum, albidum. Stylus 1,5 mm longus.

Iraq: Kurd.: Mosul: Chiya-e Gara, Ky. 337!

Distr. gen.: Endem.

31. ***A. lanigerum*** DC., Reg. Veg. Syst. Nat. 2: 308 (1821).
Syn.: *A. serpyllifolium* Desf. „forma stylo siliculis aequilongo terminatis", Boiss., Ann. Scienc. Nat. Ser. 2, 17: 151 (1842).
Typus: Persia: Inter Kermanshah et Hamadan, Olivier & Bruguière, P.

Suffrutescens, multicaule. Caules floriferi (4—) 10—15 (—20) cm longi, arcuato-ascendentes, flexuosi; surculi steriles basales pauci vel numerosi, demum elongati. Folia caulina 8—12 × 1,5—3 mm, obovato- vel oblongo-lanceolata, apice acutiuscula vel obtusiuscula, in petiolum sensim longe attenuata. Indumentum e pilis stellatis contiguis consistens appressum, albido-canescens. Inflorescentia corymbosa ramis divaricatis tenuibus, racemis contractis fructiferis quoque non elongatis. Pedicelli fructiferi 3—4 mm longi, tenues, erecto-patuli. Silicula 3,5—4 × 1,5—1,8 mm, elliptica, compressa, pilis stellatis tenuiter multiradiatis non contiguis deinde ± evanescentibus obsita. Stylus 1,5—1,9 mm longus.

Persia: W: Esf.: Esfahan, Auch. 4094!, Buhse! Lur.: Kuh-e Eshger, Haussкn.! M. Saverz, Haussкn.! — C: Tehr.: Darband, Ky. 92!

Distr. gen.: Endem.

32. ***A. penjwinense*** Dudley, Notes Roy. Bot. Gard. Edinb. 24: 162 (1962).
Syn.: *A. rhodopense* Formanek subsp. *duristellatum* Nyárády, Anal. Acad. Republ. Popul. Rom. Ser. A 1, Mem. 3: 77 (1949).
Icon.: Dudley, l. c.: 163, tab. 7, fig. 4.
Typus: Rech. 10446, W!

Suffrutescens, multiramosum, 18—25 cm altum. Surculi steriles basales, foliis orbiculato-spathulatis, indumento denso argenteo-canis. Folia caulium floriferorum obovata vel oblanceolata, acuta, sursum increscentia, pilis stellatis sparse punctata. Pedicelli 3,5—4,5 mm longi, patentissimi. Petala 3—3,5 × 1—1,5 mm, parce stellato-pilosa. Siliculae 4—4,5 × 3 mm, utrinque attenuatae, valvis aequalibus subinflatis virescentibus, pilis stellatis punctiformibus 4—8 (—10)-radiatis 0,4—0,5 (—0,6) mm diametro. Stylus 1,5—1,8 (—2) mm longus.

Iraq: Kurd.: Sul.: Penjwin, 1400—1600 m, Rech. 10446!, Guest 12971!, Rawi 12223!, 22529! M. Avroman N Halabja, Rawi 22083! Qara Dagh, 1500—1700 m, Rawi 9263! Arbil: Algurd Dagh supra Nowanda, 2000—2600 m, Guest 2818!, Rech. 11361!, Gillett 9502! Hajji Omran, 1800 m, Rawi 9145!

Distr. gen.: Endem.

33. ***A. polycladum*** Rech. f., Phyton 3: 55 (1951).
Typus: Rech. 6519, W!

Suffruticoso-caespitosum, a basi iterum ramosissimum; rami steriles flexuosi procumbentes, floriferi tenues ascendentes, usque ad 10 cm longi, ramis angulo acuto abeuntibus. Folia ramorum sterilium 3—6 × 2 mm, oblonga usque subspathulato-lanceolata, acutiuscula, densiuscule stellato-lepidota. Folia caulium floriferorum mox decidua. Siliculae ±4 × ±2,5 mm, ellipticae, utrinque subaequaliter rotundato-attenuatae, in medio circiter latissimae, virescentes, pilis stellatis breviter multiradiatis appressissimis non contiguis laxiuscule obsitae. Stylus ± 2 mm longus, tenuis, rigidulus.

Persia: N: Maz.: Kojur, M. Uloj, 3200—3400 m, Rech. 6519! Supra jugum Kandavan, 3140 m, Gilli s. n.! In jugo Kandavan, 3000 m, Gauba 226! — W: Azerb.: Khvoy, Qotur, Shar. 5647-E! Lur.: Dow Rud, 1650—2100 m, Koelz 15681!, 16046! Oshtoran

Kuh, 2100 m, Koelz 17809! — C: Tehr.: M. Damavand, 4000 m, Schwingenschuss s. n.! Emamzadeh Hashem, 2600 m, Gauba 201! Shahr.-Bust.: M. Shahvar, Raheh, 3300 m, Rech. 5973!

Distr. gen.: Endem.

34. ***A. longistylum*** (Sommier & Levier) Grossh. & Schischk., Sched. Herb. Pl. Or. exsicc. 18 (1924).
Syn.: *A. serpyllifolium* Desf. var. *longistylum* Sommier & Levier, Acta Hort. Petrop. 16: 43 (1900). *A. tortuosum* Willd. vars. *grandiflorum, Meyerianum, virides-cens* et *schirwanicum* Rupr., Mém. Acad. Scienc. Petersbg. ser. 7, 15 (2): 99—100 (1869).
Typus: Tiflis, Sommier & Levier, G!

Suffrutescens, caulibus numerosis ± tortuosis decumbentibus vel ascendentibus usque ad 35 cm longis. Folia obovata vel anguste spathulata vel obovato-lanceolata. Indumentum foliorum surculorum sterilium e pilis densis stellatis vel sublepidotis appressis multiradiatis ramosis consistens. Petala 3—3,5 × 1 mm, obovata, integra, limbo sparse piloso. Siliculae 4—6 × 2,5—3 mm, obovatae vel late ellipticae, sectione transversali anguste elliptica; indumentum e pilis minutis stellatis appressis breviter pauciradiatis consistens. Stylus 1,5—3 mm longus, glaber. Semina exalata vel raro angustissime alata.

Persia: W: Azerb.: Maragheh, Kuh-e Sahand, Shar. 6348-E!

Distr. gen.: Tauria, Caucasus, Armenia, Kurdistan, Persia boreo-occidentalis, Transcaspia.

35. ***A. constellatum*** Boiss., Ann. Scienc. Nat. Ser. 2, 4: 244 (1854); Boiss., Fl. Or. 1: 270 (1867) excl. var. *confertum*.
Typus: Anatolia, Tschihatscheff 682, G.

Perenne, basi lignescens. Caules floriferi usque ad 40 cm alti; surculi steriles ± erecti, rosulis foliorum obovatorum terminati. Folia caulina superiora oblanceolata, ± acuta, plana, sursum increscentia, indumentum foliorum bicolor, argenteum, e pilis stellatis majusculis multiradiatis compositum. Petala 2,5—3 mm longa, obovata, plerumque integra, glabra. Siliculae 4—4,5 (—6) × 2—4 mm, obovatae vel ellipticae, truncatae vel raro submarginatae, basi attenuatae; indumentum ± densum sub-appressum, e pilis stellatis minutis pauciradiatis ramosis compositum. Stylus 1,2 mm longus, glaber. Semina anguste alata.

Iraq: Kurd.: Arbil: M. Qandil, in faucibus supra Pushtashan, 2200 m, Rech. 11217!
Persia: W: Lur.: Dow Rud, 1800 m, Koelz 18167!

Distr. gen.: Anatolia, Iraq, Persia occidentalis.

36. ***A. murale*** Waldst. & Kit., Pl. Rar. Hung. 1: 5, tab. 6 (1799).
Typus (Lectotypus): „Deva atque Banatus", Herb. Waldstein 495746-a, PR.

Perenne basi ± lignescens, caulibus floriferis usque ad 60 cm altis. Folia surculorum sterilium oblanceolata vel obovata. Folia caulium floriferorum sursum increscentia, lanceolata vel oblanceolata, acuta; indumentum e pilis stellatis aequi- vel inaequiradiatis ramosis consistens. Petala 2—3,5 (—4,5) × (0,5—) 1 —1,5 mm, obovata, integra rarius retusa, glabra vel sparse pilosa. Siliculae 2,5—5 × 1—4 mm, ovatae vel late ellipticae, obtusae vel truncatae vel emarginatae, indumento ± denso stellato; valvae compressae, plerumque undulatae. Stylus (0,5—) 1—2 mm longus, tenuis, glaber vel sparse pilosus. Ala seminum 0,2—1 mm lata.

Iraq: Kurd.: Sul.: Penjwin, 1400 m, Rech. 10534! M. Avroman prope Tawilla, 1500 m, Rech. 10337!
Persia: C: Tehr.: M. Damavand, 2600 m, Gilli s.n.!

Distr. gen.: Europa australior, Asia austro-occidentalis.

Die Art ist sehr polymorph; die aus dem Gebiet der Flora Iranica vorliegenden Belege entsprechen mehr oder minder der typischen Rasse, subsp. *murale*.

63. *Lobularia*

Lobularia Desv., Journ. de Bot. 3: 162 (1814).
Syn.: *Alyssum* Sect. *Lobularia* DC., Reg. Veg. Syst. Nat. 2: 318 (1821). *Koniga* R. Br., Oberserv. Pl. Denham Clapperton Exp. Afr. App. 214 (1826).

Herbae ramosae jam primo anno florentes demum interdum perennantes. Indumentum e pilis bifidis appressis consistens. Sepala patula, obtusa, interiora non saccata. Petala alba, breviter unguiculata. Stamina edentata. Glandulae nectariferae geminatae, filiformes. Ovarium 2—10-ovulatum. Siliculae compressae. Facile dehiscentes. Septum tenue. Semina plana, anguste alata, humiditate mucilaginosa, pleurorhiza.

1. ***L. libyca*** (Viv.) Meisner, Pl. Vasc. Gen. 2: 11 (1836) „*libyka*".
Syn.: *Lunaria libyca* Viv., Fl. Lib. 34, tab. 10 (1824). *Koniga libyca* (Viv.) R. Br., Observ. Pl. Denham Clapperton Exp. Afr. App. 214, 215 (1826).
Icon.: Clavis p. 25.
Typus: Libya.

Herba annua caulibus prostratis, canescens. Folia lanceolata-linearia, obtusa, integra. Racemi basi bracteati, primum densiusculi, demum laxi. Sepala subpersistentia. Petala minuta, albida. Siliculae ovatae, planiusculae, pilis bifidis appressis obsitae, loculis 4—5-spermis.

Persia: S: Fars.: Persepolis, Ky. 1053!

Distr. gen.: Insulae Canarienses, Africa borealis, Hispania australis, Arabia, Persia australis.

64. *Buchingera*

Buchingera Boiss. & Hohen. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 29 (1849).

Planta annua, subflaccida, omnino pilis stellatis minutis obsita. Folia remote dentata. Flores singuli axillares. Pedicelli breves. Sepala erecto-patentia, obtusa, interiora non saccata. Filamenta 6, libera, edentata; antherae minutae, anguste ellipticae, obtusae. Ovarium biovulatum; stylus conicus; stigma truncatum, subbilobum. — Genus monotypicum.

1. ***B. axillaris*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 29 (1849).
Icon.: Clavis p. 23.
Typus: Esfahan, Bge., G.

Folia tenera, elliptica, breviter petiolata, remote dentata. Pedicelli fructiferi breves, recurvi. Sepala erecto-patentia, obtusa, interiora non saccata. Petala alba, spathulata, rotundata. Ovarium biovulatum, dense pilosum; stylus conicus, laxe pilosus, persistens; stigma truncatum, subbilobum. Silicula late transverse elliptica vel suborbicularis, a dorso compressa; valvae sine nervo mediano, reticulatae, facile secedentes, pilis inaequilongis apice hamatulis obsitae; septum tenue, nitidum. Semina magna, valde compressa, scarioso-marginata, submucilaginosa.

Persia: W: Esf.: Esfahan, Bge. Qohrud inter Esfahan et Tehran, Bge. Bakht.: Gahar, 2250 m, Koelz 17899! — S: Kerm.: M. Jebal Barez, Deh Bakri, 2100 m, Rech. 3688! — E: Khor.: Darreh Abshar prope Akhlamad, 1800 m, Rech. 4545! — C: Tehr.: In agris prope Tehran, Ky. 10. Ad radices montium N Tehran, 2100 m, Furse 1711! M. Shimran in faucibus prope Ferosad, Bornm. 6230. Shahrestanak, 2200 m, Bornm. 6230-b. Qazv.: Kuh Dashteh prope Karaj, 1800 m, Rech. 300! In valle Karaj, Gauba. Yazd: Yazd, Bornm. 1892. Deh Bala, 2400 m, Bornm. 2249.
Turcomania: Kopet Dagh, Litw. Jablonka, 1500 m, Litw. 582. M. Ludsch prope Ashkhabad, Litw. 583. Obrucewo, 1500 m, Litw. 582!
Afghanistan: E: Kabul: Istalif, 1800 m, Gilli 1106! — NE: Badakhshan: In parte superiore valli Zebak, fl. Warduj, 2500 m, Furse 6373.

Distr. gen.: Transcaucasia australis, Persia, Afghanistan, Turcomania, Amu Darya, Sir Darya, Tien Shan, Pamir Alaj.

✓ 65. *Clypeola*

Clypeola L., Spec. Plant. 652 (1753). Gen. Plant. ed. 5: 293 (1754).

Lit.: D. A. Chaytor & W. B. Turrill, The Genus Clypeola and its Infraspecific Variation, Kew Bulletin 1935: 1—24 (1935). M. Breistroffer, Revision systématique des variations du Clypeola Ionthlaspi L., Candollea 7: 142—166 (1936).

Herbae annuae parvae appresse stellato-pilosae, saepe basi ramosae. Folia spathulata, integra. Sepala erecto-patula, interiora non saccata. Petala parva, expallescentia. Filamenta libera, exteriora basi dente acuto provisa, interiora a basi usque ad medium alata. Ovarium uniovulatum. Pedicelli fructiferi breves, recurvati. Siliculae orbiculares, planae, saepe alatae, tenuiter reticulatae, pilis specialibus obsita; septum incompletum vel deficiens.

1a. Planta dichotome vel trichotome ramosissima fragilis. Racemi in dichotomiis sessiles, foliis axillaribus involucrati vel occultati. Folia 5-nervia, in planta fructifera accreta ..... 5. *C. dichotoma* Boiss.
b. Plantae alternatim ramosae. Racemi terminales, foliis non occultati. Folia uninervia, demum non accreta 2
2a. Siliculae papyraceae glabrae vel pilis laevibus pubescentes 3
b. Siliculae coriaceae setis rigidis retrorsum barbellatis echinatae 4
3a. Siliculae suborbiculatae apice subretusae, 3,5×3 mm ..... 1. *C. Jonthlaspi* L.
b. Siliculae obovato-ellipticae, apice emarginatae, 2—2,5 (—3)×2 mm ..... 2. *C. microcarpa* Moris
4a. Petala calyce vix longiora. Siliculae elliptico-orbiculatae obtusae. Stylus brevis, setis indumenti occultus ..... 3. *C. aspera* (Grauer) Turrill
b. Petala calyce duplo longiora. Siliculae ellipticae acutae. Stylus longiusculus, e setis longe exsertus ..... 4. *C. lappacea* Boiss.

Sect. *Jonthlaspi* (Adans.) DC., Reg. Veg. Syst. Nat. 2: 326 (1821).
Syn.: *Jonthlaspi* Adans., Fam. 2: 423 (1763).
Silicula tenuiter membranacea, integra, pilis acutiusculis sublaevibus obsita vel glabra.

1. ***C. Jonthlaspi*** L., Spec. Plant. 652 (1753).
Icon.: Clavis p. 23.
Typus: „In Italiae et Narbonae sabulosis".

Pluricaulis, caules plerumque 10—15 cm longi, ascendentes vel erecti. Folia oblongo- vel lineari-spathulata, (5—) 10 (—20) mm longa. Racemus fructifer elongatus, laxiusculus. Silicula suborbiculata, apice ± distincte retusa, semina dimidiam circiter loculi latitudinem occupantia, indumento variabili.

Iraq: Kurd.: Kirkuk: Jarmo, 800 m, Helbaek 307! Arbil: Kuh Safin prope Shaqlawa, 1100 m, Bornm. 896. Batas, Guest 578.
Talish: sec. Fl. URSS.
Persia: N: Gil.: Rudbar, 300 m, Bornm. 6261. Manjil, 300—400 m, Bornm. 6259. — Persia borealis, Ky., Bge. — W: Kermansh.: Qasr Shirin, Evans! Bakht.: In valle Bazoft, Mart.-Escal. Lur.: Shah Bazan, 500 m, Koelz 1409! — S: Kerm.: Kuh Tagh Ali, 2000 m, Bornm. 2194. Fars.: Tang-i Jiz, Stapf 255! Maharlu prope Shiraz, Gauba 218! Takht-e Jamshid, Koelz 14447! Inter Persepolis et Dowlatabad, 1000—2000 m, Schmid 5486! Shiraz, 1600 m, Grant 15490! 58 km W Shiraz, 1600 m, Grant 15551! Persia australis, Ky., Bge. — E: Khor.: Kuh-e Neyshabur, Darreh Abshar prope Akhlamad, 1600 m, Rech. 4554! Kopet Dagh: Inter Quchan et jugum Alam Ali, 1600 m, Rech. 7230-a! — C: Tehr.: M. Tuchal, Bruns. Darband, 1200—2000 m, Schmid 5123! Qazv.: Kuh-e Nemar prope Karaj, 1600—2000 m, Rech. 720! Karaj, Gauba. Yazd: Yazd, Buhse. Jandaq, Buhse. — Persia, Auch. 360.
Turcomania: In montibus prope Firyuza, Litw. 114. Kizyl-Arvat, Becker.
Afghanistan: E: Kabul: Sher Darwasa, 1800 m, Gilli 1108! Gulbahar, 2000 m, Kerst. 75-a! Babur, Volk 2027! Tang-i Gharu, 1800 m, Wdb. 3059! Shaikhabad versus Gardez, 48 km SSW Kabul, 2440 m, Furse 5713. — NE: Kataghan: Farkhar, 1250 m, Podlech 10514! — Afghanistan, Griff.
Pakistan: Quetta: Urak, Lace. 3311! — Bal.: Kalat: Surab versus Kalat, 2050 m, Lamond 684!

Distr. gen.: Regio Mediterranea, Tauria, Transcaucasia, Aralo-Caspia, Tien Shan, Pamir-Alaj, Anatolia, Iraq, Persia, Afghanistan, Pakistan.

Die Unterscheidung zwischen *C. Jonthlaspi* und *C. microcarpa* ist im Gebiet der Flora Iranica schwieriger als etwa im östlichen Mittelmeergebiet. Für das Mittelmeergebiet trifft der in der Literatur für *C. Jonthlaspi* im allgemeinen angegebene Mittelwert von 4—5 mm Länge der Schötchen meist zu; im iranischen Gebiet liegt er niedriger, und zwar, wie im Bestimmungsschlüssel angegeben, bei etwa 3,5 mm; für *C. microcarpa* dagegen etwas höher, nämlich bei ± 2,5 mm. Dennoch konnte ich mich nicht entschließen, der von Chaytor & Turrill (1935) vorgenommenen Zusammenziehung der beiden Arten zu folgen, da nach meiner Beobachtung die angegebenen Merkmale des Wuchses und Fruchtstandes mit der Größe der Schötchen korreliert sind. Dagegen variiert die Behaarung der Schötchen bei beiden Arten annähernd homolog, ohne daß sich irgendwelche geographische oder ökologische Beziehungen erkennen ließen. Formen mit behaarten Schötchen sind weitaus häufiger als solche mit kahlen.

2. ***C. microcarpa*** Moris, Atti Terz. Riun. degli Scienz. Ital. 539 (1841); Boiss., Diagn. Pl. Or. Nov. Ser. 1, 1: 74 (1842).
Typus: Athen.

Praecedenti valde affinis, differt caulibus plerumque humilioribus, 5—15 cm longis, tenuioribus, diffusis vel ascendentibus, foliis brevioribus, racemis fructiferis densiusculis, siliculis minoribus, plerumque 2—2,5 (—3) × 2mm, magis angustatis, profundius retusis. Semina loculi dimidia latitudine sublatiores.

Iraq: Kurd.: Mosul: Jabal Maqlub, 1000 m, N. Polunin in Exsicc. Baghd. 49! — Diyala: Jabal Hamrin, hb. BM.
Persia: N: Gil.: Rudbar, Kaluraz, Bornm. 6260. Manjil, Bornm. 6261. Rudbar, Polak. Harsevil prope Manjil, 1700 m, Sab. in Gauba 183! Persia borealis, Ky. — W: Kermansh.:

Tang-i Knesht, Watson in Bent & Wr. 324—105! Esf.: Shah Kuh, Deicke 362, Bornm. 2199. Arak: Prope Arak, Str. — S: Fars.: 15 km E Shiraz, 1600 m, Grant 15278 p. p.! Firuzabad prope Shiraz, Gauba 186! Kerm.: Kuh Tagh Ali, Bornm. 2198. Kuh-e Nasr, Bornm. 2197. Maskun, 2400 m, Koelz 14363! Lut: Chah Rui, 700—1000 m, Gabr. 136, 151. — E: Khor.: Ozbagu, Ruttner 122! Geredu, Ruttner 14! Kopet Dagh, in jugo Alam Ali, 1600 m, Rech. 7230-b! Robat-i Safid, Rech. 7520! — C: Tehr.: Inter Darband et Pas Qaleh, 1600 m, Rech. 2616! Tehran, Bornm. 2195, 2200, M. Tuchal, Bruns. Qazv.: 10 km W Karaj, 1500 m, Stutz 667! Yazd: Taft, Bornm. 2196.
Afghanistan: E: Kabul: Gulbahar, Neub. 538!, Kerst. 75-b!

Distr. gen.: Regio Mediterranea orientalis, Tauria, Transcaucasia, Anatolia, Iraq, Persia, Afghanistan.

Über die Unterscheidung von *C. Jonthlaspi* L. siehe unter dieser Art. Breistroffer l. c. unterscheidet nach der Behaarung der Schötchen zahlreiche Formen.

Sect. *Bergeretia* DC., Reg. Veg. Syst. Nat. 2: 328 (1821).

Silicula coriacea, margine denticulata, pilis rigidis retrorse asperis obsita.

3. ***C. aspera*** (Grauer) Turrill, Journ. Bot. 60: 269 (1922).
Syn.: *Peltaria aspera* Grauer, Decuria 6 (1784). *Clypeola chaetocarpa* Jaub. & Spach, Ill. Pl. Or. 3, tab. 206 (1847). *C. echinata* DC., Reg. Veg. Syst. Nat. 2: 328 (1821).
Icon.: Clavis p. 23.
Typus: Tournef. Coroll. 14.

Gracilis, saepe pluricaulis, 5—15 cm alta. Folia inferiora oblongo-spathulata, superiora anguste oblongo-linearia, 5—15 mm longa. Petala calyce vix longiora. Stylus brevissimus.

Iraq: Kurd.: Sul.: M. Avroman prope Tawilla, 1200 m, Rech. 12378! Kirkuk: Jarmo, Helbaek 453! 9 km a Kirkuk versus Altin Köprü, Erdtman & Goedemans in Rech. 15528! Kirkuk, 400 m, Bornm. 898. Kani Domlan, 390 m, Guest 4317. Arbil: Kuh Safin, 1100 m, Bornm. 896. 3 km W Salah ad-Din, Erdtman & Goedemans in Rech. 15564! — Diyala: 10 km E Mandali, Rech. 12780! 3 km SE Badrah, Rech. 13981! 16 km SE Badrah, Rech. 13970! 10 km S Khanaqin, Rech. 14097! Jabal Hamrin, Sutherland 163. Inter Shahraban et Jalula, Rech. 14244! Amarah: Shatt at-Tib, 70 km N Amarah, 200 m, Rech. 14193!
Persia: W: Kermansh.: Qasr Shirin, Evans M-194!, Shar. 6667-E! Bisotun, Str. Qalapain, 22 km E Kermanshah, 1300 m, Bent & Wr. 401—113! Arak: M. Rasvand, Str. Lur.: Shah Bazan, 500 m, Koeie 291! Dez Dam NE Andimeshk, Bent & Wr. 426—315! Khorramabad, Bent & Wr. 412—402! 33° 06′ N, 47° 43′ E, Jacobs 6375! Esf.: Inter Esfahan et Abadeh, 1500—2000 m, Schmid 5383! Khuz.: Kuhanak inter Shushtar et Dezful, Nab. 1367. Shush versus Dehloran, Nab. 1323. — S: Fars.: Maharlu prope Shiraz, Gauba & Sab. Persepolis, Gauba 217! Shiraz versus Kazerun, Gauba & Sab. Shiraz versus Firuzabad, Gauba & Sab. Kumaraj, substr. gyps., Staff 254! Inter Bushehr et Shiraz, Ky. 63. Takht-i Jamshid, substr. marmor., Koelz 14446! Shiraz, Grant 15277!, 15489!, 15519! S. Abadeh, 2100 m, Stutz 800! Lar.: Hormud, 800 m, Gauba & Sab. Kerm.: Kuh Tagh Ali, 2200 m, Bornm. 2193. Kuh Jebal Barez versus Jiroft, 1600 m, Rech. 3762! Bal.: Inter Khash et Karevandar, Gauba 185! — E: Khor.: Sar Chah, Bge. Ozbagu, Ruttner 130! Kuh-e Safid, Ruttner 434! Tabas, Shir Geshk, Ruttner 579!, 582! — C: Tehran, Bornm. 2191. Yazd: Deh Bala, 2400 m, Bornm. 2192.
Afghanistan: SW: Jija, 900—1300 m, Koeie 4168! — E: Kabul: 12—15 km W Sarobi, 1100 m, Wdb. 2792! — Afghanistan, Chokey, Griff.
Pakistan: Quetta: 20 km W Quetta, Rech. 29082! Quetta, Duthie. Prope Chiltan, Lace. Inter Nushki et Quetta. 1200 m, Rech. 27328! In jugo Tak, 30 km S Quetta, 2100 m, Rech. 28405! In valle Surkhab, 1800 m, Lace 3734. 26 km a Fort Sandeman

versus Wana, inter Zhob et Sambaza, 1500 m, Lamond 1445! Qila Abdullah versus Sheila Bagh, 1600—1900 m, Lamond 1052!, Rech. 29030! — Kalat: Inter jugum Bolan et Mach, 1400 m, Lamond 725, Rech. 28446! Kalat, Stocks.

Distr. gen.: Anatolia, Syria, Palaestina, Iraq, Persia, Afghanistan, Pakistan occidentalis, Pamir-Alaj.

4. ***C. lappacea*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 174 (1842).
Syn.: *C. echinata* Jaub. & Spach, Ill. Pl. Or. 3, tab. 205 (1847) nec DC. (1821).
Typus: Mesopotamia, Auch. 282, G, K.

Caulis validiusculis, (5—) 10—25 cm altus. Folia 10—30 cm longa, oblonga, quam in specie praecedente latiora. Petala calyce duplo longiora. Stylus longiusculus.

Iraq: Kurd.: Arbil: Kuh Safin, 1000 m, Bornm. 897. Shaqlawa, Guest 2014. In faucibus Rawandiz, Guest 2108. Salah ad-Din, 1000 m, Helbaek 722.
Persia: W: Azerb.: Kuh-e Mishu Dagh, Gill.-Sm. Shahpur, Gill.-Sm. Tabriz, 1300 m, Jacobs 6138! Kermansh.: Ilam, Kuh Reno, Mirzayan 5676-E! Shahabad, 1300 m, Jacobs 6208! Esf.: Prope Esfahan, Auch. 32 km E Esfahan, 2000 m, Stutz 818! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 184! Lur.: Dow Rud, 1600 m, Koelz 15476!, 17109!, 17169! Tang-e Malavi, Gauba 184-a! 57 km NE Khorramabad versus Borujerd, 2000 m, Bent & Wr. 508—101! 96 km N Khorramabad, 2000 m, Furse 1866! Oshtoran Kuh, Str. Arak: M. Rasvand, Str. — S: Fars.: 58 km W Shiraz, Grant 15538! — C: Inter Tehran et Tabriz, Bge. Qazv.: Kharzan prope Ebrahimabad, 2000 m, Bornm. 6264.

Distr. gen.: Syria, Anatolia austro-orientalis, Iraq, Persia.

Sect. *Pseudanastatica* Boiss., Fl. Or. 1: 310 (1867).

Siliculae ovatae, acutiusculae, pilis scabris capitatis obsitae. Planta ramosissima, fragilis, racemis abbreviatis foliis involucratis.

5. ***C. dichotoma*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 175 (1842).
Syn.: *C. minima* Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51: 303 (1886).
Typus: Azerbaijan, Auch. 4082, G.

Nana, conferta, 2—5 cm alta, indumento canescens, bi- usque trichotome ramosa, ramis fragilibus. Racemi inter folia occulti. Folia inferiora ovato-oblonga, basi attenuata, superiora latiora, sessilia, elevate nervosa, in planta fructifera accreta. Silicula ± 2,5 mm longa, setosa; stylus setis longior.

Persia: W: Azerbaijan, Auch. 4082. Zanjireh inter Khvoy et Tabriz, Knapp. Esf.: Aminabad, 1700 m, Pravitz 765. Esfahan versus Yazd, Bambis, Bornm. 2190. Inter Yazd et Esfahan, Bge. Takht-i Sanembert, 2000 m, Deicke 271. Arak, Str. Ham.: Mehran prope Hamadan, Knapp. — S: Kerm.: Kuh Tagh Ali, 2300 m, Bornm. 2188. Inter Mashiz, 2000 m et Khaneh Sorkh, 2500 m, Rech. 3028! Nabid inter Kerman et Bam, 2200 m, Rech. 7359! Fars.: Pasargadae, 15 km N Saadatabad, 2000 m, Grant 15803! — C: Tehr.: Tehran versus Qom, Aliabad, Bornm. 2189. 32 km S Firuzkuh, 2700 m, Furse 3021! Qazv.: Ravandeh prope Karaj, Gauba 219! Inter Karaj et Mardabad, Gauba. Shahr.-Bust.: Prope Shahrud, Bge.
Afghanistan: NW: Herat: Hari Rud, Inter Tirphul et Tuman Aqa, Aitch. 1155.

Distr. gen.: Transcaucasia, Armenia, Persia, Afghanistan.

Tribus **Drabeae**

auctore I. HEDGE, Edinburgh

Pili aut simplices aut furcati aut stellati raro deficientes. Fructus plerumque silicula, rarissime siliqua. Cellulae repli parietibus non parallelis. Radicula accumbens. — Genera 66— 69.

66. ***Petrocallis***

Petrocallis R. BR. in AITON, Hort. Kew. ed. 2, 4: 93 (1812).

Suffruticosa perennis, foliis trifidis. Pili simplices vel nulli. Sepala oblique patentia, non saccata. Petala alba vel rosea. Ovarium 4-ovulatum. Stigma capitatum. Silicula latisepta dehiscens, ovato-globosa, 2-sperma, valvis convexis. Septum ovatum, saepe apice fenestratum. Funiculi brevissimi, liberi vel adnati. Radicula accumbens.

1. ***P. fenestrata*** BOISS., Diagn. Pl. Or. Nov. Ser. 1, 8: 27 (1849).
Icon.: Clavis p. 9.
Typus: KY. 493, G.

Nana glabra glauca caespitosa perennis. Folia petiolo incluso c. 1 cm longa, carnosa, saepe subtus purpurascentia, cuneata, antice triloba, lobis linearibus. Surculi floriferi superne aphylli, pauciflori, fructiferi paulo elongati, 4—7 cm longi. Flores ignoti. Pedicelli fructiferi 5—7 mm longi, tenues, patule ascendentes. Inflorescentia fructifera subcorymbosa. Silicula ovato-orbicularis c. 4×3 mm; valvae leviter inflatae; stylus 0,75 mm longus; funiculi brevissimi liberi septum apice fenestratum vel integrum.

Persia: C: Qazv.: M. Hesarband, 3000 m, GAUBA & SAB. 220! In saxosis Meidan Abdullah in valle Loura, KY. 493! Prope Meidan, 2200 m, BORNM. 6268! Meidanak, TROTT 573!; 1820 m, DAVIS 851!; 2100 m, GAUBA & SAB. 205!

Distr. gen.: Endem.

The only other member of the genus is *P. pyrenaica* (L.) R. BR. which grows on calcareous rocks and screes in the Pyrenees, Alps and Carpathians. The Persian species is only known from a limited area of the C. Elburz. More adequate flowering and fruiting material is necessary before a decision can be reached about the status of the Persian plant. It differs in several features from *P. pyrenaica* and BOISSIER, in his description of the original KOTSCHY gathering, suggested that it might represent a separate genus. However, with the material available, the differences are mainly of a specific rather than generic nature. Furthermore, there is no doubt that the Persian *P. fenestrata* is much more closely allied to the European *P. pyrenaica* than to any other species or genus in the SW Asiatic region. The differences between the two species can be summarised thus:

P. fenestrata	Suffruticose loose habit. Leaves not in rosettes, fleshy.	Glabrous	Fruiting pedicels slender, spreading-ascending	Silicule valves thin, inflated. Funicles free
P. pyrenaica	Caespitose often pulvinate habit. Leaves in compact rosettes, stiff.	Prominent indumentum	Fruiting pedicels sturdy, erect-adpressed	Silicule valves thick not inflated.Funicles adnate to septum

The Caucasian monotypic genus *Pseudovesicaria* (*P. digitata* [C. A. Mey.] Rupr.) shares with *Petrocallis* the character of trifid (or 5-fid) leaves and is also glabrous and glaucous but clearly differs in the much larger inflated fruits.

67. *Draba*

Draba L., Spec. Plant. 642 (1753); Gen. Plant. ed. V, 291 (1754).

Lit.: R. Pohle, Drabae Asiaticae, Fedde's Repertorium, Beiheft 32: 1—225 (1925). O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae — Draba et Erophila — 89 (IV. 105): 1—343 (1927).

Herbae annuae, biennes vel perennes saepe caespitosae, indumento e pilis simplicibus, furcatis vel stellatis consistente; raro plantae glabrae. Folia simplicia, basalia plerumque rosulata ± petiolata, caulina si evoluta sessilia. Sepala erecto-patentia, non vel vix saccata, membranaceo-marginata. Petala flava, lactea vel alba, lamina obovato-cuneata, saepe retusa vel emarginata, ungue tenui. Glandulae nectariferae medianae plerumque deficientes. Ovarium pauci- usque multi-ovulatum. Stigma saepe magnum, depresso-capitatum. Fructus silicula rarius siliqua dehiscens, forma ac magnitudine variabilis, glabra vel pilosa. Semina biseriata, pauca vel numerosa, tuberculata, humiditate non mucilaginea. Radicula tenuis, accumbens. — Genus magnum polymorphum, in regionibus temperatis et arcticis late dispersum.

A natural genus in which specific differences are often very slight and, in many cases, probably artificial. In our area, most of the taxonomic difficulties occur in the species from the E Afghanistan — Chitral region. Most of the species here are at the end of the species range i. e. either Himalayan species at their westernmost extremity or Soviet Central Asiatic species at the southern end of their distribution. There are few adequate gatherings of these high alpine species and their identification is often provisional. The status of many species is very uncertain. — The sections recognised by O. E. Schulz are unsatisfactory and the species dealt with here are not grouped into his sections, although listed in a similar sequence.

1a. Scapi aphylli. Plantae perennes 2
b. Caules foliati, raro aphylli. Plantae annuae vel perennes 13
2a. Folia rigida, ciliato-pectinata, costa mediana manifesta 3
b. Folia non rigida, plerumque mollia, pilis ± mollibus, costa mediana inconspicua vel nervis 3—5 4
3a. Folia spinosa, 10—20 mm longa. Siliqua 18—26 mm longa ..... 1. *D. hystrix* Hook. f. & Thoms.
b. Folia non spinosa, 6—12 mm longa. Silicula 3,5—5 mm longa ..... 2. *D. bruniifolia* Stev.
4a. Folia 3—5-nervia, pilis simplicibus antrorsis ciliata, ceterum glabra ..... 6. *D. trinervis* O. E. Schulz
b. Folia 1-nervia 5
5a. Siliqua linearis, ultra 8 mm longa 6
b. Silicula ovoidea vel elliptica 8
6a. Folia pilis longissimis usque ad 1,5 mm longis simplicibus et pilis multo brevioribus ramosis obsita ..... 10. *D. Koeiei* Rech. f.
b. Folia pilis simplicibus et ramosis longitudine ± aequali obsita 7
7a. Siliqua 10—22×1,5 mm; stylus usque ad 0,5 mm longus. Scapi fructiferi c. 10 cm longi ..... 11. *D. Aucheri* Boiss.
b. Siliqua 8—13×1,5 mm; stylus c. 1 mm longus. Scapus fructifer c. 15 cm longus ..... 12. *D. tibetica* Hook. f. & Thoms.

8a. Planta laxe caespitosa 9
b. Planta dense caespitosa 10
9a. Scapus superne glaber; stylus 0,5 mm longus ..... 4. *D. pulchella* Willd.
b. Scapus usque ad pedicellos scabridus; stylus 1—2 mm longus ..... 5. *D. affghanica* Boiss.
10a. Silicula dense stellato-tomentosa. Scapi validi, fructiferi c. 1 mm diametro.. ..... 3. *D. rosularis* Boiss.
b. Silicula glabra vel pilis simplicibus vel stellatis laxe obsita. Scapi tenues, fructiferi 0,5 mm diametro 11
11a. Folia supra glabra. Silicula 3—3,5 mm longa ..... 7. *D. Korschinskyi* (O. Fedtsch.) Pohle
b. Folia supra pilosa vel hispida. Silicula ultra 4 mm longa 12
12a. Silicula pilis simplicibus obsita ..... 8. *D. Olgae* Regel & Schmalh.
b. Silicula glabra ..... 9. *D. oreades* Schrenk
13a. Herbae annuae vel biennes 14
b. Herbae perennes 18
14a. Petala alba, 4—4,5 mm longa. Pedicelli fructiferi erecti 2—4 mm longi.... ..... 18. *D. stylaris* J. Gay ex Koch
b. Petala flava, exsiccando alba, 2—4 mm longa. Pedicelli fructiferi patulo-ascendentes 15
15a. Planta nana, florifera 1—2 cm alta, caulibus decumbentibus vel ascendentibus..... 15. *D. alticola* Komar.
b. Plantae elatiores, floriferae c. 20 cm altae 16
16a. Pedicelli fructiferi fructu evidenter longiores ..... 13. *D. nemorosa* L.
b. Pedicelli fructiferi fructu breviores vel eum aequantes 17
17a. Fructus 10—15×2 mm. Petala 3—4 mm longa ..... 16. *D. stenocarpa* Hook. f. & Thoms.
b. Fructus 8—10×3 mm. Petala 2—2,5 mm longa..... 14. *D. Huetii* Boiss.
18a. Petala 1,5—3 mm longa. Fructus glaber 19
b. Petala 3—5 mm longa. Fructus pilosus raro glaber .. 17. *D. lanceolata* Royle
19a. Fructus oblongo-ovoideus, 3—4×1,5—2 mm ..... 19. *D. altaica* (C. A. Mey.) Bge.
b. Fructus lineari-oblongus, 5—10×1,5—2 mm..... 20. *D. siliquosa* M. B.

1. ***D. hystrix*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 149 (1861).
Syn.: *D. rhodantha* Rech. f. & Edelb., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 61 (1954), syn. nov.
Icon.: Clavis p. 27; Dan. Biol. Skr. 10, 3, fig. 12 (1958).
Typus: Griff. 478, K!

Dense caespitosa perennis, caespites compactos formans. Residua petiolorum persistentia. Folia omnia basalia, rigida, spinosa, anguste linearia, 10—20 (—30)× 0,5 mm, setis rigidis diametro folii longioribus et pilis brevibus ramosis obsita. Scapi floriferi rigide erecti, 2—4 cm longi, fructiferi usque ad 10 cm elongati. Sepala oblonga, saepe violacea, margine membranacea, 4 mm longa. Petala 7×2 mm. Pedicelli fructiferi validi 5—12 mm longi, horizontaliter patentes. Siliqua anguste linearis, 18—26×3—4 mm. Valvae longe rigide setosae et breviter stellato-pilosae; stylus 1—2,5 mm. Semina c. 2 mm longa.

Afghanistan: E: Kabul: Kabul versus Gardez in jugo Altimur, 2700—2800 m, Lamond 2408!, Rech. 32014. Ghazni: In faucibus Nawar Kotal inter Okak et Behzud, 3150 m,

in fissuris rupium calc. Rech. 17858! Hauz-i Mahiha, 2900 m, Koelz 2474! — C: Bamian: Panjao, 2700 m, Hdg. & Wdb. 4900! In jugo Aogardan, 3150 m, Hdg. & Wdb. 4998! Kotal-e Nargiz inter Panjao et Lal, 3000 m, Rech. 18779! Deh Kundi, 3000 m, Edelb. 1957! (Typus *D. rhodanthae* Rech. f. & Edelb.).
Pakistan: Quetta: In jugo Khojak, Lace 3528!; 2400 m, Sanders in Griff. 478! Qila Abdullah, Duthie 8574! In montibus Khwaja Amran, Sheilabagh, 1900 m, Lace 3327!

Distr. gen.: Endem.

A very distinct and uniform species easily distinguished by the stiff, prickly, narrow-linear leaves and the long setae covering the whole plant.

2. ***D. bruniifolia*** Stev., Mem. Soc. Nat. Mosc. 3: 268 (1812).
Icon.: Clavis p. 23.

Caespitosa, perennis, caespites ± compactos breviter multiramosos residuis petiolorum persistentibus formans. Folia 6—12×0,5—1,5 mm omnia basalia, rosulata, rigida, linearia vel lineari-oblonga, pectinato-ciliata, facie simpliciter et stellate pilosa vel glabra. Scapi 1—8 cm alti, glabri vel villosi, validi, erecti. Sepala 3 mm longa, pilis simplicibus et furcatis vel furcatis tantum obsita. Petala laete flava, 4—6 mm longa, truncata et leviter emarginata. Pedicelli fructiferi 4—10 mm longi, erecto-patuli. Silicula ovoidea, 3,5—5×2,5—3 mm, pilis simplicibus et ramosis tantum obsita; stylus c. 0,5 mm.

A most variable species only known in our area from a few gatherings in NW Persia and N Iraq but a common plant in Turkey and the Caucasus. Cullen & Coode recognised 6 subspecies in Turkey, Notes Roy. Bot. Gard. Edinb. 26: 186—188 (1965). The examined material agrees with their circumscription of subsp. *bruniifolia*.

— — subsp. ***bruniifolia***

Typus: Caucasus, Schahdagh, 1810, Steven, LE, photo E!

Differt a subspeciebus aliis scapis villosis et indumento fructus e pilis simplicibus et ramosis composito.

Iraq: Kurd.: Arbil: M. Qandil ad confines Persiae, 3500—3700 m, Rech. 11170-a!
Persia: W: Azerb.: Kuhha-ye Sabalan, 4100 m, Radde 370. Kuh-e Sahand et Kuhha-ye Sabalan, 2830 m, Buhse 591.

Distr. gen.: Anatolia, Iraq borealis, Caucasus, Persia boreo-occidentalis.

In such a polymorphic species as *D. bruniifolia*, the paucity of material from our area makes it impossible to give an adequate picture of the variation or to give anything more than a tentative nomenclature for the specimens seen.

3. ***D. rosularis*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 165 (1842).
Syn.: *D. calycosa* Boiss. & Bal. var. *Aucheri* Boiss., Fl. Or. 1: 299 (1867).
Typus: Turkey, Prov. Agri, Bayazid, Auch. 4062, G!, K!

Caespitosa perennis radice primaria lignescente, caudicibus confertis foliis anni praecedentis dense obsitis. Folia omnia basalia, rosulas densas formantes, mollia, oblonga, integra, c. 10 mm longa, indumento denso molli stellato. Scapi validi, erecti, 6—8 cm alti, stellato-pilosi. Sepala ovata, 2,5 mm longa, persistentia. Petala flava, 4—5 mm longa, leviter emarginata. Pedicelli fructiferi 10—12 mm longi. Silicula inflata, ovoidea vel ovoideo-ellipsoidea, 4—6×2—3 mm, dense stellato-tomentosa; stylus 0,25—0,5 mm.

Persia: W: Azerb.: Khvoy, Qotur, Shar. 5660-E! Kuh-e Mishu Dagh, 32 km N Khvoy, 1600 m, Furse 2297!

Distr. gen.: Anatolia orientalis, Persia boreo-occidentalis.

The two Persian gatherings have shorter leaves, a more compact habit and stiffer stellate hairs than the Turkish material of *D. rosularis* but there is so little adequate material available for comparison that it is not possible to state that the differences are significant.

4. ***D. pulchella*** WILLD. in DC., Reg. Veg. Syst. Nat. 2: 354 (1821).
Syn.: *D. persica* BOISS., Ann. Scienc. Nat. Ser. 2, 17: 164 (1842). *D. armena* BOISS., l. c.: 167. *D. incompta* STEV. var. *persica* (BOISS.) BOISS., Fl. Or. 1: 299 (1867).
Typus: PALLAS.

Laxe caespitosa, perennis, ramis numerosis tenuibus prostratis usque ad 10 cm longis; residua foliorum saepe persistentia. Folia omnia basalia, saepe rosulas laxas formantia, mollia, anguste oblonga vel oblongo-ovata, acuta, basi attenuata, integra, utrinque pilis simplicibus, furcatis et stellatis vel stellatis tantum obsita. Scapi numerosi, erecti vel ascendentes, floriferi 5—10 cm longi, fructiferi, paulo elongati, inferne pilis simplicibus et ramosis obsiti, superne glabrescentes. Sepala 2—2,5 mm longa, pilis simplicibus et ramosis obsita, raro glabra. Petala flava, c. 4 mm longa, emarginata. Pedicelli fructiferi patulo-ascendentes, 4—8 mm. Silicula 4—8×1,5—2 mm, anguste elliptica, subinflata, glabra vel pilis brevibus stellatis obsita; stylus 0,5 mm longus.

Iraq: Kurd.: Arbil: Algurd Dagh ad confines Persiae, 3000—3800 m, RECH. 11440!, RECH. 11170-b!, THESIGER 1192!
Persia: N: Maz.: Distr. Kojur, M. Uloj, 3200—3400 m, RECH. 6537! Kandavan, 2600—3100 m, RECH. 504!, BORNM. 6249, WDB. 2086!, 2169! M. Alamut, AUCH. 4061. Gil.: In alpibus, PALLAS, Herb. WILLD. — C: Tehr.: Damavand, 3100 m, GILLI!; 3600 m, FURSE & SYNGE 465! 3800 m, BORNM. 6248; 4000 m, WDB. 1683! 24 km N Tehran, 2400 m, STUTZ 1063! Takht-i Soleiman, Hazarchal et Piaschal, 3600—4100 m, BORNM. 6251, 6252. M. Tuchal, 3000—3800 m, BORNM. 6254!, 6255, 6256, KY. 230! Qazv.: Junesar in valle Loura, 2700 m, BORNM. 6250. In jugo Ladd, 2800—3100 m, BORNM. 6253. Shahr.-Bust.: M. Shahvar, 3500—3900 m, in saxosis calc., RECH. 6030!

Distr. gen.: Endem.

Variable in indumentum density. The glabrous and hairy fruited forms occur throughout the species range. The latter was recognised as var. *hebecarpa* BORNM., Bull. Herb. Boiss. 2, 4: 1270 (1904). Although the species is known from many gatherings very few of them have mature fruits. In addition to the reason that the fruits must ripen late in the season and few collections have been made then, it seems probable from the material examined that frequently the fruits do not mature and that ripe seeds are not formed. A similar condition is discussed by HEDGE in the related Turkish species *D. thylacocarpa* (NAB.) HEDGE, Notes Roy. Bot. Gard. Edinb. 23: 173—174 (1960).

5. ***D. affghanica*** BOISS., Fl. Or. Suppl. 55 (1888).
Syn.: *D. rostrata* POHLE, Feddes Repert. Beih. 32: 136 (1925).
Typus: AITCH. 99, 112, 126, K!, E!

Laxe caespitosa perennis, ramis numerosis tenuibus prostratis, inferne residuis foliorum obsitis. Folia lanceolata, acuta, basi attenuata, vix petiolata, pilis simplicibus, furcatis et stellatis dense obsita vel pilis simplicibus tantum laxe aspersa. Scapi tenues ascendentes vel erecti, 1—5 cm alti, pilis ramosis dense obsiti. Sepala 2—2,5 mm longa, stellato-pilosa. Petala flava, 4—5 mm longa, exsiccando albida, non vel vix emarginata. Pedicelli fructiferi 3—10 mm longi, ascendenti-erecti. Silicula

ovoidea, leviter inflata, 3—7×2—4 mm, pilis simplicibus furcatis et stellatis obsita, raro glabra; stylus 1—2 mm longus. Semina pauca.

Afghanistan: E: Parvan: In valle Panjshir, 4200 m, Baillie & Dunsheath 52! Darreh Rastagal, 3840—4200 m, Hdg. & Wdb. 5198! Gardez: Safed Kuh, 4000 m, Collett 93. Jaji: Ali Khel, Aitch. 120! Kabul: In montibus supra vallem Nijrao inter Gulbahar et Sarobi, 3150 m, Gilli 1093! Nuristan: In jugo Farajghan, 3040 m, Koelz 11726! In declivibus australibus jugi Pirdum, 3000—3700 m, Kerst. 1089!, 1095! — NE: Badakhshan: Darrah-i Pashui, 4400 m, Frey 409!
Pakistan: Chitral: Tirich Mir prope S Barum Glacier, 4500 m, Wdb. s. n.! — Kurram: Seratigah, 3650—4330 m, Aitch. 825. In alpinis ad Shend Toi, M. Sikaram etc. vallis Kurram, Aitch. 99, 112, 126.

Distr. gen.: Endem.

Although most variable in the density and type of the indumentum, *D. affghanica* is characterised by the loose habit and the long styles in flower and fruit.

6. ***D. trinervis*** O. E. Schulz in Engler, Pflanzenr., Cruciferae-Draba et Erophila 89 (IV. 105): 131 (1927).
Typus: Syntypi numerosi e montibus Himalaya boreo-occidentalibus.

Perennis, ± laxe caespitosa, ramis numerosis tenuibus, inferne residuis foliorum obsitis. Folia rosulata, pilis antrorsis simplicibus usque ad 0,5 mm longis ciliata, ceterum glabra, 3—5-nervia. Scapi tenues, glabri, 1—4 cm longi. Sepala glabra, 2,5 mm longa. Petala flava, 4—5 mm longa, apice rotundata. Pedicelli fructiferi 4—8 mm longi, erecto-patentes. Silicula (immatura) 3,5—6×c. 3 mm, ovoidea, glabra; stylus c. 0,5—1 mm longus.

Afghanistan: E: Nuristan: In jugo Urura, 3000—3900 m, Neub. 585!, 614!
Pakistan: Chitral: Gangalwat Gol, SW Chitral, 3600 m, Stainton 2717! Drosh, Harriss. Guigaithigol, 4600 m, Harriss. Puntgul, Shishikuh, 4300 m, Harriss.

Distr. gen.: Afghanistan occidentalis, Chitral, Himalaya boreo-occidentalis.

D. trinervis, one of the easily recognised species in our area, is characterised by the indumentum of simple hairs only and the three or five-nerved leaves. Without mature fruit, its affinities cannot be assessed.

7. ***D. Korschinskyi*** (O. Fedtsch.) Pohle, Acta Hort. Petrop. 31: 484 (1914). Feddes Repert. Beih. 32: 134 (1925).
Syn.: *D. alpina* L. var. *Korschinskyi* O. Fedtsch., Acta Hort. Petrop. 21, 3: 266 (1903). *D. pamirica* (O. Fedtsch.) Pohle, Acta Hort. Petrop. 31: 485 (1914) sensu O. E. Schulz in Engler, Pflanzenr. Draba et Erophila 89 (IV. 105): 113 (1927) p. p.
Typus: „Hab.: Buchara: Shugnan, Korshinsky Tuturin. Ferghana: Pamir, Nasarow, Korshinsky, Paulsen, O. & B. Fedtschenko, Knorring — in alpibus alt. 12—15000 ped. s. m.", LE.

Perennis, dense caespitosa, pulvinata, caudice lignescente, ramis numerosis, brevibus foliis emarcidis persistentibus. Folia omnia basalia, rosulas numerosas densas modo *Androsaces* formantia, oblongo-spathulata, saepe incurva, 2,5—4× c. 1 mm, subtus pilis simplicibus et ramosis obsita, supra glabra, vel apice pilis simplicibus obsita, margine ciliata. Scapus aphyllus, 1—5 cm longus, tenuis, ascendens, inferne pilis stellatis obsitus, superne glaber. Inflorescentia 5—10-flora, capitata, fructifera leviter expansa. Sepala ovato-oblonga, 2 mm longa, stellato-pilosa. Petala flava, c. 3 mm longa. Pedicelli fructiferi erecti, 2—4 mm longi. Silicula ovoidea glabra, 3—3,5×2,5 mm, leviter inflata; stylus 0,5 mm longus.

Afghanistan: E: Parvan: In valle Panjshir, in declivibus occidentalibus jugi Anjuman, 4100 m, Hdg. & Wdb. 5445! — NE: In jugo Munjan, 4000 m, Koelz 12731! Wakhan: In valle Futur, 3900 m, Roemer 89! Kataghan: Takhar: Khost-o Fereng, 3800 m, Podlech 11827; 4650 m, Podlech 11831. Badakhshan: Darrah-i Parshui, 4700—4900 m, Frey 291!, 336! — C: Bamian: Koh-i Baba supra Zard Darreh, 4320 m, Gilli 1098! Pakistan: Chitral: Sora Lasht, 4000 m, Bowes Lyon 1084! Inter jugum Dorah et Gabur, 4500 m, Kerst. 1539! In jugo Chumarkhan, 4200 m, Stainton 2917! Tirich Mir, Barum Gol prope S Barum Glacier, 4500 m, Wdb. s. n.!

Distr. gen.: Pamir-Alaj, Tibet, Afghanistan, Chitral.

Recognised by the small, tight leaf rosettes, the slender scapes and the short, inflated, glabrous fruits. Two very closely related species are *D. pamirica* (O. Fedtsch.) Pohle, which has a looser habit, larger leaves (5—10 mm) and fruits (3,5—5 mm), and *D. cachemirica* Gandoger with longer fruiting pedicels (up to 7 mm) and fruits up to 4 mm. *D. pamirica*, according to the recent Soviet floras, is endemic to the Pamir-Alaj; *D. cachemirica* is in Kashmir and Tibet. The identification of some of the cited specimens is provisional as many of them have no fruit.

8. ***D. Olgae*** Regel & Schmalh. in Regel, Descr. Pl. Nov. Fedtsch. 8 (1882).
Typus: „Hab. in Turkestaniae valle fluvii Sarawschan in tractu Kadschraga, O. Fedtsch.", LE.

Perennis, laxe vel dense caespitosa, ramis numerosis brevibus vel elongatis, basi residuis foliorum obsitis. Folia omnia basalia, rosulas laxas vel densas formantia, oblongo-elliptica, 7—14×1,5—3 mm, integra, utrinque stellato- interdum etiam simpliciter pilosa. Scapi inferne stellato-pilosi, superne glabri, fructiferi 5—15 cm alti, suberecti. Sepala 2 mm longa, oblonga, simpliciter pilosa. Petala 4—5 mm longa, flava. Pedicelli fructiferi erecto-patentes, 3—5 (—10) mm longi. Silicula ovoidea, 4—8×c. 2 mm, inflata, pilis simplicibus, raro etiam furcatis obsita; stylus 0,5—c. 1 mm.

Pakistan: Chitral: Achalgur, Rumbur, 4300 m, Harriss. Chitral, 3650 m, Harriss 15909.

Distr. gen.: Asia centralis, Chitral.

The cited specimens were called *D. Olgae* var. *chitralensis* O. E. Schulz in Pflanzenreich, Draba et Erophila, l. c.: 120. Very little material of this species has been available for study but it seems very closely related to *D. oreades*.

9. ***D. oreades*** Schrenk in Fisch. & C. A. Mey., Enum Pl. Nov. 2: 56 (1842).
Syn.: *D. tianschanica* Pohle, Acta Hort. Petrop. 31: 486 (1914).
Typus: E Kazakstan descripta, LE.

Perennis, dense caespitosa, ramis numerosis brevibus dense confertis, basi residuis foliorum obsita. Folia omnia basalia, 5—10× c. 2 mm rosulas densas formantia, oblonga, obtusa, integra utrinque pilis simplicibus furcatis et stellatis obsita. Scapi floriferi 8 cm fructiferi usque ad 10 cm longi, pilis simplicibus et furcatis obsiti. Sepala c. 2 mm longa, persistentia, simpliciter pilosa. Petala flava, 4 mm longa. Pedicelli fructiferi 2—4 mm longi, erecto-patentes. Silicula 4—5×3—4 mm, ovoidea basi rotundata, apice acuta, glabra; stylus 0,5 mm longus.

Pakistan: Chitral: In jugo Karumbar, E jugi Baroghil, 4200 m, Stainton 3017!

Distr. gen.: Asia centralis, Chitral, Tibet, montes Himalaya usque ad Sinam.

10. ***D. Koeiei*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 4 (1954).
Syn.: *D. Buddhae* Gilli, Feddes Repert. 57: 220 (1955).
Typus: Koeie 2618, W, C!

Perennis, laxe caespitosa ramis diffusis basi foliorum residuis obsiti. Folia omnia basalia, rosulas laxas formantia, herbacea, lanceolata, integra, sessilia pilis simplicibus rigidis usque ad 1,5 mm longis hispida, praeterea pilis brevibus furcatis et stellatis utrinque obsita. Scapi erecti vel ascendentes, floriferi 5—10 cm, fructiferi usque ad 15 cm longi, inferne pilis simplicibus furcatis et stellatis obsita, superne glabra. Sepala c. 2 mm longa, simpliciter pilosa vel glabra. Petala 4—5 mm longa, flava, retusa. Pedicelli fructiferi erecto-patuli, 8—10 mm longi. Siliquae lineares, 10—12 × 1,5—2 mm, pilis brevissimis simplicibus obsiti; stylus c. 0,5 mm longus.

Afghanistan: E: Parvan: In valle Panjshir, in declivibus occidentalibus jugi Anjuman, 3900 m, Hdg. & Wdb. 5422! Kabul: In declivibus australibus jugi Salang, 3000 m, Lamond 2102!, Rech. 31410, Podlech 12209, 12210. — NE: Kataghan: In valle Andarab S Darrah-i Shu, 3000 m, Podlech 11110. Darrah-i Til S Doab-i Til, 2800 m, Podlech 11166. Khost-o Fereng, in declivibus borealibus Kotal-i Yawnu, 3300 m, Podlech 11719. In valle Andarab, in declivibus occidentalibus jugi Khawak, 3100 m, Podlech 11236. — C: Bamian: Koh-i Baba, 3900 m, Koeie 2612!; 3780 m, Gilli 1096!, 3600 m, Gilli 1095! (Typus *D. Buddhae*).

Distr. gen.: Endem.

A distinct species easily recognised by the very long, stiff hairs on the leaves. Without any very close ally, it is probably nearest to *D. Aucheri*. Two gatherings from Chitral may be referable to this species but they are not in ripe fruit. They are: Chitral Gol, 3400 m, Stainton 2670! and Shoghot, 3200 m, Bowes Lyon 727! These specimens have the long hairs characteristic of *D. Koeiei* but in the Stainton gathering, the developing fruits are shorter and broader than at an equivalent stage in *D. Koeiei*. These gatherings may represent a separate species but better material is needed.

11. ***D. Aucheri*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 166 (1842).
Syn.: *D. linearis* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 167 (1842). *Arabis sulphurea* Boiss., Fl. Or. 1: 173 (1867). *Draba longisiliqua* Bornm., Verh. Zool. Bot. Ges. Wien 12: 554 (1898), non Schmalh. (1892).

Lit.: J. Bornmüller, Beihefte zum Botanischen Centralblatt 28, 2: 116 (1911).

Typus: Auch. 92, G, K!

Perennis, anno primo florens. Caules floriferi ascendentes, usque ad 5 cm longi, fructiferi usque ad 10 cm elongati. Folia omnia basalia rosulata, oblonga, integra, basi cuneata, utrinque pilis longis simplicibus furcatis et substellatis obsita. Scapi pilosi vel glabri. Sepala 2 mm longa, pilis simplicibus et ramosis obsiti. Petala sulfurea, 3,5—4 mm longa, oblongo-obovata, non vel leviter emarginata. Pedicelli fructiferi 5—10 mm longi, patule ascendentes. Siliqua 10—22 × 1,5 mm, a latere compressa, basi attenuata, glabra vel stellato-pilosa; stylus brevissimus. Semina biseriata.

Persia: N: Gorg.: Inter Gorgan et Shahrud, Bge. Maz.: M. Alamut, Auch. 4118. 16 km NE Firuzkuh, 2740 m, Furse 2966! — W: Bakht.: Kuh-e Kukular, Haussknecht. Zard Kuh, Auch. 92!, Archibald 2969! — S: Fars.: Kuh-e Dinar, prope nivem deliquescentem, Ky. 762! Kerm.: Kuh-e Laleh Zar, 3800—4200 m, Bornm. 2184! Kuh-e Hazaran inter Kerman et Bandar Abbas, 4000—4400 m, Bornm. 2182! Kuh-e Hazaran et Kuh-e Laleh Zar, Bornm. 2183, 2185. — C: Damgh.-Semn.: E Qadamgah, 60 km E Firuzkuh, 2600 m, Aell. 1069!

Distr. gen.: Persia. Pamir-Alaj et Tien Shan sec. Fl. URSS. 8: 454 (1939).

Variable in indumentum. O. E. Schulz in Engler, Pflanzenr. l. c.: 316—317 recognised var. *linearis* (Boiss.) O. E. Schulz — glabrous scapes, var. *velutina* (Bornm.) O. E. Schulz — valves with stellate hairs and var. *macrocarpa* (Boiss.) O. E. Schulz with larger siliquae. These varieties appear to be merely local forms. — Distinct among our species on the character of the very long siliquae.

12. ***D. tibetica*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 152 (1861) p. p.
Syn.: *D. turkestanica* Regel & Schmalh. in Regel, Descr. Pl. Nov. Fedtsch. 7 (1882). *D. Thomsonii* (Hook. f. & Thoms.) Pohle, Feddes Repert. Beih. 32: 141 (1925). *D. sikkimensis* (Hook. f. & Thoms.) Pohle var. *chitralensis* O. E. Schulz in Engler, Pflanzenr. Draba et Erophila 265 (1927). *D. tibetica* var. *chitralensis* (O. E. Schulz) Jafri, Notes Roy. Bot. Gard. Edinb. 22: 106 (1956).
Typus: „Hab. in Tibetia occidentali alpina Zanskar, alt. 13000—15000 ped., Thoms.", K.

Perennis caespitosa habitu laxo. Caudices subrepentes, residuis foliorum persistentibus. Folia rosulata, oblongo-lanceolata, integra, raro utrinque 1—2-dentata, 8—15 × 1,5—2 mm, acuta, basi attenuata, utrinque ± dense stellato-tomentosa, interdum insuper pilis simplicibus obsita. Scapi aphylli, c. 15 cm longi, stellato-pilosi. Inflorescentia laxe corymbosa. Sepala 1,5—2 mm longa, ovato-oblonga, pilis simplicibus et ramosis obsita. Petala 3—5 mm longa, flava, exsiccando alba, retusa vel obtusa. Pedicelli fructiferi 5—15 mm longi, erecto-patuli. Siliqua 8—13 × 1,5 mm, anguste oblonga, pilis brevissimis furcatis vel stellatis obsita; stylus 1 mm longus.

Afghanistan: E: Nuristan: Kantivo, 2500—3300 m, Kerst. 976! — NE: Wakhan: In valle Futur, 3900 m, Roemer 85! Badakhshan: Darrah-i Parshui, Frey 367. — C: Bamian: Koh-i Baba, 4000—4500 m, Gilli 1097!, Griff.
Pakistan: Chitral: Infra Zapotili, 3600 m, Wdb. s. n.! S Barum Glacier, 4500 m, Wdb. s. n.! Shah Jinali, 3000—3300 m, Toppin 255! Ovir, 3350 m, Bowes Lyon 875! Chitral, 4150 m, Harriss.

Distr. gen.: Asia centralis, Tibet, Afghanistan, Chitral.

The identification of the Central Afghanistan plants is uncertain due to the inadequate material. The length of the fruiting pedicels varies greatly; the lower are generally considerably longer than the upper.

13. ***D. nemorosa*** L., Spec. Plant. 643 (1753).
Icon.: Clavis p. 25.
Typus: „Hab. in Sueciae nemorosis".

Herba annua. Caulis erectus, fructifer usque ad 20 cm longus, simplex vel ramosus, inferne pilis simplicibus, ramosis et substellatis obsitus, superne glabrescens. Folia basalia rosulata, oblongo-ovata, subintegra, vix petiolata; caulina oblonga, sessilia, utrinque minute dentata. Sepala 1,5 mm longa. Petala c. 2 mm longa, pallide flava, exsiccando albida, emarginata. Pedicelli fructiferi patulo-ascendentes, 10—20 mm longi. Silicula 5—8 × c. 2,5 mm, oblongo-elliptica; valvae tenues, indumento e pilis numerosis brevibus antrorsis consistente; semina biseriata.

Talish: sec. Grossh., Fl. Kawk. ed. 2, 4 tab. 248 (1950).
Persia: C: Tehr.: Damavand, 3300 m, Gilli!
Afghanistan: NE: Badakhshan: In parte superiore vallis Zebak, 2100 m, Furse 6363!; 2440 m, Furse 6377!

Distr. gen.: Per Europam et Asiam late dispersa.

14. ***D. huetii*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 5: 31 (1856).
Typus: Anatolia prope Beybazar, Auch. 4058, K!

Herba annua. Caulis erectus, fructifer usque ad 20 cm altus, simplex vel ramosus. Indumentum totius plantae pedicellis exceptis e pilis simplicibus, ramosis et substellatis consistens. Caulis in parte inferiore tantum foliatus; folia basalia laxe rosulata, obovata, integra, vix petiolata; caulina oblongo-ovata, minute dentata. Sepala 1,5—2 mm longa. Petala 2—2,5 mm longa, flavescenti-albida, emarginata. Pedicelli fructiferi patulo-ascendentes 4—8 mm longi. Silicula 8—10×c. 3 mm, oblongo-elliptica, valvis tenuibus pilis numerosis antrorsis simplicibus obsitis; semina biseriata.

Persia: N: Maz.: Prope Kalar Dasht, 2400 m, Gauba 192-a! Hazar Jerib, Shar. 580! — W: Azerb.: Kuhha-ye Sabalan, 32 km W Ardabil, 2100 m, Furse 2445! — C: Tehr.: In jugo Kandavan, 2700 m, Rech. 489!
Turcomania: Ashkhabad sec. Nikitin.

Distr. gen.: Anatolia, Transcaucasia, Persia borealis, Turcomania.

Similar in facies to *D. nemorosa* L., but with shorter fruiting pedicels, not leafy in upper part of stem and with an indumentum on the inflorescence axis.

15. ***D. alticola*** Komar., Trav. Soc. Nat. Petersbg. 26: 103 (1896). Pohle, Feddes Repert. Beih. 32: 108 (1925).
Syn.: *D. melanopus* Komar. var. *alticola* (Komar.) O. E. Schulz in Engler, Pflanzenr. Cruciferae Draba et Erophila 89 (IV. 105) 317 (1927).
Typus: Serawshan, Komar., LE.

Herba annua vel biennis, nana, florifera 1—2 cm, fructifera usque ad 5 cm longa; caules plures, simplices, decumbentes vel ascendentes. Folia basalia 5—10 mm longa, rosulata, anguste oblonga, integra, acuta, sessilia, utrinque pilis furcatis, substellatis et nonnullis simplicibus obsita. Folia caulina nulla. Scapi graciles, flexuosi, glabri vel parce pilosi. Sepala c. 1 mm longa, pilis simplicibus et furcatis obsita. Petala c. 2 mm longa, flava, exsiccando alba, obtusa vel retusa. Pedicelli fructiferi tenues 3—6 mm longi, patulo-ascendentes. Siliqua 3—6×c. 1,5 mm, oblongo-elliptica, glabra vel pilis paucis simplicibus obsita; stylus brevissimus.

Afghanistan: E: Kabul: Paghman, 4000 m, Hdg. & Wdb. 5087! Parvan: In valle Panjshir, Darreh Rastagal, 3840 m, Hdg. & Wdb. 5197!
Pakistan: Chitral: Tirich Mir, Barum Gol, S Barum Glacier, 4500 m, Wdb. s. n.!

Distr. gen.: Afghanistan orientalis, Chitral, Tien Shan.

Insufficient material of this taxon and its allies has been seen to assess its status and it may be, as O. E. Schulz regarded it, a high alpine form of *D. melanopus*. The differences between the two species are mostly of a quantitative nature.

16. ***D. stenocarpa*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 153 (1861).
Icon.: Clavis p. 31.
Typus: „Hab. in Tibetia occidentali temperata ad Das Kirim", Winterbottom, K.

Annua vel biennis, florifera 10—20 cm, fructifera usque ad 35 cm alta. Caules plerumque plures, simplices, erecti vel ascendentes. Folia basalia rosulas laxas formantia, oblongo-elliptica, acuta, subsessilia, integra vel 1—3-dentata; caulina lanceolata sessilia, omnia supra pilis longis simplicibus strigosa, subtus pilis stellatis et furcatis obsita. Scapi usque ad 5-phylli vel aphylli, pilis simplicibus et furcatis obsiti vel glabrescentes. Sepala c. 1,5 mm longa, simpliciter pilosa. Petala flava exsiccando alba, 3—4 mm longa, leviter emarginata. Pedicelli fructiferi arcuato-

ascendentes, 8—17 mm longi. Siliqua 10—15 × c. 2 mm, erecta pilis simplicibus antrorsis obsita vel glabra; stylus brevissimus. Semina numerosa, biseriata.

Afghanistan: E: Parvan: In valle Panjshir, in declivibus occidentalis jugi Anjuman, 3700 m, HDG. & WDB. 5488! Darreh Rastagal, 3700 m, HDG. & WDB. 5169! — NE: Wakhan: In regione Noshaq, 4150 m, ROEMER 212! Munjan: In jugo Munjan, 3900 m, KOELZ 12729!
Pakistan: Chitral: Gangalwat Gol, SW Chitral, 3600 m, STAINTON 2718! Owir An, SE Tirich Mir, 3600 m, STAINTON 2763! Tirich Mir: Shokor Shal, 3500 m, WDB. s. n.! Supra Jamishi Glacier, 4200 m, WDB. s. n.! Chitral, 3300 m, BOWES LYON 957!

Distr. gen.: Asia centralis, Afghanistan orientalis, Chitral, Gilgit, Tibet, Himalaya boreo-occidentalis.

Closely related to *D. melanopus* KOMAR. but differing in the larger petals, longer fruiting pedicels and siliquae. Although *D. melanopus* has not been collected in our area, its presence in Wakhan or Chitral would not be unexpected. It is intermediate in dimensions between the dwarf *D. alticola* and the taller growing *D. stenocarpa*. — NIKITIN, Fl. Ashkhabad 172 (1965) records this species from Ashkhabad but this requires confirmation.

17. ***D. lanceolata*** ROYLE, Illustr. Bot. Himal. Mount. 1: 72 (1839).
Typus: Himalaya. „Hab. Shalkur", ROYLE.

Perennis caulibus pluribus erectis simplicibus 10—25 cm alta. Tota planta breviter substellato-tomentosa. Folia basalia rosulata, oblongo-lanceolata, integra vel minute dentata, basi attenuata; caulina oblongo-ovata sessilia, utrinque minute 1—5-dentata. Sepala c. 2 mm longa, oblonga, saepe atroviridia vel violacea. Petala 4 mm longa, alba, obtusa vel emarginata. Pedicelli fructiferi 2—5 mm longi, erecti. Silicula oblonga 5—10 × c. 1,5 mm. Stylus c. 0,5 mm longus.

Afghanistan: NE: Badakhshan: In parte superiore vallis Zebak, 2440 m, FURSE 6382!
Pakistan: Chitral: In jugo Karumbar E jugi Baroghil, 3900 m, STAINTON 3019!

Distr. gen.: Afghanistan orientalis, Pakistan boreo-occidentalis, Himalaya, Asia centralis, Siberia, Sina.

O. E. SCHULZ in ENGLER, Pflanzenr. l. c. 297 recognised a glabrous fruited form as var. *leiocarpa* O. E. SCHULZ which he recorded from Gilgit. — NIKITIN, Fl. Ashkhabad 172 (1965) records this species from the Ashkhabad region but this requires confirmation.

18. ***D. stylaris*** J. GAY ex KOCH, Syn. Fl. Germ., ed. 2, 1: 70 (1843).
Syn.: *D. incana* L. prol. *Thomasii* (KOCH) ARCANGELI, Comp. Fl. Ital. ed. 2: 276, (1894) emend. O. E. SCHULZ in ENGLER, Pflanzenr. Cruciferae — Draba et Erophila — 89 (IV. 105): 286 (1927) p. p.
Typus: C Europe. „Im Schlerngebirge des südl. Tyrols; in St. Nicolai u. Saasthale im Wallis."

Biennis interdum perennis, caulibus nonnullis erectis simplicibus vel ramosis foliatis, c. 20 cm altis. Indumentum dense totam plantam usque ad pedicellos obtegens, e pilis longis simplicibus et brevioribus stellatis et furcatis consistens. Folia basalia rosulata, lanceolata, integra vel dentata, basin versus attenuata usque ad 4 × 1 cm; caulina anguste lanceolata quam basalia minora. Racemi floriferi densi, fructiferi valde elongati. Sepala 2—2,5 mm longa, pilis simplicibus et ramosis vel ramosis tantum obsita. Petala 4—4,5 mm longa, alba. Pedicelli fructiferi 2—4 mm longi, erecti. Silicula 7—12 × 2—3 mm, saepe contorta, pilis stellatis obsita; stylus usque ad 0,75 mm longus.

Persia: W: Azerb.: Prope Karingan sec. Grossh., Fl. Kawk, ed. 2, 4 tab. 244 (1950).

Distr. gen.: Europa centralis, Caucasus, Persia boreo-occidentalis.

The status of this species is uncertain. The Caucasian material agrees well with that from the Alps of Europe but their exact relationship with the widespread European species *D. incana* requires further investigation.

19. ***D. altaica*** (C. A. Mey.) Bge., Delect. Sem. Hort. Dorpat. 8 (1841).
Syn.: *D. rupestris* R. Br. var. *altaica* C. A. Mey. in Ledeb., Fl. Alt. 3: 71 (1831). Ledeb., Icon. Pl. Fl. Ross. 3, 19, tab. 260 (1832).
Typus: „In humidis alpium altaicarum", Bge., LE.

Herba perennis, nana, caespitosa, habitu compacto; caudices residuis foliorum diu persistentibus obsiti. Folia conferta, rosulata, 5—8 mm longa, lineari-oblonga apice acuta, basi attenuata, integra vel utrinque 1—2-dentata, indumento laxo e pilis longis simplicibus et paucis furcatis consistente. Folium caulinum singulum vel nullum. Scapi 1—3 cm alti erecti simplices, glabri vel pilis simplicibus furcatis et ramosis stellatis obsiti. Racemi parvi capitati, pauci-(c. 8-)flori. Sepala 1 mm longa, oblonga, saepe violacea, pilis simplicibus et ramosis obsita. Petala 1,5—2 mm longa, alba, non vel vix emarginata. Pedicelli fructiferi 2—3 mm longi, erecto-patuli. Silicula 3—4 × 1,5—2 mm, oblongo-ovoidea, basi rotundata, apice acuta, glabra; stylus brevissimus.

Afghanistan: E: Parvan: In valle Panjshir, in declivibus occidentalibus jugi Anjuman, 4200 m, Hdg. & Wdb. 5442! — NE: Kataghan: Khost-o Fereng, 3800 m, Podlech 11826. Pakistan: Chitral: Siru Gol S jugi Jinali, 4100 m, Stainton 3054! Tirich Mir, 4500 m, Wdb. s. n.! Inter Marmano Shal et Jamishi Ghochar, 4800 m, Jörstad.

Distr. gen.: Altai, Tibet, Pamir Alaj, Tien Shan, Afghanistan, Chitral, Himalaya boreo-occidentalis.

Although no fruiting specimens from our area have been seen, *D. altaica* is recognised in flower by the compact habit, the small leaf rosettes, the capitate, few-flowered inflorescence and the white flowers. O. E. Schulz in Engler, Pflanzenr., Draba et Erophila l. c. 217—219, recognised several subspecific taxa on habit and indumentum variation.

20. ***D. siliquosa*** M. B., Fl. Taur.-Cauc. 2: 94 (1808).
Syn.: *D. subglabra* (Rupr.) Tolm. in Komar., Fl. URSS. 8: 405 (1939).
Icon.: Clavis p. 27.
Typus: „Hab. in alpibus Caucasicis", Stev., LE, photo E!

Herba perennis, nana, caulibus simplicibus erectis vel ascendentibus 2—7 cm altis. Folia basalia rosulata, lineari-lanceolata in petiolum attenuata, utrinque stellato-pilosa raro glabra; folia caulina nulla. Scapi inferne sparse stellato-pilosa, superne glabri. Sepala 1—1,5 mm longa, ovata, parce simpliciter pilosa. Petala 2,5—3 mm longa, alba, non vel leviter emarginata. Pedicelli fructiferi erecto-patentes, 2—6 mm longi. Silicula 5—10 × 1,5—2 mm, lineari-oblonga, glabra; semina biseriata.

Persia: N: Maz.: In declivibus orient. M. Damavand, 4200 m, Grant 16534! — C: Tehr.: Takht-i Suleiman, Hazarchal, 4100—4200 m, Bornm. 6257!, 6257-b. Damavand, 3800—4000 m, Auch. 4067, Bornm. 6258!, Gilli!

Distr. gen.: Anatolia orientalis, Caucasus, Persia borealis.

Very variable in density of indumentum, there are all transitions between plants with a hirsute indumentum and plants that are glabrous. In Bornm. 6257 the leaves are glabrous.

68. *Erophila*

Erophila DC., Reg. Veg. Syst. Nat. 2: 356 (1821).

Lit.: O. E. Schulz in Engler, Pflanzenreich, Cruciferae — Draba et Erophila — 89 (IV. 105): 343—372 (1927). F. Markgraf in G. Hegi, Illustrierte Flora von Mittel-Europa, ed. 2, 4, 1: 320—327 (1960—62).

Omnia ut in *Draba* sed plantae nanae annuae vel perhiemantes, petalis profunde bifidis.

A difficult genus taxonomically in which the limits of the species and infra-specific taxa have varied greatly with different authors. Much cytotaxonomic work has been done on NW European material (O. Winge, Compt. Rend. Trav. Lab. Carlsb. Ser. Physiolog. 23: 41—73, 1940) but no investigations have been carried out throughout the species range. Until such work has been done, it is premature in our area to take any other view than a broad specific concept.

1a. Folia spathulata vel lanceolata. Ovula plus quam 20. Semina 0,3—0,5 mm diametro ..... 1. *E. verna* (L.) Besser

b. Folia anguste linearia. Ovula 10—15. Semina c. 1 mm diametro ..... 2. *E. minima* C. A. Mey.

1. ***E. verna*** (L.) Besser, Enum. Pl. Volhyn. 71 (1822).

Syn.: *Draba verna* L., Spec. Plant. 642 (1753). *E. vulgaris* DC., Reg. Veg. Syst. Nat. 2: 356 (1821).

Icon.: Clavis p. 25.

Typus: „Hab. in Europae aridis."

Herba annua tenuis, caulibus plerumque pluribus simplicibus erectis, 2—10 cm altis. Folia omnia basalia rosulata, lanceolata vel elliptica, acuta, basi attenuata, integra vel paucidentata, pilis furcatis et stellatis obsita. Scapi inferne ramoso-pilosi, superne glabri. Inflorescentia dense racemosa, fructifera elongata. Sepala c. 2 mm longa, glabra vel simpliciter pilosa. Petala 2,5 mm longa, alba. Pedicelli fructiferi erecto-patuli, 3—6 mm longi. Silicula oblonga vel elliptica, 3—10×1,5—3 mm, glabra. Stylus nullus.

Iraq: Kurd.: Arbil: Inter Salah-ad Din et Shaqlawa, Barkley 7075! Kirkuk: Jarmo, 800 m, Helbaek 310!, 311!

Talish: sec. Grossh., Fl. Kawk. ed. 2, 4 tab. 249 (1950).

Persia: N: Gorg.: 45 km ENE Gonbad-e Kavus, 900 m, Furse 5132! Sharbat inter Gorgan et Ziarat, Gauba & Esfand. 193! Maz.: Mahmudabad, 30 m, Furse 5055! — W: Ham.: M. Alvand, 2740 m, Furse 1974!, 1975! Lur.: Ti, Koelz 17080! Dow Rud, Koelz 17112! — E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4572! — C: Qazvin, 1200 m, Schmid 5038!

Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 174 (1965).

Afghanistan: NW: Maimana, 1000 m, Koeie 4174! Qala Nau, 800 m, Koeie 3491! — E: Kabul: Sher Darwasa, 1820 m, Gilli 1101! Munar Shakrie, 2100—2400 m, Gilli 1102!, 1103! Shakh-e Barantai, 2200 m, Gilli 1104! Sarobi, Volk 2449! Paghman, 1910 m, Gilli 1100! Inter planitiem Koh-e Daman et Istalif, 1750 m, Gilli 1099! Chakewardak, Neub. 4023! Top Tara, Neub. 4006! Parvan: In valle Porandeh prope Basarak, 2200 m, Gilli 1105! Gulbahar, 2000 m, Kerst. 61! Nuristan: Gusalak, 1000 m, Edelb. 49, 157, 189, 264.

Distr. gen.: Per totam Europam et Asiam.

Most variable in all characters. Several subspecific taxa have been recognised (conf. O. E. Schulz in Engler, Pflanzenr. l. c.). In our area the following subspecies have been recognised:

— — subsp. ***spathulata*** (Láng) Walters, Feddes Repert. 69: 57 (1964).
Syn.: *E. spathulata* Láng, Syll. Soc. Ratisbon. 1: 180 (1824). *E. Boerhaavii* (Van Hall) Dum., Fl. Belg. 120 (1827).
Typus subspeciei: Hungaria: In montibus calcareis Budae, Lang.
Silicula obovata usque orbicularis, usque ad 5 mm longa.

— — subsp. ***praecox*** (Stev.) Walters, Feddes Repert. 69: 57 (1964).
Syn.: *Draba praecox* Stev., Mém. Soc. Nat. Mosc. 3: 269 (1812). *Erophila praecox* (Stev.) DC., Reg. Veg. Syst. Nat. 2: 357 (1821).
Typus subspeciei: Caucasus circa Gandsham, Kruse.
Silicula oblanceolata usque lineari-elliptica, plerumque ultra 5 mm longa. Planta pilis simplicibus numerosis, interdum insuper pilis furcatis obsita.

— — subsp. ***verna.***
Silicula ut in subspecie praecedente. Pili simplices nulli vel percauci; pili plurimi furcati.

Intermediates between these subspecies are frequent and often it is not possible to apply these subspecific names with certainty.

2. ***E. minima*** C. A. Mey., Verz. Pfl. Cauc. 184 (1831).
Icon.: Clavis p. 15.
Typus: Transcaucasia, Baku, C. A. Mey. 1624, LE.
Habitu *E. vernae* similis sed fructifera quoque humilior, foliis linearibus, pilis simplicibus tantum obsitis, sepalis c. 1 mm longis. Silicula 3—5×2—2,5 mm oligosperma.

Iraq: Kurd.: Mosul, 210—300 m, Low 17.
Talish: sec. Grossh., Fl. Kawk. ed. 2, 4 tab. 249 (1950).
Persia: N: Maz.: In valle Haraz, Zardman, 600 m, Wdb. 123! — W: Kermansh.: Karand, Evans 116! — S: Fars.: Takht-e Jamshid, Koelz 14403! Fars versus Shiraz, Esfand. 996-E! Shiraz, Koeie 1452! Maharlu prope Shiraz, Gauba & Sab. 189!, 216! Tang-i Abdui, Stapf 226! — C: Tehr.: Ad ruinas oppidi Shahr Rey, 1200 m, Bornm. 2178! Ad radices M. Shimran, 1400—1500 m, Bornm. 2177!

Distr. gen.: Graecia, Syria, Palaestina, Lebanon, Anatolia, Iraq borealis, Transcaucasia, Talish, Persia.

Fairly constant in its characters.

√ 69. *Graellsia*

Graellsia Boiss., Ann. Scienc. Nat. Ser. 2, 16: 379 (1841) et l. c. 17: 172 (1842).
Syn.: *Physalidium* Fenzl in Tchihatch., Asie Mineure 3, Bot. 1: 327 (1860).

Lit.: B. Poulter, The Genus Graellsia, Notes from the Royal Botanic Garden, Edinburgh 22: 85—93 (1956).

Herbae glabrae perennes basi lignescentes. Folia basalia longe petiolata, simplicia, ± integra vel sinuato-lobata, ovata, reniformia vel suborbicularia; caulina pauca vel deficientia. Sepala patula, non saccata. Petala alba. Glandulae nectariferae medianae evolutae. Ovarium 4—12-ovulatum. Silicula dehiscens vel indehiscens, latisepta, angustisepta vel non septata, 1- vel plurisperma; valvae membranaceae vel coriaceae; septum integrum, fenestratum vel ± deficiens. Radicula incumbens.

Six very closely allied saxatile species in SW and C Asia.

In this account, Poulter's treatment of the genus has been accepted i. e. *Physalidium* is included within *Graellsia*. This means that *Graellsia* contains both clearly latiseptate and clearly angustiseptate species; a condition not occurring in any other SW Asiatic genus. As, however, almost all transitions occur between virtually eseptate, fenestrated and entire septa, and between lati- and angustiseptate fruits, there are certainly strong reasons for considering *Physalidium* and *Graellsia* congeneric.

The absence of mature fruit in many gatherings is a handicap in giving an account and assessing the importance of specific variation. Field observations and further gatherings are needed to determine, for example, how variable are the characters of fruit dehiscence, development of septum, the texture of the fruit valves and the shape of the silicule.

1a. Fructus manifeste angustiseptus ...4. *G. stylosa* (Boiss. & Hohen.) Poulter
b. Fructus sine septo distincto vel latiseptus 2
2a. Folia non cordata, integra vel leviter lobata .....
.....3. *G. integrifolia* (Rech. f.) Rech. f.
b. Folia cordata, profunde vel leviter lobata 3
3a. Silicula 5—7×1,5—2 mm. Inflorescentia simplex .....
..... 2. *G. chitralensis* O. E. Schulz
b. Silicula 5—13×2,5—5,5 mm. Inflorescentia superne pluriramosa .....
..... 1. *G. saxifragifolia* (DC.) Boiss.

1. ***G. saxifragifolia*** (DC.) Boiss., Ann. Scienc. Nat. Ser. 2, 16: 379 (1842).
Syn.: *Cochlearia saxifragifolia* DC., Reg. Veg. Syst. Nat. 2: 370 (1821).
Icon.: Clavis p. 5.
Typus: Persia: M. Alvand, Olivier & Bruguière, P.

Perennis, 15—35 cm alta, basi lignescens, caudicibus numerosis residuis petiolorum comosis. Folia plurima basalia; petiolus 3—12 cm longus; lamina subintegra vel 5—10-lobata, 10—25×10—20 mm, cordata, suborbicularis vel reniformis; folia caulina pauca, parva, petiolata plerumque ramos inflorescentiae suffulcrantia. Petala c. 5 mm longa, lamina ovato-orbiculari, ungue angusto. Inflorescentia compacta, fructifera elongata. Pedicelli fructiferi tenues, 8—12 (—18) mm longi, patuli. Silicula 5—13×2,5—5,5 mm, recta vel curvata; semina 1,2 vel 3.

1a. Stylus brevis, 0,3—0,5 mm ..... subsp. *saxifragifolia*
b. Stylus longior, 0,75—1,5 mm ..... subsp. *longistyla* Poulter

— — subsp. ***saxifragifolia***

Persia: W: Ham.: M. Alvand, Olivier & Bruguière, Bornm. 98. Bakht.: Kuh Rang, 2400 m, Wdb. 981! Gahar, 2700 m, Koelz 17920! Zard Kuh, Auch. 490!; 4100 m, Archibald 2991! Arak: Arak, Str. — S: Kerman: Kuh-e Hazaran, Balls! Kuh-e Laleh Zar, 3000—3800 m, Balls 48!, Bornm. 2201!, 2201-b. Fars.: Kuh-e Dinar, Ky. 767.
Turcomania: Prope Ashkhabad, 1200 m, Litw. 584! Kopet Dagh, in cacumine Tschapan, Korov. 671!

Afghanistan: NW: Maimana: Darreh Zang prope Belchiragh, 1400 m, Hdg. & Wdb. 3744! — E: Kabul: Paghman, 2400—2800 m, Hdg. & Wdb. 2818!, 2847! Chaw.-Must.!, Hay 139!, Neub. 523!, 4178!, Lindb. 58/269!, Gilli 1107-b!, Podlech 10812, 11583. Kabul, 2000 m, Meinertzhagen s. n.! Tang-e Gharu, Volk 1504!, Gilli 1107-a!, Neub. 4045! Inter Barbur et Gulbagh, 1700 m, Kerst. 135. In declivibus australibus jugi Salang, 2300—2600 m, Rech. 31372! Bagrami in valle Nijrao, 2500 m, Neub. 295! In jugo Altimur inter Kabul et Gardez, 2800—3000 m, Lamond 2336!, Rech. 31856!, 31915! In valle Panjshir: Darreh Rastagal, 3200 m, Hdg. & Wdb. 5231! Basarak, Neub.

522 p. p., Volk 1890. Nuristan: Gomando, 2740 m, Koelz 11707. Gardez: Nozi, 3040 m, Koelz 11979! — C: Bamian: Inter Shibar et Doshi, Furse 5829! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16835! In jugo Shibar, 2400 m, Neub. 4693! Ghorat: 12 km SW Qala-i Ghor, Mollah Allah, 2300 m, Rech. 18987!

Distr. gen. subspeciei: Endem.

— — subsp. ***longistyla*** Poulter, Notes Roy. Bot. Gard. Edinb. 22: 90 (1956).
Typus subspeciei: Persia, Haussk., K, BM.

Iraq: Kurd.: Sul.: M. Avroman supra Daramar, 2250 m, Gillett 11884. M. Avroman, 2100—3000 m, Haussk. Qara Dagh, 1700 m, Gillett 7295.
Persia: W: Kurd.: M. Shahu, Haussk. Kuh-e Kukular, 3000 m, Haussk.

Distr. gen. subspeciei: Endem.

G. saxifragifolia is the only widespread species of the genus. It is most variable in several characters; size of leaf, degree of leaf lobing, development of septum, dehiscence of the fruit and the length of the fruiting style.

The other species in the genus are all very closely allied to *G. saxifragifolia* and further gatherings may show that some currently recognised taxa should be reduced to synonymy.

Usually confined to rock crevices, one of the characteristic features of its leaves is that, on crushing, they smell of *Allium sativum*.

2. ***G. chitralensis*** O. E. Schulz, Notizbl. Bot. Gart. Berlin 9, 90: 1085 (1927).
Typus: Chitral, Jarashmir, Harriss, photo DD!

Habitu *G. saxifragifoliae* similis. Caules fructiferi subsimplices vel simplices, c. 20 cm alti. Folia basalia reniformia, 10—18 mm lata, subintegra vel obtuse 5-lobata; petioli 5—7 cm longi. Flores ignoti. Racemi fructiferi elongati, laxi. Pedicelli fructiferi erecto-patentes, 6—15 mm longi. Silicula oblonga vel lanceolata, curvata vel subcontorta, 5—7 × 1,5—2 mm; stylus 0,5—0,75 mm longus; septum fenestratum.

Pakistan: Chitral: Jarashmir, 5650 m, Harriss.

Distr. gen.: Endem.

Only known from one gathering, *G. chitralensis* differs from *G. saxifragifolia* in the simple inflorescence, the smaller, narrower silicules and the slightly thicker fruiting pedicels. It may not be specifically different from *G. saxifragifolia*. The very high altitude given by Harriss for this gathering must be considered very suspect.

3. ***G. integrifolia*** (Rech. f.) Rech. f., Phyton 2, 1—2: 58 (1951).
Syn.: *Physalidium integrifolium* Rech. f., Feddes Repert. 48: 35 (1940); Ann. Nat. Mus. Wien 51: 381 (1940).
Typus: Rech. 1710, W!

Perennis, caespitosa, caudice residuis petiolorum dense comoso. Caules floriferi 7—25 cm alti, inflorescentia simplex vel breviter ramosa. Folia basalia ovata, 8—25 × 10—18 mm, cuneata vel raro subcordata, coriacea, prominenter reticulato-venosa, integra vel sinuato-lobata; folia caulina pauca vel nulla, petiolata. Petala c. 4 mm longa, alba. Inflorescentia subcorymbosa, fructifera elongata. Pedicelli fructiferi tenues, c. 12 mm longi, ± horizontaliter patentes. Silicula 5—9 × 3—6 mm, oblongo-elliptica, apice rotundata, assymetrica, subcurvata vel recta; stylus 0,5 mm longus. Semina (1—) 2—3 (—4).

Persia: E: Khor.: Kuh-e Neyshabur, Darreh Abshar prope Akhlamad, 1800 m, Rech. 4602! Hazar Masjed, 2800 m, Rech. 5060! Kopet Dagh inter Quchan et Lotfabad, in fissuris rupium calc. jugi Allah Akbar, 1800 m, Rech. 1710!

Distr. gen.: Endem.

A distinct species apparently restricted to Khorassan, *G. integrifolia* is most closely allied to *G. saxifragifolia* but differs in the shape, size and texture of the leaves, the size and shape of the silicules. Some shade forms of *G. saxifragifolia* have a similar facies to *G. integrifolia* but can be recognised by the larger fruits and the shorter fruiting pedicels.

4. ***G. stylosa*** (Boiss. & Hohen.) Poulter, Notes Roy. Bot. Gard. Edinb. 22: 92 (1956).

Syn.: *Sobolewskia stylosa* Boiss. & Hohen. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 41 (1849). *Physalidium stylosum* (Boiss. & Hohen.) Fenzl in Tchihatch., Asie Mineure 3, Bot. 1: 327 (1860).

Icon.: Clavis p. 7.

Typus: Ky. 85, G, K!, BM.

Lit.: J. Bornmüller, Bull. Herb. Boiss. ser. 2, 5: 49 (1904).

Habitu *G. saxifragifoliae* similis. Caulis fructifer usque ad 35 cm altus, inferne simplex, inflorescentia ramosa. Folia basalia reniformia, cordata, ± coriacea, firma, lobis 7—9 prominentibus obtusis; lamina 1—3×1—2 cm; petiolus usque ad 14 cm longus; folia caulina in regione inflorescentiae tantum evoluta. Racemi fructiferi paulo elongati. Pedicelli fructiferi c. 8 mm longi, tenues, patulo-ascendentes. Silicula 8—20× c. 5 mm, oblongo-elliptica, recta; stylus 1—2 mm longus.

Persia: C: Tehr.: Darband, Ky. 85. M. Tuchal supra Emamzadeh Dawud, 2700 m, Bornm. 6217! M. Tuchal, 3150 m, Linds. 517! Prope Shahrestanak, 2200 m, Bornm. 6218! S Damavand, Emamzadeh Hashem, 2200 m, Wdb. 745! Supra Ferosad, 2000 m, Bornm. 6219. 56 km N Tehran, 2100 m, Furse 1710! Qazv.: Karaj, in montibus Kuh Dashteh, 1800 m, Rech. 316! Inter Karaj et Gach Sar, 1400—2500 m, Schmid 5685! 56 km N Karaj, 1700 m, Stutz 1101!

Distr. gen.: Endem.

Restricted to the Elburz mountains, *G. stylosa* is easily recognised by the extremely narrow septum and the long fruiting style.

Tribus ***Arabideae***

auctore I. Hedge, Edinburgh

Pili simplices furcati vel deficientes. Sepala ± patula. Fructus siliqua. Radicula plerumque accumbens (rarissime incumbens). — Genera 70—79.

70. ***Cardamine***

Cardamine L., Spec. Plant. 653 (1753); Gen. Plant. ed. 5: 295 (1754).
Syn.: *Dentaria* L., Spec. Plant. 653 (1753).

Lit.: O. E. Schulz, Monographie der Gattung Cardamine, in Engler, Bot. Jahrb. 32: 280—623 (1903).

Herbae annuae, biennes vel perennes, glabrae vel pilis simplicis obsitae. Folia pinnata, raro simplicia. Sepala interiora leviter saccata. Petala alba, lactea vel purpurascentia, lamina et ungue plerumque distinctis. Fructus siliqua compressa elongata; valvae plerumque a basi apicem versus spiraliter dehiscentes. Stigma ± bilobum. Semina uniseriata, humiditate non vel vix mucilaginea. Radicula accumbens.

A large cosmopolitan genus.

1a. Rhizoma carnosum foliis carnosis squamiformibus. Cotyledones stipitatae 2
b. Rhizoma deficiens vel si evolutum foliis carnosis squamiformibus non obsitum; cotyledones non stipitatae 4
2a. Axillae superiores bulbillos proferentes .....1. *C. bulbifera* (L.) Crantz
b. Axillae superiores non bulbilliferae 3
3a. Folia plerumque 3, verticillata, pinnata, foliolorum paribus 2 .....
.....2. *C. quinquefolia* (M. B.) Schmalh.
b. Folia plura alterna, pinnata, foliolorum paribus usque ad 6 .....
.....3. *C. microphylla* (Willd.) O. E. Schulz
4a. Petioli auriculati .....6. *C. impatiens* L.
b. Petioli non auriculati 5
5a. Petala usque ad 4 mm longa 6
b. Petala 8—11 mm longa 7
6a. Planta glabra. Petala 1,2—2 mm. Foliola lineari-oblonga 7. *C. parviflora* L.
b. Planta pilis simplicibus nonnullis quidem obsita. Petala 2,5—3 mm longa. Foliola obovata .....8. *C. hirsuta* L.
7a. Foliolum terminale foliorum inferiorum quam lateralia vix majus. Petala alba vel lactea .....5. *C. uliginosa* M. B.
b. Foliolum terminale foliorum inferiorum quam lateralia evidenter majus. Petala purpurascentia .....4. *C. tenera* Gmel. jun.

Subgen. *Dentaria* (L.) Bentham & Hooker, Gen. Plant. 1: 70 (1862).

Rhizoma subterraneum foliis squamiformibus. Cotyledones stipitatae.

1. ***C. bulbifera*** (L.) Crantz, Class. Crucif. 127 (1769).
Syn.: *Dentaria bulbifera* L., Spec. Plant. 653 (1753).
Typus: „Hab. in Europa australi ad radices montium umbrosas".

Herba perennis usque ad 70 cm alta. Folia alterna, inferiora petiolata, foliolorum paribus c. 2; foliola serrata, terminale ceteris haud majus; folia summa simplicia.

Bulbilli axillares purpurascenti-brunnei. Racemi pauciflori. Petala lilacina, 15—17×5—6 mm. Siliqua c. 30×2,5 mm, saepe non evoluta.

Persia: N: Maz.: S Karehsang, in fageto, 1100 m, Wdb. 285! In valle Haraz E Emarat, 1200 m, Wdb. 229! Gorg.: Bandar-i Gaz, Shab. 609!

Distr. gen.: Europa, Anatolia borealis, Caucasus, Persia borealis.

2. ***C. quinquefolia*** (M. B.) Schmalh., Fl. Sred. Juž. Ross. 1: 51 (1895).
Syn.: *Dentaria quinquefolia* M. B., Fl. Taur.-Cauc. 2: 109 (1808).
Typus: „Hab. in Tauriae et Caucasi sylvis sub arboribus. Fl. Aprili", LE.

Herba perennis usque ad 30 cm alta. Folia plerumque tantum 3, saepe verticillata, pinnata, plerumque foliolorum paribus 2 serratis. Petala roseo-violacea, 12—18×5—6 mm. Pedicelli fructiferi 10—20 mm longi. Siliqua 22—45×2—2,5 mm; stylus 1—3 mm longus.

Talish: sec. Grossh., Fl. Kawk, ed. 2, 4, tab. 217 (1950).
Persia: N: Gil.: Safid Rud 48 km S Rasht, 213 m, Furse 5022!

Distr. gen.: Europa austro-orientalis, Anatolia borealis, Caucasus, Talish, Persia borealis.

Similar to the preceding species but differing in the smaller size, the whorl of 3 leaves and the absence of bulbils.

3. ***C. microphylla*** (Willd.) O. E. Schulz, Bot. Jahrb. 32: 342 (1903).
Syn.: *Dentaria microphylla* Willd., Spec. Plant. ed. 4, 3: 479 (1800).
Typus: „Hab. in Sibiria", LE.

Herba perennis, usque ad 20 cm alta. Folia alterna, infima et summa pinnata, inferiora foliolorum paribus usque ad 6; foliola anguste elliptica serrata vel integra. Petala purpurea, 12—18 mm longa. Siliqua 40—55×2—3 mm; stylus crassus, c. 3 mm longus.
Distr. gen.: Caucasus, Anatolia orientalis.

Not yet recorded from our area but as it is known from M. Ararat (Flora of Turkey 1: 441 [1965]), it may occur in NW Azerbaijan. In contrast to *C. bulbifera* and *C. quinquefolia* which are usually woodland or forest species, *C. microphylla* grows in non-woodland habitats, often alpine or subalpine, up to 3200 m.

Subgen. *Cardamine*.

Rhizoma epigaeum foliis squamiformibus evolutis vel deficientibus. Cotyledones stipitatae vel sessiles.

4. ***C. tenera*** Gmel. jun. in C. A. Mey., Verz. Pfl. Cauc. 179 (1831).
Typus: Talish, Gmel. jun., LE.

Herba perennis, 25—40 cm alta. Rhizoma et caulis tenues. Folia basalia interdum rosulata, petiolata, pinnata, foliolorum paribus 4—8; foliola ovata, integra, terminale quam lateralia evidenter majus; folia caulina pinnata, petiolata vel sessilia. Petala violacea raro alba, 8—11×3,5—6 mm. Siliqua (17—) 24—30×1—1,5 mm, suberecta; pedicelli suberecti (10—) 15—18 mm longi; stylus c. 2 mm longus.

Talish: sec. Grossh. Fl. Kawk. ed. 2, 4, tab. 213 (1950). In silvis montium Talish, Gmel. jun.
Persia: N: Gil.: Pir Bazar, Pichler!

Distr. gen.: Tauria, Caucasus, Persia borealis, Talish.

5. ***C. uliginosa*** M. B., Fl. Taur.-Cauc. 3: 438 (1819).
Syn.: *C. tenera* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 56 (1842) non Gmel. jun. (1831). *C. ochroleuca* Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51: 297 (1886).
Icon.: Clavis p. 15 et 21.
Typus: „Circa Tatartup promontorii Cauc. septentr. etiam reperitur, in Ucrania circa Charkoviam pariter occurrens", LE.

Herba perennis ad 50 cm rhizomatosa. Folia petiolata, pinnata, foliolorum paribus 4—8; foliola oblonga, integra, glabra, ciliata vel pubescentia, ± carnosa, glauca, terminale quam lateralia submajus. Petala 8—11 × 3,5—6 mm, alba vel raro lactea. Siliqua (17—) 24—30 × 1—1,5 mm, suberecta; pedicelli erecto-patentes, (10—) 15—18 mm longi; stylus c. 2 mm longus.

Iraq: Kurd.: Arbil: In montibus S Hajji Omran, Poore 638! M. Qandil, Rawi 24099! In declivibus orientalibus supra Pushtashan, 2000—2200 m, Rech. 11095!; 3000 m, Rech. 11780! Algurd Dagh, 2000 m, Gillett 9546!, Guest 2946!; 2600 m, Bornm. 856! Talish: Hohen.
Persia: N: Maz.: In jugo Kandavan, 2500 m, Furse & Synge 363! In jugo Kandavan, 2700—3000 m, Rech. 488!; 2800 m, Gilli!; 1800—2000 m, Schmid 5562! — W: Azerb.: Darband, Cowan & Darlington 2384!, 2389! Kuh-e Sahand supra Liqvan, Furse 2351! Maragheh, Shar. 6350-E! Bakht.: Gahar, Koelz 17954! Ham.: M. Alvand, Furse 1980!, Pichler, Haussk. Lur.: Dow Rud, Koelz 18302! — C: Qazv.: Gach Sar, Furse 2608! Tehr.: In valle Shahrestanak, 2200 m, Bornm. 6119!

Distr. gen.: Caucasus, Syria occidentalis, Anatolia, Iraq borealis, Persia (orientali excepta).

The young leaves in Rech. 11095 are quite densely pubescent.

6. ***C. impatiens*** L., Spec. Plant. 655 (1753).

Herba annua vel biennis, 20—50 cm alta, glabra vel pilis paucis simplicibus obsita. Folia basalia non persistentia; caulina petiolata, pinnata; foliola ovato-oblonga vel elliptica integra paribus 4—8; foliolum terminale lateralibus simile vel vix majus; petioli auriculis minutis amplexicaulibus. Petala 2—4 mm longa, alba, sepalis interdum vix longiora. Siliqua 12—35 × 0,8—1 mm, erecta vel patula; pedicelli fructiferi 3—9—15 mm longi; stylus (0,5—) 1—2 mm longus.

A variable species in which two intergrading varieties, sometimes regarded as separate species, are recognisable in our area.

1a. Foliola elliptica vel oblonga. Planta basi parce ramosa. Siliqua c. 1 mm diametro, suberecta ..... var. *impatiens*
b. Foliola ovata. Planta basi valde ramosa. Siliqua 0,8 mm diametro, patens ..... var. *pectinata* (Pall.) Trautv.

— — var. ***impatiens***
Syn.: *C. impatiens* L. subsp. *elongata* O. E. Schulz, Bot. Jahrb. 32: 459 (1902—3).
Typus: „Hab. in Europae nemoribus ad radices montium".

Persia: N: Maz.: In valle Haraz E Emarat, 1200 m, Wdb. 244. Kuh-i Nizwa inter Orim et Taru, 2000 m, Wdb. 1139! — C: Tehr.: Tehran, Ky. 178!
Afghanistan: E: Nuristan: Gusalak, 1000 m, Edelb. 130, 158, 200, 225. Wama, Edelb. 382. — Otipore, Griff. 99!
Pakistan: Chitral, Jambatai, Harriss 15904! — Swat: In valle Jabba E Kolalai, 2200 m, Rech. 30754. Utror, 2300 m, Rech. 30828. Inter Khwazakhiela et Shangla,

1900 m, Rech. 30557. Shangla, in pinetis, 2050 m, Lamond 1732! Manglaur, R. R. Stewart 27496! — Kurram: Kurram versus Shalozan, Aitch. 279!

Distr. gen. varietatis: Europa, Asia borealis, austro-occidentalis et centralis.

There are no satisfactory reasons for recognising O. E. Schulz's subsp. *elongata* (Engler, Bot. Jahrb. 32: 459, 1902—3). It is a local form with an elongated infructescence and long (10—15 mm) fruiting pedicels, which was described from Afghanistan and the Himalayan region. — A pubescent fruiting form is sometimes recognised as var. *dasycarpa* (M. B.) O. E. Schulz.

— — var. ***pectinata*** (Pall.) Trautv., Acta Hort. Petrop. 4: 105 (1876).
Syn.: *C. pectinata* Pall. in DC., Syst. 2: 264 (1821).
Typus: „Hab. in Persia", Pall., LE.

Talish: Inter Swant et Lenkoran, Hohen., C. A. Mey.
Persia: N: Gorg.: In silvis inter Gorgan et Ziarat, Gauba 105!, 106! Bandar-i Gaz, Shar. 565! Inter Khozlok et Gorgan, 300—1600 m, Schmid 6022! Galand Rud, Sab. 184! Gorgan, Bge. Dimalu, Koelz 16541! Maz.: In silva Lajim, Mooney 6633! Prope Chalus, Furse 2885! Gilan, Linds. 870!, 1063!

Distr. gen. varietatis: Graecia, Bulgaria, Caucasus, Anatolia borealis, Talish, Persia borealis.

7. ***C. parviflora*** L., Syst. Nat. ed. 10, 2: 1131 (1759). Spec. Plant. ed. 2, 914 (1763).
Typus: „Hab. in Europa".

Herba annua 10—30 cm alta, glabra. Folia basalia non persistentia; folia caulina plurima petiolata, pinnata; foliola lineari-oblonga, integra, paribus 5—7; foliolum terminale lateralibus simile. Petala 1,2—2×1 mm. Siliqua 12—20×0,5—1 mm, suberecta; pedicelli fructiferi (3) 7—13 mm longi, patentes. Semina humiditate minute papillosa.

Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 204 (1950).
Persia: N: Gil.: Lahijan, Linds. 786!, Sab. 102!

Distr. gen.: Passim per Europam et Asiam.

8. ***C. hirsuta*** L., Spec. Plant. 655 (1753).
Typus: „Hab. in Europae areis hortis arvis".

Herba annua, 5—30 cm alta, caule glabro. Folia basalia rosulata, petiolata, pinnata; foliola obovata, integra, paribus 2—4; foliolum terminale lateralibus majus. Folia caulina pauca vel deficientia, quam basalia minora, pinnata, petiolata, supra pilis simplicibus obsita. Inflorescentia racemum inconspicuum formans. Petala 2,5—3 (—4)×1—1,5 mm. Siliquae 15—26×0,5—1 mm flores superantes; pedicelli fructiferi (3—) 7—13 mm longi; stylus 0—0,5 mm longus.

Iraq: Kurd.: Mosul: Aqrah, N. Polunin & al. 44! Sirsang, Haines 969! Dihok, Barkley 4629! Sharifa prope Amadiyah, 1200 m, O. Polunin 5126! Arbil: Bastura Chai, 600 m, Gillett & Rawi 10500! Ad radices M. Baradost, 10—20 km SSW Shanidar, 700 m, Erdtman & Goedemans in Rech. 15613! Shaqlawa, 950 m, Rawi 10448! In faucibus Rawandiz, Guest 605!
Persia: N: Gorg.: Bandar-i Gaz, Sint. 1443! Inter Gorgan et Ziarat, Gauba & Esfand. 108! Maz.: In valle Haraz supra Zardman, 800 m, Wdb. 143! Jamishan prope Babol Sar, Gauba & Sab. 107! 32 km S Shahi, 600 m, Furse 5079! Gil.: Bandar-e Pahlavi, Bornm. 5116!, Pichler! — W: Kermansh.: Qasr Shirin, Shar. 5672-E! Lur.: Shah Bazan, 500 m, Koelz 382! — Sihahpur, Haussk.!

Turcomania: In montibus prope Ashkhabad, Litw. 496!
Pakistan: Swat: In valle Jabba E Kolalai, 1600—2200 m, Rech. 30767!

Distr. gen.: Planta cosmopolitica.

Species doubtfully recorded.

A specimen collected by Giles and only labelled „Plants of the Gilgit Expedition" is apparently *C. loxostemonoides* O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1069 (1927). This is an alpine species (3300—4600 m) with a slender creeping rhizome, flowering stems up to 15 cm (often less) and large (c. 8 mm long) purplish petals. Giles's specimen is rather immature but probably is this handsome species, which is known from Kumaon and Nepal. Although the Giles gathering is without an exact locality, it may be from the Flora Iranica area because his „Gilgit" sometimes refers to Chitral. — *C. loxostemonoides* is often determined in herbaria as *C. pratensis* L.

71. *Phaeonychium*

Phaeonychium O. E. Schulz, Notizbl. Bot. Gart. Berlin 9, 90: 1092 (1926).
Syn.: *Wakilia* Gilli, Feddes Repert. 57, 3: 221 (1955).

Herba perennis nana, dense stellato-tomentosa, foliis simplicibus integris. Sepala erecto-patula, non saccata. Petala lamina alba vel flavescente, ungue atropurpureo. Filamenta basi dilatata. Sepala et petala post anthesin persistentia, demum decidua. Siliqua stellato-pilosa, curvata et contorta, erecto-ascendens. Semina 4—9, humiditate mucilaginea. Radicula incumbens vel oblique incumbens. — Species regionis summae montium Himalaya.

1. ***P. surculosum*** (N. Busch) Botsch., Not. Syst. Leningrad 17: 177 (1955).
Syn.: *Parrya surculosa* N. Busch in Komar., Fl. URSS. 8: 270, 647 (1939). *Wakilia afghanica* Gilli, Feddes Repert. 57: 221 (1955).
Icon.: Clavis p. 27.
Typus: Tadzhikistan: Schugnan, in ascensu a Kaldok ad jugum Abchary, Fedtschenko, LE.

Herba perennis caudice lignescente, caulibus brevibus repentibus. Folia plurima basalia, oblongo-spathulata, in petiolum attenuata; residua petiolorum persistentia. Caules floriferi erecti vel ascendentes, 4—8 cm longi, interdum aphylli. Racemi floriferi densi, fructiferi elongati. Petala 5—6,5 × 2—4 mm, lamina lata obovata, ungue brevi. Stigma magnum, depresso-capitatum. Ovula 10—14. Pedicelli fructiferi 3—6 mm longi. Siliqua 12—22 × c. 2 mm; stylus 1—2 mm longus.

Afghanistan: E: Parvan: In valle Panjshir: Darreh Rastagal, 3840 m, Hdg. & Wdb. 5199! In declivibus occidentalibus jugi Anjuman, 3700 m, Hdg. & Wdb. 5491!; 3900 m, Hdg. & Wdb. 5427!, 4350 m, Podlech 12433. In valle Panjshir, 4400 m, Baillie & Dunsheath 53! — NE: Munjan: Darrah-i Parshni, 4700 m, Frey 342. Wakhan: In valle Futur, 3900—4300 m, Roemer 89! Kataghan: Khost-o Fereng, in valle Echani E jugi Chunduk, 4650 m, Podlech 11833. — C: Bamian: Koh-i Baba, supra Zard Darreh, 4320 m, Gilli 903!

Distr. gen.: Afghanistan, Pamir-Alaj.

The record of the closely allied *P. parryoides* (Kurz) O. E. Schulz from Wakhan, M. Noshaq, Qasideh Valley, 3800—4000 m, Yosii 1006 may be a misidentification for *P. surculosum* [Kitam., Addit. Fl. Afgh. 98 (1966)], but the specimen has not been seen.

72. *Barbarea*

Barbarea R. Br. in Aiton, Hort. Kew. Ed. 2, 4: 109 (1812).

Herbae biennes vel perennes, caulibus erectis angularibus, glabrae vel pilis paucis simplicibus obsitae. Folia integra, pinnatifida vel pinnatisecta, caulina amplexicaulia. Sepala leviter saccata. Petala flava vel albida, indistincte unguiculata. Siliqua dehiscens, teres, quadrangula vel applanata; valvae nervo mediano prominente percursae. Semina uniseriata, humiditate non mucilaginea. Radicula accumbens.

All species usually occur in marshy places. The specific limits are often indistinct and in some cases probably obscured by hybridization. A thorough re-investigation of the status and distribution of the species is much needed.

In the following account only specimens seen, for the most part, have been cited. The treatment is provisional.

1a. Siliquae axi appressae ..... 2. *B. stricta* Andrz.
b. Siliquae erecto-patentes 2
2a. Folia basalia paribus foliolorum 3—5 lateralibus ..... 1. *B. vulgaris* R. Br.
b. Folia basalia paribus foliolorum 0—1 lateralibus 3
3a. Siliqua teres. Planta 25—50 cm alta ..... 3. *B. plantaginea* DC.
b. Siliqua applanata. Planta ad summum 20 cm alta ..... 4. *B. minor* C. Koch.

1. ***B. vulgaris*** R. Br. in Aiton, Hort. Kew. Ed. 2, 4: 109 (1812).
Syn.: *B. arcuata* (Opiz ex Presl) Reichenb., Fl. Germ. Excurs. 2: 683 (1830—32).
Icon.: Clavis p. 15.
Typus: Anglia.

Perennis vel biennis, glabra. Caules erecti, saepe ramosi, 20—40 cm alti. Folia inferiora petiolata paribus 3—5 foliolorum lateralium, foliolo terminali majore ± cordato ovato-oblongo; caulina superiora simplicia ovata, amplexicaulia, dentata vel pinnatifida. Alabastra glabra. Petala (4,5—) 7—9 × (1,5—) 2—3,5 mm; pedicelli fructiferi 4—6 mm longi. Siliqua patula, saepe curvata 15—30 × 1,5 mm; stylus c. 2 mm; stigma capitatum.

Iraq: Kurd.: Mosul: Sirsang, 1200 m, O. Polunin 5087!
Turcomania: Ashkhabad sec. Nikitin, Fl. Ashkhabad 162 (1965).
Afghanistan: E: Nuristan: Eshtawai, Kitam.
Pakistan: Chitral: Rumbur, 2900 m, Bowes Lyon 660! Gujar, 2600 m, Harriss 15893! — Swat: Kalam, 2700—3200 m, Lamond 1840!

Distr. gen.: Passim per Europam et Asiam.

Some of the records from Pakistan of *B. intermedia* Boreau may refer to *B. vulgaris*.

2. ***B. stricta*** Andrz. in Besser, Enum. Pl. Volhyn. 72 (1822).
Typus: Podolia.

Biennis, caule erecto usque ad 50 cm alto vel elatiore. Folia basalia petiolata, lyrato-pinnatifida, paribus 1—2 foliorum lateralium, foliolo terminale ovato-oblongo non cordato; folia caulina superiora simplicia, dentata vel integra. Alabastra pubescentia. Petala 4—5 × 1—1,5 mm. Pedicelli fructiferi appressi, 3—6 mm longi. Siliquae erectae, appressae, 20—30 × 1,5—2 mm; stylus 1,5—2 mm; stigma capitatum.

Talish: sec. Grossh., Fl. Kawk. Ed. 2, 4, tab. 210, 1950.

Distr. gen.: Europa, Asia austro-occidentalis et centralis (?)

Recognised by the erect, appressed fruits.

3. ***B. plantaginea*** DC., Reg. Veg. Syst. Nat. 2: 208 (1821).
Icon.: Clavis p. 13.
Typus: „Hab. in Oriente". Tournefort, BM.

Herba valida, glabra, biennis vel perennis usque ad 60 cm alta, plerumque superne ramosa, caule interdum singulo. Folia inferiora sine lobis lateralibus vel pari singulo foliolorum lateralium; folia caulina superiora amplexicaulia, dentata. Petala flava, 5—7 (—9)×2,5—3,5 mm. Pedicelli fructiferi horizontaliter patuli vel ascendentes, 4—7 mm longi. Siliquae patenti-ascendentes vel arcuatae, 24—35×1,5—2 mm; stylus 1—2 mm longus; stigma capitatum.

Iraq: Kurd.: Arbil: Algird Dagh, in valle supra pagum Nowanda, 2000—2600 m, Rech. 11850! Hajji Omran, ad rivulos, 1700—1800 m, Rech. 11845! M. Qandil, 3000 m, Rech. 11782! Persia: N: Maz.: Gaduk, 2400—2700 m, Behb. 5675-E! In declivibus borealibus jugi Kandavan, 2600—3000 m, Rech. 6747! In valle fluvii Chalus, Pol-e Zanguleh, 2200—2600 m, Rech. 6322! — W: Kurd.: Salavatabad, 1600 m, Remaudière 82! Dezh Shahpur, 1800—2000 m, Jacobs 6541! Bakht.: Gahar, 2400 m, Koelz 17964! Arak: Girdu, Str. Ham.: Soltan Bagh, Sab. 71! M. Alvand, Str. Lur.: Nijiu, Koeie 487! Khorramabad versus Kermanshah, 1980 m, Furse 1872! Dow Rud, Koelz 17464! Oshtoran Kuh, Str. Esf.: Kuh-e Darabshah supra Damaneh, 2280 m, Furse 1453! — S: Fars.: Kalat prope Shiraz, 1600 m, Pravitz 648! Kerm.: Kerman, Bornm. 2066! — E: Khor.: Kuh-e Neyshabur, in valle infra Akhlamad, 1200 m, Rech. 4633!; supra Akhlamad, 1600—1800 m, Rech. 4530! M. Hazar Masjed, 2000 m, Rech. 5093!; inter Ardak et Talqur, 1200—1600 m, Rech. 4951! — C: Tehran, Ky. 70! In jugo Kandavan, 2700—3000 m, Rech. 463! M. Tuchal, 1300—1500 m, Aell. 1068! In declivibus australibus M. Tuchal ad pagum Pas Qaleh prope Darband, 1500—2000 m, Rech. 1084! Qazv.: Sultanabad, Linds. 134! Karaj, Kuh Dashteh, Rech. 303! In montibus prope Kalak, Rech. 141! Elburz, Ky. 505! Shahr.-Bust.: M. Shahvar prope Nokarman, 2000 m, Rech. 6271! Sefid Khok, 2400 m, Schmid 5925! Damgh.-Semn.: In jugo Bashm, 2400 m, Rech. 1204! S Kuh-i Nizwa, 2350 m, Behb. & Aell. 1014!
Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 218 (1950).
Afghanistan: E: Kabul: Darulfanun, Kerst. 445! Ad viam versus Band-e Kargha, Rech. 31450, Lamond 2130! Tang-i Gharu, 1800 m, Hdg. & Wdb. 3087! Inter Guzar Gah et Gulbagh, Neub. 23! Guzar Gah, Neub. 34! Paghman supra Begtut, 2900 m, Gilli 924! Paghman, 2400 m, Hdg. & Wdb. 2851!; 2819!; Rech. 17164! Gilli 922!, Podlech 10822. In jugo Altimur, Koelz 11885! Qala-e Wazir inter Sar-i Chashma et jugum Unai, 2900 m, Rech. 18067! Bagram in valle Nijrao, 2500 m, Neub. 304! In valle Panjshir: Porandeh, 2800 m, Gilli 923! In declivibus occidentalibus jugi Anjuman, 3700 m, Hdg. & Wdb. 5488-a! In valle Panjshir, 2500 m, Hdg. & Wdb. 5121!, Neub. 522 p. p.! In declivibus australibus jugi Salang, 2700 m, Lamond 2189!, 1900—2200 m, Rech. 31321! Ghazni: 64 km N Ghazni, Furse 5683! In valle Ghorband, Furse 5804! Jaji: In jugo Shuturgardan (Latakor) inter Qasim Khel et Dobandi, 3300 m, Rech. 32374. Nuristan: Farajghan Kotal, 3000 m, Koelz 11732! In jugo Atsui prope Pashki, 3000 m, Edelb. 703! — NE: Badakhshan: In valle Zebak ad fluvium Warduj, Furse 6395! Kataghan: Farkhar, 1250 m, Podlech 10483. In valle Khinjan ad viam versus jugum Salang ducentem, 2200 m, Podlech 10899. Banu in valle fluvii Andarab, 1550 m, Podlech 10913. Darrah-i Til, 2800 m, Podlech 11180. Ishkamish, 1150 m, Podlech 10669. — C: Orozgan: Prope pagum Dorahi Tarbulak inter Panjao et Lal, 2700 m, Rech. 18805! — Mazanak, Lindb. 512!

Distr. gen.: Syria, Caucasus, Anatolia, Iraq, Talish, Persia, Afghanistan.

The typical form of this species is a sturdy branched plant with bluish-green leaves. Some of the extreme forms are intermediate between *B. vulgaris* L. and *B. plantaginea* — e. g. Koeie 487! (Persia, Nijiu, 1900 m), Edelb. 1820! (Afhganistan C, Unai pass, 3000 m) and Giles! from Gilgit.

4. ***B. minor*** C. Koch, Linnaea 19: 55 (1847).
Icon.: Clavis p. 21.
Typus: „In Somchetia et in Armenia Ruthenica, Koch", LE, B.

Perennis, ad summum 20 cm alta. Folia basalia glabra vel pilosa, paribus 0—1 foliolorum lateralium; folia caulina amplexicaulia, oblonga, dentata, sese plerumque tegentia. Petala (5—) 6—8 mm. Pedicelli fructiferi 4—7 mm longi. Siliqua 12—20 × 1 mm, erecto-patens, compressa; stylus 1,5—3 mm longus; stigma capitatum.

Talish: sec. Grossh., Fl. Kawk, ed. 2, tab. 220 (1950).
Persia: W: Kurd.: M. Avroman et M. Shahu, Haussкn.

Distr. gen.: Syria, Anatolia, Caucasus, Talish, Persia boreo-occidentalis.

73. *Alyssopsis*

Alyssopsis Boiss., Ann. Scienc. Nat. Ser. 2, 17: 57 (1842).

Planta perennis, erecta. Folia simplicia. Indumentum molle stellatum canescens. Flores flavi. Folia caulina amplexicaulia, sagittata. Sepala non saccata. Petala lamina suborbiculari, ungue brevi angusto. Siliqua deflexa, dehiscens, saepe corrugata. Radicula accumbens. — Genus monotypicum.

1. ***A. mollis*** (Jacq.) O. E. Schulz in Engler, Pflanzenreich, Cruciferae-Sisymbrieae 86 (IV. 105): 186 (1924).
Syn.: *Sisymbrium molle* Jacq., Icon. Pl. Rar. 1: 12, tab. 122 (1781—86) et Collect. 1: 68 (1786). *S. sagittatum* Aiton, Hort. Kew. 1 ed. 2: 396 (1789). *Nasturtium sagittatum* (Aiton) R. Br. in Aiton, Hort. Kew. 2 ed 4: 111 (1812). *Alyssopsis deflexa* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 58 (1842). *A. sagittata* (Aiton) Boiss., Fl. Or. 1: 182 (1867). *Arabis secunda* N. Busch, Journ. Bot. URSS. 20, 1: 87 (1935).

Lit.: J. Bornmüller & E. Gauba, Feddes Repertorium 50: 370 (1941).

Icon.: Clavis p. 27.
Typus: Non designatus.

Perennis, ramosa, erecta, usque ad 30 cm alta, radice tenui. Folia basalia anguste lanceolata, dentata, longe petiolata. Folia plurima caulina ovato-lanceolata integra vel minute paucidentata, acuta, sagittato-amplexicaulia, utrinque molliter appresse pilosa. Inflorescentia fructifera valde elongata. Petala 4 × 2 mm, ungue angusto, lamina lata. Siliqua c. 30 × 1,5 mm, stellato-pilosa vel glabra; pedicelli fructiferi 6—10 mm longi, deflexi. Stylus c. 0,5 mm longus. Stigma capitatum.

Talish: Swant, Fisch.
Persia: N: Gorg.: Dimalu, 2740 m, Koelz 16522! In declivibus borealibus M. Shahvar prope Hajjilang, 2400—2600 m, Rech. 6131! Gorgan, Koelz 16977! Robat-e Qozloq, Koelz 16241! Maz.: In valle fluvii Talar inter jugum Gaduk et Abbasabad, 1800 m, Rech. 1999! Gaduk, Aell. 999! Distr. Kojur in M. Uloj, 3200 m, Rech. 6490! In valle fluvii Chalus, 2400 m, Rech. 961! Hasan Kif, 1070 m, Schmid 6643! 48 km S Shahi, 1200 m, Furse 2931! Gil.: Prope Astara, Stutz 571!, Starm. 279! — Sekisterak, Yehlah, Linds. 1437!, 1438! — C: Shahr.-Bust.: In jugo Khash Aylan c. 70 km a Shahrud orientem versus, 2000—2200 m, Rech. 5419! Qadamgah 60 km E Firuzkuh, 2600 m, Aell. 1070!

Distr. gen.: Endem.

A species of uncertain generic position with points of similarity to both *Arabis* and *Arabidopsis*. Although regarded in most Russian floras as an *Arabis* of sect. *Alliariopsis* there are several reasons for regarding it as a separate monotypic genus — the habit, indumentum, petal shape and deflexed fruits.

Two varieties have been described: var. *liocarpa* O. E. Schulz in Engler, Pflanzenr. l. c. with glabrous fruits; var. *subintegra* Rech. f., Ann. Nat. Mus. Wien 51:378 (1940) with almost entire lower leaves.

74. *Arabis*

Arabis L., Spec. Plant. 644 (1753). Gen. Plant. ed. 5: 298 (1754).

Herbae annuae, biennes vel perennes, interdum caespitosae vel suffrutescentes. Indumentum e pilis simplicibus, ramosis vel stellatis compositum, raro deficiens. Folia inferiora petiolata, saepe rosulata, caulina sessilia, interdum amplexicaulia. Sepala distincte vel indistincte saccata. Petala alba, flavescentia, rosea vel violacea. Fructus siliqua linearis dehiscens, plerumque compressa. Semina uniseriata vel subbiseriata, numerosa, alata vel exalata. Radicula accumbens.

1a. Perennes 2
b. Annuae vel biennes 13
2a. Folia basalia cordata 3
b. Folia basalia cuneata 4
3a. Siliqua 15—25 mm longa. Lamina foliorum basalium 20—40×20—40 mm. ..... 1. *A. brachycarpa* Rupr.
b. Siliqua 20—50 mm longa. Lamina foliorum basalium 14—20×14—20 mm. ..... 2. *A. nepetifolia* Boiss.
4a. Plantae nanae perennes, in statu fructifero ad summum 10 cm altae 5
b. Plantae elatiores suffrutescentes vel herbaceae non caespitosae, fructiferae 15—60 cm altae 8
5a. Siliqua c. 10 mm longa. Folia basalia pectinato-ciliata .. 9. *A. armena* N. Busch
b. Siliqua 10—40 mm longa. Folia basalia appresse stellato-pilosa 6
6a. Siliquae valvae convexae, carinatae. Stylus 0,5—2 mm longus. Petala alba ..... 11. *A. tenuisiliqua* Rech. f. & Koeie
b. Siliquae valvae planae. Stylus ad summum 0,5 mm longus. Petala flava vel lactea 7
7a. Siliqua 25—40×1 mm; valvae longitudinaliter plurinervosae ..... 12. *A. ariana* Hedge
b. Siliqua 12—25×1,5—2 mm; valvae prope basin tantum indistincte uninerviae ..... 10. *A. rimarum* Rech. f.
8a. Suffrutex lignescens. Petala purpurea vel violacea ..... 13. *A. fruticulosa* C. A. Mey.
b. Herbae perennes. Petala alba vel lactea 9
9a. Folia omnia vel fere omnia basalia, 15 mm longa ..... 15. *A. saxicola* Edgew.
b. Folia caulina evoluta 10
10a. Planta perennis procumbens, foliis canescentibus vel albidis ..... 8. *A. caucasica* Willd.
b. Plantae erectae biennes vel perennes, foliis viridibus 11
11a. Folia caulina amplexicaulia ..... 16. *A. amplexicaulis* Edgew.
b. Folia caulina sessilia non amplexicaulia 12
12a. Pedicelli fructiferi 8—20 mm longi ..... 17. *A. bijuga* Watt
b. Pedicelli fructiferi 6—8 mm longi ..... 18. *A. nuristanica* Kitam.
13a. Pedicelli fructiferi incrassati 14
b. Pedicelli fructiferi non incrassati 16
14a. Folia caulina amplexicaulia, auriculata vel sagittata 15
b. Folia caulina sessilia nec auriculata nec sagittata ..... 7. *A. Aucheri* Boiss.

15a. Herba biennis glabra ..... 6. *A. Ottonis-Schulzii* Bornm. & Gauba
b. Herba annua indumento stellato ..... 5. *A. nova* Vill.
16a. Folia caulina amplexicaulia, auriculata vel sagittata 17
b. Folia caulina sessilia, nec auriculata nec sagittata 19
17a. Siliqua recta, axi appressa 18
b. Siliqua curvata vel recta, axi non appressa ..... 16. *A. amplexicaulis* Edgew.
18a. Pili ad basim caulis plerumque 2—3-fidi. Auriculi foliorum caulinorum appressi ..... 4. *A. Gerardii* Besser
b. Pili ad basim caulis plurimi simplices, 2—3-fidis paucis immixtis. Auriculi foliorum caulinorum divergentes ..... 3. *A. sagittata* (Bertol.) DC.
19a. Herba annua pumila, 6—15 cm alta. Folia caulina pauca, lineari-oblonga... ..... 14. *A. tibetica* Hook. f. & Thoms.
b. Herba biennis, 30—60 cm alta. Folia caulina plura, ovato-lanceolata..... ..... 17. *A. bijuga* Watt (conf. etiam *A. nuristanicam* Kitam.)

1. ***A. brachycarpa*** Rupr., Fl. Cauc. 73 (1869).
Syn.: *A. stylosa* Boiss. & Bal. in Boiss., Fl. Or. Suppl. 34—35 (1888).
Typus: Caucasus, Alexandropolis, Frick, LE, photo!

Perennis, basi lignescens. Caules ascendenti-erecti, usque ad 40 cm alti. Folia basalia 2—4×2—4 cm, longe petiolata, cordata, ovato-orbicularia, serrato-dentata, caulina ovata, amplexicaulia, irregulariter serrata. Inflorescentia subcorymbosa, fructifera elongata. Petala 9—13×4 mm, alba vel lactea. Pedicelli fructiferi 6—10mm longi. Siliqua 15—25×2 mm, leviter stipitata, inter semina constricta; valvae reticulatae; septum tenuissimum; stylus 1—2 mm longus.
Distr. gen.: Transcaucasia, Lazistan et Armenia borealis.

Not recorded from our area but it may grow in NW Persian Azerbaijan. — Another species not yet collected in our area but possibly occurring in NW Azerbaijan is *A. graellsiiformis* Hedge, Notes Roy. Bot. Gard. Edinb. 23: 22 (1957). At present only known from SE Turkish Kurdistan, it is similar in habit and facies to *A. brachycarpa* but differs in the longer non-stipitate fruits (30—60 mm) and the absence of style. *A. graellsiiformis* is known from several gatherings about 3000 m, on the Cilo Dagh, close to the Persian border.

2. ***A. nepetifolia*** Boiss., Fl. Or. 1: 177 (1867).
Typus: Persia, inter Asterabad et Shahrud, Bge., G!

Herba perennis, 20—25 cm alta, indumento farinoso. Folia basalia 14—20× 14—20 mm, lobis 12—14, caulina cordato-amplexicaulia c. 10 mm longa. Pedicelli fructiferi 5—6 mm longi. Siliqua 20—50×1,5 mm, inter semina non constricta.

Persia: N/C: In alpinis M. Elburz inter Gorgan et Shahrud, Bge.! — W: Azerb.: In jugo Mishu Dagh prope stationem viae ferrae Yam, 2200—2400 m, Grossh.

Distr. gen.: Transcaucasia australis, Azerbaijan, Elburz.

Of similar facies to the preceding species, *A. nepetifolia* differs in the farinose indumentum, the small leaves and the scarcely torulose siliquae. — Although Bornmüller recorded the allied *A. Christianii* Busch (syn. *A. mollis* Stev.) from a gathering by Knapp in Qareh Dagh, Ali Bolaghi in NW Azerbaijan, Verh. Zool. Bot. Ges. Wien 60: 71 (1910), this is probably a misidentification of *A. nepetifolia*.

3. ***A. sagittata*** (Bertol.) DC. in Lam. & DC., Fl. Fr. ed. 3, 5: 592 (1815).
Syn.: *Turritis sagittata* Bertol., Plantae Genuenses, ed. 1: 79 (1704).
Typus: Italy, Genoa, in collibus cultis prope il Lagazzo, Bertol.

Herba biennis, caulibus erectis simplicibus, 30—80 cm altis. Caulis basi pilis numerosis simplicibus et paucis 2—3-fidis obsitus, superne glaber. Folia basalia ovato-lanceolata in petiolum attenuata, pilis plurimis ramosis obsita. Folia caulina ovato-lanceolata usque ad lineari-lanceolata, amplexicaulia, sagittata, auriculis divergentibus, pilis simplicibus et ramosis obsita. Inflorescentia subcorymbosa, fructifera elongata. Petala 5—6 × 1 mm, alba, oblonga, in unguem attenuata. Antherae acutae vel apiculatae. Pedicelli fructiferi appressi, 2—6 mm longi. Siliqua 20—55 × 1 mm, recta, appressa, glabra; stylus quam 0,5 mm brevior, stigma capitatum. Semina alata.

Iraq: „Kurdish hills", Low 158.
Talish: In nemoribus, C. A. Mey. Lenkoran, Swant, Hohen. sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 224 (1950).
Persia: N: Gorg.: Prope Naudeh, Mooney 6530! Gorgan, Bge. Dimalu, 2600 m, Schmid 5976! M. Shahvar prope Hajjilang, 2500 m, Rech. 6145! — C: Tehr.: Darband, Ky. 197! Qazv.: Gach Sar versus Chalus, Schmid 5759! Damgh.-Semn.: Kuh-i Nizwa prope Orim, 2100 m, Wdb. 1091!
Afghanistan: E: Nuristan: Kushtos, 1850 m, Neub. 4530!

Distr. gen.: Europa centralis et australis, Africa borealis, Anatolia, Iraq, Talish, Persia, Afghanistan.

The Bunge, Kotschy and Rechinger specimens have glabrous stems and ciliate leaf margins. They agree with the variety described by Boissier, Fl. Or. 1: 171 (1867) as var. *glabrata*.

The relationship of *A. sagittata* with *A. hirsuta* (L.) Scop. is certainly extremely close. In some recent floras: Flora Europaea 1: 293 (1964), they are kept separate; in others: Grossheim, Fl. Kawk. ed. 2, 4: 192 (1950), they are united under the name *A. hirsuta*. The usual way they are separated is: biennial with sagittate leaf bases — *A. sagittata*; perennial with cordate leaf bases — *A. hirsuta*. Although there are many intermediate specimens between these two types, especially in Europe where the complex has its centre, all the specimens seen from our area agree well with *A. sagittata*. Because of the confusion between the two species, records of this taxon from Persia are sometimes under the name *A. hirsuta*.

4. ***A. Gerardii*** Besser in Koch, Syn. Fl. Germ. ed. 1: 38 (1837).
Syn.: *Turritis hirsuta* L. var. *planisiliqua* Pers., Syn. Pl. 2: 205 (1807). *A. planisiliqua* (Pers.) Reichenb., Icon. Fl. Germ. 12: 13 (1847).
Typus: „In Helvetia, Gallia".

Habitu *A. sagittatae* valde similis sed notis sequentibus ab ea diversa: Pili ad basim caulis plurimi 2—3-fidi, pilis simplicibus nullis vel paucissimis immixtis. Auriculi foliorum caulinorum appressi. Petala 4—4,5 mm longa. Pedicelli fructiferi tenuiores, 3—7 mm longi.

Talish: Lenkoran, C. A. Mey. sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 223 (1950).
Persia: N: Maz.: In montibus inter Kalar Dasht et Kojur, Buhse.

Distr. gen.: Europa, Caucasus, Talish, Persia.

This species like the previous one is very closely allied to *A. hirsuta* (L.) Scop. and has often been regarded as an infra-specific taxon of it.

5. ***A. nova*** Vill., Prosp. Pl. Dauph. 39 (1779).
Syn.: *A. auriculata* Lam., Encycl. Meth. Bot. 1: 219 (1783). *A. Montbretiana* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 53 (1842), syn. nov. *A. cadmea* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 21 (1849).

Icon.: Clavis p. 31.
Typus: France, Dauphiné.

Herba annua 10—30 cm alta erecta, indumento omnino stellato vel planta superne glabrescens. Folia basalia ovato-lanceolata, petiolata, dentata; caulina ovata, cordata, amplexicaulia, dentata, auriculata. Inflorescentia fructifera elongata. Petala 2—3,5 (—4,5) × 1—1,5 mm longa, alba. Pedicelli fructiferi 1—4 (—7) mm longi, siliquas crassitudine aequantes. Siliqua 20—30 (—45) × 1—1,5 mm, torulosa, glabra vel stellato-pilosa, apice obtusa vel attenuata. Stylus nullus.

Iraq: Kurd.: Arbil: Bastura Chai, 600 m, Gillett & Rawi 10503! Salah ad-Din, 900 m, Chapman 11971! Kuh Safin, 1500 m, Bornm. 857! 5 km N Shaqlawa, 700 m, Erdtman & Goedemans in Rech. 15575-b! Ad radices M. Baradost prope Shanidar, 900 m, Erdtman & Goedemans in Rech. 15600!, 15682! Mosul: Jabal Khantur prope Sharanish, 1480 m, Rech. 12055! Kirkuk: Jarmo, Helbaek 495! Palegawra, 1000 m, Helbaek 674! Sul.: Pira Magrun supra Qarachitan, 1330 m, Gillett 7779! M. Avroman ad confines Persiae in ditione pagi Tawilla, 1800—2000 m, Rech. 12354! In jugo Malakawa prope Penjwin, 1400 m, Rech. 12310!
Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 225 (1950).
Persia: N: Gorg.: 64 km NE Gonbad-e Kavus, Golestan Forest, Furse 5121! Maz.: In valle Haraz, Zardman, 600 m, Wdb. 126! 48 km S Amol, 900 m, Furse 5058! In jugo Kharzan, 2000 m, Bornm. 6132! Gil.: Rudbar, in arenosis, Stapf. Inter Kaluraz et Rudbar, 100—300 m, Bornm. 6133. — W: Azerb.: Kuhha-ye Sabalan, 32 km W Ardabil, 2130 m, Furse 2446! In collibus prope Marand, Knapp. Ad pagum Var prope Khvoy, Knapp. M. Karnaru prope Shahpur, Knapp. Kermansh.: In montibus supra pagum Rijab prope Qasr Shirin, 1200—1800 m, Nab. 1290. Inter Bisotun et Kinisht, Str. Bisotun, 1350—1650 m, Jacobs 6239! Shahabad, 1100—1300 m, Jacobs 6222! Esf.: Esfahan versus Damaneh, 96 km W Esfahan, Furse 1419! Ham.: M. Karaghan N Hamadan, Str. Aq Bolagh-e Aqdaq 100 km N Hamadan, Rioux & Golv. 180! Lur.: Shah Bazan, 500 m, Koeie 447!; 1000 m, Koeie 1443! Khorramabad, Bent & Wr. 412—403! Gauba & Sab. 122! 48 km a Khorramabad ad viam versus Dezful, 1060 m, Furse 1133! 48 km W Azna, Furse 1521! Dow Rud, Koelz 17209!, 17211!, 17242! — S: Fars.: Kazerun prope Shiraz, Gauba & Sab. 123! Takht-e Jamshed, Koelz 14436-a!, 14453! Inter Bushehr et Shiraz prope Gere, Ky. 47! Firuzabad, Kashkouli 5669-E, Persepolis, Gauba & Sab. 163! Maharlu prope Shiraz, Gauba & Sab. 121! Tang-e Saadatabad prope Shiraz, Gauba & Sab. 162! Kerm.: Inter Khabis et Kerman, Bge. M. Jebal Barez inter Bam et Jiroft, 2400 m, Rech. 3757! — E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4669! Mashhad, Furse 5272! — C: Tehr.: M. Tuchal, Bruns, Ky. 79! In montibus prope Shahrestanak, 2200 m, Bornm. 6130. M. Damavand, 2900 m, Gilli. Darband, 1200—2000 m, Schmid 5122! Qazv.: Qazvin, Pichler, Stapf. Yazd: In montibus pr. Yazd, Buhse. — Kuh-e Zengalian, 1400 m, Merton 3262!
Turcomania: Prope Ashkhabad, Litw. 497!, 498, 499, 500!, 502, 503! In montibus prope Gaudan, Litw. 501! Kopet Dagh, Litw. Kizyl Arvat, Becker; Nepthon, Sint. 81.
Afghanistan: SW: Jija, 900 m, Koeie 4161! — E: Kabul: Paghman, 2400 m, Hdg. & Wdb. 2864!, Neub. 4174; 2470—2500 m, Gilli 906-a!, 906-b! Sarobi, Volk 2596! Otipore, Griff.! Nuristan: Gusalak, 1000 m, Edelb. 144! Wama, 2200 m, Edelb. 429. — NE: Badakhshan: Jurm SE Faizabad, 1800—2400 m, Furse 6315!
Pakistan: Chitral: Jambatai, Harriss 15911! — Swat: In valle Jabba E Kolalai, 1900—2200 m, Lamond 1772! — Peshawar: In jugo Khyber, Halcro Johnston 63!

Distr. gen.: Europa, Cyprus, Anatolia, Caucasus, Syria, Persia, Transcaspia, Turcomania, Afghanistan, Pakistan.

Study of abundant SW Asiatic material showed that it was impossible to recognise *A. Montbretiana* as a separate species. The short length (1—3 mm) of the fruiting pedicels was used as the main distinctive feature for it but every transition between subsessile

and clearly pedicellate fruits occurs. Although the European material of *A. nova* differs in the generally longer pedicels it does not appear, on morphological grounds, to be significantly different.

6. ***A. Ottonis-Schulzii*** Bornm. & Gauba, Feddes Repert. 39: 80, tab. 198a (1935).
Icon.: Clavis p. 13.
Typus: Kalak, 1600 m, Gauba, B!

Herba biennis glabra caulibus pluribus simplicibus 15—30 cm altis. Folia plurima basalia rosulata, carnosa, ovata, longe petiolata, dentata vel subintegra; caulina pauca, sessilia, oblonga vel lineari-oblonga, integra, obtusa, amplexicaulia, auriculata, sagittata. Racemi pauciflori, fructiferi valde elongati. Petala alba vel violaceo-suffusa, 5—6 mm longa. Pedicelli fructiferi siliquas crassitudine aequantes, 2—4 mm longi. Siliqua 50—60 × 1,2 mm, compressa, non torulosa. Stylus 1 mm longus. Semina non alata.

Persia: C: Tehr.: In jugo Kandavan, 2700 m, Rech. 468! Qazv.: Kalak, 1600 m, Gauba!, Gauba 104! Kuh Dashteh, 1800 m, Gauba!

Distr. gen.: Endem.

A distinct species, most closely related to the Mediterranean *A. verna* (L.) R. Br. but differing in the complete absence of an indumentum.

7. ***A. Aucheri*** Boiss., Ann. Scienc. Nat. ser. 2, 17: 52 (1852).
Typus: Syria, Aleppo, Auch. 97, G.

Herba annua, 10—30 cm alta, erecta, pilis stellatis et pilis longis simplicibus aut inferne tantum aut in regione inflorescentiae quoque obsita. Folia basalia oblanceolata, petiolata, integra vel dentata, caulina lanceolata, sessilia, non auriculata, integra vel dentata. Petala 6 × 1,5 mm alba. Pedicelli fructiferi incrassati, 1—2 (—5) mm longi. Siliqua 25—35 (—50) × 1—1,5 mm, erecto-patula, non torulosa. Stylus usque ad 0,5 mm longus.

Iraq: Kurd.: Sul.: Goizha Dagh, 1100 m, Gillett & Rawi 10622! Arbil: Bastura Chai, 600 m, Gillett & Rawi 10505!
Persia: W: Kermansh.: In montibus supra pagum Rijab ditionis Qasr Shirin, 1200—1800 m, Nab. 1366! — C: Tehr.: In declivibus australibus M. Tuchal inter Darband et Pas Qaleh, 1400—1600 m, Rech. 2613! Darband, 1200—2000 m, Schmid 5125!

Distr. gen.: Anatolia australis, Persia centralis et boreo-occidentalis, Iraq borealis, Syria.

Similar in facies to *A. nova* Vill. but distinct in the larger petals and the exauriculate leaf bases.

8. ***A. caucasica*** Willd., Enum. Hort. Berol. Suppl. 45 (1813).
Syn.: *A. albida* Stev. in Fischer, Cat. Jard. Gorenk. ed. 2 (1812), nom. nud.

Herba perennis ascendens, 15—30 cm alta, omnino indumento e pilis stellatis composito obsita vel axis inflorescentiae glabra. Folia basalia rosulata, lanceolato-spathulata vel oblongo-obovata, sessilia vel indistincte petiolata, integra vel dentata, canescentia vel albida; caulina ovato-lanceolata, acuta, cordata vel subamplexicaulia. Petala 11—16 × 3—5 mm, alba vel lactea; lamina obovata, longe anguste unguiculata. Glandulae nectariferae laterales deflexae. Pedicelli fructiferi (6—) 13—15 mm longi, erecto-patentes. Siliqua 20—50 (—65) × 1,5 mm, compressa, glabra vel stellato-pilosa; stylus 0,5—1 mm longus. Semina alata.

— — subsp. ***caucasica***.
Syn.: *A. flaviflora* Bge., Mém. Acad. Scienc. Petersbg. ser. 6, 6: 582 (1859).
Typus subspeciei: Planta quaedam in horto botanico berolinensi culta.
Folia inferiora ± oblongo-obovata, sessilia vel indistincte petiolata.

Iraq: Kurd.: Arbil: M. Qandil, 2600 m, Rawi 26742! Supra lacum Goam-e Kirmosoran, 3200 m, Rech. 11135! Algurd Dagh, 3000—3800 m, Rech. 11153!, 11452!, Bornm. 859!, Ludlow-Hewitt 1527!, Guest 2877. Karokh, Kass 27427! Supra Nowanda, 2600 m, Rech. 11851. Kudu prope Hajji Omran, 2700 m, Rawi 9200! M. Sakri Sakran, 2200 m, Bornm. 858. M. Handren supra Rawandiz, 2050 m, Nab. 1283. In montibus N Rost, 2440—3050 m, Thesiger 934! Mosul: Amadiyah, Guest 1261! In cacumine Zawita prope Sharanish, 2100 m, Rech. 10975! Jabal Khantur, 1480 m, Rech. 10858! Sul.: M. Avroman, Hausskn.! N Biyara, 1700 m, Gillett 11815! Pira Magrun, 1900 m, Rawi 12115! Poore 597! Zewiya, Rawi 11524! Qara Dagh, 1700 m, Gillett 7924!
Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 226 (1950).
Persia: N: Gorg.: In valle Ketul, 2000 m, Gauba 103! Shahvar prope Hajjilang, 2500 m, Rech. 6135! Dimalu, 2600 m, Schmid 6000! Maz.: M. Uloj, 3200—3400 m, Rech. 6512! In valle fluvii Chalus, 2400 m, Rech. 898! In jugo Kandavan, 2820 m, Gilli, Furse & Synge 396!; 2700—3000 m, Rech. 493!, Gilli! In valle Haraz W Emarat, 2000 m, Wdb. 347! Hazarchal, 3800 m, McDougall 2!, 9!, 18!, Ky. 134-a!, Bornm. 6127! Pol-e Zanguleh, 2300 m, Gauba 1354. M. Alamut, 4100 m, Norton 2! — W: Azerb.: M. Sahand prope Isperechan, Knapp. M. Karnaru prope Shahpur, Knapp. Kuhha-ye Sabalan, Buhse; 3800 m, Harrington 294! Kurd.: Karand, Kuh-i Marab, Bornm.! 16 km E Sanandaj, Furse 2069-a! Kuh-i Bilqis, distr. Afshar, Knapp. Sonqor, Kuh-e Emrullah, Str. Kuh-e Mishu Dagh prope Yam, 2200 m, Grossh. M. Shahu, Hausskn. Kermansh.: Bisotun, 1650—1950 m, Jacobs 6358!, Str. Kuh-i Girdell, Sorkheh Dizeh, Str.! Kuh-i Parrau, Watson 517—102!, Str. Ham.: M. Alvand, Hausskn. 92!, Str. Kuh-i Garri W Borujerd et Nahavand, Str. Esf.: Kuh-e Darabshah supra Damaneh, Furse 1441! Esfahan, Auch. 4117! Arak: Kuh-e Safid Khaneh, Str. M. Rasvand, Str. Kuh-e Gasavand, Str. Bakht.: Gahar, 2740 m, Koelz 17921! Lur.: Dow Rud, Koelz 15680!, 17152! Oshtoran Kuh, Str. Ilam, 2300—2600 m, Jacobs 6814! 25 km E Khorramabad, 2200 m, Koeie 547! In jugo Razan, 64 km E Khorramabad, Furse 1856! Khorramabad, Str. — S: Persia australis, Ky. — C: Tehr.: Ad saxa prope cataractas Ser Abi Sher supra pagum Pas Qaleh, Ky. 134! M. Tuchal prope Shahrestanak, 2400 m, Bornm. 6128. Ab Ali 2400—2900 m, Schmid 3641! Emamzadeh Hashem, 2700 m, Wdb. 728! Qazv.: Gach Sar, 80 km NE Karaj, Furse 2704!; 2500 m, Gauba. In valle Garmab, 2500 m, Gauba. In valle Loura prope Meidan, 2200 m, Bornm. 6129! In montibus Elburz centralibus, 1300—1350 m, Jacobs 6157!
Turcomania: M. Ludsch prope Ashkhabad, Litw. 509! Obruczewo, Litw. 508.

Distr. gen. subspeciei: Peninsula Balcanica, Anatolia, Caucasus, Syria, Iraq, Persia, Talish, Turcomania.

A very variable species in which Boissier, Fl. Or. 1: 174—175 (1867) recognised 6 varieties. Recent gatherings have revealed that these are local forms of no taxonomic consequence. In a discussion of the variation of the species, Cullen, Notes Roy. Bot. Gard. Edinb. 26: 188—189 (1965) recognised two subspecies: subsp. *caucasica* from the Balkans, Turkey, Caucasus, Syria and Persia, and subsp. *brevifolia* (DC.) Cullen from Syria and S. Turkey. All the material from our area agrees with the type subspecies, which differs from subsp. *brevifolia* in the not or scarcely petiolate lower leaves which are ± oblong-obovate (not ± orbicular). Intermediates are frequent only in the Turkish Anti-Taurus range.

9. ***A. armena*** N. Busch, Monit. Jard. Bot. Tiflis, nov. ser. 3—4: 4 (1927).
Typus: Transcaucasus d. Nachitshevan in monte Sojuch, Grossh., LE, photo!

Perennis, 2—5 cm alta, Folia basalia lineari-lanceolata, pectinato-ciliata, caulina pauca, lineari-oblonga, sessilia. Inflorescentia pauciflora, plerumque non ramosa, fructifera vix elongata. Petala 6—7 mm longa, alba. Siliqua linearis, glabra, c. 10 mm longa; pedicelli quam siliqua breviores.

Distr.-gen.: Transcaucasia australis.

Recorded by Grossheim, Fl. Kawk. ed. 2, 4, tab. 211 (1950) on the Soviet side of the Persian frontier near Ordubad, but not yet known from Persian territory. — No specimens of *A. armena* have been seen but from a photograph of the type and the original description, it must be very closely related to the Turkish Kurdistan *A. Carduchorum* Boiss., and doubtfully different from it.

10. ***A. rimarum*** Rech. f., Phyton 3: 58 (1951).
Icon.: Clavis p. 27.
Typus: Rech. 6469-c, W!

Perennis. Folia omnia basalia rosulas densas formantia, integra, 3—8 × 2—5 mm, dense stellato-pilosa. Caules floriferi erecti superne ramosi, 8—10 cm alti, aphylli, glabri vel inferne parce stellato-pilosi. Inflorescentia pauciflora. Petala 5,5 × 2,5 mm, flava. Pedicelli fructiferi 3—10 cm longi. Siliqua 12—25 × 1,5—2 mm, erecta vel suberecta, applanata, glabra; nervus medianus prope basin valvae tantum visibilis. Stigma capitatum, subsessile. Semina subbiseriata.

Persia: N: Maz.: Gaduk, Behb. 5661-E. Kojur, M. Uloj, 3200—3400 m, Rech. 6469-c! Kuh-i Nizwa, 3200 m, Wdb. 1294! — C: Shahr.-Bust.: In jugo Khash Aylan 70 km NE Shahrud, 2200 m, Rech. 5420!

Distr. gen.: Endem.

11. ***A. tenuisiliqua*** Rech. f. & Koeie, Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 5 (1954).
Syn.: *A. Griffithiana* Jafri, Notes Roy. Bot. Gard. Edinb. 22: 100 (1956), syn. nov.
Icon.: Clavis p. 27.
Typus.: Koeie 2532, W, C!

Herba pumila caespitosa perennis, basibus petiolorum persistentibus. Caulis usque ad 8 cm longa, aphyllus, flexuoso-ascendens. Folia basalia linearia usque oblongo-lanceolata, integra, in petiolum sensim attenuata, utrinque dense appresse stellato-tomentosa. Inflorescentiae axis et sepala glabra vel stellato-pilosa. Petala 5—7 × 1,5—2,5 mm, alba. Pedicelli fructiferi (5—) 10—16 mm, tenues, ascendentes. Siliqua 10—20 × (0,8—) 1—1,5 mm; stylus 0,5—2 mm longus. Stigma minutissimum; valvae convexae, carinatae, glabrae vel stellato-pilosae. Semina numerosa, uniseriata, latitudine duplo longiora, non alata. Radicula incumbens.

Afghanistan: E: Kabul: Farakulum, 2700 m, Koeie 2532! Paghman, 3200 m, Hdg. & Wdb. 5053! In jugo Unai, 3000—3700 m, Volk 1630!, Rech. 18566! Hdg. & Wdb. 4555! Kuh-i Qhalandaran, 3700 m, Hdg. & Wdb. 4505! In valle Panjshir, Darreh Rastagal, 3800 m, Hdg. & Wdb. 5207! Panjao, In jugo Aogardan, 3150 m, Hdg. & Wdb. 5000! In jugo Altimur inter Kabul et Gardez, 3200 m, Lamond 2340! Ghazni: Bozghalak prope Shashgao 24 km NE Ghazni, 2400 m, Rech. 17275! Inter Okak et Behzud, 3150 m, Rech. 17844! Inter jugum Kotal-e Kechru et pagum Miradina NW Sang-i Masha, 2700—3200 m, Rech. 17549!

Distr. gen.: Endem.

This rock crevice species differs from other species of *Arabis* in the scarcely compressed silicules and the incumbent radicle. The following two specimens are possibly different

from *A. tenuisiliqua* but as the valves of the fruit have been shed their identification is uncertain. Afghanistan: C: Ghorat: M. Cheling Safed Daraq, 2700 m, Rech. 19089! SW Sar-i Naorak, 2480 m, Rech. 18952!

There are reasons for not regarding this species as an *Arabis* but until more mature fruit is available it is best regarded as anomalous within the genus. Superficially, it is similar to the following species.

12. ***A. ariana*** Hedge, sp. nov.

Typus: Hdg. & Wdb. 3295, holotypus E!, isotypus BG!

Herba pumila caespitosa perennis, basibus petiolorum persistentibus. Caules usque ad 6 cm longi, aphylli vel unifoliati. Folia basalia oblonga usque oblongo-lanceolata, integra, utrinque dense stellato-pilosa. Inflorescentia et sepala stellato-pilosa. Petala 6×1 mm, lactea vel flavescentia. Pedicelli fructiferi 1—10 mm longi, erecto-ascendentes. Siliqua 25—40×c. 1 mm; stylus 0,5 mm; stigma minute capitatum; valvae planae, glabrae. Semina numerosa, uniseriata, alata. Radicula accumbens.

Afghanistan: E: Kabul: In jugo Hajjigak, 3550 m, Hdg. & Wdb. 4614! In jugo Unai, Kuh-i Qhalandaran, 3800 m, Hdg. & Wdb. 4506-a! — C: Bamian: In montibus W jugi Shibar, 3000 m, Hdg. & Wdb. 4215! In declivibus occidentalibus jugi Shibar, 2490 m, Hdg. & Wdb. 3295! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16797! Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18133! In faucibus inter Bamian et jugum Hajjigak, in fissuris rupium calc., 3000 m, Rech. 18492!

Distr. gen.: Endem.

A. pangiensis Watt, Journ. Linn. Soc. Bot. 18: 378 (1881) described from Pangi in the NW Himalaya is closely related to *A. ariana* but differs in the larger toothed leaves, the looser habit and taller stems. — *A. ariana* is a little known species and its variation is therefore uncertain. A Chitral specimen (Tirich Mir, Zapotili, 3500 m, Wdb.!) is intermediate between *A. pangiensis* and *A. ariana* but until further material is available it would be premature to give this interesting gathering a definite identification.

13. ***A. fruticulosa*** C. A. Mey. in Ledeb., Fl. Alt. 3: 19 (1831).

Icon.: N. Busch, Fl. Sib. et Orient. Extremi, Cruciferae 449 (1926).

Typus: „In collibus ad fl. Ulba in rupestribus et paraeruptis montium a fortalitio Buchtarminsk orientem versus sat frequens, nec non similibus locis deserti occidentalioris soongoro-kirghisici trans fl. Irtysch, praesertim in montibus Arkat et Tschingistau et prope metallifodinam Loktewsk", LE.

Suffrutex ramis ascendentibus herbaceis, 10—25 cm altus, omnino pilis minutis stellatis appressis obsitus. Folia inferiora integra, oblongo-lanceolata, in petiolum attenuata, caulina ovato-oblonga, subamplexicaulia. Racemi pauciflori. Sepala stellato-pilosa. Petala 10—11 mm longa, purpurascentia vel violacea, obovata. Pedicelli fructiferi erecto-ascendentes, 3—8 mm longi. Siliqua recta, compressa, 25—50× 1,25—1,5 mm, torulosa, stellato-pilosa; stylus brevissimus.

Pakistan: Chitral: Shah Jinali, 3350 m, Toppin 373!, 464! Ovir (Nichagh), 3150 m, Bowes Lyon 877!

Distr. gen.: Sibiria occidentalis et orientalis, Mongolia occidentalis, Asia centralis, Chitral.

A very distinct species, easily recognised by the woody caudex, the appressed stellate indumentum and the handsome violet flowers.

14. ***A. tibetica*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 143 (1861).
Typus: „Hab. in Tibetia occidentali temperata et alpina, alt. 10.000—16.000 ped., Zanskar, Ladak, Sassar, Nubra, Thomson. Balti, Winterbottom, Thomson, K.

Herba humilis annua vel biennis, plerumque a basi ramosa, 6—15 cm alta, omnino indumento e pilis longis simplicibus furcatis et stellatis composito obsita. Folia basalia parva, rosulata, obovato-spathulata, lyrata vel dentata, petiolata. Folia caulina pauca, lineari-oblonga, dentata, sessilia, non amplexicaulia. Inflorescentia pauciflora, fructifera elongata. Petala alba, 3—5 × 1—1,5 mm. Pedicelli fructiferi (3—) 7—9 mm, ascendentes. Siliqua 40—50 × 1 mm, erecto-patens, glabra, apice in stylum brevissimum attenuata.

Afghanistan: E: Kabul: In valle Paghman, Neub. 529! In valle Panjshir: In declivibus occidentalibus jugi Anjuman, 4100 m, Hdg. & Wdb. 5441!
Pakistan: Chitral: Barum Gol, 4500 m, Wdb. s. n.! Shokor Shal, 3500 m, Wdb.! Marmano Shal, 3700 m, Wdb. s. n.! Lastarakh, 6150 m (?), Harriss.

Distr. gen.: Tibet, Kashmir, Lahul, Chitral, Afghanistan.

Jafri, Notes Roy. Bot. Gard. Edinb. 22, 1: 100 (1956) gives as synonyms *A. Thomsonii* Hook. f., Journ. Linn. Soc. Bot. 5: 143 (1861), *A. quinqueloba* O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1065 (1927) and *Arabidopsis multicaulis* Pamp., Agg. Fl. Caracorum in Sped. Ital. Filip. Ser. 2, 11: 160 (1933). None of these species was described from our area and no authentic specimens of them, except *A. Thomsonii*, have been seen. — *A. tibetica* grows at high altitudes sometimes reaching the altitudinal limit of vegetation. In facies it resembles some *Arabidopsis* species.

15. ***A. saxicola*** Edgew., Trans. Linn. Soc. Bot. 20: 32 (1851).
Syn.: *A. scaposa* O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1066 (1927).
Typus: „Hab. in glareosis saxosisque in valle fluminis Dhawli, Garhwal superioris alt. ped. 9000—10.000", Edgew., K!

Herba perennis 9—11 cm alta, fructifera usque ad c. 20 cm elongata. Basis caulis residuis petiolorum comosa. Folia omnia basalia, c. 1,5 cm longa, oblongo-lanceolata, integra vel apice dentata, in petiolum attenuata, pilis stellatis et furcatis obsita, folia caulina plerumque nulla. Petala alba, 5,5 mm longa. Pedicelli fructiferi 5—6 mm longi. Siliqua (immatura) glabra, 2 cm longa.

Pakistan: Chitral: Zapotili, 3500 m, Wdb. s. n.! Madaklasht, 2100 m, Bowes Lyon 627! Marmano Shal, 4000 m, Wdb.! — Kurram: Seratigah, 4300 m, Aitch. 822!

Distr. gen.: Kashmir, Gilgit, Chitral.

In var. *elatior* (O. E. Schulz) Jafri, Notes Roy. Bot. Gard. Edinb. 22: 100 (1956) the plant is more robust, taller and the leaves are larger (with petioles up to 5 cm). The Pakistan gatherings are referable to this variety.

16. ***A. amplexicaulis*** Edgew., Trans. Linn. Soc. 20: 31 (1851).
Icon.: Clavis p. 31.
Typus: „Hab. in sylvis humidis, alt. ped. 8000—9000, Chur, Shioli in Garhwal", Edgew., K.

Herba biennis vel perennis erecta; caules 30—60 cm alti, plerumque irramosi; indumentum e pilis simplicibus et ramosis compositum; inflorescentia plerumque glabra. Folia basalia ± rosulata, lanceolato-obovata, integra vel dentata, in petiolum latum attenuata; folia caulina amplexicaulia sessilia, integra vel dentata. Petala 10—11 × 2—3 mm, alba. Racemi fructiferi elongati. Pedicelli fructiferi 8—10 mm

longi, patule ascendentes. Siliqua 30—60 × 1,5 mm; stylus tenuis, 1—1,5 mm longus. Semina numerosa, uniseriata, marginata, tenuiter reticulata.

Afghanistan: E: Nuristan: In jugo Ashpi, Edelb. 1774!
Pakistan: Swat: Bahrain, R. R. Stewart 25033! Utror, 2500 m, Rech. 19551!, 19576!, 30791! Inter Kalam et Ushu, Lamond 1807! In valle Jabba E Kolalai, 1600—2200 m, Lamond 1797!, Rech. 30706! Kalam, in cedretis, 2000 m, Rech. 30789! — Kurram: Shend Toi, Aitch. 377! — Quetta: Ziarat, in faucibus calc. 2100 m, Rech. 29379!

Distr. gen.: Afghanistan, montes Himalaya occidentales, Swat, Hazara, Pakistan.

17. ***A. bijuga*** Watt, Journ. Linn. Soc. Bot. 18: 378 (1881).
Typus: Chamba, Pangi, 2400—2700 m, Watt 837, 899, E!

Habitu *A. amplexicauli* similis, ab ea differt notis sequentibus: folia tenuiora, indumento sparsiore, foliis caulinis cuneatis non amplexicaulibus, petalis paulo majoribus usque ad 14 mm longis.

Pakistan: Chitral: Darn Gol, Toppin 96!

Distr. gen.: Montes Himalaya occidentales, Chitral.

The specific epithet refers to the petals which, according to the author, diverge in pairs. This species is only doubtfully different from *A. amplexicaulis*.

18. ***A. nuristanica*** Kitam., Acta Phytotax. Geobot. 17: 139 (1958).
Icon.: Kitam., Fl. Afgh. fig. 53 (1960).
Typus: Nuristan, Kitamura, KYO.

Herba perennis (?) erecta, 30—50 cm alta. Folia basalia rosulata, oblongo-obovata, dentata vel subintegra, in petiolum latum attenuata, utrinque glabra, margine pilis simplicibus et ramosis ciliata; folia caulina pauca, sessilia, non amplexicaulia, glabra vel parce pilosa. Pedicelli fructiferi 6—8 mm longi. Siliqua ascendenti-patula 30—35 × 1 mm; stylus 0,5 mm longus. Semina numerosa, uniseriata, tenuiter reticulata.

Afghanistan: E: Nuristan: Kushtos, 1900 m, Neub. 4578! Nuristan, Kitam.

Distr. gen.: Endem.

Apparently a close ally of *A. bijuga* and only differing in the shorter fruiting pedicels and the ciliate leaf margins.

Species dubia

A. doberanica Parsa, Pl. Nov. Ir.: 13 (1946).
Typus: Persia: C: Tehran, Doberan, 2840 m, Parsa.

The type specimen has not been seen and from the original description it is not possible to assess either its taxonomic status or its closest allies.

√ 75. *Ermania*

Ermania Cham., Linnaea 6: 533 (1831).

Lit.: S. M. H. Jafri, Christolea with Special Reference to the Species in NW Himalayas W Pakistan and Afghanistan. Notes Royal Botanic Garden, Edinburgh 22: 49—59 (1955). V. Botschantzev, De Cruciferis Notae Criticae, Not. Syst. Leningrad 17: 160—178 (1955). A review of Jafri's paper on Christolea in Bot. Zhurn. 41: 728—732 (1956).

Herbae perennes pilis simplicibus, foliis simplicibus superne dentatis, floribus violaceis plerumque odoratis. Sepala ± patentia, interiora non saccata. Siliqua oblonga vel lineari-oblonga, dehiscens, compressa. Radicula accumbens.

High alpine, usually scree, species from C Asia and the W Himalayas.

1a. Racemi bracteati. Petala 5—6 mm longa. Pedicelli fructiferi 6—8 mm longi ..... 1. *E. himalayensis* (CAMB.) O. E. SCHULZ

b. Racemi ebracteati. Petala 12—14 mm longa. Pedicelli fructiferi usque ad 25 mm longi ..... 2. *E. flabellata* (REGEL) O. E. SCHULZ

1. ***E. himalayensis*** (CAMB.) O. E. SCHULZ, Notizbl. Bot. Gart. Berlin 9: 1080 (1927).

Syn.: *Cheiranthus himalayensis* CAMB. in JACQUEM., Voy. Bot. 4: 14, tab. 13 (1844). *Christolea himalayensis* (CAMB.) JAFRI, Notes Roy. Bot. Gard. Edinb. 22: 53 (1955).
Icon.: Clavis p. 21.
Typus: NW Himalaya. „Inter lapides mobiles, supra omnes caeteras plantas in declivitate orientali jugi vulgo Kioubrung-ghaut in Tataria sinensi, alt. 5300 m, flor. Aug." JACQUEMONT.

Herba perennis, 5—15 cm alta, suberecta vel decumbens, pubescens. Folia basalia interdum rosulata, apice dentata. Racemi bracteati, floriferi compacti, fructiferi elongati. Petala 5—6×2—2,5 mm, purpurea vel purpurascenti-rosea. Pedicelli fructiferi 6—8 mm longi. Siliqua 20—30×1 mm, pilis simplicibus dense obsita; stigma sessile, bilobum.

Pakistan: Chitral: Laspur, 4400 m, BOWES LYON 44! Barum Gol supra Hamishi Ghochar, 4300 m, WDB. s. n. Siru Gol, S jugi Shah Jinali, 4600 m, STAINTON 3055!

Distr. gen.: Himalaya boreo-occidentalis, Afghanistan (?), Gilgit, Chitral.

Probably also referable to this species is the following gathering: Pakistan, Chitral, in jugo Dorah, in valle Lutko, Chitral boreo-occidentalis, 4100 m, STAINTON 3241!. This is an immature specimen in which the leaves are almost all in basal rosettes and the young fruit is distinctly horned at the apex so that the stigma is included within the horns. — The relationship of *E. himalayensis* with the Pamir-Alaj endemic *E. linearis* (BUSCH) BOTSCH. needs further investigation with more abundant material. The latter species has been recorded from Wakhan, M. Noshaq, Qasideh Valley, 4000—4500 m, YOSHI 676 (KITAM., Addit. Fl. Afgh. 97 [1966]) but may be a misidentification for *E. himalayensis*. The specimen has not been seen.

2. ***E. flabellata*** (REGEL) O. E. SCHULZ, Bot. Jahrb. 66: 98 (1933).
Syn.: *Parrya flabellata* REGEL, Bull. Soc. Nat. Mosc. 2: 261 (1870). *Christolea flabellata* (REGEL) BUSCH in KOMAR., Fl. URSS. 8: 330 (1939).
Typus: Turkestan, REGEL.

Perennis caudice lignescenti, surculis sterilibus et fertilibus repentibus, ramis floriferis prostratis vel ascendentibus usque ad 10 cm longis. Folia basalia conferta, spathulata, truncata, antice dentata; caulina similia; indumentum e pilis simplicibus consistens densitate variabili. Inflorescentia speciosa, compacta, multiflora, interdum fragrans. Petala coeruleo-violacea, distincte nervosa, lamina lata, ungue longo, 12—14×2—4 mm. Siliqua patula, 40—60×2—5 mm, simpliciter pilosa; pedicelli fructiferi suberecti, usque ad 25 mm longi.

Afghanistan: E: Parvan: In valle Panjshir, in declivibus occidentalibus jugi Anjuman, 4100 m, HDG. & WDB. 5451! In valle Panjshir, 4800 m, BAILLIE & DUNSHEATH! Kotal-i

Zuria N Safed Jir, 4500 m, Podlech 12556. Nuristan: In jugo Munjan, 3800 m, Koelz 12763! Netshingel, 4200 m, Edelb. 2006! — NE: Kataghan: Khost-o Fereng, in valle Echani E jugi Chunduk, 4650 m, Podlech 11832.

Distr. gen.: Tien Shan, Pamir-Alaj, Afghanistan orientalis.

76. *Drabopsis*

Drabopsis C. Koch, Linnaea 15: 253 (1841).

Herba annua, nana, erecta, caule et foliis pilis ramosis, calyce pilis simplicibus obsitis. Sepala non saccata. Petala inconspicua, flava vel albescentia. Siliqua elongata, dehiscens, plana, polysperma. Radicula accumbens. — Genus monotypicum.

1. ***D. verna*** C. Koch, Linnaea 15: 253 (1841).

Syn.: *Arabis nuda* Bel. ex Boiss., Ann. Scienc. Nat. Ser. 2, 17: 54 (1842). *A. scapigera* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 54 (1842). *Sisymbrium nudum* (Bel.) Boiss., Fl. Or. 1: 214 (1867). *Drabopsis nuda* (Bel.) Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51, 2: 298 (1886). *Arabidopsis nuda* (Bel.) Bornm., Beih. Bot. Centrbl. 28, 2: 535 (1911). *A. verna* (Koch) N. Busch, Fl. Cauc. Crit. 3, 4: 457 (1909).

Lit.: O. Stapf, l. c.

Icon.: Clavis p. 31.

Typus: „In arenosis Armeniae", C. Koch, LE.

Herba annua nana raro biennis, 1—10 (—15) cm alta. Folia omnia basalia rosulata, spathulata vel oblongo-lanceolata, integra vel minute paucidentata, breviter petiolata vel sessilia, utrinque pilis ramosis obsita. Caulis singulus vel pauci, e rosula basali orientes. Racemi pauciflori. Petala 2—3 × 1 mm, anguste spathulata; sepala et petala usque ad maturitatem fructus persistentia. Pedicelli fructiferi 1—3 (—5) mm longi, crassi, erecto-patentes. Siliqua 18—38 × 0,5—1 mm glabra, striata; stigma minutum, compressum, latitudine siliquae angustius. Semina uniseriata, funiculis tenuibus, humiditate granulato-mucilaginea.

Iraq: Kurd.: Mosul: Zawita, N. Polunin & al. 155! Arbil: S Hajji Omran, Poore 631! Sul.: Goizha, 1100 m, Gillett & Rawi 10635!

Persia: W: Azerb.: Tabriz, Gill.-Sm. 1379!, 1431! Arak: Inter Arak et Golpayegan, 1900 m, Bornm. 2088! Arak, 1800 m, Bornm. 2090! Kurd.: Dezh Shahpur, 1800—2100 m, Jacobs 6524! — S: Kerm.: Inter Khabis et Kerman, Bge.! Fars.: 20 km SW Saadatabad, 1800 m, Rech. 15440! — E: Khor.: Quchan versus Soltanabad, 1820 m, Furse 5215! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 5046! — C: Tehr.: Firuzkuh, Sab. 276! Tehran, 1160 m, Bornm. 2091! 56 km N Tehran, 2100 m, Furse 1707! Pas Qaleh, Ky. 104! M. Tuchal inter Darband et Pas Qaleh, 1400—1600 m, Rech. 2631! Qazv.: In valle Ab Shar prope Karaj, Gauba 128! Qazvin, Pichler, Schmid 5038 p. p.!

Turcomania: Prope Ashkhabad, Litw. 525!

Afghanistan: NW: Qala Nau, 800 m, Koelz 3500! — E: Kabul: Chakandarah, Neub. 4022! Aliabad, Neub. 13!, 90!. Korogh, Gilli 977!, 978! Sher Darwasa, 1800 m, Hdg. & Wdb. 2900!, Kerst. 37-a!, Gilli 971! Podlech 10188. Kuh-i Asmai, 1900 m, Hdg. & Wdb. 2732! Inter Sher Darwasa et Koh-e Chelsotun, 1810 m, Gilli 972!, 973! Kabul, Volk 38!, Hay 25! Tang-i Gharu, 1740 m, Gilli 969! Sarobi, Volk. Logar, Volk 1803, 1814, 2462, 2502. Istalif, 1840 m, Gilli 974!, Neub. 4328. Paghman, 2400 m, Hdg. & Wdb. 2871!, Gilli 983!, Neub. 4092. Inter Kabul et Paghman, 1880 m, Gilli 975!, Podlech 10196. Prope Paghman, Lindb. 232! Pul-e Sorkh prope Charikar, Neub. 539! Top Tara, Neub. 4008. Nuristan: Gusalak, 1000 m, Edelb. 40, 50, 142, 188, 244, 245. Wama, 2200 m, Edelb. 433. — NE: In jugo Munjan, 3900 m, Koelz 12732! —

Kataghan: In valle Khinja, 1750 m, Podlech 10219. In valle Andarab S Darrah-i Shu, 2600 m, Podlech 11103. — C: Bamian, Band-e Amir, 2900 m, Gilli 984! In jugo Shibar, Furse 5815!
Pakistan: Chitral: Bromboret Gol, Bowes Lyon 602! — Swat: Bahrain, Ali 26023! — Peshawar: In jugo Khyber, Halcro Johnston 20!, 59! — Kurram: In valle Kurram, Aitch. 97!, 97-a! — Quetta: Spin Karez prope Quetta, 1800 m, Rech. 29272. Urak, Lace! Quetta, Lace 3542! Quetta versus Ziarat, 2200 m, Lamond 1175!, Rech. 29322. Ziarat, 2100 m, Rech. 29352. In jugo Khojak, 2300 m, Rech. 29044. Sheilabagh, Duthie 8585! — Kalat: 40 km N Kalat versus Mastung, 2000 m, Rech. 28368.

Distr. gen.: Anatolia, Transcaucasia, Iraq, Persia, Afghanistan, Asia centralis, Pakistan occidentalis, Himalaya occidentalis.

A distinct and fairly uniform species which has had a chequered taxonomic history but is probably best regarded in the monotypic *Drabopsis*.

77. *Turritis*

Turritis L., Spec. Plant. 666 (1753). Gen. Plant. 298 (1754).

Herbae biennes, erectae, glaucae, glabrae vel pilis ramosis obsitae. Folia caulina amplexicaulia, sagittata vel auriculata. Sepala vix saccata. Petala alba vel pallide flava. Siliqua elongata, dehiscens, teres vel indistincte quadrangula. Semina uni- vel biseriata, anguste alata, humiditate non mucilaginea. Radicula accumbens vel oblique accumbens, — Genus *Arabidi* affinis; interdum in hoc genere inclusum.

1a. Siliqua erecta vel appressa. Semina biseriata. Petala pallide flava..... 1. *T. glabra* L.
b. Siliqua deflexa vel patula. Semina uniseriata. Petala alba vel violascentia.. 2. *T. laxa* (Sibth. & Sm.) Hayek

1. ***T. glabra*** L., Spec. Plant. 666 (1753).
Syn.: *Arabis perfoliata* Lam., Encycl. Meth. Bot. 1: 219 (1783). *A. glabra* (L.) Bernh., Syst. Verz. Erfurt 1: 219 (1800).
Icon.: Clavis p. 31.
Typus: „Hab. in Europae pascuis siccis apricis".

Herba biennis, usque ad 100 cm alta, rigide erecta, basi excepta glabra. Folia basalia, ± rosulata, oblongo-lanceolata, integra vel sinuato-dentata, petiolata, utrinque stellato-pilosa vel glabra; folia caulina ovato- vel oblongo-lanceolata, integra, glabra, raro margine ciliata, glauca, sagittata vel auriculata. Petala 5—6 × 1,5 mm, lineari-oblonga. Inflorescentia fructifera valde elongata. Pedicelli fructiferi 10—15 mm longi, erecti vel axi appressi, non incrassati. Siliqua 50—90 × 1 mm, glabra. Semina numerosa; funiculi tenues.

Persia: N: Gorg.: Bandar-i Gaz, Sint. Gorgan, Shar. 576! Gorgan versus Naudeh, 150—500 m, Schmid 5900! Maz.: Inter Amol et Zardman, Schmid 5846! In declivibus borealibus jugi Kandavan, 2250 m, Gauba 130! Kandavan, 2400 m, Gauba 1359. Gil.: Bandar-e Pahlavi, Buhse. Rudbar, 500 m, Bornm. 6126. — W: Azerb.: M. Gelosa prope Khosrava, Knapp.
Turcomania: Suluklü, Sint. 837. Kopet Dagh, Fedtsch.
Afghanistan: E: Nuristan: In valle Pech, 1400—2000 m, Kerst. 849. Chetras, Kitam.
Pakistan: Swat: Utror, 2200 m, Rech. 30790!

Distr. gen.: Europa, Anatolia, Caucasus, Cyprus, Persia borealis, Asia centralis, Afghanistan, Swat, Siberia, Himalaya usque ad Japoniam. In alias terras introducta.

2. ***T. laxa*** (Sibth. & Sm.) Hayek, Prodr. Fl. Penins. Balcan. 1: 402 (1925).
Syn.: *Arabis laxa* Sibth. & Sm., Fl. Graec. Prodr. 2: 28 (1863).
Icon.: Clavis p. 13.
Typus: Greece. „In agro Laconico", Sibth.

Habitu *T. glabrae* similis, sed caules 30—60 cm alti, siliqua usque ad 100 × 1,5 mm.

Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 214 (1950).

Distr. gen.: Graecia, Jugoslawia australis, Cyprus, Anatolia (Anatolia orientali excepta), Syria occidentalis, Talish, Transcaucasia.

78. *Nasturtium*

Nasturtium R. Br. in Aiton, Hort. Kew. ed. 2, 4: 110 (1812).

Herbae perennes, glabrae vel pilis simplicibus paucis obsitae. Folia pinnata vel pinnatisecta. Sepala leviter saccata. Petala alba vel virescentia. Siliqua dehiscens, teres vel ± applanata. Semina uni- vel biseriata, numerosa. Stigma capitatum. Radicula accumbens. Species aquatica vel paludicola.

1a. Semina biseriata, utraque facie foveolis polygonalibus c. 25 ..... 1. *N. officinale* R. Br.
b. Semina uniseriata, utraque facie foveolis polygonalibus c. 100 ..... 2. *N. microphyllum* (Boenn.) Reichenb.

1. ***N. officinale*** R. Br. in Aiton, Hort. Kew. Ed. 2, 4: 110 (1812).
Syn.: *Sisymbrium nasturtium-aquaticum* L., Spec. Plant. 657 (1753). *Rorippa nasturtium-aquaticum* (L.) Hayek, Sched. Fl. Styr. Exs. 22 (1905).
Icon.: Clavis p. 15.
Typus: „Hab. in Europa et America septentrionali ad fontes".

Herba perennis, 20—80 cm alta, glabra, basi procumbens saepe ad nodos radicans, ascendens vel fluitans. Folia pinnata, petiolata, foliorum paribus 3—5 ± integris; foliolum terminale lateralibus simile vel majus. Petioli foliorum superiorum minute amplexicauli-auriculati. Petala 4—6 × 2,5 mm. Siliqua 11—18 × 2 mm, recta vel curvata; pedicellus fructifer 6—12 mm longus, horizontalis, deflexus vel ascendens.

Iraq: Kurd.: Kirkuk: Fl. Zab prope Kirkuk, Grigg 64! Kirkuk, Rogers 0487! Qara Anjir, 700 m, Gillett & Rawi 7509! Mosul: Sharifa prope Amadiyah, 1210 m, O. Polunin 5142! Prope Dihok, 500 m, Rawi 8431! Arbil 7 km W Salah ad-Din, Barkley 5779! 30 km NW Ranya, Rawi 28764! M. Baradost inter Shanidar et cavernam, 800 m, Erdtman & Goedemans in Rech. 15649! Ad radices M. Baradost, 10—20 km SSW Shanidar 700 m, Erdtman & Goedemans in Rech. 15601! Sul.: Prope Surdash inter Sulaymaniyah et Dokan, Rech. 10110! M. Avroman in ditione pagi Tawilla, 1000 m, Rech. 12351! In planitie Sulaymaniyah, Thesiger 351!
Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 229 (1950).
Persia: N: Gorgan, Shar. 575! Maz.: In valle Haraz W Zardman, Wdb. 420! Gil.: Lahijan, Linds. 926! 37° 15′ N, 49° 30′ E, Jacobs 6161! — W: Azerb.: Rezaiyeh, Arghand 6723-E! M. Sabalan, Harrington 258! Kurd.: 80 km E Dezh Shahpur, inter Dezh Shahpur et Sanandaj, Bent & Wr. 525—1002! 5 km E Sanandaj, Furse 3372! Dezh Shahpur, 1600 m, Jacobs 6498! Lur.: Dow Rud, Koelz 17146! Shah Bazan, 1200 m, Koeie 1427! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 183! Kermansh.: Khorramabad versus Kermanshah, 96 km N Khorramabad, Furse 1873! — S: Fars.: Pul Abgineh prope Bushehr, Horner 164! — S: Sistan: Nezzar prope Bagh, Shar. 5637-E! — C: Tehr.: M. Tuchal, Bruns.
Turcomania: Badghiz, Litw. 510!

Afghanistan: SW: N Girishk, 1000 m, Koeie 2156! — E: Kabul: Paghman, Hay 276!, Hdg. & Wdb. 4375!, Kitam., Rech. 17192!, Gilli 919!, Neub. 516! Tang-e Gharu, 1800 m, Hdg. & Wdb. 3088! Sarobi, Volk 1868! Hauz-e Mahiha, 2500 m, Koeie 2486 p. p.!, Edelb. 1810! Kabul, 1800 m, Hdg. & Wdb. 3261! Guzar Gah, Neub. 96!, Dehmazang versus Guzar Gah, 1770 m, Gilli 918! Logar: Charasiah, 1740 m, Gilli 917! In valle Logar, Hay 209! Ghazni: Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17958!
Pakistan: Swat: Inter Khawazakhiela et Shangla, 1300—1900 m, Rech. 30634. — Peshawar: Prope Akora, Burtt 500! — Kurram: Parachinar, Afendi 96, 228. — Quetta: Ziarat, Jafri!, Crookshank 252!; 2000 m, Lamond 1211!, Rech. 29383. Prope Sanjawi, 1500 m, Lamond 1316! Quetta, Lace 3558! — Sukkur, Sabnis B 532.

Distr. gen.: Europa et Asia temperatae.

Often cultivated as a salad plant.

2. ***N. microphyllum*** Boenn. ex Reichenb., Fl. Germ. Excurs. 683 (1832) et Icon. Fl. Germ. 2, tab. 50, fig. 4360 (1837—38).
Syn.: *Nasturtium uniseriatum* Howard & Manton, Ann. Bot. n. ser. 10: 11 (1946). *Rorippa microphylla* (Boenn.) Hyl. ex Löve & Löve, Rep. Univ. Inst. Appl. Sci. Reykjavik, Dept. Agric. Ser. B, 3: 109 (1948).

Lit.: H. K. Airy Shaw, The botanical name of the wild tetraploid Watercress, Kew Bull. 1, 1947: 39—46 (1947).

Typus: „Auf Moorboden, auf Wiesengräben, z. B. in Westphalen bei Coesfeld, Rothenfelde, Boenn.; Gegend von Leipzig bei Abtnaundorf", Reichenb.

Differt a *N. officinale* petalis submajoribus, pedicellis longioribus, seminibus uniseriatis, utraque facie foveolis ± 100 provisis.

Persia: W: Bakhtiari: Belu, Koelz 15216!
Afghanistan: E: Kabul: Hauz-i Mahiha, 2500 m, Koeie 2486 p. p.!; 2800 m, Rech. 18549! Sar-i Chashma, Griff.! Nuristan: Wama, 1300 m, Edelb. 1235!
Pakistan: In valle Kurram prope Peiwar Kotal, Aitch. 894!

Distr. gen.: Europa et Asia.

Apparently an allotetraploid hybrid of *N. officinale*, *N. microphyllum* is scarcely (except for leaf stomatal counts) distinguishable from it in the vegetative state. In flower, the two species can be recognised by the slightly larger petals and pollen grains in the tetraploid. An account of the pollen differences is given by P. S. Green in Trans. Bot. Soc. Edinb. 36, 4: 289—304 (1955). In mature fruit, they can readily be separated by the characters given above.

The sterile hybrid between *N. officinale* and *N. microphyllum* is frequent in W Europe and probably occurs in our area where the two species grow together. The only specimens that are probably referable to the hybrid are the following: Pakistan: Kohat: Kohat versus Thal, 20 km from Kohat, 675 m, Lamond 1565!, Rech. 30228!

79. ***Rorippa***

Rorippa Scop., Fl. Carn. ed. 1: 52 (1760).

Herbae annuae vel perennes, foliis simplicibus vel divisis, glabrae vel sparse pilosae. Sepala non vel vix saccata. Petala flava. Siliqua vel silicula dehiscens. Semina numerosa, subbiseriata. Stigma capitatum, subbilobum. Radicula accumbens.

Most species of our area usually grow near water or in marshes.

1a. Petala quam sepala vix longiora vel nulla 2
b. Petala quam sepala evidenter longiora 3
2a. Silicula 5—8×2—2,5 mm ..... 1. *R. islandica* (Oeder) Borbás
b. Silicula 10—15×1 mm ..... 3. *R. indica* (L.) Hiern.
3a. Folia caulina superiora sessilia, interdum auriculata. Silicula 3—6×1—2 mm ..... 2. *R. amphibia* (L.) Besser
b. Folia caulina superiora petiolata, numquam auriculata. Silicula (5—) 7—18×1—2 mm 4
4a. Foliorum segmenta late ovata; folia superiora interdum simplicia ..... 4. *R. kurdica* (Boiss. & Haussk.) Hedge
b. Foliorum segmenta lineari-oblonga; folia superiora semper pinnata ..... 5. *R. sylvestris* (L.) Besser

1. ***R. islandica*** (Oeder) Borbás, Balaton Tav. Part. 2: 392 (1900).
Syn.: *Sisymbrium islandicum* Oeder, Fl. Dan. 3: 7, tab. 409 (1761—71). *S. amphibium* L. var. *palustre* L., Spec. Plant. 657 (1753). *S. palustre* Leyss., Fl. Hal. 679 (1761). *Rorippa palustris* (Leyss.) Besser, Enum. Pl. Volhyn. 27 (1822). *Nasturtium palustre* (L.) DC., Reg. Veg. Syst. Nat. 2: 191 (1821). *Rorippa islandica* (Oeder) Schinz & Thell., Viert. Naturf. Ges. Zürich 53: 538 (1908).
Icon.: Clavis p. 9 et 17.
Typus: E Dania.

Herba annua vel biennis. Caules erecti, saepe inferne purpurascentes, 20—70 cm alti, glabri vel prope basin pilis nonnullis simplicibus obsiti. Folia inferiora pinnatifida vel lyrata, segmentis irregulariter lobatis vel dentatis, petiolata; superiora subsessilia auriculis parvis, pinnatifida vel subintegra. Petala 1,5×0,5 mm. Silicula 5—8×2—2,5 mm, oblonga, tumida; pedicelli fructiferi horizontaliter patentes, 4—5 mm longi. Stylus 0,5—1,5 mm longus.

Talish: sec. Grossh., Fl. Kawk. ed. 2, 4, tab. 232 (1950).
Afghanistan: E: Kabul: In parte superiore faucium Tang-e Gharu, 1800 m, Hdg. & Wdb. 3089! Darulfanun, Volk 75. Farakulum, 2700 m, Koelz 2590! Kabul, 1800 m, Rech. 17033!, Gilli 920, 921!, Hdg. & Wdb. 2949! Nuristan: Gusalak, 1000 m, Edelb. 227, 1524. Kushtos, 1850 m, Neub. 4603! Inter Seprigal et Wama, Kitam. — NE: Badakhshan: Jurm, 2350 m, Koelz 12890! Kataghan: 48 km W Faizabad, Furse 6452! Taliqan, 720 m, Podlech 10313.
Pakistan: Chitral: Drosh, Toppin 102! Jambatai, Harriss 15900! — Swat: Kalam, R. R. Stewart 25108! Bahrain, Ali 26011! — Peshawar: Prope Akora, Burtt 501! — Kurram: Shalozan, Aitch. 276!

Distr. gen.: Per regionem temperatam late dispersa.

2. ***R. amphibia*** (L.) Besser, Enum. Pl. Volhyn. 27 (1822).
Syn.: *Sisymbrium amphibium* L. var. *aquaticum* L., Spec. Plant. 657 (1753). *Nasturtium amphibium* (L.) R. Br. in Aiton, Hort. Kew. ed. 2, 4: 110 (1812).
Icon.: Clavis p. 9.
Typus: Ex Europa.

Herba perennis glabra, plerumque stolonifera, caulibus validis fistulosis usque ultra 1 m altis. Folia inferiora breviter petiolata valde variabilia, integra, pectinata vel pinnatifida; folia superiora sessilia, lanceolata, integra vel dentata, auriculata vel exauriculata. Petala aurea, c. 5×3 mm. Silicula 3—6×1—3 mm; pedicelli fructiferi 8—10 mm longi, horizontaliter patentes. Stylus usque ad 2 mm longus.

Iraq: Kurd.: Sul.: In valle Penjwin, 1400 m, RAWI 12162!
Persia: W: Azerb.: 2 km W Ushnuiyeh, COWAN & DARLINGTON 1423! Kurd.: Dezh Shahpur, lacus Zaribar, 1300 m, JACOBS 6460!

Distr. gen.: Europa et Asia temperatae.

3. ***R. indica*** (L.) HIERN, Cat. Afr. Pl. Welw. 1, 26 addit. et corr. 1896, L. H. BAILEY, Rhodora 18: 155 (1916), HOCHREUTINER, Candollea 2: 370 (1925).
Syn.: *Sisymbrium indicum* L., Mantissa 1: 93 (1767). *Nasturtium indicum* (L.) DC., Reg. Veg. Syst. Nat. 2: 199 (1818).
Icon.: Tab. 13, fig. 1.
Typus: „Hab. in India".

Herba annua (vel biennis?) usque ad 60 cm alta, pilis paucis simplicibus obsita. Folia inferiora petiolata, pinnatifida; caulina lyrata vel simplicia, auriculata vel exauriculata. Inflorescentia elongata, multiflora. Sepala 2—2,5 mm longa, flavescentia. Petala deficientia vel si evoluta anguste spathulata, sepala vix excedentia. Pedicelli fructiferi 3—5 mm longi, patule ascendentes. Siliqua 10—15 × 1 mm, glabra; stylus c. 1 mm longus; semina subbiseriata.

Pakistan: Kohat: 20 km a Kohat versus Thal, 675 m, LAMOND 1566!, RECH. 30232!

Distr. gen.: Pakistan occidentalis, Himalaya, Indonesia, Africa.

4. ***R. kurdica*** (BOISS. & HAUSSKN.) HEDGE comb. nov.
Syn.: *Nasturtium kurdicum* BOISS. & HAUSSKN., Fl. Or. Suppl. 35 (1888).
Icon.: Tab. 13, fig. 2.
Typus: HAUSSKN., G!

Herba perennis, c. 70 cm alta, glabra, valde ramosa. Folia basalia petiolata, pinnatisecta, segmentis late ovatis; caulina petiolata, exauriculata, pinnata, lyrata vel simplicia. Inflorescentia elongata, multiflora. Sepala c. 2 mm longa. Petala c. 3 mm longa. Pedicelli fructiferi 6—8 mm longi, patuli. Siliqua 10—13 × 2 mm, lineari-oblonga, leviter curvata, glabra, substipitata; stylus c. 1 mm longus; stigma stylo latior; semina biseriata, tuberculata.

Persia: W: Kurd.: Ad rivulos montium Kurdistaniae Persicae prope Avihang et Sanandaj, 1500—2100 m, HAUSSKN.! 31 km N Sanandaj, 2000 m, GRANT 16066. — W: Lur.: Azna, 1800 m, KOEIE 1441!

Distr. gen.: Endem.

An imperfectly understood species whose status is doubtful. It clearly differs from other species of *Rorippa* in our area in the much broader leaf segments and linear-oblong fruits. Field studies are needed to assess its true status.

5. ***R. sylvestris*** (L.) BESSER, Enum. Pl. Volhyn. 27 (1822).
Syn.: *Sisymbrium sylvestre* L., Spec. Plant. 657 (1753). *Nasturtium sylvestre* (L.) R. BR. in AITON, Hort. Kew. ed. 2, 4: 210 (1812).
Typus: „Hab. in Helvetiae, Germaniae, Galliae".

Herba perennis, stolonifera. Caules ascendentes vel erecti, 12—60 cm alti, sulcati, ± glabri. Folia omnia pinnata vel pinnatisecta, segmentis oblongis dentatis, petiolata. Petala 3—5 × 1,5—2 mm. Siliqua (5—) 7—18 × 1 mm, linearis, saepe curvata. Pedicelli horizontaliter vel ± erecto-patuli, 5—9 mm longi. Stylus 0,5—1 mm.

Persia: W: Kuh Alvand, BABAI 6698-E!

Distr. gen.: Eurasia temperata.

Species e regione nostra nondum indicata.

R. brachycarpa (C. A. Mey.) Hayek, Prodr. Fl. Penins. Balcan. 1: 390 (1925), characterised by the almost globose fruits, c. 3 x 1,5 mm, is recorded by Grossheim, Fl. Kawk. ed. 2, 4, tab. 233 (1950) from Azerbaijan very close to the Persian frontier.

Tribus ***Matthioleae***

auctore K. H. Rechinger, Wien

Pili simplices, furcati vel ramosi. Sepala erecta. Fructus siliqua, raro silicula. Radicula accumbens. — Genera 80—91.

80. ***Aubrieta***

Aubrieta (*Aubrietia*) Adans., Fam. 2: 420 (1763).

Lit.: J. Mattfeld, Blätter für Staudenkunde 1: 1—7 (1937). J. Mattfeld, Bulletin of the Alpine Garden Society 7: 157—181 & 217—227 (1939).

Plantae perennes caespitosae rupicolae. Indumentum e pilis pro maxima parte ramosis consistens. Caules tenues flexuosi, ex axillis foliorum ramigeri. Folia rhombica vel ovato-spathulata, paucidentata. Sepala erecta, exteriora angustiora obtusiuscula, interiora latiora acutiuscula, basi saccata. Filamenta libera, anguste alata. Antherae ovatae obtusae, interiores minores. Siliculae ovatae vel ellipsoideae (in specie nostra), dehiscentes, valvis convexis; stylus longus; septum tenue. Semina numerosa, biseriata, minuta.

1. ***A. parviflora*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 14 (1845).
Syn.: *A. parviflora* Boiss. var. *kurdica* Boiss., Fl. Or. 1: 253 (1867). *A. Kotschyi* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 32 (1849).
Icon.: Clavis p. 25.
Typus: Ky. 4169, G.

Laxe vel dense caespitosa, canescens vel ± virescens. Folia forma variabilia, utrinque plerumque bidentata. Racemi laxiusculi, 3—12-flori. Petala rosea vel alba. Filamenta majora ala superne sensim vel abrupte truncata, minora ad medium breviter dentata. Silicula ovoidea vel ellipsoidea, valvis enerviis; stylus siliculam longitudine aequans vel paulo superans.

Iraq: Kurd.: Mosul: Jabal Khantur prope Sharanish, 1300 m, Rech. 12071! Inter Marsis et montem Zawita, 1100—1400 m, Rech. 12021! Supra Marsis, 1200 m, Rech. 10888! Supra Basingera, 1200 m, Rech. 11519! In monte Zawita, 1600 m, Rech. 12017! Aqrah, F. Naib in Exsicc. Univ. Baghdad 48! Sul.: M. Avroman supra Tawilla, 1600 m, Rech. 10254!; 2000 m, Rech. 15812! Arbil: Pushtashan, 1100 m, Rech. 11741! Inter Dukan et Mirza Rostam, 1200 m, Rech. 10997! In fissuris rupium calc. infra Rawandiz, 700 m, Rech. 11249! In faucibus prope Rawandiz, Guest 2109. Jindian, Guest 727. Kuh Safin prope Shaqlawa, 1000—1600 m, Bornm. 883. In montibus supra Rost, 3000 m, Thesiger 942! In montibus prope Salah ad-Din, Barkley 7114!
Persia: W: Azerb.: M. Karnaru prope Shahpur, Knapp. Ser, Knapp. Kurd.: Kuh-i Emrullah, Str. 16 km E Sanandaj, 2000 m, Furse 2069! Kermansh.: 16 km N Kermanshah, 1500 m, Stutz 1319! Kermanshah, Str. Bisotun, 1350—1650 m, Jacobs 6339!, Str. Kuh-i Parrow, Str. Kuh-i Karand, Str. Kuh-i Dalahu, Str. Kuh Shahu, Str. Kinisht prope Bernaj, Str. Kuh-e Nevoh NW Karand, Archibald 1873! Khargush Chika, Str. Qasr Shirin supra Rijab, 900—1700 m, Nab. 1287, 1294. Ham.: Kuh-e Vafs, Str. M. Karaghan, Str. Kabutar Khan, Str. Arak: Arak versus Kashan, Str. Yekab, Str. Kuh Kohrud, Str. Golpayegan, Str. M. Rasvand, Str. Kuh Gasavand, Str. Kuh Milleh Michan, Str. Bakht.: Gatvand in valle Bazoft, Mart.-Escal. Kuh Rang, 2400 m, Wdb. 980! Taleh, Koelz 15131! Lur.: Tidar, 2000 m, Koelz 17558! Dow Rud, Koelz 17181!, 17362! Shah Bazan, 600 m, Koeie 1422! Inter Khorramabad et Dezful, 1050 m, Furse 1137! Kuh-e Saverz, Haussk. Kuh-e Eshger, 3000—3900 m, Haussk. — S: Fars.:

Kuh-e Sabz Pushan prope Shiraz, 2500 m, Stapf 230! Dasht-e Arzhan, Stapf 228! Kuh Dashteh prope Kazerun, Stapf 231! Kuh Bungi, Stapf 229! Kuh Abbas Ali, Stapf 227! Kuh-e Barfi, Ky. 342. Prope Shiraz, Auch. 4169! — C: Tehr.: In declivibus australibus M. Tuchal in valle Hafthauz, 1300—1500 m, Aell. 1091! Darband prope Tehran, 1200—2000 m, Schmid 5120!, Ky. 84. M. Tuchal supra Ferosad, 1700—1900 m, Bornm. 6231. Supra Dereke, Bruns. Qazv.: Prope Fashand, Gauba. In valle fluvii Karaj, 2100 m, Gauba 260! 16 km N Karaj, 1500 m, Stutz 1094!

Distr. gen.: Kurdistan, Persia borealis et occidentalis.

Nach ausgedehnten Naturstudien in Kurdistan und Untersuchung eines reichen Herbarmaterials sehe ich mich außerstande, die von Boissier aufgestellten Arten und die Varietät zu unterscheiden. Wohl scheint es durch feinere Merkmale von einander unterschiedene Populationen zu geben, doch ist weder eine deutliche Korrelation der Merkmale noch eine geographische Bindung zu erkennen. Dazu kommt, daß anscheinend nicht nur die Blattform und das Indument, sondern bis zu einem gewissen Grad auch die Fruchtmerkmale von Standortseinflüssen abhängig zu sein scheinen. — Auffällig ist, daß die Scheidewand der Schötchen nach dem Abfallen der Fruchtklappen und dem Ausstreuen der Samen die Tendenz hat, sich spiralig zu drehen.

81. *Pseudocamelina*

Pseudocamelina (Boiss.) N. Busch, Journ. Soc. Bot. Russe 13: 113 (1928).
Syn.: *Cochlearia* Sect. *Pseudocamelina* Boiss., Fl. Or. 1: 247 (1867).

Plantae perennes vel biennes, glabrae, saepe valde ramosae. Folia carnosa, basalia rosulata, caulina reducta. Racemi laxissimi. Pedicelli tenues, saepe valde elongati. Sepala erecta, exteriora anguste, interiora late oblonga, basi subsaccata, omnia tenuiter venulosa, apice obtusa scarioso-marginata. Petala alba vel rosea, oblonga, obtusa. Ovarium 10—18-ovulatum. Stylus perbrevis. Stigma depressum. Siliqua ovata usque linearis, dehiscens, saepe torta; valvae convexae, costa mediana tenui, tenuiter reticulato-nervosa. Septum tenuissimum saepe fenestrellatum. Semina univel biseriata, non marginata, laevia. Embryo pleurorrhizus.

1a. Silicula ovata; semina biseriata 2
b. Siliqua linearis; semina uniseriata 4
2a. Rhachis racemi recta. Pedicelli siliculis triplo longiores ..... 1. *P. Szowitsii* (Boiss.) N. Busch
b. Rhachis racemi infracto-flexuosa. Pedicelli siliculis multoties longiores 3
3a. Planta mediocris validiuscula. Pedicelli erecto-patuli, siliculis ultra 4-plo longiores. Siliculae loculi 4-spermi .....2. *P. Camelinae* (Boiss.) N. Busch
b. Planta humilis gracillima. Pedicelli tenuissime filiformes, elegantissime recurvato-patentes, siliculis multoties longiores. Siliculae loculi 2-spermi .. .. 3. *P. campylopoda* Bornm. & Gauba
4a. Herba caespitosa, nana ..... 7. *P. aphragmodes* (Boiss.) N. Busch
b. Herbae procerae 5
5a. Racemi fructiferi flexuosi. Pedicelli siliquis longiores ..... 4. *P. glaucophylla* (DC.) N. Busch
b. Racemi fructiferi recti. Pedicelli siliquis breviores 6
6a. Glabra (?). Folia radicalia obovato-oblonga, integra vel crenata. Siliqua glabra (?). Petala violascentia ..... 5. *P. violacea* (Boiss.) N. Busch
b. Breviter pubescens. Folia radicalia orbicularia repanda. Siliqua hirtula. Petala alba ..... 6. *P. campylocarpa* (Boiss.) N. Busch

1. ***P. Szowitsii*** (Boiss.) N. Busch, Journ. Soc. Bot. Russe 13: 114 (1928).
Syn.: *Cochlearia Szowitsii* Boiss., Fl. Or. 1: 248 (1867).
Typus: Azerbaijan, Szovits, LE.

Biennis? Caulis 25—40 cm altus, scoparius, subdichotome ramosus, subaphyllus. Folia basalia ignota. Folia caulina brevia filiformia. Racemi fructiferi elongati rachide recta. Sepala rubella ovata. Pedicelli patuli siliculis triplo longiores. Siliculae ± 3 mm longae, ovato-ellipticae; loculi dispermi; stigma sessile.

Persia: W: Azerb.: Kuh-e Mishu Dagh, Gill.-Sm. 2630. Azerbaijan, Szov.

Distr. gen.: Endem.

2. ***P. Camelinae*** (Boiss.) N. Busch, Journ. Soc. Bot. Russe 13: 114 (1928).
Syn.: *Cochlearia Camelinae* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 172 (1842).
Typus: Persia: Auch. 4164, G!

Biennis (?). Caulis ± 30 cm altus, scoparius, subdichotome ramosus, subaphyllus. Folia basalia et caulina adhuc ignota. Racemi fructiferi tenerrimi rachide valde infracto-flexuosa. Sepala 2,5 mm longa, oblongo-lanceolata, anguste albo-marginata. Pedicelli erecto-patuli 8—13 mm longi, siliculis 4—5-plo longiores. Siliculae ± 4×1 mm, ovatae, crassiusculae, loculi quadrispermi; stylus brevis, 0,3 mm longus, mucronatus.

Persia: W: Esf.: Kuh-e Sofeh prope Esfahan, Stapf 189! Inter Esfahan et Abadeh, 2000 m, Schmid 5367, 5382, 5420! — Persia, loco non notato, Auch. 4164, 331.

Distr. gen.: Endem.

Die Zugehörigkeit der blühenden Schmid'schen Belege ist zweifelhaft.

3. ***P. campylopoda*** Bornm. & Gauba, Feddes Repert. 36: 355 (1934) pro syn. *Cochleariae campylopodae* Bornm. & Gauba.
Icon.: Clavis p. 5.
Typus: Elburz, in montosis supra Keredj sitis ad pagum Allangeh, Gauba 140, W!

Biennis. Caulis 10—25 cm altus, tenuis, a basi iteratim paniculato-ramosissimus, ramis in racemos ± demum elongatos excurrentibus axibus tenerrimis eximie infracto-flexuosis. Folia pauca 2—3 cm longa, tenuiter pinnatisecta, subcarnosa, mox decidua. Pedicelli tenuissimi, 20—30 mm longi, semicirculariter recurvi. Sepala ± 1,5 mm longa, albida, obtusa. Petala 3 mm longa. Siliculae ad summum 3×2 mm, saepe minores, basi late attenuatae, apice rotundatae vel obtusae, loculis dispermis; stylus brevissimus vix 0,5 mm longus.

Iraq: Kurd.: Sul.: Pira Magrun, Haines 1865. In glareosis serpentinicis jugi Malakawa prope Penjwin, 1400 m, Rech. 10435! Arbil: M. Qandil supra Pushtashan, Rech. obs. Persia: C: Qazv.: Karaj, Koelz 33441! Pich Kuh, Gauba 141! Kuh Dashteh, Rech. 340! Vardeh, 1600 m, Rech. 757! Alangeh, Gauba 140!

Distr. gen.: Endem.

4. ***P. glaucophylla*** (DC.) N. Busch, Journ. Soc. Bot. Russe 13: 115 (1928).
Syn.: *Nasturtium glaucophyllum* DC., Reg. Veg. Syst. Nat. 2: 195 (1821). *Cochlearia glaucophylla* (DC). Boiss., Ann. Scienc. Nat. Ser. 2, 17: 170 (1842).
Icon.: Clavis p. 13; Delessert, Icon. 2, tab. 14 (1823).
Typus: Tehran, Oliv., P.

Perennis, glaucescens. Caulis 40—60 cm altus, a basi fere iteratim dichotome ramosus. Folia basalia 2—4 cm longa, orbiculato- vel fere flabellato-spathulata,

integra vel antice grosse sinuato-dentata, in vivo carnosa, nervis tenuibus; petiolus lamina brevior vel ± longior. Folia caulina pauca oblongo-linearia, minuta. Axis inflorescentiae tenuis leviter angulato-flexuosa. Sepala ± 3 mm longa. Pedicelli 10—15 mm longi erecto-patuli tenues, rigidi, siliquis subaequilongi vel eis usque ad subduplo longiores. Siliqua 7—11 × ± 1 mm; stylus ± 1 mm longus.

Persia: N: Persia borealis, Ky. 259. Maz.: In valle fluvii Chalus, 2400 m, Rech. 960! In declivibus borealibus jugi Kandavan, 2400 m, Gauba 151! In valle Haraz prope Panjab, 1000 m, Wdb. 638! Kojur: Ileka, Gauba 135!, 152! — W: Azerb.: Einal Zeinal prope Tabriz, Grossh. In declivibus australibus M. Sahand prope Ashan, Knapp. Distr. Afshar prope Ahmadabad, Knapp. Esf.: Inter Esfahan et Tehran, Bge. Arak: Prope Girdu, Str. Lur.: Oshtoran Kuh, Str. Kebara, 2000 m, Koelz 18249!, 18278-a! Dow Rud, 2100 m, Koelz 17865! Ham.: Kuh-e Kharzane prope Hamadan, Sab. in Gauba 136! — S: Fars.: Kuh-e Dinar, Ky. 636. — C: Tehr.: Lashkarak versus Ushan Pasha, Bruns. Tehran, Oliv., Bornm. 2139. M. Tuchal supra Ferosad, Bornm. 6182. Shahrestanak, 2200 m, Bornm. 6183. Shahr Rey, Bornm. 2139. M. Tuchal, Hafthauz, 1500 m, Aell. 1079! In jugo Ladd, Bornm. 6184. Qazv.: Gach Sar NE Karaj, 2100 m, Furse 2636! Kalak prope Karaj, 1500 m, Rech. 977! Kuh Dashteh, Rech. 372!, Vardeh, Rech. 766! Vessieh, Rech. 6851! Inter Qazvin et Rasht, 1500—1200 m, Schmid 6586! Karaj, Gauba. — Persia, Auch. 90, 4137, 4165.

Distr. gen.: Endem.

5. ***P. violacea*** (Boiss.) N. Busch, Journ. Soc. Bot. Russe 13: 115 (1928).
Syn.: *Cochlearia violacea* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 171 (1842).
Typus: Auch. 91, G!

Perennis, multicaulis caespitosa suffrutescens, caules floriferi tenues pauciramosi, 10—20 (—30) cm alti. Folia basalia usque ad 14 × 9 mm, obovato-spathulata, integra vel crenata, caulina pauca, linearia. Racemi fructiferi laxi, axi recta vel subflexuosa. Pedicelli fructiferi tenues rigidi, angulo valde acuto patentes vel axi fere appressi, 4—9 mm longi. Calyx 2,5—3 mm longus. Petala violascentia usque ad 4,5 mm longa. Siliqua (immatura) 7 mm longa, 0,7 mm lata. Stylus fere 1,5 mm longus.

Persia: W: Ham.: M. Alvand: In declivibus borealibus versus Tuysarkan, Stapf. Bakht.: In montibus Bakhtiari, Haussk. — S: Fars.: In montibus ad Persepolis, Ky. 903. — C: Kashan: Qohrud inter Esfahan et Tehran, Bge. — Persia, Auch. 91.

Distr. gen.: Endem.

6. ***P. campylocarpa*** (Boiss.) N. Busch, Journ. Soc. Bot. Russe 13: 115 (1928).
Syn.: *Cochlearia campylocarpa* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 171 (1842).
Typus: Auch. 95, G!

Perennis, 60 cm alta, breviter puberula. Folia basalia 13 mm lata, orbiculata, repanda, basi breviter cuneata; folia ramealia linearia. Racemi fructiferi longi recti nec flexuosi. Pedicelli 1,5 mm longi cum siliculis axi appressi stricti. Sepala 2,5 mm longa, oblonga hirta. Petala alba. Siliquae 5—7 × 1 mm, lanceolatae, 4—6-spermae. Stylus 0,7 mm longus.

Persia: W: Ad Esfahan, Auch. 95.

Distr. gen.: Endem.

7. ***P. aphragmodes*** (Boiss.) N. Busch, Journ. Soc. Bot. Russe 13: 115 (1928).
Syn.: *Cochlearia aphragmodes* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 15 (1845).
Typus: „Kuh-e Daena", Ky. 656-a, G!

Herba caespitosa, nana, ad 5 cm alta, multicaulis; caules filiformes, a basi racemiferi. Folia rosularia longe petiolata, oblongo-lanceolata vel -spathulata, integra, usque ad 10×4,5 mm. Racemi 7—9-flori, e caespite breviter exserti, a basi fere fructiferi angulato-flexuosi. Flores violacei. Pedicelli usque ad 8 mm longi patentes. Siliquae 6—7,5×1,2 mm, lineari-lanceolatae, cylindricae, 3—6-spermae; septum evanidum. Stylus brevissimus. Calyx 2 mm longus. Petala 3,5 mm longa.

Persia: S: Fars.: Kuh-e Dinar, Ky. 656-a!

Distr. gen.: Endem.

82. *Notoceras*

Notoceras R. Br. in Aiton, Hort. Kew. ed. 2, 4: 117 (1812).
Syn.: *Diceratium* Lag., Elench. Hort. Matrit. 20 (1815).

Herba annua foliis integris racemis confertis. Pili bifidi. Sepala erecto-patula, aequalia, non saccata. Filamenta libera tenuissima, basi vix dilatata; antherae ovatae, obtusae. Ovarium apice bicorne, 6—8-ovulatum. Stylus brevissimus; stigma conicum.

1. ***N. bicorne*** (Aiton) Amo, Fl. Iber. 6: 536 (1873).
Syn.: *Erysimum bicorne* Aiton, Hort. Kew. 2: 394 (1789). *Notoceras hispanicum* DC., Reg. Veg. Syst. Nat. 2: 204 (1821). *N. canariense* R. Br. in Aiton, Hort. Kew. ed. 2, 4: 117 (1812).
Icon.: Clavis p. 23.
Typus: Insulae Canarienses.

Herba annua, decumbens, ramis 3—20 cm longis, pilis bipartitis appressis canescens. Folia anguste lanceolata, basin versus attenuata, integra. Racemus fructifer confertus, strictus, pedicelli crassi breves; siliquae maturae axi appressae. Petala minuta, flava, ovata, apice rotundata, longe unguiculata, sepala paulo superantia, saepe duo maiora. Filamenta libera, tenuissima, basi vix dilatata; antherae ovatae, obtusae. Siliqua brevis, quadrangula, demum dehiscens; valvae basi obtusae, apice rotundatae, costa mediana valida, in cornu breve excurrentes, reticulato-nervosae. Semina uniseriata, ovata, compressa.

Persia: S: Lar.: Minab, Behb. 201-E! Bal.: Inter Iranshahr et Bazman, Behb. 218-E! Inter Khash et Iranshahr, 1500 m, Rech. 4011! Biaban: Jask, Behb. 204-E! Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1900 m, Rech. 3510! Hamun-e Jaz Murian, Khanu, 400 m, Starm. 87!
Afghanistan, Griff.
Pakistan: Peshawar: In jugo Khyber, Halcro Johnston 116! Kund, Lamond 1637! Inter Attock et Kushalghar, 500 m, Rech. 30407!, Tor Khama, 700 m, Rech. 30351! — Kohat: In jugo Kohat, 700—900 m, Rech. 30187! 20 km a Kohat versus Thal, 670 m, Lamond 1558!, Rech. 30210! — N. Wazir.: Miram Shah Fort, Blatt. & Fz. 158, 159. W Spinwam Fort, Blatt. & Fz. 699-A, 849. Shewa Post, Blatt. & Fz. 902. Dwa Warkha, Stewart. Fl. Chasmai, Blatt. & Fz. 254, 286. — Bal.: Makran: 10 km W Hoshab, 100—200 m, Lamond 376!, Rech. 28035! 8—25 km W Awaran versus Turbat, Rech. 27728! Baluchistan, Stocks.

Distr. gen.: Insulae Canarienses, Hispania australis, Africa borealis, Iraq, Persia australis, Afghanistan, Pakistan.

83. *Tetracme*

Tetracme Bge., Del. Sem. Hort. Dorpat. 7 (1836).
Syn.: *Notoceras* R. Br. Sect. *Tetraceratium* DC., Reg. Veg. Syst. Nat. 2: 203 (1821).

Herbae annuae ramosae; indumentum e pilis brevibus ramosis compositum, canescens. Folia angusta, basi attenuata, dentata vel pinnatifida. Sepala aequalia non saccata. Petala parva, alba, basi late unguiculata, apice rotundata. Siliqua quadrangula, a dorso paulo compressa, sub apice quadricornis, valvis duabus dehiscens. Valvae trinerviae. Semina uniseriata, anguste ovata, subcompressa, pleurorhiza.

1a. Stigma subsessile 2
b. Stylus distinctus, conicus 5
2a. Racemi secundi, conferti, abbreviati ..... 1. *T. secunda* Boiss.
b. Racemi non secundi, ± elongati 3
3a. Folia subintegra. Racemi fructiferi densi. Flores minimi. Pedicelli breves, incrassati. Siliquae cornubus stigma paulo superantibus 4
b. Folia dentata. Racemi fructiferi laxi. Flores mediocres. Pedicelli longiores, non incrassati. Siliquae rectae, cornubus stigma multo superantibus ..... 4. *T. Stocksii* Boiss.
4a. Siliquae 6—8 mm longae, curvatae 2. *T. quadricornis* (Steph. in Willd.) Bge.
b. Siliquae 10—13 mm longae, rectae ..... 3. *T. pamirica* Vassilcz.
5a. Flores minimi. Racemi fructiferi laxiusculi parum elongati. Cornua siliquarum elongata, 2—3 mm longa, patenti-recurva. ..... 5. *T. recurvata* Bge.
b. Flores mediocres. Racemi fructiferi densi, demum valde elongati. Cornua siliquarum abbreviata ..... 6. *T. contorta* Boiss.

1. ***T. secunda*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 1: 29 (1854).
Typus: Afghania: Dair-Haj, Griff., W!

Planta humilis, ramis 3—10 cm longis decumbentibus vel ascendentibus. Indumentum hispidulum. Folia oblongo-spathulata subintegra vel sinuato-dentata, petiolata, usque ad 30×10 mm. Racemi fructiferi valde conferti scorpioidei. Pedicelli fructiferi incrassati siliquarum latitudini aequilongi. Siliquae 4—5 mm longae, ± 3 mm crassae, tetragonae, cornubus brevissimis gibbiformibus.

Afghanistan: In glareosis ad Dair-Haj, Griff.!
Pakistan: Quetta: 20 km W Quetta ad radices montium Mashelak, 1700 m, Rech. 29085!, Lamond 1086!

Distr. gen.: Endem.

2. ***T. quadricornis*** (Steph. in Willd.) Bge., Del. Sem. Hort. Dorpat. 7 (1836).
Syn.: *Erysimum quadricorne* Steph. in Willd., Spec. Plant. 3: 514 (1800). *Notoceras quadricornis* (Steph. in Willd.) DC., Reg. Veg. Syst. Nat. 2: 204 (1821).
Icon.: Clavis p. 23 et 29.
Typus: Ad lacum Aral, Lehm. 121, W!

Planta 5—15 (—25) cm alta, erecta, a basi iteratim stricte ramosa, appresse canescenti-pubescens. Folia lineari-oblonga, subintegra. Racemi fructiferi breves densi vel ± elongati, stricti. Pedicelli fructiferi crassi, siliquarum latitudinem aequantes. Siliquae 6—8 (—10) mm longae, deorsum curvatae vel axi ± appresse, ± rectae, tetragonae, cornubus erecto-patulis siliquae latitudine non longioribus.

Afghanistan: N: Mazar-i Sharif: Inter Chashmeh-i Shafal et Akupruk, 800—1000 m, Rech. 16277!, 16280! Akupruk, 750 m, Hdg. & Wdb. 3937! Takht-i Rostam prope Haibak, 1200 m, Rech. 16384!, 16385!, Hdg. & Wdb. 3992! — E: Kabul, 1750 m, Neub. 4427! Paghman, Neub. 4650! Qaleh Eslam 25 km S Kabul, 1830 m, Hdg. & Wdb. 3201! Jussufabad, Neub. 49/1333! — NE: Katahgan: Doshi, 1100 m, Hdg. & Wdb. 3500!, Meinertzhagen! Pul-i Khumri versus Doshi, 750 m, Hdg. & Wdb. 4058! Inter Pul-i Khumri et Karkar, Volk 2676! In valle Andarab, 1100 m, Rech. 31797!, Lamond 2296! — C: Doab, Volk s. n.! Darreh-i Shikar, 15 km S Doab, 1500 m, Hdg. & Wdb. 3384!, Rech. 16653! Bamian: Inter Bulola et Doab, Kitam. Inter Bulola et jugum Shibar, 2800 m, Rech. 16836! In jugo Shibar, 2800 m, Neub. 4730! Parwan: In latere occidentali jugi Shibar, 3000 m, Hdg. & Wdb. 4220! Bamian, 2800 m, Volk 2715!, Neub. 4661!, Gilli 1111!, Lindb. 30!, 78!

Distr. gen.: Rossia europaea austro-orientalis, Asia centralis, Afghanistan.

3. ***T. pamirica*** Vassilcz., Fl. URSS. 8, Addenda 7: 648 (1939).
Syn.: *T. appressa* Rech. f., Phyton 3: 60 (1951).
Typus: Schugnan, inter rivos Kasedar et Kambedar, Alexeenko, LE.

Planta 20—30 cm alta, pluricaulis, prope basin tantum longe tenuiter ramosa. Folia oblongo-lanceolata, 20—30 × 4—6 mm, subintegra. Racemi fructiferi usque ad 25 cm longi, fructibus ± contiguis. Pedicelli fructiferi 0,5 mm longi, crassi. Petala quam sepala vix longiora. Siliquae axi inflorescentiae arcte appressae alternantes, 11—13 mm longae, apice cornubus 4 aculeiformibus ± 1 mm longis divaricatis praeditae. Stigma subsessile.

Afghanistan: E: Panjshir: Auz Anjuman, 3400 m, Hdg. & Wdb. 5466! — C: Bamian: In jugo Shibar, 3300 m, Koelz 12156 (Typus *T. appressae* Rech. f.)! Band-i Amir, ad lacum Band-i Panir, 2800 m, Rech. 18371! Bulola, 2800 m, Gilli 1110!

Distr. gen.: Pamir-Alaj, Afghanistan.

4. ***T. Stocksii*** Boiss., Fl. Or. 1: 317 (1867).
Typus: Stocks 974.

Planta 10—20 (—30) cm alta, gracilis, ramis tenuibus erectis. Folia oblonga, lanceolata, sinuato-dentata. Racemi fructiferi laxi recti. Flores mediocres, quam in *T. quadricorni* duplo maiores, longiuscule pedicellati. Siliquae 3—6 mm longae, tetragonae, rectae vel ± recurvae. Pedicelli fructiferi dimidiam longitudinem siliquarum attingentes, cornubus tenuibus erecto-patulis siliquarum latitudine sublongioribus, stigma multo superantibus.

Pakistan: Kalat: 10 km S Kalat versus Surab, 2000 m, Rech. 28360!, Lamond 679! — Bal.: Gurghina, Stocks 974. Paloz, Lace 3665!

Distr. gen.: Endem.

5. ***T. recurvata*** Bge., Arb. Naturf. Ver. Riga 1: 158 (1848).
Icon.: Clavis p. 23.
Typus: Kysil Kum, Jan Darya, Lehm. 122, W!

Planta multicaulis, a basi tenuiter ramosa, arcuato-ascendens, ramis usque ad 10—15 cm longis. Indumentum breve molle canescens. Folia lineari-lanceolata, sinuato-dentata vel pinnatifida. Racemi fructiferi laxiusculi, 5—10 cm longi. Flores minimi. Pedicelli fructiferi 1—1,5 mm longi. Siliquae 7—8 mm longae, compressae, ± deorsum arcuatae, cornubus patenti-recurvis, 2—3 mm longis. Stylus compressus, 1—1,5 mm longus.

Persia: S: Kerm.: Inter Saidabad et pagum Chah-e Chaghak, 1700 m, Rech. 3220! — E: Khor.: Sar Chah, Bge.
Turcomania: Repetek, in arenosis, Litw. 1040!

Distr. gen.: Asia centralis, Turcomania, Persia.

6. ***T. contorta*** Boiss., Fl. Or. 1: 317 (1867).
Syn.: *T. recurvata* Bge. var. *integrifolia* Gilli, Feddes Repert. 69: 170 (1964).
Typus: Griff., lectotypus W!

Planta 20—35 cm alta, basi ramosa. Indumentum molle canescens. Racemi fructiferi demum valde elongati laxi, 15—30 cm longi. Folia lineari- vel oblongo-lanceolata, remote sinuato-dentata vel pinnatifida. Flores 2—3 mm longi. Pedicelli fructiferi incrassati siliquarum latitudine duplo longiores. Siliquae c. 5 mm longae compressae deorsum contortae, cornubus siliquae latitudine brevioribus. Stylus vix 1 mm longus.

Afghanistan: SE: Kandahar: N Girishk, Germab, Kerst. 393! Kandahar, Volk K-101! — C: Bamian: NE Bamian, 3000 m, Gilli 1112! Inter Bamian et Band-i Amir, 2900 m, Rech. 18115!, 18148! — Choky, Griff.!
Pakistan: Bal.: Gurghina, Stocks 953. Garu Karez, 1500 m, Lace 3391.

Distr. gen.: Endem.

84. *Diceratella*

Diceratella Boiss., Diagn. Pl. Or. Nov. Ser. 1, 5: 80 (1844).
Syn.: *Diceratium* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 61 (1842), nec Lag. (1815).

Suffrutices intricate ramosi, pilis ramosis appresse canescenti-tomentosi, eglandulosi. Folia petiolata. Flores rosei, speciosi; racemi pauciflori; petala obovata, ungue longo tenui. Sepala angusta, erecta, cohaerentia, non saccata. Filamenta libera, tenuia, exteriora quam interiora multo breviora; antherae magnae, lineares, acutae. Ovarium multiovulatum, infra stigma bicornutum; stylus brevissimus; stigma magnum, emarginatum. Siliqua brevis, crassa, quadrangularis, sero dehiscens; valvae apice cornutae. Semina minuscula, suborbicularia, compressa.

1a. Indumentum subfloccosum lutescens. Folia inferiora rotundata, obtusissime crenato-subquinqueloba, superiora oblonga, parce denticulata. Siliquae torulosae, subincurvae, valvis convexis ..... 1. *D. floccosa* (Boiss.) Boiss.
b. Indumentum appressum griseum. Folia ovata obtusa, inferiora integra, suprema breviter remote dentata. Siliquae tetragonae, valvis carinatis .... 2. *D. canescens* (Boiss.) Boiss.

1. ***D. floccosa*** (Boiss.) Boiss., Fl. Or. 1: 315 (1867).
Syn.: *Diceratium floccosum* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 61 (1842).
Typus: Persia australis, Auch. 4075, G.

Suffrutex ramis prostratis usque ad 15 cm longis, indumento subfloccoso lutescente. Folia 15—20 cm lata, inferiora rotundata obtusissime crenato-subquinqueloba, superiora oblonga parce denticulata. Flores 10—12 mm longi. Siliquae 10—13 mm longae, torulosae, subincurvae, valvis convexis; cornua stylum superantia.

Persia: S: Persia australis, Auch. 4075.

Distr. gen.: Endem.

2. ***D. canescens*** (Boiss). Boiss., Fl. Or. 1: 315 (1867).
Syn.: *Diceratium canescens* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 61 (1842). *Matthiola dentata* Parsa, Kew. Bull. 1947: 17 (1948), synon. nov.
Icon.: Clavis p. 27.
Typus: Prov. Laristan, Persia australis, Auch. 5077, G.

Suffrutex multicaulis ramosissimus, 10—25 cm altus, ramis crassis ascendentibus, omnino indumento stellato appresso canescens. Folia usque ad 15×15 mm, late ovata vel suborbicularia, obtusa, nervatura indistincta, petiolata. Calyx 8—9 mm longus. Petala calyce duplo longiora, saturate rosea, lamina late cordato-cuneata, antice emarginata; unguis calycem aequans vel eo paulo longior. Siliquae obtuse tetragonae, 12—15 mm longae, rectae vel curvatae, dense stellato-tomentosae, cornua stylum superantia.

Persia: S: Lar.: In deserto Laristan, Auch. 5077. Parabedin prope Hajjiabad inter Saidabad et Bandar Abbas, Mird. in Gauba 156! Hajjiabad prope Tarom, 900 m, Rech. 3242! Bandar Abbas, Shervinovsky in Gauba 157! Inter Isin et Genu, Gabr. 111! 16 km N Bandar Abbas, 30 m, Popov 51/42! Isin, Behb. 5640-E! Bal.: Makran: Tang-e Sorkh, Shar. 985-E!; 1050 m, Popov 51/95! Chah Bahar, Shar. 224-E!

Distr. gen.: Endem.

Aus Parabedin besitze ich Mirdamadi in Gauba 156, die offenbar die Grundlage von Parsa 249 vom selben Fundort ist.

85. *Pyramidium*

Pyramidium Boiss., Diagn. Pl. Or. Nov. Ser. 2, 1: 46 (1854).

Herba annua. Petala roseo-violacea, lamina torta. Calyx clausus, bisaccatus. Siliqua indehiscens, quadrangulato-pyramidalis, crassa, in rostrum longum subulato-conicum aspermum attenuata, cornu brevi horizontali aucta, intus in utroque latere septi quadrilocularis; stigma acutissimum. — Genus monotypicum.

1. ***P. Griffithianum*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 1: 47 (1854).
Icon.: Clavis p. 23; tab. 14.
Typus: Afghanistan: Dair-Haj, Griffith, K.

Herba annua, a basi ramosa, floccosa. Folia usque ad 4×1,5 cm oblonga, sinuato-dentata, obtusa. Racemus ebracteatus, ad 15 cm longus. Flores subsessiles; petala roseo-violacea, anguste linearia, lamina torta. Calyx 6—8 mm longus, clausus, bisaccatus. Siliqua 11—15 mm longa, indehiscens, quadrangulato-pyramidales, crassa, in rostrum longum subulato-conicum aspermum attenuata, cornu brevi horizontali aucta, intus in utroque latere septi quadrilocularis, ceterum spongioso-lacunosa; stigma acutissimum, superne bipartitum, lineis carpidialibus longe decurrentibus. Antherae maiusculae.

Afghanistan: SW: Jija, 1000 m, Koelz 4171! Inter Farah et Shindand, 800 m, Koelz 3900! Rech. 33377! 96 km S Herat, 1066 m, Furse 5459! — SE: Kandahar: N Girishk, 1200 m, Kerst. 389! Kandahar, Volk K-109! Panjvai, Lindb. 292! — Dair-Haj, Griff.

Distr. gen.: Endem.

86. *Matthiola*

Matthiola R. Br. in Aiton, Hort. Kew. ed. 2, 4: 119 (1812) nom. conserv. nec *Matthiola* L., Spec. Plant. 1: 119 (1753).
Syn.: *Leucojum* Adans., Fam. 2: 418 (1763).

Lit.: P. Conti, Les Espèces du Genre Matthiola, Mém. Herb. Boiss. 18: 1—88 (1900).

Suffruticosae vel annuae. Indumentum e pilis ramosis consistens, praeterea interdum glanduliferum. Folia dense canescenti- vel albido-tomentosa, integra vel dentata vel pinnatifida. Sepala erecta, interiora saccata. Petala longe unguiculata, colore vario saepe ± sordido. Filamenta libera, interiora dilatata. Antherae longe acuminatae. Ovarium multiovulatum. Stylus brevis vel saepius deficiens. Stigma bilobum, lobis carpidialibus angustis decurrentibus, superne saepe emarginatis. Siliqua linearis, teres vel a dorso compressa, apice interdum bicornuta. Semina uniserialia compressa saepe marginata.

Die im vorstehenden gebotene Bearbeitung der Gattung ist provisorisch. Die Monographie von Conti (1900) ist unkritisch. Sie bietet keine geeignete Grundlage für eine Neubearbeitung. Die Deutung vieler von Bunge bzw. Boissier beschriebenen Arten ist problematisch, da viele Typus-Exemplare unvollständig sind und sie die zur Unterscheidung wesentlichen Merkmale nur teilweise erkennen lassen. Auch die Begrenzung der Gattung ist problematisch. In der hier angenommenen weiten Fassung enthält sie mehrere Arten, wie *M. alyssifolia* (DC.) Bornm., *M. Codringtonii* Rech. f. und das Artenpaar *M. graminea* Rech. f. und *M. ghorana* Rech. f., die nach verschiedenen Richtungen divergieren und daher nach dem bei den Cruciferen meist recht engen Gattungsbegriff aus der Gattung *Matthiola* ausgeschieden werden könnten. Dies sei hier nur angedeutet. Die Entscheidung bleibt, wie auch eine neue Sektionsgliederung von *Matthiola*, dem künftigen Monographen vorbehalten.

1a. Plantae annuae 2
b. Plantae perennes 5
2a. Siliquae apice bicornutae 3
b. Siliquae non cornutae 4
3a. Indumentum appressum. Petala in sicco flavescentia vel sordide purpurascentia, lamina lineari-elliptica ..... 16. *M. longipetala* (Vent.) DC.
b. Indumentum patulum asperum. Petala in sicco intense rosea, lamina oblongo-spathulata ..... 17. *M. aspera* Boiss.
4a. Petala calyce ad minimum duplo longiora. Calyx 7—9 mm longus ..... 14. *M. chenopodiifolia* Fisch. & C. A. Mey.
b. Petala calyce vix tertia parte longiora. Calyx 6 mm longus ..... 15. *M. macranica* Rech. f.
5a. Planta pumila ad summum 10 cm alta. Caulis subscaposus ..... 5. *M. perpusilla* Rech. f.
b. Plantae elatiores. Caulis foliatus 6
6a. Pedicelli floriferi breves 10
b. Pedicelli floriferi 5—10 mm longi vel longiores 7
7a. Caulis plerumque singulus, crassus, basi usque ad 10 mm diametro. Siliqua ultra 5 mm lata 8
b. Caules plerumque plures, multo tenuiores. Siliqua tenuior 9
8a. Planta valde glabrescens, demum saepe subglabra. Siliqua 8—12 cm longa. Stigmatis lobi divergentes ..... 1. *M. alyssifolia* (DC.) Bornm.
b. Planta dense tomentosa et insuper copiose glandulifera. Stigmatis lobi conico-compressi. Siliqua 6—7 cm longa ..... 2. *M. Codringtonii* Rech. f.

9a. Pedicelli floriferi 5—9 mm longi. Calyx 10—12 mm longus. Siliqua 5—8 cm longa. Stylus 1,5—2 mm longus ..... 3. *M. ghorana* Rech. f.
b. Pedicelli floriferi 6—12 mm longi. Calyx ± 8 mm longus. Siliqua 6—10 cm longa. Stylus vix 1 mm longus ..... 4. *M. graminea* Rech. f.
10a. Caules 10—20 cm longi, diffusi vel ascendentes, breviter divaricate ramosi. Folia obovato-oblonga, parva, ad summum 20 mm longa ..... 7. *M. revoluta* Boiss. ex Boiss.
b. Caules elatiores, ascendentes vel erecti. Folia majora 11
11a. Folia rosularia et caulina obovata vel ovata, latitudine sesqui- usque ad summum duplo longiora. Caulis saepe singulus crassissimus, simplex vel subsimplex ..... 6. *M. ovatifolia* (Boiss.) Boiss.
b. Folia proportione longiora. Plantae fere semper pluri- vel multicaules, saepe suffruticosae 12
12a. Siliqua matura crassa, 3—4 mm crassa 13
b. Siliqua matura tenuis, 1,5—2 mm crassa, raro crassior 15
13a. Folia fere omnia profunde sinuato-dentata. Indumentum cinerascenti-viride asperulum 14
b. Folia integra vel sinuato-dentata. Indumentum albidum tomentosum ± molle ..... 8. *M. farinosa* Boiss. ex Boiss.
14a. Suffrutex ± dumulosus valde lignescens, caulibus humilibus paucifoliatis. Siliqua paulo tantum compressa ..... 9. *M. dumulosa* Boiss. & Buhse
b. Basi tantum lignescens, caulibus elatioribus multifoliatis. Siliqua evidenter compressa ..... 10. *M. afghanica* Rech. f. & Koelz
15a. Caulis ± copiose ramosus et foliatus. Indumentum asperum 16
b. Caulis subsimplex vel pauciramosus, in parte infima tantum foliatus. Indumentum brevissimum molle subvelutinum ..... 11. *M. tenera* Rech. f.
16a. Folia omnia vel plurima integra vel ad summum remote breviter pauciden-tata. Indumentum cinerascenti-viride ... 12. *M. chorassanica* Boiss. ex Boiss.
b. Folia omnia sinuato-dentata. Indumentum albidum vel flavescens ..... 13. *M. flavida* Boiss.

1. ***M. alyssifolia*** (DC.) Bornm. in Bornm. & Gauba, Feddes Repert. 39: 80 (1935). Syn.: *Hesperis alyssifolia* DC. in Del., Icon. Sel. 2, tab. 61 (1823). *M. albicaulis* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 46 (1842).
Icon.: Tab. 16, fig. 1 et 2.
Typus: Persia, Michaux, P.

Perennis, collo fibroso. Caulis singulus, basi usque ad 10 mm crassus, erectus, teres, pallidus, nitidulus, 30—60 cm altus, simplex vel parce ramosus. Tota planta valde glabrescens, demum omnino glabra. Folia oblonga vel lanceolata, inferiora late pallide petiolata, 6—15 cm longa, 2—3 cm lata; superiora basi attenuata, sessilia, omnia costa mediana crassa pallida percursa, crassiuscula, integerrima. Racemi ab initio laxi demum valde elongati. Pedicelli floriferi 5—8 mm, fructiferi usque ad 25 mm longi, erecto-patentes. Calyx ± 10 mm longus, purpurascens, albo-villosus. Petala sordide purpurascentia, lamina oblongo-cuneata, calyce vix duplo longior. Siliqua compressa, 8—12 cm longa, 6—8 mm lata, septum crassum. Stylus crassiusculus, 1—2 mm longus. Stigma bilobum, lobis divergentibus. Semina latissime alata.
Persia: W: Ham.: Kuh-e Vafa, Str. M. Karaghan, Str. Shurab, Pichler. Arak: Mowdar Str. Yekab, Str. Inter Arak et Kashan, Str. 5 km S Delijan, 1700 m, Stutz 766! Tafresh, Str. 32! — S: Fars.: Inter Deh-e Girdu et Yazd-e Khvast, Stapf 83! — E: Khor.: Bar, 1800—2500 m, Schmid 6269! Inter Torbat-e Heydariyeh et Mashhad, Gauba 281! Kuh-e

Neyshabur, Darreh Abshar prope Akhlamad, 1800 m, Rech. 4531! In montibus prope Birjand, 1800 m, Rech. 114! — C: Tehr.: Inter Esfahan et Tehran, Bge. Amaret-i Jaji Rud, Bruns. Qazv.: Kuh Dashteh, 2300 m, Gauba 117! Yazd: Shir Kuh prope Yazd, Balls 68! In montibus prope Yazd, Buhse 1343. — Persia, Auch. 108.
Turcomania: Prope Gaudan, Litw. 492. M. Ludsch prope Ashkhabad, 2000 m, Litw. 490!, 491.
Afghanistan: NW: Badghiz, 900 m, Aitch. 337. — E: Ghorat: Shutargardan Kotal inter Qala Ahangaran et Qala Shahrak, 2700 m, Rech. 18856! — C: In montibus calc. prope Bamian, Gilli 893!

Distr. gen.: Persia, Afghanistan, Turcomania, Pamir-Alaj.

Die Art nimmt habituell wie auch durch den deutlich ausgeprägten Griffel und die divergierenden Narbenlappen in der Gattung *Matthiola* eine so weitgehend isolierte Stellung ein, daß ihre generische Abtrennung zu erwägen ist.

2. ***M. Codringtonii*** Rech. f., Symb. Afgh. IV in Dan. Biol. Skr. 10, 3: 40 (1958).
Syn.: *Parrya Codringtonii* (Rech. f.) Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1964: 424 (1964).
Icon.: Clavis p. 27; tab. 15.
Typus: Afghanistan: C: Bamian: Band-i Amir, Codrington s. n., BM!

Suffruticoso-caespitosa, collo residuis petiolorum copiose comoso. Caules floriferi 10—20 (—25) cm alti, crassi, fragillimi, simplices rarius pauciramosi, dense foliati. Tota planta indumento e pilis albidis ramosis intertextis consistente tomentosa, pilis glanduliferis flavescentibus vel brunnescentibus ubique in regione inflorescentiae crebre immixtis. Folia omnia integerrima, utrinque aequaliter tomentosa, nervatura vix visibili; folia basalia petiolo lamina breviore incluso usque ad 6 cm longa, ad 0,8 cm lata, lanceolata, acuta; folia caulina gradatim decrescentia et angustiora. Racemus florifer densiusculus, fructifer elongatus laxior. Pedicelli floriferi 1—4 mm longi, crassiusculi, erecto-patuli, fructiferi magis patentes, 5—12 mm longi. Calyx 10—12 mm longus, sepalis basi saccatis, saepe purpureo-suffusis. Petala rosea speciosa, calyce subduplo longiora; lamina oblongo-obovata, antice late rotundata, plana, erecto-patula 5,5 mm. Siliqua matura 5—7 cm longa, 5—7 mm lata, basi apiceque subrotundato-attenuata; valvae plano-convexae, potius membranaceae quam coriaceae, nervo mediano tenui sed distincto, nervatura ceterum tenerrima elongato-reticulata; indumentum floccoso-tomentellum laxiusculum, glandulis stipitatis brunneo-flavescentibus viscidis creberrimis; septum tenuiter membranaceum nitidum enervium. Stigma sessile breviter bilobum, lobis parallelis vel ± conico-compressis. Semina 4—5 mm diametro, in utroque loculo 8—14, orbiculata, valde compressa, atrobrunnea, perlate pellucide membranaceo-alata, alis usque ultra 1 mm latis. Radicula accumbens.

Afghanistan: C: Bamian: Band-i Amir, Codrington s. n.! Ad lacum Band-i Gholaman, 2800 m, Rech. 18485! Ad lacum Band-i Panir, substr. calc.-toff. 2800 m, Rech. 18363!, Hdg. & Wdb. 4779!

Distr. gen.: Endem.

Die Art nimmt durch ihren gedrungenen Habitus, die dicken, beblätterten, jedoch höchst gebrechlichen Stengel, die dichte Bekleidung mit dicken Stieldrüsen, die das aus Sternhaaren bestehende Indument zahlreich überragen, die dicke, aus Blattstielresten bestehende basale Tunica, sowie durch die breiten, membranösen, undeutlich gestreckt-netznervigen Valven oben wie unten fast abgerundeten Schoten eine höchst isolierte Stellung ein. Durch mehrere der hervorgehobenen Merkmale nähert sie sich deutlich der Gattung *Parrya*, in der sie jedoch ebenfalls keine näheren Verwandten besitzt.

3. ***M. ghorana*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1964: 422 (1964).
Typus: Rech. 19054, W!

Suffrutex; pilis minutis stellatis obsita, superne glabrescens, flavescenti-viridis. Caules 50—70 cm alti, erecti. Folia caulina inferiora 8—12 cm longa, 1—1,5 (—2) mm lata, anguste oblongo-lanceolata, apice acuta, sinuato-paucidentata, folia caulina superiora sensim angustiora, folia summa anguste linearia, subintegra. Pedicelli floriferi 5—9 mm longi. Calyx 10—12 mm longus; sepala acuta, anguste scarioso-marginata, demum glabrescentia, exteriora basi manifeste saccata. Petala (marcescentia) sordide viridi-flavescentia. Siliqua 5—8 cm longa, ± 1,5 mm lata, anguste linearis, ecornuta; stylus 1,5—2 mm longus; stigma profunde incisum; valvae costa mediana tenuiter prominente percursae, haud torulosae, glabrae; septum crassiuscule membranaceum subopacum. Semina ± 2 mm longa, ± 1,2 mm lata, subrectangulari-elliptica, compressa, anguste membranaceo-alata.

Afghanistan: **SW:** Ghorat: In faucibus calc. infra Parjuman, 33° 10′ N, 63° 52′ E, 1850 m, Rech. 19054!

Distr. gen.: Endem.

Man vergleiche die Bemerkung unter *M. graminea* Rech. f.

4. ***M. graminea*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1964: 423 (1964).
Typus: Rech. 17518, W!

Basi suffrutescens, ima basi et foliis infimis stellato-pubescente excepta glaberrima pallide viridis. Caules 40—50 cm alti, tenues, erecti, in dimidio superiore subaphylli pauciramosi. Folia basalia 2—4 cm longa, 1—1,5 mm lata, angustissime linearia, denticulo unico provisa, ceterum integra; folia caulina filiformia sursum decrescentia, stricta, cauli subappressa. Pedicelli floriferi 6—12 mm longi, stricti, filiformes, fructiferi usque ad 17 mm longi, patuli. Calyx ± 8 mm longus; sepala linearia, acuta, anguste scarioso-marginata, exteriora basi manifeste saccata. Petala (marcescentia) angusta, sordide virentia, purpurascenti-suffusa. Siliqua 6—10 cm longa, ± 1,5 mm lata, angustissime linearis, ecornuta; stylus vix 1 mm longus; stigma profunde incisum; valvae nervo mediano prominulo percursae, haud torulosae, glabrae, nitidulae, virides, demum purpurascentes; septum membranaceum albidum tenue. Semina ± 2,5 mm longa, latitudine subduplo longiora, anguste membranaceo-alata.

Afghanistan: **E:** Ghazni: In valle fluvii Arghandab prope Sang-i Masha, 33° 15′ N, 67° 10′ E, 2400 m, Rech. 17518! Sang-i Masha, in saxosis ad fluv. Arghandab, 2500 m, Rech. 17468!

Distr. gen.: Endem.

M. graminea ist durch die fast grasartigen Blätter, die weitgehende Kahlheit und die langen Fruchtstiele innerhalb der Gattung *Matthiola* eine auffällige und fremdartige Erscheinung. Sie bildet zusammen mit *M. ghorana* Rech. f. eine besondere Gruppe.

5. ***M. perpusilla*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1964: 424 (1964); descr. emend.
Icon.: Tab. 18.
Typus: Volk 1806, W!

Perennis. Radix tenuis perpendicularis usque ad 7 cm longa, caules 1—3 scapiformes vel subaphyllos, 2—16 cm longos proferens. Collum residuis albo-tomentosis

foliorum dense vestitum. Folia rosulata, dense stellato-tomentosa albida, lamina 3—8 (—20) mm longa, 2—5 (—10) mm lata, late spathulata, apice late rotundata vel retusa vel leviter emarginata, integra vel late obtuse dentata vel subcrenata, consistentia crassiuscula, petiolo 3—10 (—20) mm longo suffulta. Flores subsessiles; calyx ± 10 mm longus, basi saccatus; sepala virescentia, hyaline marginata, laxe appresse stellato-tomentella. Petala in vivo luride purpurea, anguste linguiformia, ± 3 mm lata, margine crenato-crispata, in sicco valde corrugato-convoluta, calyce ut videtur sesquilongiora. Pedicelli fructiferi crassiusculi, vix 1 mm longi. Siliqua usque ad 60 mm longa, vix 2 mm lata, subcompressa, horizontaliter patens, recta vel ± deorsum curvata, leviter torulosa, pilis stellatis appressiusculis sublaxe obsita, nervo mediano tenui sed distincto, ecorniculata; stylus subnullus, stigma sessile, crassitudine siliquam aequans, lobis brevibus crassis conico-compressis.

Afghanistan: E: Kabul: Logar, Volk 1806! Pul-i Alam, 2100 m, Koelz 11876! Qaleh Eslam, 25 km S Kabul, 1800 m, Hdg. & Wdb. 3205!

Distr. gen.: Endem.

Die Beschreibung wurde nach Hdg. & Wdb. 3205 ergänzt. Die Art ist mit keiner anderen der Gattung zu vergleichen. Dünne Wurzel, niedriger Wuchs, an der Stengelbasis gehäufte Blätter, dicht filzige Blattroste am Wurzelhals und im Vergleich zur geringen Größe der ganzen Pflanze unverhältnismäßig lange, oft herabgebogene Früchte kennzeichnen die Art eindeutig.

6. ***M. ovatifolia*** (Boiss.) Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 9 (1845).
Syn.: *M. odoratissima* (M. B.) R. Br. var. *ovatifolia* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 49 (1842). *M. damascena* Boiss. forma *ecbatanensis* Conti, Mém. Herb. Boiss. 18: 31 (1900).
Icon.: Tab. 17, fig. 1 et 2.
Typus (Lectotypus): Auch. 4072, G!

Perennis (vel interdum biennis?). Tota planta dense canescenti- vel flavescenti-tomentosa, pilis ramosis intertextis, pilis glanduliferis flavescentibus imprimis in regione inflorescentiae intermixtis. Caulis 30—60 cm altus, erectus, simplex vel imprimis in parte inferiore pauciramosus, crassus, usque ad inflorescentiam regulariter foliatus. Folia rosularia et basalia breviter crasse petiolata, lamina 6 (—10) × 2 (—4) cm, parce grosse vel interdum indistincte sinuato-dentata; folia caulina ovata, obtusiuscula vel acuta, inferiora breviter petiolata, superiora sessilia, gradatim decrescentia. Racemi floriferi primum densiusculi, fructiferi elongati, laxi. Pedicelli floriferi subnulli vel usque ad 2 mm longi, fructiferi valde incrassati, interdum usque ad 5 mm elongati. Calyx ± 10 mm longus, dense albo-floccoso-tomentosus. Petala calyce ad summum duplo longiora, lamina oblongo-lanceolata, 3—4 mm lata, sordide flava, virescens, demum fuscescens. Siliqua 10—14 cm longa, 3,5—4 mm lata, compressa, stellato-tomentosa, pilis crassis glanduliferis ± copiose immixtis ± flavescens vel brunnescens, apice brevissime attenuata; stigma crassitudine siliquam subaequans, lobis brevibus ± compressis.

Persia: W: Azerb.: In collibus N Tabriz, Gill.-Sm. 2245. Ham.: Yalfan prope Hamadan, Pichler! (Typus formae *ecbatanensis* Conti). Arak: Dumbe Kemer prope Khunsar, Str. Esf.: Ad Esfahan, Auch. 4068-A, 4072! — S: Kerm.: Kerman, 2800 m, Deicke 394. Kuh-e Dinar, Ky. 619! In arenosis gyps. inter Rafsanjan et Kabutar Khan, Rech. 2868-b! Fars.: Kakun inter Shiraz et Tal-e Khosravi, Behb. 994! — E: Khor.: Inter Shahrud et Neyshabur, Bge.! Prov. Khorasan, Bge. — C: Tehr.: Darband, Ky. 147! 56 km E Tehran, 2120 m, Furse 1691! Prope Tehran, Auch. 4070! Inter Damavand et

Tehran, 1400 m, Bornm. 6134! Marunak, Behb. 168-E! Aliabad prope Khar et Varamin, Gauba 115! Inter Tehran et fl. Jaji Rud, 1600 m, Aell. 1058! Prope Ardineh, Bruns. Qazv.: Kuh Dashteh prope Karaj, Darreh Wardi, 1600 m, Rech. 782! Damgh.-Semn.: In deserto gypsaceo ad Sorkheh, 1600 m, Rech. 1236!, 2794! Prope Rashm, Buhse. Yazd: Shir Kuh inter Taft et Deh Bala, 2000 m, Bornm. 2062, 2063. Prope Yazd, Buhse. — Persia, Auch. 82!, Bélanger!

Distr. gen.: Endem.

M. ovatifolia ist habituell durch schwach verholzte Basis, mangelnde oder geringe Verzweigung, einzeln entspringende, dicke Stengel, kurze, breite, entfernt gezähnte Blätter und lange, dicke, stumpfliche, oft reichdrüsige Schoten gekennzeichnet. Ihre Hauptverbreitung liegt im Umkreis der großen iranischen Wüsten. Am Südfuß des mittleren Elburs ist sie relativ häufig. Sie scheint Gipsboden zu lieben.

Da Boissier, Diagn. Pl. Or. Nov. (1845) seine *M. odoratissima* var. *ovatifolia* (1842) zitiert, ist der Lectotypus aus den (1842) angeführten Belegen auszuwählen. Conti's (1900) Typifizierung durch Ky. 619, die von Boissier erst 1845 zu der zur Art erhobenen *M. ovatifolia* zitiert wird, ist nicht zulässig.

Über den systematischen Wert der nur vom Originalfundort durch buchtigfiederschnittige Blätter bekannten var. *Buhseana* Boiss., Fl. Or. 1: 150 (1867) konnte ich keine Klarheit gewinnen: Persia orientalis: Rashm, Buhse, G! Literaturangaben von *M. damascena* Boiss. für Persien dürften sich wohl zumeist auf *M. ovatifolia* Boiss. beziehen.

7. ***M. revoluta*** Bge. ex Boiss., Fl. Or. 1: 151 (1867).
Syn.: *M. revoluta* var. *Bungeana* Conti, Mém. Herb. Boiss. 18: 21 (1900). *M. deserticola* Rech. f., Aell. & Esfand., Phyton 3: 61 (1951).
Typus: Inter Esfahan et Tehran, Bge., G!

Perennis, basi lignescens, pluricaulis, pauciramosa, rosulas foliorum et caules floriferos 10—20 cm longos saepe diffusos vel ascendentes divaricate ramosos proferens. Indumentum canum vel albidum. Folia usque ad 20×7 mm, obovato-oblonga vel oblanceolata, subobtusa, obtuse paucidentata vel subintegra. Racemi pauciflori, laxi. Calyx 10 mm longus. Petala linearia, in sicco revoluta. Siliqua juvenilis breviter crasse pedicellata, patens, 7×0,3 cm; stigma breve angustum breviter bilobum.

Persia: W: Ham.: Kuh-e Tafresh, Str. Arak: Mowdar, Str. M. Rasvand, Str. Esf.: Inter Esfahan et Tehran, Bge. Inter Esfahan et Abadeh, 2000 m, Schmid 5365! — C: Yazd: Inter Hoseynabad et Aqda, 1300—1400 m, Bornm. 2060. Ad margines deserti inter Nain et Aqda, 1000 m, Rech. 2694 (Typus *M. deserticolae*)!

Distr. gen.: Endem.

M. revoluta wurde bisher nur selten gesammelt, man kennt daher ihre Variationsbreite nicht. Sie ist durch den niederliegend-aufsteigenden Wuchs mit kurzen, oft etwas sparrig verzweigten Blütensprossen und die kleinen, kurzen, breiten Blätter auffällig. Reife Früchte sind noch unbekannt.

8. ***M. farinosa*** Bge. ex Boiss., Fl. Or. 1: 150 (1867).
Syn.: *M. revoluta* Boiss. var. *farinosa* (Boiss.) Conti, Mém. Herb. Boiss. 18: 21 (1900). *M. Boissieri* Grossh., Not. Syst. Leningrad 13: 14 (1950).
Icon.: Clavis p. 27.
Typus: Inter Asterabad et Shahrud, Bge., G!

Suffrutex caulibus pluribus crassis floriferis ascendentibus vel erectis simplicibus 15—30 cm altis; indumentum densiusculum canum stellatum. Folia basalia petiolata,

3—5×1—2 cm, oblongo-spathulata vel late lanceolata, sinuato-dentata vel integra; folia caulina non numerosa multo minora et angustiora, lanceolata vel linearia, integra. Racemus pauciflorus laxus. Flores subsessiles vel brevissime pedicellati; pedicelli fructiferi incrassati 2—4 mm longi. Calyx 10 mm longus. Petala livida. Siliqua (6—) 10—12 (—14) cm longa, 3—4 mm lata, compressa apice attenuata, nervo mediano crassiusculo ceteri quoque ± conspicui, minute stellato- tomentella ± glabrescens erecta vel patula; stigma bilobum lobis conniventibus crassitudine siliquam maturam subaequans.

Persia: N: Gorg.: Inter Gorgan et Shahrud, Bge. Maz.: Inter Gach Sar et Chalus, Schmid 5753! Inter Amol et Zardman, Schmid 5845! Sorkhabad in valle fluvii Talar, 1400 m, Rech. 5560! Zardman in valle fluvii Haraz, 500 m, Wdb. 377! In valle Haraz: E Emarat, 650 m, Wdb. 503! In valle fluvii Talar inter Gaduk et Abbasabad, 1600 m, Rech. 1980! — W: Azerb.: Khvoy: Prope Shabanli, Szov. 171. Meshg Anbar Mianeh prope Tabriz, 1400 m, Mird. in Gauba 282! — E: Khor.: Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, Rech. 4763-a! — C: Tehr.: Inter Simin Dasht et Kabutar Darreh in valle fluvii Hableh Rud, 1100 m, Aell. 1062! Damgh.-Semn.: Qomrud Pain 60 km E Firuzkuh, substr. gyps., 2200 m, Aell. 992! Shahmirzad Kuh, 2500 m, Wdb. 1310!; 2100 m, Wdb. 1371! Jashm in valle fluvii Chashmeh-i Ali substr. gyps., 2200 m, Aell. 1073. Shahr.- Bust.: M. Shahvar ad Dihi supra Nokarman, 2500 m, Rech. 5922! Turcomania: Ashkhabad, Malaklar, Sint. 472! Suluklü, Sint. 839. Afghanistan: N: Mazar-i Sharif: Chashmeh-i Shafal, 900 m, Hdg. & Wdb. 3886! — NE: Kataghan: Paigah Kotal inter Haibak et Pul-i Khomri, 1500 m, Rech. 16478!, Hdg. & Wdb. 3542!, 4028! In valle Andarab S Doab-i Til, 2700 m, Podlech 11198!

Distr. gen.: Endem.

Der Holotypus ist äußerst fragmentarisch; nur ein blühender Stengel mit zwei Blüten ist vorhanden, Früchte fehlen. Die hier angenommene Interpretation der Art bleibt daher zweifelhaft.

Während die Belege aus Nord- und Nordostpersien verhältnismäßig einheitlich sind, weichen die afghanischen durch höheren, kräftigeren Wuchs, größere Blätter, zum Teil längere Früchte, teilweise mehr lockeres, rauhes, teilweise jedoch sehr dichtes, gelblichgrünes Indument ab. Sie stellen vielleicht eine besondere Rasse dar. Wdb. 1371 bildet einen Übergang zwischen den beiden Extremen.

Literaturangaben von *M. odorata* (M. B.) R. Br. aus Persien dürften sich wohl zumeist auf *M. farinosa* beziehen.

9. ***M. dumulosa*** Boiss. & Buhse, Nouv. Mem. Soc. Nat. Mosc. 12: 14 (1860). Typus: „Djendak", Buhse 1253, G!

Suffrutex 10—20 cm altus, ramosissimus, ramis lignescentibus rigidis divaricatis, pilis stellatis cano-tomentosus. Folia caulina 20—25×7—10 mm, oblanceolata vel linearia, grosse sinuato-dentata, superiora integra, oblanceolata, crenulato-incisa. Racemi laxi, pauciflori. Petala 19×3,5 mm, limbo elliptico crispato nec autem in sicco revoluta. Siliqua 50—70 mm longa, ± 3 mm lata, compressa, apicem versus attenuata, nervo mediano vix visibili. Pedicelli fructiferi 2—3 mm longi, valde incrassati. Siliqua interdum insuper pilis glanduliferis immixtis ± appresse stellato-tomentosa, 5—7 cm longa, 3 mm crassa, subcompressa, demum ± glabrescens; valvae nervo mediano paulo elevato percursae; stigma minutum conico-attenuatum. Semina 2—3 mm longa, in parte inferiore alata.

Persia: E: Khor.: Mashhad, 1000 m, Schmid 6182!, 6183! Inter Mashhad et Quchan, 1100 m, Rech. 116! Kopet Dagh supra Quchan, 1700 m, Rech. 1629! Inter Quchan et jugum Alam Ali, 1600 m, Rech. 4763-b! Kuh-e Neyshabur, Darreh Abshar supra Akhla-

mad, 1800 m, Rech. 449! In montibus serpentinicis ditionis Robat-i Safid, 1800—2000 m, Rech. 1541! In montibus calc. inter Shirvan et Bojnurd, Rech. 1849! Deh-i Mohammad inter Herat et Tabas, Bge.! — C: Yazd: Jandaq, Buhse 1253!

Distr. gen.: Endem.

M. dumulosa ist durch außerordentlich starkes Verholzen, grob buchtig gelappte Blätter, rauhes Indument, wodurch die ganze Pflanze eine graugrünliche Färbung erhält, sowie durch relativ kurze, dicke, nur schwach zusammengedrückte Früchte und eine kleine konische Narbe mit spitzen, eng zusammengepreßten Lappen ausgezeichnet. Sie ist in ihrem Vorkommen auf den Nordosten von Persien beschränkt. Über die Unterscheidung von *M. afghanica* siehe unter dieser.

10. ***M. afghanica*** Rech. f. & Koeie, Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 5 (1954); Dan. Biol. Skr. 10, 3: 38, fig. 15 (1958).
Typus: Koeie 3849, W, C!

Suffrutex, multicaulis. Caules floriferi validi, 20—40 cm alti, foliati, simplices vel inferne pauciramosi; indumentum asperulum stellatum canescenti-virens. Folia inferiora 7—9×3—4 cm, irregulariter crebre pinnatifida, segmentis numerosis ± acutis; folia caulina omnia similiter pinnatifida paulo decrescentia. Pedicelli floriferi 1—2 mm longi, fructiferi elongati, paulo incrassati, usque ad 5 mm longi. Calyx ± 10 mm longus. Petala speciosa, calyce usque sesquilongiora, ± 4 mm lata, in sicco flavida. Siliquae maturae 8—10 cm longae, ± 3 mm latae, compressae, plerumque patulae, indistincte longitudinaliter plurinervosae, nervo mediano magis distincto, apice attenuatae, stellato-tomentellae, demum ± glabrescentes. Stigma capitato-bilobum, siliquae latitudine angustius.

Persia: E: Khor.: In montibus serpentinicis Robat-i Safid inter Mashhad et Torbat-e Heydariyeh, 1700 m, Rech. 1512!
Afghanistan: SW: Herat, 1500 m, Koeie 3849! — E: Kabul: Ad fontes fluvii Helmand prope jugum Unai, 2900 m, Thesiger 180! — C: Bamian: In jugo Lorinj, 3000 m, Koelz 13756! In faucibus Paimuri, 2700 m, Hdg. & Wdb. 4692! Bulola, 2700 m, Gilli 894! Parwan: In declivibus occidentalibus jugi Shibar, 2400 m, Hdg. & Wdb. 3299! In jugo Shibar, 2400 m, Neub. 4692!

Distr. gen.: Endem.

M. afghanica hat die grob buchtig gelappten Blätter und das rauhe Indument, das der Pflanze eine graugrünliche Färbung verleiht, mit *M. dumulosa* gemeinsam, unterscheidet sich jedoch von dieser durch geringere Neigung zum Verholzen, höhere, aufrechte, höher hinauf beblätterte Stengel, größere Kelche (über 10 mm), längere, dickere, deutlich zusammengedrückte Früchte mit deutlichem vorspringendem Mittelnerv.

11. ***M. tenera*** Rech. f., sp. nov.
Icon.: Wendelbo, Nytt Mag. Bot. 1: 33, fig. 12 (1952) sub *M. flavida* Boiss.
Typus: Rech. 31972, W!

Suffrutex caules floriferos tenues erectos 20—30 cm altos in tertia parte inferiore tantum foliatos simplices vel pauciramosos emittens. Indumentum omnino aequale, e pilis minutis stellatis intertextis consistens, velutino-tomentosum canum. Folia omnia indumento denso concoloria, basalia ambitu lanceolata, usque ad 5 cm longa, 1,5 cm lata, basi anguste cuneata, apice acuta rarius obtusiuscula, margine subintegra vel remote dentata vel sinuato-, rarius sublobato-dentata. Folia caulina abrupte decrescentia, anguste lanceolata, subintegra vel remote paucidentata, basi petioliformi-attenuata, summa anguste lineari-lanceolata valde diminuta vix conspicua. Racemi ab initio laxi. Pedicelli floriferi tenues, axi appressi, 1—2 mm, rarius usque

ad 5—7 mm longi, fructiferi aliquantum incrassati. Calyx ± 9 mm longus, tenuis; sepala virescentia, anguste hyaline marginata, laxiuscule appresse stellato-tomentella. Petala in vivo sordide viridi-flavescentia, demum fuscescentia, calyce subduplo longiora; lamina anguste lingulata, margine subplana. Siliqua 8—9 cm longa, vix 1,5 mm lata, compressa, erecto-patula, recta vel leviter curvata; valvae nervo mediano tenui sed distincto, pilis stellatis minutissimis appressissimis obsitae, virescentes. Stylus vix distinctus. Stigma anguste clavato-capitatum, lobis stigmaticosis angustis brevibus compressis, siliquae latitudinem aequans. — Differt a *M. flavida* habitu gracili, caulibus tenuibus imprimis prope basin ramosis et foliatis siliquis tenuioribus, sub stigmate magis constrictis, stigmatis lobis longioribus acutioribus, foliis latioribus, pedicellis p. p. quidem longioribus tenuioribus, indumento magis appresso subvelutino non aspero, calycibus floribusque minoribus.

Afghanistan: E: Gardez: M. Safed Kuh, in faucibus calc. declivium boreo-occidentalium ad occidentem jugi Altimur, 2600—2700 m, 6. VII. 1965, Rech. 31972! Logar, 2300 m, Volk 1710!
Pakistan: Chitral: In faucibus Brumboret SW oppidi Chitral, 1650 m, Bowes Lyon 612! Barum Gol, Shokor Shal, 3600 m, Wdb. s. n.! Infra Zapotili, 3500 m, Wdb. s. n.!

Distr. gen.: Pakistan occidentalis, Afghanistan orientalis, Kashmir.

M. tenera wurde bisher meist mit *M. flavida* identifiziert. Von dieser unterscheidet sie sich deutlich durch die in der Differentialdiagnose hervorgehobenen Merkmale. In ihrem Vorkommen ist sie auf die Gebirge von Ost-Afghanistan, West-Pakistan und Kashmir beschränkt. Aus den östlich außerhalb des iranischen Florengebietes gelegenen Gebieten liegen mir zwei sicher hierher gehörige Belege vor, nämlich: Kashmir, zwischen Astor und Bunji, 1300—2300 m, Schmid 1793, herb. G, und NW-Karakorum: Kl. Hunza-Engtal, 2300 m, Paffen 198, herb. M.

Die Zugehörigkeit meiner 28460 von Pakistan: Kalat, in fissuris rupium calc. inter Kolpur et Mach, 900 m, die sich vom Typus bei völliger Übereinstimmung in den Blüten-, Frucht- und Behaarungsmerkmalen durch schmälere, scharf bis fast gelappt-gezähnte Blätter unterscheidet, erscheint fraglich. Möglicherweise ist *M. revoluta* var. *thibetana* Conti, von der ich keine authentischen Belege gesehen habe, zu *M. tenera* zu stellen.

12. ***M. chorassanica*** Bge. ex Boiss., Fl. Or. 1: 151 (1867).
Typus: Inter Shahrud et Neyshabur, Bge., G!

Basi lignescens, pluricaulis. Caules 20—35 cm ± alti tenues, erecti vel ascendentes, imprimis in parte inferiore ramosi et foliati; rami arcuato-divergentes, ± virgati. Indumentum cinereum asperulum e pilis minutis stellatis ± laxiuscule dispositis consistens, cinereum vel virescens. Folia inferiora longiuscule petiolata, usque ad 6×1 cm, superiora minora, oblonga vel elliptica, acuta vel obtusiuscula, integra, subintegra vel remote dentata. Racemi ab initio laxi. Pedicelli 1,5—3 (—5) mm longi, fructiferi paulo incrassati. Calyx 8—11 mm longus. Petala sordide virescentia vel flavescentia vel brunnescentia. Siliqua 60—100×2 mm, tenuis, valde compressa, apice ± attenuata, laxe minute stellato-pubescens, virens, nervo mediano tenui sed distincto; stigma bilobum, lobis longiusculis conniventibus, siliquae maturae latitudine angustius. Semina 2,5×1,5 mm, anguste alata.

Persia: E: Khor.: Inter Shahrud et Neyshabur, Bge. In montibus serpentinicis ditionis Robat-e Safid, 1800—2000 m, Rech. 7341!
Afghanistan: NW: Badghiz, Aitch. 514. — SW: Inter Herat et Farah, 1500 m, Gilli 895! — E: Kabul: Barbur, 1700 m, Kerst. 110! 12—15 km W Sarobi, 1100 m, Hdg. & Wdb. 2785! Kuh-i Asmai, 1900 m, Hdg. & Wdb. 2719!, 3110! Sher Darwasa, 1800—2000 m, Gilli 896!, 897!, 898!, Hdg. & Wdb. 3174!, Podlech 10826! Chakewardak,

2600 m, Gilli 900! Kabul, 1800 m, Volk 701! Aliabad, 1860 m, Gilli 899! Sar-i Chashma, 2250 m, Hdg. & Wdb. 4457! Istalif, 1900 m, Lamond 2004! Hauz-i Mahiha, 2500 m, Koeie 2351! Ghazni: Inter Miradina et jugum Ghoutch Kol N Sang-i Masha, 3300 m, Rech. 17635! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17950! Dahan-e Abdila 35 km E Sar-i Chashma, 2800 m, Rech. 17996!, 18610! Qala Nau NW Ghazni, 2300 m, Rech. 17808! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Rech. 32090! — **NE**: Wakhan: Sar-i Skhaur in alveo fluvii Amu Darya, 2650 m, Roemer 23! Kataghan: In valle fluvii Andarab: 1100 m, Rech. 31772!, Lamond 2308! Inter Doshi et Doab, 950 m, Rech. 16560!, Hdg. & Wdb. 4082! Infra Sarab, 2400 m, Podlech 11137! Infra Tadjikan, 2200 m, Podlech 11247! Taganak, 2250 m, Podlech 11038! — **C**: Bamian: 4 km E Panjao, 2800 m, Rech. 18642! Panjao, 3000 m, Hdg. & Wdb. 4904! Unai, 3000 m, Hdg. & Wdb. 4545! Kuh-i Baba prope Bamian, 2900 m, Gilli 901! Band-i Amir, 2900 m, Hdg. & Wdb. 4766!, Rech. 18216! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16754!, 16755! Inter Kotal Deraz Kol et Panjao prope Mandigak, 2800—3200 m, Rech. 18693! Kuh-i Josha prope Panjao, 2900 m, Rech. 18760! Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18131! In valle Darreh-i Shikar inter Doab et Bulola, 1600—2000 m, Rech. 16710! 30 km S Doab, 2100 m, Hdg. & Wdb. 3357! In valle Ajar W Doab, 1400 m, Hdg. & Wdb. 4111! Bamian, 2500 m, Hdg. & Wdb. 4644! Inter Nil Kotal et Band-i Amir, 3200 m, Podlech 12089!

Distr. gen.: Endem.

Die Art ist gekennzeichnet durch halbstrauchig-vielstengeligen Wuchs, meist reichliche Verzweigung im unteren Stengeldrittel, weitaus überwiegend ganzrandige oder höchstens entfernt kurz gezähnte Blätter und durch kurzes, deutlich rauhes Indument, durch welches die ganze Pflanze einschließlich der Früchte eine graugrünliche Färbung erhält. Die Art ist in Afghanistan die häufigste der Gattung. Sie wurde bisher manchmal mit *M. integrifolia* Komar. identifiziert; ob zu Recht oder zu Unrecht, müßte durch Vergleich des Typus der letztgenannten Art festgestellt werden. Das von Bunge bei Boissier hervorgehobene Narbenmerkmal „stigmatis lobis longis divergentibus" ist am Typus nicht deutlich, ebensowenig an den von mir damit identifizierten Exemplaren.

13. ***M. flavida*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 9 (1845).
Typus: Ky. 392, G!

Basi lignosa, pluricaulis, omnino stellato-tomentosa. Caules erecti, usque ad 40 cm alti, a basi ramosi. Folia usque ad 5×1 cm, petiolata, lanceolato-oblonga, inferiora sinuato-dentata, superiora integra. Racemi floriferi laxi, pauciflori. Flores subsessiles. Calyx ± 8 mm longus. Petala lineari-spathulata, sordide flavescentia. Pediccli fructiferi 2—4 mm longi, incrassati. Siliquae 50—110×2 mm, compressae, stellato-tomentellae, nervo mediano vix prominulo; stigma truncato-bilobum quam siliqua paulo tantum angustius.

Persia: **S**: Kerm.: M. Jebal Barez, Deh Bakri, 2100 m, Rech. 3842! Kuh-e Jupar, 2300 m, Bornm. 2061. Kuh Tagh Ali, 2000 m, Bornm. 2065! In jugo Sang Bur inter Kerman et Saidabad, 2200 m, Rech. 2983! Kerman, Bge.! Kuh Seidin, 2100 m, Bornm. 2064. Fars.: Neyriz, Koelz 14703! Shiraz, 1600 m, Grant 17530! Kuh Ayub prope Persepolis, Ky. 392!, Davis 752!

Distr. gen.: Endem.

Die Art hat den halbstrauchig-vielstengeligen Wuchs, die reichliche Verzweigung und das rauhe Indument mit *M. chorassanica* gemeinsam, unterscheidet sich jedoch von dieser dadurch, daß Verzweigung und Beblätterung oft bis über die Stengelmitte hinausreichen, sowie durch die durchaus deutlich buchtig gezähnten, meist verhältnismäßig längeren und schmäleren Blätter und das mehr weißliche Indument. *M. flavida* ist bisher von wenigen, durchaus in den Gebirgen von Südpersien gelegenen Fundorten bekannt. Reife

Früchte habe ich nicht gesehen. An den unreifen erscheint das Indument im Vergleich zu *M. chorassanica* dichter und mehr weißlich, der Mittelnerv ist kaum hervortretend und die Narben breiter, mit weniger eng zusammengepreßten Narbenlappen.

14. ***M. chenopodiifolia*** Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 33 (1835).
Syn.: *M. porphyrantha* Rech. f., Aell. & Esfand., Phyton 3: 61 (1951).
Icon.: Clavis p. 29.

Typus: In litore orientali Maris Caspii, Karelin, LE.

Planta annua, 5—40 cm alta, saepe a basi ramosa, breviter appresse tomentella, cinerascenti-virens, raro ± glabrescens. Folia basalia et caulina inferiora usque ad 6×3 cm, late lanceolata usque elliptica, utrinque breviter attenuata, subintegra vel irregulariter remote sinuato-paucidentata, breviter petiolata; folia caulina valde decrescentia, caules ramique superne longe nudi. Racemi ab initio laxi, ± multiflori. Flores subsessiles vel breviter pedicellati; pedicelli fructiferi elongati et ± incrassati, patuli, usque ad 5 (—10) mm longi. Calyx 7—9 mm longus. Petala 24—30×3,7—4,7 mm, flavescenti- vel ± purpurascenti-virentia, limbus calyce subduplo longior, linearis. Siliquae 60—90×2,30 mm, patentes, subtorulosae compressae, saepe ± recurvatae, apicem versus attenuatae; stigmatis lobi arcte compressi, subconici.

Persia: W: Esf.: Kuh Siah, Gav Khuni, Stapf 84! Takht-i Sanembert, Deicke 323. — S: Fars.: Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5319! Kerm.: 30—40 km E Zahedan versus Mirjaveh, Lamond 126! Inter Saidabad et Chah-e Chaghak, 1700 m, Rech. 3153!, 3161!, 3170 (Typus *M. porphyranthae*)!, 3533! Inter Anar et Rafsanjan, Rech. 2828! Tahrud inter Kerman et Bam, 1500 m, Rech. 3589! Kerman, Bge.! Bal.: Inter Iranshahr et Khash, 900 m, Gauba 284! Persia australis: Aliabad, 1200 m, Popov 51/213! — E: Sistan: Naroui, Shar. 5838-E. 2 km SW Kohak, 36 km SE Zabol, 500 m, Grant 15340! Khor.: In parte boreali deserti Lut, 32° 20′ N, 57° 34′ E, Ruttner 504! Tabas, Jalgeh, Ruttner 547! Ozbagu, Kuh-e Safid, Ruttner 411! Inter Mashhad et Soltanabad prope Sabzevar, Rech. 5269! Inter Mayamey et Shahrud, Rech. 5301! — C: Qazv.: Mardabad prope Karaj, Gauba 283!, Rech. 1042-a! Shahr.-Bust.: Inter Shahrud et Abbasabad, 1000—1500 m, Schmid 6092! 20 km E Shahrud, Rech. 5398! Yazd: Jandaq: Chah-e Ebrahim Zahre ad meridiem deserti Kavir, Gabr. 79! — Shulgistan, 1800 m, Pravitz 726.
Turcomania: sec. Nikitin, Fl. Ashkhabad 169 (1965).
Afghanistan: NW: Hari Rud, Tirphul, Aitch. 278, 294.
Pakistan: Bal.: Kharan, H.-B. 23192.
Inter Padag et Nushki, 700 m, Lamond 159! Makran: 20—30 km a Panjgur versus Hoshab, Lamond 569!, Rech. 30113!

Distr. gen.: Persia, Turcomania, Afghanistan, Asia centralis.

M. chenopodiifolia ist in der Höhe des Wuchses, Dichte der Behaarung, Länge und Grad der Krümmung der Früchte und Farbe der Petalen — gelblich grün, mit oder ohne rötliche bis bräunliche Streifen, ausnahmsweise ganz purpurn — ziemlich variabel. Nachdem ich neuerdings die Art mehrfach in der Natur beobachten und reichlicheres Herbarmateriel vergleichen konnte, sehe ich bei den in allen wesentlichen Punkten übereinstimmenden Fruchtmerkmalen in *M. porphyrantha* nur mehr eine luxuriante, stark verkahlende, rotblühende Form der Art.

15. ***M. macranica*** Rech. f., sp. nov.
Typus: Rech. 30111, W!

Annua, radix tenuis. Caules singulus vel plures, prope basin ramosi tenues, 8—15 cm longi, erecti, in dimidio vel in tertia parte inferiore foliati. Indumentum totius plantae e pilis ramosis minutis albidis appressis laxiuscule dispositis consistens,

canescens. Folia basalia rosulata, petiolata; petiolus lamina brevior vel eam subaequans; lamina ovata, 10—20×7—14 mm, basi late cuneata, apice obtusiuscula vel ± acuta, margine breviter remote subsinuato- vel subcrenato-dentata; folia caulina omnia petiolata, inferiora late, superiora anguste lanceolata, basi cuneata, apice acuta, margine remote breviter dentata. Racemi pauciflori. Pedicelli floriferi 1—3 mm longi, tenues, erecto-patentes, fructiferi haud elongati et incrassati. Calyx 6 mm longus, basi saccatus; sepala anguste indistincte membranaceo-marginata, pilis ramosis appresse laxe tomentella, canescentia. Petala sordide flavescentia, calyce vix tertia parte longiora, lamina linguiformi, 1 mm lata, antice rotundata. Siliquae maturae 3,5—6 cm longae, 1,5 mm latae, lineares, compressae, leviter torulosae, basi brevius, apice sublongius attenuatae, pilis minutis ramulosis albidis laxe obsitae virescentes; stigma elongato-clavatum usque ad 2 mm longum, lobis compressis 1 mm longis. Semina valde compressa, anguste scarioso-marginata, 2 mm fere longa, vix 5 mm lata, rotundato-subquadrata.

Pakistan: Makran: In planitie arenosa 20—30 km S Panjgur versus Hoshab, 20. IV. 1965, Rech. 30111!, Lamond 579!

Distr. gen.: Endem.

M. macranica steht der *M. chenopodiifolia* zunächst, ist aber von ihr durch folgende Merkmale auffällig verschieden: zarten, niedrigen Wuchs, schmale, an der Spitze kurz verschmälerte Früchte, relativ breite, von der Schote deutlich abgesetzte Narbe, kleine Kelche und winzige Blüten.

16. ***M. longipetala*** (Vent.) DC., Reg. Veg. Syst. Nat. 2: 174 (1821).
Syn.: *Cheiranthus longipetalus* Vent., Descr. Pl. Jard. Cels. 93 (1800). *Matthiola oxyceras* DC., Reg. Veg. Syst. Nat. 2: 173 (1821).
Icon.: Clavis p. 31.
Typus: Baghdad, Oliv. sec. DC., P.

Planta annua, tenuiter pubescens, glandulosa vel eglandulosa, 10—25 (—30) cm alta, raro elatior. Caulis ± ramosus vel simplex, erectus, rarius ascendens. Folia oblanceolata vel linearia, basalia runcinata, caulina sinuato-dentata vel integra. Pedicelli floriferi 4,5—5 mm longi, fructiferi incrassati, patuli, usque ad 9 mm longi. Calyx 7—9 mm longus. Petala 23—27×3—5 mm, flavida purpurascentia, limbo lineari-elliptico. Siliquae 4,5—9 cm longae patentes, rectae, apice bicornutae, cornua lateralia usque ad 10 mm longa, rectangulariter patentia vel ± reflexa, subulata; stigma crasse conicum obtusum dimidiam vel tertiam partem longitudinis cornuum lateralium attingens.

Iraq: Arbil: Jindian prope Rawandiz, Guest 746. Kirkuk: Darbandikhan, Issac 322! Inter Khanaqin et As Sadiyah, Evans M-203! 9 km a Kirkuk versus Altin Köprü, Erdtman & Goedemans in Rech. 15521! Prope Kirkuk, Guest 1358. Jarmo, Helbaek 316! Diyala: Jabal Hamrin, Sutherland 137!, Rech. 14214!, Nab. 1330, Bornm. 853!, Guest 1795, Haines. Shahraban, Rech. 9721!, 9728! 10 km E Mandali, Rech. 12790! Khanaqin, Rech. 14089!, 14126!, Jalula, Guest 1881. Amarah: Shatt at-Tib, 70 km N Amarah, Rech. 8876! Jabal Ruhaila, Rech. 8904! Kut-al Imara: 30 km SE Badrah, Rech. 9157!, 14009!, 14044!
Persia: W: Kurd.: 18 km N Sanandaj, 1500 m, Wdb. 1835! Kermansh.: Bisotun, Str. Kurd.: Kuh-i Emrullah prope Sonqor, Str. Ham.: 48 km NE Hamadan, 2000 m, Stutz 1302! Hamadan, Pichler! 57 km SE Hamadan, 5 km N Kord Khvord, 1700 m, Bent & Wr. 528—703! 48 km SW Hamadan versus Kermanshah, 1500 m, Furse 1947! Khuz.: Inter Shushtar et Dezful, Nab. 1365. Inter Ahvaz et Shushtar, Nab. 1373. Ahvaz, Koelz 14889!, Wdb. 3! Mehran, Salihabad, Farahbakhsh 5839-E! Aboudasht, Esfand. 113-E!

Lur.: Posht Kuh, Halat-e Mehran, Behb. 117! Dehloran, Nab. 1369. Shah Bazan, Koeie 422! Khorramabad, Bent & Wr. 412—409!, Gauba 112! Dow Rud, Koelz 17200! Ilam, 400 m, Jacobs 6254! Bakht.: Gatvand, Mart.-Escal. Arak: Mowdar, Str. — S: Fars.: Inter Ali Changi et Hawize prope Bushehr, Nab. 1359. Persepolis, 800—1700 m, Schmid 5433!, Grant 15182!, Gauba 113! Takht-e Jamshid, Koelz 14458!, Wdb. 778! Khafr prope Shiraz, 1400 m, Gauba 110! Kotal-e Malu, Stapf 85! Bushehr, Stapf 86! Baghmani prope Bushehr, Bornm. 51. Dalaki, Kmendt. Kumaraj in collibus gyps., Stapf 88! 64 km W Kazerun, Stutz 889! Lar.: Ad pagum Gohreh N Bandar Abbas, 700 m, Rech. 3270!, 3319! Hormoz, Behb. in Gauba 109! Lar, Gauba 111! Parabedin prope Hajjiabad, Mird. in Gauba 120! Minab, Popov 51/221! In planitie Tasht Khvord, 900 m, Popov 51/49! Persia australis, Auch. 4074, Ky. 176.

Distr. gen.: Rossia australis, Persia, Iraq, Syria, Anatolia, Arabia, Cyprus.

Die im Gebiet der Flora Iranica vorkommende Sippe entspricht der subsp. *longipetala*. Sie ist in fast allen Merkmalen äußerst variabel.

17. ***M. aspera*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 16 (1849).
Icon.: Tab. 11, fig. 2.
Typus: „In sterilissimis calidis Judeae inter S. Saba et Mare Mortuum", Boiss., G!

Annua, 10—25 cm alta. Indumentum caulis et foliorum e pilis patulis superne pauciramosis (simplicibus interdum immixtis) consistens; planta virens. Caules plures ascendentes vel unicus erectus inferne ramosus. Folia basalia usque ad 8×2 cm, lanceolata, pinnatifida et sinuato-dentata acutiloba, superiora anguste lanceolata, integra. Flores subsessiles. Calyx 10 mm longus, hispidulus. Petala calyce plusquam duplo longiora, lamina oblongo-spathulata, in sicco intense rosea unguem versus expallescentia. Siliquae 6—8 cm longae, crassiusculae, teretes, suberectae, erecto-patentes, pilis ramulosis appressiusculis laxe obsitae, canescenti-virentes; stigma 1,5 mm longum, conicum; cornua usque ad 8 mm longa, horizontaliter patentia, apice leviter antice curvata.

Iraq: Kirkuk: Jarmo, Helbaek 459!, 460!

Distr. gen.: Israel, Iraq.

Die Art war meines Wissens bisher nur aus Israel bekannt. Sie steht der *M. longipetala* sehr nahe, ist aber durch das rauhe, etwas abstehende Indument, die noch in trockenem Zustand rosenfarbigen bis purpurnen Petalen und die grüne Färbung der ganzen Pflanze auffällig verschieden.

Species incomplete nota

M. spathulata Conti, Mém. Herb. Boiss. 18: 49 (1900).
Typus: In monte Karaghan, Pichler, WU!

Planta humilis, tenuiter pubescens, glaucescens, non glandulosa. Caules floriferi simplices, erecti, copiose foliati. Folia parva, partim rosulato-congesta, ut caulina inferiora subspathulata vel obovata, apice rotundata, basi in petiolum lamina longiorem attenuata, superiora oblonga, breviter petiolata. Racemi brevissimi. 6—12-flori. Pedicelli floriferi 3—5 mm longi. Calyx 12—14 mm longus. Petala 29—33 × 4—4,5 mm, limbo ungue duplo longiore; unguis latus indistinctus. Siliqua ignota.

Distr. gen.: Endem.

Species excludenda

M. dentata Parsa, Kew. Bull. 1947: 17 (1948) = *Diceratella canescens* Boiss. (Typus in hb. K!)

87. *Chorispora*

Chorispora R. Br. ex DC., Reg. Veg. Syst. Nat. 2: 435 (1821), nom. conserv.
Syn.: *Chorispermum* R. Br. in Aiton, Hort. Kew. ed. 2, 4: 129 (1852).

Lit.: O. E. Schulz, Notizblatt des botanischen Gartens und Museums zu Berlin-Dahlem 9: 1071 (1927).

Herbae perennes vel annuae, pilis simplicibus, interdum glandulosae. Folia dentata vel pinnatisecta. Sepala erecta, saepe cohaerentia, interiora saccata. Petala purpurea vel flava, longe unguiculata. Filamenta exteriora linearia, interiora saepe latiora et per paria cohaerentia. Ovarium subulatum, 8—26-ovulatum. Stylus elongatus, acuminatus; stigma bipartitum, lobis carpidialibus decurrentibus. Siliqua linearis, cylindrica, inter semina constricta, articulata, in rostrum cavum excurrens, demum siliqua in articulos diffracta.

1a. Plantae perennes regionis nivalis 2
b. Plantae annuae regionum depressorum aridorum 3
2a. Petala flava ..... 1. *Ch. macropoda* Trautv.
b. Petala roseo-violacea ..... 2. *Ch. Bungeana* Fisch. & C. A. Mey.
3a. Petala flava, retusa ..... 3. *Ch. iberica* (M. B.) DC.
b. Petala rosea vel purpurea, integra 4
4a. Rostrum siliqua longius, extus curvatum; siliqua crassa, vix strangulata .. .. 6. *Ch. persica* Boiss.
b. Rostrum siliquam ad summum aequans, ± rectum 5
5a. Calyx 5—6 mm longus. Petala 8—10 mm longa ... 4. *Ch. tenella* (Pall.) DC.
b. Calyx 7—10 mm longus. Petala 15—18 mm longa .... 5. *Ch. purpurascens* (Banks & Soland.) Eig

1. ***Ch. macropoda*** Trautv., Bull. Soc. Nat. Mosc. 33, tab. 109 (1860).
Icon.: Tab. 20, fig. 2.
Typus: Dschabika, Dsungaro-Tarbagatai, Schrenk, LE.

Planta caespitosa, glabra. Rhizoma verticale validum pluriceps. Caules tenues flexuosi, 5—8 (—10) cm longi. Racemi fructiferi laxi. Folia longe tenuiter petiolata; lamina usque 20×7 mm, lanceolata, pinnatisecta vel argute inciso-dentata. Sepala 3 mm longa. Petala flava, sepalis duplo usque triplo longiora. Pedicelli fructiferi erecto-patentes, tenues, elongati, usque ad 8 mm longi. Siliqua stylo fere 2 mm longo incluso 8 mm longa, moniliformis, plerumque 3-articulata.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, in glareosis ad nives liquescentes, 3300 m, Rech. 31543!, Lamond 2217!, 4000 m, Podlech 12207. Paghman: Sanlakh, 3900 m, Thesiger 200! Panjshir: In declivibus occidentalibus jugi Anjuman, 3900 m, Wdb. 5424! In declivibus orientalibus jugi Anjuman, 4400 m, Podlech 12418. Darreh Rastagal, 4000—4400 m, Wdb. 5206! — NE: In jugo Munjan, Koelz 12726. Wakhan: In valle Futur, 4500 m, Roemer 65.— Kataghan: Khost-o Fereng in valle Echani, 4300 m, Podlech 11819. — C: Bamian: Kuh-i Baba supra Zard Darreh, 4320 m, Gilli 891!, 892! Infra jugum Hajigak, 3100 m, Dückelmann in Gilli 890!
Pakistan: Swat: Inter Diwangol et Pichar, 3500 m, Ogino 137, 156, 179; 3650 m, Honda 147. In jugo Dadarili, 4500 m, Honda 211. — Chitral: Gangalwat Gol, 3500 m, Stainton 2728! Chitral Gol, 3500 m, Stainton 2666! Gasin Gol, 36° 36′ N, 72° 55′ E, 3750 m, Bowes Lyon 949!

Distr. gen.: Tien Shan, Pamir-Alaj, Dsungaro-Tarbagatai, Chitral, Swat, Afghanistan.

2. ***Ch. Bungeana*** Fisch. & C. A. Mey. in Schrenk, Enum. Pl. Nov. 1: 96 (1841).
Syn.: *Ch. exscapa* Bge. ex Ledeb. Fl. Ross. 1: 169 (1842).
Icon.: Clavis p. 19; tab. 19, fig. 1 et 2.
Typus: Baskan, Dsung. Alatau, Ledeb., LE.

Rhizoma verticale, pluriceps; caespitosa, glabra. Caules floriferi et fructiferi valde abbreviati vel nulli. Folia longe tenuiter petiolata; lamina usque 30×8 mm, lyrato-pinnatifida vel inciso-dentata. Sepala 7 mm longa. Petala roseo-violacea, sepalis duplo longiora. Pedicelli fructiferi elongati, demum usque ad 30 (!!) mm longi. Siliqua 20—30 mm stylo ± 5 mm longo incluso longa, tenuis, moniliformis, articulis numerosis.

Afghanistan: E: Panjshir: Darreh Rastagal, 3600 m, Hdg. & Wdb. 5251! Nuristan: In declivibus australibus jugi Pirdum, 3000—3700 m, Kerst. 1088! — NE: Kataghan: Khost-o Fereng, in declivibus borealibus Kotal-i Yawnu, 3400 m, Podlech 11713. In valle Echani, 3700 m, Podlech 11856.
Pakistan: Chitral: Infra Zapotili, 3500 m, Wdb. s. n. Chitral Gol, 3750 m, Stainton 2663! Lutko, Chinko Ghari, 2600 m, Bowes Lyon 770! South Barum Glacier, 4500 m, Wdb. s. n. — Kurram: In ditione Hariab in apricis alpinis, 3500—3600 m, Aitch. 119.

Distr. gen.: Altaj, Dsungaro-Tarbagatai, Tien Shan, Pamir-Alaj, Chitral, Afghanistan, Pakistan occidentalis.

3. ***Ch. iberica*** (M. B.) DC., Reg. Veg. Syst. Nat. 2: 437 (1821).
Syn.: *Raphanus ibericus* M. B., Fl. Taur.-Cauc. 2: 129 (1808). *Ch. compressa* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 385 (1842). *Ch. iberica* var. *torulosa* Boiss., Fl. Or. 1: 144 (1867).
Typus: Iberia, LE.

Annua, (5—) 10—40 cm alta, glandulosa et pilis patulis obsita. Folia lanceolata, acuta, pinnatifida vel runcinata. Sepala 5—7 mm longa. Petala flava, 10—15 mm longa, retusa. Siliqua 20—30 (—40) mm longa, crassiuscula, a latere compressa, in rostrum 10—15 mm longum attenuata, tenuiter papillosa, matura non strangulata, utrinque canaliculata, loculis vacuis latis.

Talish: Swant, 1200—1500 m, Hohen.
Persia: W: Azerb.: Marand, Grossh. Azerbaijan, Auch. Khvoy, Knapp. Tabriz, Gill.-Sm. 1320, 1335, 1368.

Distr. gen.: Iberia, Armenia, Talish, Persia boreo-occidentalis.

4. ***Ch. tenella*** (Pall.) DC., Reg. Veg. Syst. Nat. 2: 435 (1821).
Syn.: *Raphanus tenellus* Pall., Reise 3, Anh. 105 (1776).
Typus: Rossia europaea austro-orientalis, LE.

Annua, 8—20 (—40) cm alta, sparse glandulosa. Folia inferiora usque ad 9×2 cm, breviter petiolata, late vel anguste lanceolata, runcinato-pinnatifida vel sinuato-dentata, rarius subintegra, superiora decrescentia brevius petiolata vel basi attenuata sessilia, dentata vel integra. Calyx 5—6 mm longus. Pedicelli calyce breviores, tenues, erecti, fructiferi incrassati, patuli. Petala rosea vel purpurea, 8—10 (—12) mm longa. Siliqua 15—30 mm longa, patula vel saepe arcuato-ascendens, tenuiter cylindrica, indistincte articulata, in rostrum tenue rectum siliqua paulo brevius sensim attenuata.

Persia: N: Gorg.: 72 km ENE Gonbad-e Kavus, 900 m, Furse 5131! Maz.: 48 km S Amol, 900 m, Furse 5061! Ileka, Furse 2774! In valle Haraz, Zardman, Wdb. 360!

Persia borealis, Buhse, Szov., Bge. — W: Azerb.: Inter Bostanabad et Ardabil, 1500 m, Furse 2401! Tabriz, Knapp, Gill.-Sm. 1342, 1366, 1398, 1404. Kermansh.: Sar-i Pul prope Qasr Shirin, 600 m, Nab. 1293. Ham.: M. Tafresh, Str. Aq Bolagh-e Aqdaq, Rioux & Golv. 173! Arak: Kuh Kohrud, Str. Arak versus Golpayegan, 1900 m, Bornm. 2125. Esfahan, 1600 m, Bornm. 2123. Bakht.: 24 km NE Shahr Kord, 2400—2700 m, Furse 1411! — S: Fars.: Shiraz, Koelz 14511!, Pravitz 539. Inter Persepolis et Yazd, 1780 m, Furse 1292! Kuh-e Bamu, Archibald 1381! Kerm.: Inter Mashiz et Khan-e Sorkh, 2000 m, Rech. 3026! Kuh-e Jupar, 3000 m, Bornm. 2127. — E: Khor.: Inter Torbat-e Heydariyeh et Assadabad, Rech. 4454! Kuh-e Mish, Ruttner 617! — C: Tehr.: In declivibus australibus M. Damavand, 2100 m, Furse 2550! Hashemabad, Bruns. Tehran, Bornm. 96. Qazv.: Soltanabad prope Qazvin, Linds. 27. Mazraeh, 1200 m, Schmid 5040! Qazvin, 1200 m, Schmid 5093!, Stutz 704! Karaj, Gauba. Qom: Qom, 1900 m, Bornm. 2093-b. Yazd: Feyzabad versus Bambis, 1900 m, Bornm. 2129. Deh Bala, 2300 m, Bornm. 2126. In montibus prope Yazd, Buhse 1319, 1330.
Turcomania: Kizyl Arvat, Becker. In montibus prope Gaudan, 1800 m, Litw. 484.
Afghanistan: NW: Herat: Tirphul, Aitch. 1016. Obeh, 1700 m, Koelz 3777! Qala Nau, 700 m, Koelz 3527! Morghab, 500 m, Koelz 3511! — SW: Jija, 1400 m, Koelz 4149! — SE: Kandahar, 1000 m, Gilli 889! — E: Kabul: Guzar Gah, Neub. 51/31! Kabul, 1700 m, Volk 81-C! Sher Darwasa, 1900 m, Podlech 10185! Ghorband, Neub. 50/555! — Afghanistan, Griff.
Pakistan: Kurram: Parachinar, 1800 m, Afendi 155! Habibkala, Aitch. 211. Inter Shalozan et Habibkala, Aitch. 133. — N. Wazir.: Boya Fort, Blatt. & Fz. 77, 115, Fz. 1169. Datta Khel, Blatt. & Fz. 596, 1498-A, Fz. 1209, 1231. — S. Wazir.: Shindar, 2100—2700 m, Blatt. & Fz. 1584. — Quetta: Sheila Bagh, 1800 m, Lace s. n.! Spin Karez, 1800 m, Rech. 27351! Quetta, Lace 3624, 3634. Sibi, Jafri s. n. Ziarat, 2200 m, Rech. 29304! Sariab, 1700 m, Lamond 938!, Rech. 28820! — Kalat: A Surab 20 km versus Kalat, 1800 m, Lamond 678! — Sibi, Jafri s. n. — Baluchistan, Stocks.

Distr. gen.: Rossia europaea austro-orientalis, Peninsula balcanica, Caucasus, Transcaucasia, Turcomania, Anatolia, Persia, Afghanistan, Pakistan, Asia centralis, Sibiria occidentalis, Mongolia.

5. ***Ch. purpurascens*** (Banks & Soland.) Eig, Journ. Bot. 75:189 (1935).
Syn.: *Brassica purpurascens* Banks & Soland. in A. Russell, Nat. Hist. Aleppo 258 (1794). *Ch. syriaca* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 384 (1842).
Typus: Non indicatus.

Annua, (10—) 20—40 cm alta, glanduloso-pilosa. Folia inferiora lanceolata, 3—4 cm × 1—1,2 cm, breviter petiolata, lyrato-pinnatifida, superiora angustiora, acuta, dentata. Calyx 9—10 mm longus. Pedicelli floriferi calycem ± aequantes, fructiferi elongati, paulo incrassati, patentes. Siliqua rostro incluso 3—4 cm longa, ± 3 mm lata, subcylindrica, breviter compressa, leviter strangulata, rugulosotuberculata, retrorse papillosa, in rostrum subulatum siliqua paulo brevius sensim attenuata.

Persia: W: Azerb.: Tabriz, Jacobs 6136! Esf.: Inter Delijan et Esfahan, Schmid 5183!

Distr. gen.: Palaestina, Syria, Libanon, Iraq, Persia occidentalis.

6. ***Ch. persica*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 384 (1842).
Syn.: *Ch. persica* var. *longirostris* Bornm., Bull. Herb. Boiss. 4: 1259 (1904). *Ch. persica* var. *stipitato-glandulosa* Parsa, Kew. Bull. 1947: 17 (1947).
Icon.: Tab. 20, fig. 1.
Typus: Auch. 4169-a.

Annua, 10—25 cm alta, glandulosa. Folia oblongo-lanceolata vel lanceolata, sinuato-dentata, inferiora 3—4 × 1 cm, breviter petiolata, superiora angustiora.

Calyx 6—7 mm longus. Petala intense rosea, angusta, calyce vix duplo longiora. Pedicelli floriferi calyce breviores, fructiferi paulo elongati, incrassati, erecti. Siliqua sine rostro ± 10 mm longo crassa brevis, 3—4-articulata; rostrum siliqua pluries longius, subulatum, erectum, omnino vel apice tantum extus curvatum.

Persia: W: Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 172! Inter Hamadan et Sanandaj, 1800 m, Furse 2001! Kermansh.: „Dscheiranbulagh", Str. Esf.: Prope Esfahan, Auch. 4169-A. Arak, 1600—1800 m, Str. Lur.: Azna, 1800 m, Furse 1516! — C: Qazv.: Kuhin inter Qazvin et Manjil, Gauba 285! Qazvin, 1500 m, Jacobs 6205! Fashand, 1600 m, Gauba 1351. In jugo inter Rasht et Qazvin, 2000 m, Bornm. 6301. Soltanabad prope Qazvin, Linds. 79!

Distr. gen.: Endem.

Bornmüller hat in Bull. Herb. Boiss. 4: 1259 (1904) eine var. *longirostris* beschrieben, die, nach vorliegenden, reichlichen Belegen zu urteilen, innerhalb der normalen Variationsbreite der Art fällt. *Ch. persica* var. *stipitato-glandulosa* Parsa, Kew Bull. 1947: 17 weicht vom Typus überhaupt nicht ab.

88. *Diptychocarpus*

Diptychocarpus Trautv., Bull. Soc. Nat. Mosc. 23, 1: 108 (1860).
Syn.: *Alloceratium* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 129 (1861). *Orthorrhiza* Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51: 306 (1886). *Chorispora* R. Br. Sect. *Diptychocarpus* Prantl in Engler & Prantl, Natürl. Pflanzenfam. ed. 1, 3: 2: 203 (1891).

Herba annua, pilis longiusculis simplicibus obsita. Folia lineari-lanceolata, dentata, summa integra. Sepala erecta, ± cohaerentia, interiora saccata. Filamenta exteriora quam interiora angustiora; antherae oblongae. Siliquae variabiles. — Genus monotypicum.

1. ***D. strictus*** (Fisch.) Trautv., Bull. Soc. Nat. Mosc. 23, 1: 108 (1860).
Syn.: *Raphanus strictus* Fisch. ex M. B., Fl. Taur.-Cauc. 3: 452 (1819). *Chorispora stricta* DC., Reg. Veg. Syst. Nat. 2: 436 (1821). *Matthiola Fischeri* Ledeb., Fl. Ross. 1: 110 (1842). *Alloceratium strictum* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 135 (1861). *Orthorrhiza persica* Stapf, Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 51: 306 (1886).
Icon.: Clavis p. 19.
Typus: Circa lacum Inderiensem, Tauscher.

Herba annua, (10—) 40—50 cm alta, stricte erecta, pilis longiusculis simplicibus obsita. Folia lineari-lanceolata, dentata, summa integra. Sepala erecta, ± cohaerentia, interiora saccata. Petala alba demum violacea, angusta. Filamenta exteriora quam interiora angustiora; antherae oblongae. Siliquae variabiles, inferiores in plantis validis subarticulatae, superiores compressae, bivalves; stylus distinctus; stigma lobis carpidialibus decurrentibus. Semina siliquorum indehiscentium basi apiceque anguste alata; ea siliquarum dehiscentium circumcirca late alata.

Persia: N: Gorgan, Shar. 558. — W: Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 182! Mehran prope Hamadan, Pichler. — S: Lar.: Bandar Khamir, Ab-e Garm, Soltani 6382-E! — E: Khor.: Mashhad, 1520 m, Furse 5271! Kuh-e Neyshabur: Darreh Abshar prope Akhlamad, 1800 m, Rech. 4538! — C: Tehr.: Shahr Rey prope Tehran, Ky. Yazd: Inter Jandaq et Yazd, Buhse. Qazv.: In montibus prope Kalak, Gauba.

Turcomania: Ashkhabad, Litw. 486! In deserto ad fluvium Tedzhen, Litw. 487! Suluklü, Sint. 1059. Kizyl Arvat, Sint. 1660!
Afghanistan: NW: Qala Nau, 700 m, Koeie 4160! Tirphul, Hari Rud, Aitch. — SW: Herat: 48 km S Herat, 1360—1800 m, Furse 5448! Inter Farah et Shindand, 1000 m, Koeie 4148! — NE: Kataghan: Farkhar, 1250 m, Podlech 10480! Banu in valle Andarab, 1550 m, Podlech 10918!
Pakistan: Quetta: Quetta versus Ziarat, 200 m, Rech. 29286!, Lamond 1165. Spin Karez, 1800—1900 m, Lamond 1138, Rech. 29271! Quetta, Lace. Sheila Bagh, Lace. Chiltan inter Dulai et Kanak, 1600 m, Lamond 1098, Rech. 29100! Inter Bostan et Saran Tangai, 1700 m, Rech. 29171!

Distr. gen.: Rossia europaea austro-orientalis, Persia, Afghanistan, Pakistan occidentalis, Asia centralis.

89. *Parrya*

Parrya R. Br. in Parry, Jour. Voy. N. W. Pass. App. 268 (1824).
Syn.: *Parria* Steud., Nomencl. Bot., ed. 2, 2: 269 (1841).

Herbae perennes, ± caespitoso-suffruticosae, caulibus floriferis saepe scaposis, ± glabrae vel indumento e pilis simplicibus interdum glanduliferis obsitae. Flores rosei vel purpurei, speciosi; petala longe unguiculata. Sepala erecta, interiora saccata. Antherae oblongae. Filamenta libera, interiora quam exteriora latiora. Siliqua oblonga vel linearis, a dorso compressa; valvae reticulato-nervosae, nervo mediano distincto. Stigma bifidum lobis conniventibus. Semina biseralia compressa. Radicula accumbens.

Die Bearbeitung ist wegen des spärlichen verfügbaren Vergleichsmaterials als provisorisch zu betrachten.

1a. Laxe suffruticoso-caespitosa, caudicibus vix comosis, ± glabra vel pilis longis eglandulosis sparse obsita. Folia aut ± integra aut pinnatisecta, lobis 1—2 mm latis ..... 1. *P. minjanensis* Rech. f.
b. Dense ± pulvinato-caespitosa, caudicibus residuis petiolorum crassis dense comosis, ± glabra vel pilis brevibus glanduliferis obsita. Folia aut ± integra aut dentata aut inciso-serrata ..... 2. *P. nudicaulis* (L.) Regel

1. ***P. minjanensis*** Rech. f., Phyton 3: 62 (1951); Dan. Biol. Skr. 10, 3: 42, fig. 16 (1958).

Syn.: *P. chitralensis* Jafri, Notes Roy. Bot. Gard. Edinb. 22: 115 (1956). *P. chitralensis* Rech. f., Dan. Biol. Skr. 10, 3: 41 (1958), syn. heterotypicum.
Icon.: Clavis p. 11 et 19.
Typus: Koelz 12679, W!, US.

Laxe caespitosa, ± suffrutescens, caudicibus brevibus vel ± elongatis non comosis, subglabra vel folia pilis simplicibus longiusculis sparse obsita. Scapus 5—30 cm altus; racemus abbreviatus, pauciflorus, fructifer elongatus. Folia omnia rosulata, 2—7×1—1,6 cm, 5—7-jugo-pinnatisecta, lobis integris 1—2 mm latis, vel folia ± anguste lineari-lanceolata ± integra. Pedicelli 2—6 mm longi, fructiferi valde elongati, usque ad 35 mm longi. Calyx 7—10 mm longus; sepala hyaline marginata, glabra vel sparse longe pilosa. Petala 15—18×3—5 mm, spathulata, antice leviter emarginata, longe unguiculata. Siliquae submaturae usque ad 80×4 mm, lineares inter semina leviter constrictae, apice in stylum sensim attenuatae.

Afghanistan: E: Panjshir: Darreh Rastagal, 3200 m, Hdg. & Wdb. 5218! Nuristan: Inter Parun et Bashgul, Edelb. 1167! Kantivo, 3300 m, Kerstan 972! Nuristan orientalis, Edelb. 1082!, 1083! — NE: In jugo Munjan, Koelz 12679. Kataghan: Darreh-i Til, S Doab-i Til in valle Andarab, 2800 m, Podlech 11188! Khost-o Fereng, NE Kotal-i Yawnu versus vallem Kala, 3200 m, Podlech 11715! — C: Bamian: In jugo Shahtu, 3200 m, Hdg. & Wdb. 4867!
Pakistan: Chitral: Birmogh Lasht, 35° 55′ N, 71° 64′ E, 3500 m, Bowes Lyon 739. Chitral, 3300 m, Harriss 15910 (Typus *P. chitralensis* Jafri). Shah Jinali, 3150—3300 m, Toffin 375. Barum Gol supra Och Anzog, 3900 m, Jörstad in Wdb. s. n.! Marmano Shal, 3700 m, Wdb. s. n. (Typus *P. chitralensis* Rech. f.)!

Distr. gen.: Endem.

Die Art wurde unabhängig von Jafri (1956) und von Rechinger (1958) auf Grund verschiedener Typen unter demselben Artnamen beschrieben.

2. ***P. nudicaulis*** (L.) Regel, Bull. Soc. Nat. Mosc. 11: 256 (1870).
Syn.: *Cardamine nudicaulis* L., Spec. Plant. 654 (1753).
P. macrocarpa R. Br. in Parry, Jour. Voy. N. W. Pass. App. 270 (1824).
Typus: „Hab. in Sibiria", D. Gmelin.

Herba perennis suffrutescenti-caespitosa interdum ± pulvinaris, caudicibus residuis crassis petiolorum dense comosis. Planta aut ± glabra (var. *glabra* Hooker) vel pilis glanduliferis obsita. Scapus florifer 5—10 cm, fructifer 10—15 (—25) cm altus, racemis fructiferis elongatis. Folia usque ad 5×1 cm, omnia rosulata, in petiolum crassum sensim attenuata, lanceolata, acuta, subintegra vel remote dentata vel inciso-serrata. Pedicelli floriferi 3—10 mm, fructiferi usque ad 30 mm longi. Calyx 7—8 mm longus; sepala anguste hyaline marginata, plerumque glabra. Petala 16—20 mm longa, lamina late obcordato-cuneata, leviter emarginata. Siliqua usque ad 55×5 mm, linearis, basi apiceque subaequaliter attenuata, glabra vel glandulosopilosa; stylus 1,5—2 mm longus.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, 3300 m, Rech. 31558! Panjshir: Darreh Rastagal, 3800 m, Hdg. & Wdb. 5208! Unai, Kuh-i Qhalandaran, 3800 m, Hdg. & Wdb. 4502! — C: Bamian: Kuh-i Baba, Zard Darreh, 4200 m, Gilli 905! Kuh-i Baba, 3900 m, Koelz 2619!; 4000 m, Gilli 904! — Afghanistan, in regione alpina, 3600 m, Griff.

Distr. gen.: Asia et America occidentalis arctica, montes Asiae centralis, Himalaya occidentalis, Afghanistan.

Die Art ist in Wuchs, Blattform, Behaarung und Länge der Schoten variabel.

Species dubiae

P. scapigera G. Don, Gen. Syst. 1: 173 (1831). — Icon.: Clavis p. 13. — Afghanistan, in arenosis, Griff.

This species was provisionally recorded from Afghanistan on the basis of an immature Griffith gathering (Dan. Biol. Skr. 10, 3:40 ([1958]).

90. *Koeiea*

Koeiea Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 2 (1954); Dan. Biol. Skr. 10, 3: 28, fig. 8 (1958).

Suffrutices. Folia laceolata-linearia. Sepala scarioso-marginata, exteriora leviter saccata. Indumentum e pilis ramosis consistens. Siliquae latiseptae compressae, latitudine 6—15-plo longiores, torulosae inter semina interdum ± irregulariter constrictae. Nervatura septi reticulata longitudinaliter extensa. Semen pleurorhizum applanatum marginatum. Stigma umbilicato-pileiforme, lateraliter paulo compressum, ± emarginatum vel subbilobum.

1a. Stylus evolutus 2
b. Stigma sessile ..... 4. *K. altimurana* Rech. f.
2a. Folia surculorum 20—25 mm longa. Siliqua gynophoro 1—3 mm longo provisa, basi apiceque sensim attenuata ..... 2. *K. flexuosa* Rech. f.
b. Folia surculorum breviora. Siliqua gynophoro non provisa, basi apiceque breviter attenuata 3
3a. Pedicelli fructiferi 5 (—7) mm longi. Stylus 2 mm longus. Stigma pileiforme, vix emarginatum ..... 1. *K. afghanica* Rech. f.
b. Pedicelli fructiferi 7—10 mm longi. Stylus 1 mm longus. Stigma minus dilatatum, distincte emarginatum ..... 3. *K. ghorana* Rech. f.

Die systematische Stellung der Gattung *Koeiea* läßt sich nunmehr, da von der Typusart, *K. afghanica*, reichlicheres, sowohl blühendes als auch fruchtendes Material bekanntgeworden ist und da inzwischen drei weitere Arten entdeckt worden sind, genauer definieren. Sie erhält ihren Platz unter den *Matthioleae* (nicht, wie ursprünglich vermutet, unter den *Alysseae*), und zwar neben der Gattung *Parrya*, von welcher sie sich durch halbstrauchigen Wuchs, aus verzweigten Haaren bestehendes Indument und kopfige Narbe mit nicht herablaufenden karpidialen Lappen unterscheidet.

Mehrere der aus Zentralasien als *Parrya* beschriebenen xerophytischen Arten mit halbstrauchigem Wuchs und aus Sternhaaren bestehendem Indument, deren Zugehörigkeit zur Gattung *Parrya* schon von Popov, Sched. Herb. Fl. As. Med. 4, Nr. 97 (1925) bezweifelt worden ist, dürfte ihre natürliche Verwandtschaft bei *Koeiea* finden, so z. B. *Koeiea karatavica* (Lipsch.) Rech. f., comb. nov., Syn. *Parrya karatavica* Lipsch., Feddes Repert. 39: 318 (1936). Von den übrigen in Betracht kommenden Arten liegen mir keine Belege vor.

1. ***K. afghanica*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 3 (1954); Dan. Biol. Skr. 10, 3: 28, fig. 8 (1958).
Icon.: Clavis p. 27; tab. 22, fig. 1.
Typus: Koeie 2845, W!

Indumentum canescens, pubescenti-tomentosum. Folia surculorum 10—15 × 2 m. Calyx 5 mm longus; sepala late scarioso-marginata exteriora leviter saccata, obtusiuscula, stellato-pilosa. Pedicelli floriferi 2—3 mm, fructiferi (3—) 5—7 mm longi, crassiusculi, patuli. Petala intense lutea, quam sepala sesquilongiora; lamina 2 mm lata, antice truncata vel late rotundata, margine crispata, basi sensim in unguem brevem attenuata. Siliqua 30—40 × 2—3 mm, abrupte in stylum 2 mm longum attenuata. Stigma crassum pileiforme. Semina 4 × 3 mm.

Afghanistan: C: In jugo Shibar, 3000 m, Furse 6652! In montibus supra jugum Shibar, 3050 m, Furse 5821! In declivibus orientalibus jugi Shibar, 2600 m, Hdg. & Wdb. 3328! Band-i Amir, 2800—2900 m, Podlech 12142, Koeie 2845! Ad lacum Band-i Zolfikar, 2900 m, Rech. 18413! Panjao, 2700 m, Koeie 2751!, Hdg. & Wdb. 4898!

Distr. gen.: Endem.

2. ***K. flexuosa*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 15: 42 (1964).
Icon.: Tab. 21, fig. 1.
Typus: Rech. 18027, W!

Indumentum laxum, demum evanescens; planta virens. Folia surculorum usque ad 25×1—1,5 (—2) mm, in petiolum sensim longissime attenuata. Pedicelli fructiferi 10—12 (—15) mm longi, tenues, erecto-patentes, crispule pilosi. Siliqua (submatura) 40×2,5 mm, basi in gynophorum distinctum 1—3 mm longum sensim longe attenuata, apice in stylum ± 1,5 mm longum sensim attenuata. Stigma stylo paulo tantum crassior, depresso-capitatum, vix emarginatum.

Afghanistan: E: Kabul: Sanglakh supra Jalrez, in saxosis umbrosis silic., 2400 m, Rech. 18027!

Distr. gen.: Endem.

3. ***K. ghorana*** Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 101, 15: 425 (1964).
Icon.: Tab. 22, fig. 2.
Typus: Rech. 18866, W!

Indumentum sublanato-tomentellum canescens. Folia surculorum 5—10×1 mm, in axillis fasciculos foliorum minutos ferentia. Pedicelli fructiferi (8—) 10 (—12) mm longi, tenues, erecto-patentes. Siliqua matura 30—35×15—20 mm, basi apiceque breviter attenuata. Stylus crassus, brevis, vix 1 mm longus. Stigma stylo vix crassius, ± emarginatum.

Afghanistan: C: Ghorat: In jugo Shutur Khun Kotal inter Ahangaran et Qala Shahrak, in saxosis calc., 2725 m, Rech. 18866!

Distr. gen.: Endem.

4. ***K. altimurana*** Rech. f., sp. nov.
Icon.: Tab. 21, fig. 2.
Typus: Rech. 31845, W!

Suffrutex caespitosus multicaulis. Caules floriferi erecti, 15—25 cm alti, simplices, in dimidio inferiore foliati. Folia rosularia oblongo-lanceolata, 1,5—3 mm lata, obtusiuscula vel acutiuscula, in petiolum lamina breviorem sensim longe attenuata; folia caulina basi paulo dilatata semiamplexicaulia, oblonga, erecto-patentia vel cauli appressa. Indumentum foliorum e pilis minutis stellatis consistens; folia primum canescentia deinde viridia. Flores ignoti. Pedicelli fructiferi 3—6 mm longi, erecto-patentes. Siliquae 25—40 mm longae, ± 1,5 mm latae, anguste lineares, compressae, in sicco torulosae, basi apiceque subaequaliter breviter attenuatae, inter semina non constrictae; valvae tenuiter nervosae, nervatura reticulata longitudinaliter valde extensa; indumentum siliquae e pilis stellatis minutissimis laxe dispositis consistens; siliqua in statu submaturo atroviridis 10—15-sperma. Semina in statu submaturo ± 2,2 mm longa, valde applanata, utrinque attenuata, marginata. — Differt ab omnibus speciebus generis adhuc notis stylo nullo, stigmate sessile (vix emarginato) siliquis angustissimis, inter semina non constrictis leviter tantum torulosis, indumento siliquorum e pilis minutissimis consistente.

Afghanistan: E: Gardez: Safed Kuh: In saxosis ad jugum Altimur (Tera Kotal) 23 km a Gardez septentriones versus, 5—6. VII. 1965, Rech. 31845 Lamond 2353.

Distr. gen.: Endem.

91. *Cithareloma*

Cithareloma Bge., Del. Sem. Hort. Dorpat. 6: 2 (1843); Linnaea 18: 149 (1844).

Herbae annuae, pube stellata scabrae. Sepala erecta, exteriora basi saccata. Petala longe unguiculata, lamina obovato-oblonga. Filamenta libera, interiora basi dilatata. Antherae magnae, lineares, acutae. Glandulae nectariferae medianae nullae. Siliqua elliptica vel linearis, valvis planis tenuiter uninerviis. Stylus subulatus, stigmatibus erectis conniventibus. Septum tenue nitens, areolis transverse elongatis. Semina uniseriata, valde compressa, alata.

1a. Pedicelli floriferi 1—2 (—5) mm, fructiferi (8—) 10 mm longi. Siliqua ± 15×5 mm, loculis usque ad 3(—4)-spermis ..... 1. *C. Lehmannii* Bge.

b. Pedicelli floriferi 1—2 mm, fructiferi 3—5 mm longi. Siliqua 25—32× 3,5—4 mm, loculis (5—) 6—8-spermis ..... 2. *C. registanicum* Rech. f.

1. ***C. Lehmannii*** Bge., Del. Sem. Hort. Dorpat. 6: 2 (1843).
Icon.: Clavis p. 31.
Typus: Kisyl Kum, LE.

Herba annua prostrata, valde ramosa, ramis usque ad 40 cm longis. Folia usque ad 25×10 mm, breviter petiolata, ovato-oblonga, obtusa, integra vel subsinuata. Calyx 4—6 mm longus. Petala rosea. Siliqua ± 15×5 mm, inter semina interdum ± constricta, loculis 1—3-spermis.

Turcomania: In arenosis prope Repetek, Litw. in Hb. Fl. Ross. 1106!
Pakistan: Bal.: Inter Nushki et Sanduri, Aitch. 13.

Distr. gen.: Kizil Kum, Kara Kum, Baluchistan.

2. ***C. registanicum*** Rech. f., sp. nov.
Typus: Rech. 34636, W!

Annuum. Caulis a basi in ramos (10—) 20—45 cm longos arcuato-ascendentes divisus flavescenti-virens glabrescens. Indumentum totius plantae e pilis plerumque inaequaliter 5—7-radiatis, appressis laxiuscule dispositis consistens, scabridum. Folia caulina inferiora usque ad 3×18 cm, ovata, basi rotundata, laete viridia, in petiolum usque ad 1 cm longum cuneato-attenuata, apice rotundata, margine subintegra vel indistincte remote sinuato-dentata; folia caulina superiora decrescentia sensim paulo angustiora et acutiora. Racemi floriferi valde laxi. Pedicelli floriferi 1—2 mm, fructiferi 3—5 mm longi, primum erecti, demum saepe subhorizontaliter patentes. Calyx 6 mm longus, sepalis herbaceis anguste scarioso-marginatis laxe appressiuscule stellato-pilosis exterioribus basi rotundato-saccatis. Petala pallide carnea, albescentia, lamina obtuso-rotundata ± 3×2,5 mm, in unguem calyci aequilongum attenuata. Siliqua 25—32×3,5—4 mm, compressa, inter semina saepe leviter constricta, basi rotundata, apice breviter subrotundato-attenuata; valvae tenuiter membranaceae pilis ramosis subpatulis scabridae; septum tenue pellucidum cellulis transversaliter expansis; loculi (5—) 6—8-spermi. Stylus 1,5—2 mm longus. Stigma breviter bilobum. Semina orbiculata valde applanata ± 4 mm diametro, margine membranaceo 0,4—0,5 mm lato.

Afghanistan: SE: Kandahar: In arenosis mobilibus deserti Registan prope Bhagat, 30°32′ N, 63°52′ E, 600 m, 19. V. 1967, Rech. 34636!

Distr. gen.: Endem.

Differt a *C. Lehmannii* Bge. imprimis pedicellis duplo brevioribus, siliquis multo longioribus angustioribus plurispermis. Differt a *C. verno* Bge. indumento appresso, petalis pallidis, siliqua recta angustiore apice breviter attenuata, pedicellis fructiferis longioribus, stylo breviore.

Tribus **Hesperideae**

auctore K. H. Rechinger, Wien

Pili simplices, bifidi, furcati vel stellati. Sepala erecta. Fructus siliqua, raro silicula. Radicula incumbens, raro accumbens. — Genera 92—106.

92. ***Leptaleum***

Leptaleum DC., Reg. Veg. Syst. Nat. 2: 510 (1821); Prodr. 1: 200 (1824).

Herba annua. Folia in segmenta filiformia divisa vel indivisa filiformia. Pili minutissimi plerumque ramulosi sparsissimi vel omnino deficientes. Flores singuli vel breviter racemosi. Pedicelli breves. Sepala linearia, erecta, cohaerentia, non saccata. Filamenta filiformia, ea staminum interiorum complete connata; antherae angustae, acutae, ea filamentorum interiorum loculo uno reducto. Ovarium multiovulatum; stylus valde reductus; stigma lineis decurrens.

1a. Siliqua apice recta ..... 1. *L. filifolium* (Willd.) DC.
b. Siliqua apice hamato-incurva ..... 2. *L. hamatum* Hemsl. & Lace.

1. ***L. filifolium*** (Willd.) DC., Reg. Veg. Syst. Nat. 2: 511 (1821).
Syn.: *Sisymbrium filifolium* Willd., Spec. Plant. 3: 495 (1800). *Leptaleum pygmaeum* DC., Reg. Veg. Syst. Nat. 2: 511 (1821). *L. longisiliquosum* Freyn & Sint., Bull. Herb. Boiss. 3: 692 (1893).
Icon.: Clavis p. 15 et 29.
Typus: „Habitat in Sibiria ad Kumam fluvium", B.

Herba annua, basi crebre ramosa. Folia usque ad basin in segmenta filiformia divisa vel indivisa filiformia. Petala pallide rosea vel alba vel ungue flavescentia, anguste spathulata, paucivenosa. Siliqua linearis, longitudine variabilis, recta vel tota levissime curvata, apice semper recta, linearis, a dorso compressa, in parte superiore humiditate tantum dehiscens; valvae induratae, nervo mediano distincto, reticulato-rugosae. Semina numerosa, minuta, biseriata.

Iraq: Diyala: Jabal Hamrin, Bornm. 878, Evans s. n.!, Haines s. n.! Inter Shahraban et Jalula, Rech. 14229! Amarah: Shatt at-Tib, 60 km N Amarah, Rech. 14256!, 70 km N Amarah, 50—200 m, Rech. 8882! 60 km SE Badrah, Rech. 14057!
Persia: N: Gorg.: Dasht-e Gorgan, Shar. 577! 28 km N Gorgan, Grant 17352! — W: Azerb.: Tabriz, Knapp. Esf.: Inter Esfahan et Qom, Gauba 158! Jolfa prope Esfahan, 1600 m, Rech. 2671! Esfahan, Auch. 4169. Arak: Golpayegan, Str. Arak, Bornm. 2135, Str. — S: Kerm.: Kuh Tagh Ali, Bornm. 2136. S Kerman, Lamond 76. Inter Saidabad et jugum Chah Chaghak, 1700 m, Rech. 3096! 120 km W Zahedan, 15 km W Nosratabad, 1300 m, Grant 15386! Fars.: Takht-e Jamshid, Koelz 14502! Persepolis, 1800 m, Schmid 5430!, Grant 15188! Shiraz, 1600 m, Grant 15272! Prope Dalaki, Ky. 185. Lar.: Mansurabad, Gauba 142! Bal.: Khash, Mirzayan 226-E! — E: Khor.: Inter Chanaran et Quchan, 1200 m, Rech. 4750! Mashhad, 1520 m, Furse 5270! Persia orientalis, Bge. — C: Tehr.: Shahr Rey, Bornm. 2138. Inter Tehran et Delijan, 500—1000 m, Schmid 5161! Inter Tehran et Varamin, 1000 m, Rech. 2750! Hashemabad, Bruns. Qom: W Qom, Bornm. 2137. Qazv.: Karaj, Gauba.
Turcomania: Ashkhabad, Kultjassov s. n.!, Sint. 53-a. 117. Karakala M. Sundsodagh, Sint. 2127. In collibus prope Meterova, Sint. 53-b.
Afghanistan: NW: Tirphul, Aitch. 159. — SW: Herat: In montibus 48 km S Herat, 1350—1800 m, Furse 5457! Inter confines Persiae et Herat, 900 m, Furse 5339! Farah, Khurmalik, 1000 m, Koelz 3467! — SE: Kandahar: Girishk, 880 m, Gilli 1049! Chamal Baba, 1000 m, Gilli 1050! — E: Kabul: Aliabad, 1800 m, Gilli 1053! Botkhah, 1700 m,

Gilli 1051-b! Inter Kabul et Tang-i Gharu, 1700 m, Gilli 1051-a! Kabul, Volk 1528!, 1413! Guzar Gah, Neub. 51/6!, 51/49! Darulfanun, Manger. 111. 20 km a Kabul versus Tang-i Gharu, Hdg. & Wdb. 3049! — NE: Kataghan: Taliqan, 720 m, Podlech 10276. Ab Sarina, 18 km W Taliqan, 680 m, Podlech 10239. Mughul, 20 km NW Taliqan, 740 m, Podlech 10349. In valle Andarab, Deh Salah, 1600 m, Podlech 10993. — C: Bamian: In declivibus occidentalibus jugi Shibar, Hdg. & Wdb. 3302!
Pakistan: Peshawar: In jugo Khyber, Halcro Johnston 50, Lace. Landi Kotal, Lowndes 716, Lace. — Quetta: Sheila Bagh, 2000 m, Lace 3537! Sariab, 1700 m, Rech. 32987! Quetta versus Chaman, 1500 m, Lamond 955! Inter Quetta et Pishin, 1500 m, Rech. 28888! Spin Karez, 1800 m, Rech. 29205! Quetta, 1700 m, Rech. 28801! Pishin, Lace 3573! — Kalat: Surab versus Kalat, 2050 m, Lamond 682! Kalat versus Quetta, 2000 m, Lamond 695. Inter Kolpur et Mach, 900—1800 m, Rech. 28472! Inter Kalat et Mastung, 2000 m, Rech. 28369! Mastung, H.-B. 17178. — Baluchistan, Stocks, Lace.

Distr. gen.: Transcaucasia, Asia centralis, Syria, Iraq, Arabia, Persia, Afghanistan, Pakistan.

2. ***L. hamatum*** Hemsl. & Lace, Journ. Linn. Soc. Bot. 28: 321, tab. 38 (1891). Typus: Lace 3325, E!

Differt a praecedente siliquis proportione longioribus tenuioribus, apice hamato-incurvis.

Pakistan: Quetta: Sheila Bagh, 1800 m, Lace 3325! In jugo Khojak, Lace 3537. — Bal.: Khwaja Amran, Lace.

Distr. gen.: Endem.

93. *Malcolmia*

Malcolmia (errore *Malcomia*) R. Br. in Aiton, Hort. Kew. ed. 2, 4: 121 (1812), nom. conserv.
Syn.: *Wilckia* Scop., Introd. Hist. Pl. 317 (1777). *Strigosella* Boiss., Diagn. Pl. Or. Nov. Ser. 2, 4: 22 (1859). *Fedtschenkoa* Regel & Schmalh. ex Regel, Descr. Pl. Nov. Fedtsch. 8 (1882).

Herbae annuae. Indumentum varium, aut e pilis simplicibus aut ramosis, aut appressis aut patentibus consistens. Folia (in speciebus nostris) indivisa, sinuato-dentata rarius ± integra. Sepala erecta, interiora saepe ± saccata. Petala longe unguiculata, rosea vel violacea vel alba, tenuiter venulosa. Filamenta libera, interiora interdum latiora et cohaerentia. Antherae lineares, obtusae. Ovarium multiovulatum. Siliqua linearis, ± teres, breviter pedicellata; valvae interdum aegre dehiscentes; septum crassiusculum; stylus brevis vel distinctus; stigma ± acuminatum, lobis carpidialibus decurrentibus. Semina plerumque uni-, rarissime biseriata, plerumque notorrhiza, raro pleurorrhiza.

Die Unterscheidung mancher *Malcolmia*-Arten ist wegen ihrer großen, vielfach homologen Variabilität nicht leicht.

Manche *Malcolmia*- und *Torularia*-Arten sind einander täuschend ähnlich; sie variieren vielfach auch homolog; wegen der aufrechten, einen geschlossenen Kelch bildenden Sepalen wird jedoch *Malcolmia* zur Tribus *Hesperideae*, *Torularia* mit schräg abstehenden, einen offenen Kelch bildenden Sepalen zu den *Sisymbrieae* gestellt.

1a. Folia caulina plerumque basi auriculata sessilia vel ± amplexicaulia 2
b. Folia caulina basi numquam auriculata sed attenuata, sessilia vel petiolata. 3
2a. Pedicellus calycem subaequans. Siliqua 4—6 cm longa, 1 mm crassa; septum hyalinum ..... 14. *M. Meyeri* Boiss.

b. Pedicellus calyce 2—3-plo brevior. Siliqua 6—9 (—12) cm longa, 2 mm crassa; septum crassum spongiosum ..... 15. *M. crenulata* (DC.) Boiss.
3a. Petala calyce ad minimum triplo longiora [1]) 4
b. Petala calyce ad summum duplo longiora [1]) 10
4a. Plantae humiles crassicaules, internodiis abbreviatis 5
b. Plantae elatiores caulibus tenuibus, internodiis ± elongatis 6
5a. Petala purpureo-violacea ..... 13. *M. cabulica* (Boiss.) Hook. f. & Thoms.
b. Petala alba basi flavescentia ..... 12. *M. longipetala* Gilli
6a. Siliqua longa tenuis, 25 mm longa vel longior, 0,6—1,5 mm crassa 7
b. Siliqua brevis, crassa, ± 10×2,5 mm ..... 10. *M. Toppinii* O. E. Schulz
7a. Pedicellus calyci aequilongus vel longior .. 2. *M. spryginioides* Botsch. & Vved.
b. Pedicellus calyce brevior vel subnullus 8
8a. Folia margine tantum pilis ramosis ciliata, ceterum glabra. Caulis in parte infima tantum sparse pilosus ..... 4. *M. Behboudiana* Rech. f. & Esfand.
b. Caulis et folia pilis rigidis ramosis plerumque dense setosi 9
9a. Folia integra vel raro remote obsolete dentata. Caulis imprimis in parte inferiore crebre ramosus. Siliquae 1—1,5 mm latae, valde compressae, valde torulosae ..... 1. *M. turkestanica* Litw.
b. Folia sinuato-dentata. Caulis simplex vel parce breviter ramosus. Siliqua 0,6—0,8 mm lata, leviter compressa, leviter torulosa ..... 3. *M. grandiflora* (Bge.) O. Kuntze
10a. Pedicelli subnulli vel brevissimi 11
b. Pedicelli distincti, ad minimum 2 mm longi 13
11a. Indumentum totius plantae densum, scabridum. Calyx 3—4 mm longus .. .. 11. *M. strigosa* Boiss.
b. Plantae glabrae vel subglabrae vel laxe pilosae 12
12a. Planta humilis saepe subacaulis ± glabra. Folia crassiuscula, in vivo subcarnosa. Petala albida ..... 8. *M. taraxacifolia* Balbis
b. Caulis evolutus, 10—30 cm altus; planta plerumque laxe pilosa. Folia tenuia non carnosa. Petala rosea ..... 6. *M. Karelinii* Lipsky
13a. Folia runcinato-dentata. Siliqua tenuis ..... 5. *M. Boissieriana* Jafri
b. Folia integra, subintegra vel remote breviter dentata, numquam runcinata. Siliqua 1 mm crassa vel crassior 14
14a. Planta valida. Siliqua matura ± horizontaliter patens, recta vel levissime deorsum curvata, nec circinnata, nec torulosa .... 7. *M. africana* (L.) R. Br.
b. Planta gracilis. Siliqua curvata vel circinnata, leviter torulosa ..... 9. *M. scorpioides* (Bge.) Boiss.

1. ***M. turkestanica*** Litw., Sched. Herb. Fl. Ross. 4, no. 1005 (1900).
Syn.: *M. Bungei* Boiss. var. *lasiocarpa* Regel et var. *macrantha* Regel in Regel & Herd., Suppl. 2, Bull. Soc. Nat. Mosc. 1, no. 95 (1870) p. p.
Icon.: Tab. 23, fig. 2.
Typus: Ferghana, inter Osch et Chodshewat, Herb. Fl. Ross. 1005, W!

Planta 20—40 cm alta, a basi ramosa, omnino pilis longis rigidis bifurcatis hispida. Folia lanceolata, acuta, usque ad 4 cm longa, 1 cm lata, integra vel obsolete remote dentata. Racemi elongati, laxiusculi, pluriflori. Pedicellus 1—2 mm longus. Calyx 4 mm longus. Petala calyce 3—4-plo longiora, ungue calyce longiore, lamina oblongo-

[1]) Zweifel über dieses Merkmal könnten bei *M. africana*, *M. Boissieriana* und *M. Karelinii* auftreten!

cuneata, rosco-violacea. Siliquae 30—45×1—1,5 mm, erecto-patentes, hirsutae, torulosae, valde compressae, rigidulae seu ± flexuosae, in stylum usque ad 0,5 mm longum attenuatae. Cotyledones accumbentes.

Persia: N: Gorg.: Gonbad-e Kavus, Ghalamekhor, Shar. 5636-E!
Afghanistan: N: Mazar-i Sharif: Inter Robatak et Haibak, Lindb. 525! Bala Murghab, Neub. 4218! Sorkh Kotal, Lindb. 482!, Neub. 4280! Akupruk, 500 m, Hdg. & Wdb. 3912! Inter Chashmeh-i Shafal et Akupruk, 800—1000 m, Rech. 16241! — NW: Maimana: Chobaqtu, Lindb. 452! Maimana, 500 m, Hdg. & Wdb. 3600! — SW: Herat, 1100 m, Koelz 4145! — NE: Kataghan: Kunduz, ad aerodromum, 450 m, Rech. 16092!, 16106! Inter Pul-i Khumri et Haibak, 900 m, Hdg. & Wdb. 3518! Baghlan, P. Seip in Hdg. & Wdb. 4429! Taliqan: 4 km S Taliqan, 800 m, Podlech 10382! Aq Bulaq Qeshlaq, 14 km SE Taliqan, 900 m, Podlech 10334! Badam Darreh S Taliqan, 1000 m, Podlech 11408! — Kuh Baz, Lindb. 469!

Distr. gen.: Persia, Turcomania, Afghanistan, Asia centralis.

M. turkestanica ist durch mehrstengelig-tiefgabeligen Wuchs, lange dichte Borstenbehaarung der vegetativen Teile, meist ganzrandige Blätter, vor allem aber durch die flachgedrückten, wohl oft verbogenen, dabei aber starren, stark torulösen Früchte gut gekennzeichnet. Die Fruchtbreite variiert ziemlich stark. Die Fruchtstiele sind kurz und starr.

2. ***M. spryginioides*** Botsch. & Vved., Not. Syst. Herb. Inst. Bot. et Zool. Acad. Sci. Uzbekistan 13: 12 (1951); Fl. Uzbekistanica 3: 135, tab. 11, fig. 4 (1955) e descr. et icon.
Icon.: Tab. 23, fig. 1.
Typus: Uzbekistan.

Herba annua, tenera, 10—50 cm alta, a basi patule ramosa, inferne cum foliis pilis 2—3-furcatis hispidula, superne glabra. Folia basalia et caulina inferiora petiolata, petiolo laminam latitudinem circiter aequante; lamina 3—5×0,8—1,2 mm, late lanceolata vel oblonga, basi cuneata, apice obtusa vel acuta, subintegra aut obsolete aut breviter remote dentata; folia caulina superiora angustiora, acutiora, basi ± longe attenuata sessilia. Inflorescentia ab initio laxa, axi saepe leviter angulato-flexuosa. Pedicelli floriferi calyce paulo breviores usque ad manifeste longiores, fructiferi vix incrassati, erecto-patentes. Calyx ± 4 mm longus. Petala calyce pluries longiora, 11—17 mm longa, lamina antice rotundata vel truncata, sub apice latissima 3 mm lata, intense rosea vel purpurascentia unguem versus pallescentia. Siliqua 35—75 mm longa, vix 1 mm lata, interdum anguste linearis erecto-patula, non torulosa, glabra vel pilis brevibus ramosis et setulis nonnullis simplicibus obsita, apice saepe indistincte subclavato-incrassata; stigma breviter conicum, acutiusculum vel obtusiusculum.

Afghanistan: N: Mazar-i Sharif: Takht-i Rostam prope Haibak, 1200 m, Rech. 16398!, Hdg. & Wdb. 3987! Inter Robatak et Haibak, Lindb. 526! Hazrat Sultan, Lindb. 1959/461! — NE: Kataghan: Inter Pul-i Khumri et Haibak, 900 m, Hdg. & Wdb. 3514! Inter Haibak et Paigah Kotal, 1300—1400 m, Rech. 16417! Doshi, 700 m, Meinertzhagen s. n.! Taliqan: Andarab, Dahan-i Badjga, Podlech 11279! Taliqan, 720 m, Podlech 10443-a! — C: Bamian: Darreh-i Shikar, 15 km S Doab, 1500 m, Hdg. & Wdb. 3378!

Distr. gen.: Afghanistan, Uzbekistan.

M. spryginioides ist unter den großblütigen Arten durch die zarten Stengel und Früchte, besonders durch die relativ langen, dünnen Blüten- und Fruchtstiele sehr gut gekennzeichnet. Sie variiert nur bezüglich der kahlen oder behaarten Früchte.

3. ***M. grandiflora*** (Bge.) O. Kuntze, Acta Hort. Petrop. 10: 167 (1887).
Syn.: *Dontostemon grandiflorus* Bge., Rel. Lehm. 1, no. 98 (1848). *M. Bungei* Boiss., Fl. Or. 1: 226 (1867) excl. var.
Typus: Kizil Kum, Lehm., LE, W!

Planta 15—40 (—60) cm alta, simplex vel ramosa, imprimis inferne setis longis albis plurimis furcatis obsita. Folia inferiora anguste lanceolata, 4—7 cm longa, 0,5—1 cm lata, remote sinuato-dentata, superiora angustiora, dentata rarius subintegra. Racemi ab initio laxi, glabrescentes. Pedicellus 2—3 mm longus. Calyx 4 (—5) mm longus. Petala purpureo-violacea, calyce usque ad quadruplo longiora, ungue calycem superante, lamina oblongo-lineari. Siliqua 30—50 mm longa, 0,6—0,8 (—1) mm lata, erecto-patula, saepe flexuosa, interdum ± incurva, leviter compressa, torulosa, glabra; stigma breviter conicum acutiusculum.

Persia: **N**: Gorg.: Atrak, Shar. 557! Dasht-e Gorgan, Shar. 579! — **S**: Lut: Ab Kharan, 800 m, Gabr. 115. Chah Sam, 800 m, Gabr. 167. — **E**: Khor.: Inter Robat-i Safid et Sharifabad, 900 m, Rech. 4465! Gonabad inter Qayen et Torbat-e Heydariyeh, 900 m, Rech. 7284!.
Turcomania: Ashkhabad, in collibus arenosis inter Annaju et Gyaurs, Sint. 77-a!, 77-b! Kizyl Arvat, Sint. 1661, Becker 107. Ashkhabad, Litw. 558! Jaglyolum, Radde 366.
Afghanistan: **NW**: Qala Nau, 900 m, Koeie 3797! — **SW**: Jija Sarai, 1400 m, Koeie 4141.

Distr. gen.: Persia, Afghanistan, Turcomania, Asia centralis.

Über die Nomenklatur vgl. Burtt & Lewis, Kew. Bull. 1949: 293 (1949) und Jafri, Notes Roy. Bot. Gard. Edinb. 22: 111 (1956).

M. grandiflora ist der im selben Gebiet vorkommenden *M. turkestanica* ziemlich ähnlich. Sie läßt sich jedoch durch meist relativ schwächere Verzweigung resp. Einstengeligkeit, grob gezähnte oder buchtig gelappte Blätter und durchschnittlich schmälere, längere Früchte unterscheiden. Die Bekleidung mit Borsten ist im Durchschnitt bei *M. grandiflora* weniger dicht. — Die Angaben von *M. grandiflora* aus Iraq, Westpersien etc. sind irrtümlich. Sie beziehen sich auf *M. Behboudiana*.

4. ***M. Behboudiana*** Rech. f. & Esfand., Phyton 3: 64 (1951).
Syn.: *M. circinnata* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 155 (1861), nom. illeg. — non *M. circinnata* (Bge.) Boiss. (1867). *M. Bungei* Boiss. var. *glabrescens* Boiss., Fl. Or. 1: 226 (1867). *M. grandiflora* (Bge.) O. Kuntze var. *glabrescens* (Boiss.) Burtt & Lewis, Kew. Bull. 1949: 243 (1949). *M. Bungei* Boiss. var. *assyriaca* Bornm., Beih. Bot. Centrbl. 28, 2: 108 (1911). *Torularia kandaharensis* Rech. f. & Koeie, Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 6 (1954).
Icon.: Tab. 25, fig. 2; Rech., Dan. Biol. Skr. 10, 3: 49, fig. 19 (1958).
Typus: Behb. 109, W!

Planta 10—40 cm alta, plerumque pluricaulis vel fere a basi longe ramosa, praeter folia margine pilis plerumque furcatis laxe ciliatis fere omnino glabra. Folia plurima prope basin vel in parte inferiore plantae approximata, breviter petiolata, lamina oblongo-ovata usque ovato-lanceolata, 3—5 cm longa, 1,5—2 cm lata, grosse sinuato-dentata; folia superiora cito decrescentia. Racemi ab initio laxi, aphylli. Calyx 4 mm longus (bisaccatus). Petala longe unguiculata, sepalis usque quadruplo longiores, intense purpureo-violacea, lamina oblonga 2—3 mm lata. Siliquae (3,5) 4—5 cm longae, 0,8—1 mm latae, compressae, leviter torulosae, erecto-patentes, rectae vel flexuosae vel rarius circinnatae. Stigma anguste conicum acutum, vix 1 mm longum.

Iraq: Diyala: Jabal Hamrin N Al Mansuriyah, Barkley 6831! Inter Shahraban et Jalula, Rech. 8986! Haines s. n.! Jabal Hamrin, Nab. 1328, Guest, Eig & Zohary 5087; Bornm. 879 (Typus *M. Bungei* subsp. *assyriacae*). „Table Mountain", Graham 626. Injana, Guest 1429, 1796. Inter Baqubah et Khanaqin, Gillett & Rawi 7340. Kut-al Imara: 20—30 km SE Badrah, Rech. 9126!, 13925!, 14004! Amarah: Shatt at-Tib 70 km N Amarah, Rech. 8909!, 14184! et in exsicc. Univ. Baghdad 152!
Persia: W: Lur.: Posht-Kuh, Halat-e Mehran, Behb. 109! Khuz.: Inter Dehloran et Amarah, Nab. 1319. — S: Kerm.: Jiroft, Hamun-e Jaz Murian, Sorkh-Gaz, 400 m, Starm. 112! Bal.: Inter Zahedan et Khash, Safavi & Dezfoulian 6353-E!
Afghanistan: SE: Kandahar: Ad fl. Helmand inter Kandahar et Girishk, Kushk-i Nakhud, Kerst. 259! Pirzada, 900 m, Koeie 3834 (Typus *Torulariae kandaharensis*)! N Kandahar, 1000 m, Kerst. 2232! Ghazni: Shashgao, Kitam.
Pakistan: Quetta: Yaro prope Bostan, 40 km NNE Quetta, 1450 m, Rech. 28944!, Lamond 1003! Pishin, Lace 3583! — Nushki: Inter Padag et Nushki, 700 m, Rech. 27312!, Lamond 160! N Nushki, Maynard. — Makran: 70 km NE Panjgur, 1100 m, Rech. 28238! 60 km S Panjgur, 800 m, Rech. 28077! Inter Hoshab et Panjgur, 850 m, Lamond 546! Khudabadan N Panjgur, 940 m, Hotson M-188. — Kalat: Basima prope Jangal inter Panjgur et Surab, 1350 m, Rech. 32992! — Bal.: Gurghina, Stocks. Kharan, H.-B. 23151. — W Gazechah, Maynard.

Distr. gen.: Iraq, Persia, Afghanistan, Pakistan.

Charakteristisch für die Art ist die spärliche, fast ausschließlich auf den Blattrand und die Stengelbasis beschränkte Behaarung, ferner die satt purpurrosa, beim Trocknen lang erhalten bleibende und dann oft ins Purpurviolettliche spielende Blütenfarbe. Die Petalennägel sind immer deutlich länger als der Kelch. Die Art variiert sehr erheblich in bezug auf so gut wie alle vegetativen Merkmale. Auch die Größe der Petalen schwankt; die beiden Extreme werden einerseits vom Typus der *M. Behboudiana*, andererseits vom Typus der von mir ursprünglich als *Torularia kandaharensis* beschriebene Pflanze repräsentiert. Im allgemeinen scheint die Petalengröße von Westen (Iraq) gegen Osten (Pakistan) abzunehmen; alle Übergänge kommen jedoch vor, und es scheint, als ob auch dieses Merkmal bis zu einem gewissen Grad von Standorts- bzw. Klimafaktoren beeinflußt würde. Die Früchte sind bei *M. Behboudiana* immer leicht torulös; gerade und gebogene oder auch spiralig eingerollte Früchte finden sich, homolog zu anderen *Malcolmia*- und *Torularia*-Arten, oft an ein und derselben Pflanze. Die Blütenstiele sind immer kürzer als der Kelch, im Fruchtzustand verlängern sie sich etwas, verdicken sich aber nur wenig.

5. ***M. Boissieriana*** Jafri, Notes Roy. Bot. Gard. Edinb. 22: 111 (1956).
Syn.: *Dontostemon circinnatus* Bge., Rel. Lehm. 1, no. 99 (1848). *Malcolmia circinnata* (Bge.) Boiss., Fl. Or. 1: 277 (1867), non Hook. f. & Thoms. (1861).
Typus: In arenosis deserti Kizil Kum, Lehm. 99, LE, W!

Planta 10—30 (—40) cm alta; caulis erectus, tenuis, a basi ramosus; planta praeter pilos bifurcos ad foliorum marginem glabra. Folia oblongo-lanceolata, runcinato-dentata. Racemi elongati, laxi. Pedicelli calyce breviores. Petala anguste linearia, calyce subduplo longiora, pallide rosea. Siliqua tenuis, subcompressa, glabra, circinnatim contorta; stigma breviter conicum acutum.

Turcomania: Ashkhabad, Sint. s. n.
Afghanistan: NW: In valle fluvii Hari Rud, Aitch. 1006.

Distr. gen.: Afghanistan, Deserta Kizil Kum et Kara Kum.

Ich habe keine Belege aus dem iranischen Florengebiet gesehen.

6. ***M. Karelinii*** Lipsky, Acta Hort Petrop. 23: 31 (1904); Mat. Fl. Sred. Asia 2: 31 (1904). p. p.; Vassilcz., Fl. URSS. 8: 281 (1939).
Syn.: *Dontostemon brevipes* Bge., Rel. Lehm. 1, no. 100 (1848). *Sisymbrium brevipes* Kar. & Kir., Bull. Soc. Nat. Mosc. 155, no. 1244 (1842) p. p., quoad var. siliquis contortuplicatis. *Malcolmia brevipes* (Kar. & Kir.) Boiss., Fl. Or. 1: 226 (1867).
Typus: Pribalch., in regione fluvii Sassik-Pastau, LE.

Annua, 10—30 cm alta. Caulis tenuis, a basi ramosus, pilis simplicibus et ramosis laxe obsitus vel subglaber. Folia oblonga, profunde inciso-dentata, petiolata. Racemi laxi. Flores subsessiles; pedicelli fructiferi ad summum 1 mm longi. Calyx 2—2,5 mm longus. Petala 4—5 mm longa, 0,6—0,8 mm lata, anguste lineari-spathulata, rosea. Siliqua 30—40×0,8 mm, contorta vel recta, compressa, ± pilosa vel glabra; stigma breve, acutum.

Persia: C: Kavir: Arusan, 1060 m, Gabr. 66. — S: Kerman, Bornm. 2107.
Turcomania: Gyaurs, Sint. 55-b. In valle Atrak: Jaglyolum, Radde 355. Ashkhabad, Erlandt. Usun Ada, Komar. Inter Annaju et Gyaurs, Sint. 56.

Distr. gen.: Asia centralis, Persia, Afghanistan (fide Fl. URSS. 8: 281 [1939]).

Ich habe keine Belege aus dem iranischen Florengebiet gesehen. Die Angaben aus Persien bleiben zu überprüfen.

7. ***M. africana*** (L.) R. Br. in Aiton, Hort. Kew. ed. 2, 4: 121 (1812).
Syn.: *Hesperis africana* L., Spec. Plant. 663 (1753).
Icon.: Clavis p. 31.
Typus: „Africa".

Caulis 5—30 cm altus, saepe a basi ramosus. Indumentum substellatum, scabridum, vel planta glabrescens vel subglabra. Folia oblonga, integra vel sinuato-dentata. Pedicelli fructiferi 2 (—5) mm longi, fructiferi incrassati. Calyx 2,5—5 mm longa. Petala (5—) 8—10 (—12) mm longa, rosea. Siliqua 25—65×1—1,5 mm, matura ± horizontaliter patens, rigida, ± quadrangula, tota longitudine aequilata, non torulosa, rarius apice ± clavato-incrassata, pilis ramosis brevioribus vel longioribus, interdum etiam setis rigidis patentibus obsita, rarius ± glabrescens vel omnino glabra; stigma 0,5—1,5 mm longum, acutum, rarius siliqua apice ± clavato-incrassata et truncata et tunc stigma brevissime apiculatum.

Iraq: Kurd.: Arbil: Jindian prope Rawandiz, Guest 746-b. — Kirkuk, 400 m, Bornm. 869. — Diyala: Jabal Hamrin, Bornm. 873, Sutherland 144.
Persia: N: Gil.: Rudbar, Manjil, Bornm. 6144. Yehlah, Linds. 1099-c. — W: Azerb.: Einal Zeinal prope Tabriz, Grossh. Tabriz, Gill.-Sm. 1364, 1397, 1408, 1498, 1709, 1814, Knapp. Khvoy, Knapp. Lacus Rezaiyeh, Knapp. Khuz.: Shush, Nab. 1392. Arak: Khunsar inter Esfahan et Arak, Bornm. 2114. Arak, Bornm. 2113. Inter Arak et Qom, Bornm. 2112. — S: Fars.: Kuh-e Khormuj, Hawize prope Bushehr, Nab. 1362, 1376. Kerm.: Kerman, Bornm. 2116. Baghin, Bornm. 2110. — E: Khor.: Sar Chah, Bge. — C: Qazv.: Pachenar, Stapf. Sultanabad prope Qazvin, Linds. 14. Yazd: Taft, Bornm. 2111. Shahrud, Bge. — Persia, Auch. 4109, 4114.
Turcomania: Ashkhabad, Sint. 2054, 60-b, Litw. 545. Prope Gyaurs, Sint. 60-a. Bami, Paulsen.
Afghanistan: NW: Hari Rud, Tirphul, Aitch. 178, 186. — SE: Inter Kandahar et Kabul, Kitam. — E: Kabul: Darulaman, Manger 71. 36 km N Kabul ad viam versus Charikar ducentem, Podlech 10203, Jaji: Ali Khel, Aitch. — NE: Kataghan: Ishkamish, 1150 m, Podlech 10656. Farkhar, 1250 m, Podlech 10477. 3 km S Pul-i Khumri, Podlech 10235. Mughul, 20 km NW Taliqan, 740 m, Podlech 10347. Banu, in valle Andarab,

1550 m, Podlech 10917. — C: Bamian: Band-i Amir, 2800 m, Podlech 12170. — Afghanistan, Griff., Manger 88.
Pakistan: Quetta: Qila Abdullah, Duthie 8579. Hindubagh, H.-B. 19880. Zhob distr., Gaz. 323. Mastung, H.-B. 17166. Quetta, Lace, Duthie 8580, Griff. N. Wazir.: Datta Khel, Fz. 1225, 1228, 1320, 1323. Miram Shah Fort, Blatt. & Fz. 264, 468, 503. S. Wazir.: Razmak, Fz. 2281. — Nushki: Dak Plains, Chagai Gaz. 231. Nushki, H.-B. 19204.— Kalat: Pab, Jhalowan, H.-B. 19804. In collibus Harboi, H.-B. 19537. — Bal.: Gurghina, Stocks. — In valle Narmukh, H.-B. 17467.

Distr. gen. speciei: Regio Mediterranea Europae et Africae borealis, Asia austro-occidentalis et centralis.

M. africana ist äußerst polymorph; bisher fehlt es an einer befriedigenden Darstellung dieses Formenkreises. Boissier, Fl. Or. 1: 223 (1867) unterscheidet auf Grund von Merkmalen der Behaarung, der Größe der Blüten und der Ausbildung der Narbe vier Varietäten, die sämtlich von manchen Autoren als Arten angenommen wurden. Für Persien werden *M. trichocarpa* Boiss. & Buhse, Mém. Soc. Nat. Mosc. 21 (1860), „siliqua pilis longis patentibus hispida, stigma conicum truncatum vel inter lobos apiculatum" und *M. stenopetala* Bernh., Hort. Erf. (1832) ex Ledeb., Fl. Ross. 1: 170 (1842), „petala oblongo-linearia, siliqua strigulosa, stigma conicum" angegeben; man vergleiche auch Vassilczenko in Fl. URSS. 8: 279—280 (1939). Nach meinen Beobachtungen ist die Korrelation der hervorgehobenen Merkmale unvollständig und eine geographische Sonderung nicht deutlich erkennbar, wohl aber angedeutet, indem nämlich die Variabilität gegen Osten des Artareales deutlich zunimmt. Ich habe hier die Formenfülle der Art provisorisch auf drei hauptsächlich auf die Art der Behaarung der Früchte begründete Varietäten verteilt, wobei die Zuteilung mancher Exemplare wegen des relativ häufigen Vorkommens von Zwischenformen willkürlich bleibt. Dem Wortlaut der var. *laxa* (Lam.) Boiss., Fl. Or. 1: 223 (1867) entsprechende Exemplare ziehe ich zu var. *intermedia*. Formen mit schmalen Petalen, die der var. *stenopetala* (Bernh.) Boiss. l. c. entsprechen, scheinen im östlichen Arealteil zu überwiegen. Es scheint jedoch keine durchgehende Korrelation mit den Merkmalen der Fruchtbehaarung und Narbenform zu bestehen.

— — var. ***africana***

Siliquae pilis ramosis ± appressis vel patulis, siliquae diametro semper multo brevioribus obsitae.

Iraq: Kurd.: Kirkuk: Jarmo, Helbaek 447! Diyala: Khanaqin, Rech. 14138! Amarah: Shatt at-Tib, 70 km N Amarah, Rech. 14173!
Persia: N: Gorg.: Shahkuh, Koelz 16322! Dasht-e Gorgan, Shar. 579-b! — W: Azerb.: 64 km SE Tabriz, 1800 m, Furse 2372! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 175! Kuh Alvand, Babai 6702-E! Lur.: Dow Rud, 1500 m, Koelz 15701! — S: Fars.: Jahrom, Koelz 14546! 12 km E Shiraz, 1600 m, Grant 15268!, 15269! Chah Mana prope Persepolis, Ky. 296-a! Dalaki, 600 m, Koeie 1439! Kerm.: Kuh Jebal Barez infra Deh Bakri, 1800 m, Rech. 3823! Tomagoa, Koelz 14326! — E: Khor.: Robat-i Safid, 1800 m, Rech. 7339! Wakilabad prope Mashhad, 900 m, Gilli s. n.! Quchan, 1500 m, Rech. 1608! Inter Quchan et jugum Alam Ali, Rech. 7286-b! Inter Chanaran et Quchan, 1200 m, Rech. 4743! Inter Birjand et Qayen, 1900 m, Rech. 7514! Ozbagu, Ruttner 89! Sarhangi, Ruttner 462! — C: Tehr.: Inter Tehran et Delijan, 1000 m, Schmid 5156! Garmsar inter Tehran et Semnan, 900 m, Rech. 2764-b! Qazv.: Karaj, 1400 m, Rech. 251! Qazvin, 1500 m, Jacobs 6199! Damgh.-Semn.: In valle Sar Tash S Kuh-e Nizwa, 2300 m, Aell. 1015! Inter Kashan et Qom, 1050 m, Furse 1600! — Shahankareh, Saadabad, Soltani 6385-E!
Turcomania: Ashkhabad, Sint. 60-b!
Afghanistan: SW: Herat, 1100 m, Koeie 4144! Girishk, 1000 m, Koeie 2167! — E: Kabul: Inter Kabul et Sarobi, in faucibus Tang-i Gharu, 1700 m, Hdg. & Wdb. 2761! Inter Kabul et Lataband, 1900 m, Lamond 1956! Sheikhabad inter Kabul et Ghazni,

2300 m, Rech. 17265! Kabul, Lab-e Darja, 1770 m, Gilli 1011! Sarobi, Volk 2004!, 2452! Kabul, 1800 m, Gilli 1013!, 1014!, Volk 1910-a!, Hdg. & Wdb. 2833! Kabul versus Band-e Kargha, Rech. 31433! Pul-i Alam, 2100 m, Koelz 11870! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Rech. 32042! Ghazni: Sang-i Masha, 2500 m, Rech. 17440! Panjshir: Inter Dasht-i Rewat et Deh Khawak, 2300 m, Hdg. & Wdb. 5313! — **NE**: Kataghan: In declivibus borealibus jugi Salang, 2700—3100 m, Lamond 2224!, Rech. 31604! — **C**: Bamian: Inter Bamian et Band-i Amir, 2800 m, Rech. 18165-A! Band-i Amir, ad lacum Band-i Panir, 2800 m, Rech. 18395! Naiak inter Band-i Amir et Panjao, 2600 m, Hdg. & Wdb. 4836!
Pakistan: Chitral: Ojor Gol, 2600 m, Bowes Lyon 826! — Peshawar: In jugo Khyber, 1090 m, Halcro Johnston 39! — Quetta: Sibi, Jafri s. n.! Yaro prope Bostan, 1450 m, Rech. 28909! Sariab, 1700 m, Rech. 28833! Quetta, 1700 m, Lace 3641! 30 km NNE Quetta versus Chaman, 1500 m, Lamond 965! In jugo Tak, 2100 m, Rech. 28390! In jugo Bolan, 1500 m, Rech. 28797! Lamond 889! — Kutchlak, Jafri s. n.!

Distr. gen. varietatis: Verosimiliter in tota area speciei.

An der Spitze keulig verdickte Früchte haben folgende Belege: Lamond 889, 2224, Rech. 28390, 28797, Koelz 11870. Man vergleiche im übrigen die Anmerkung zu var. *trichocarpa*.

— — var. ***intermedia*** (C. A. Mey.) Boiss., Fl. Or. 1: 223 (1867).
Syn.: *M. intermedia* C. A. Mey., Enum. 186 (1831).
Typus varietatis: Ad mare Caspium prope Baku, C. A. Mey., G!
Siliqua glabra.

Persia: **W**: Azerb.: Inter Marand et Yam, 1960 m, Grossh. Tabriz, Gill.-Sm. 1365, 1407, 1815. Esf.: Jolfa, 1500 m, Rech. 2666! Arak: In planitie prope Arak, Str. — **S**: Kerm.: Kuh Tagh Ali, Bornm. 2114. Hamun-e Jaz Muriyan, Khanu, Starm. 115! Bal.: Inter Zahedan et Khash, 1300—1600 m, Rech. 4242-b! Iranshahr: Damin, Shar. 207-E! — **E**: Khor.: Tabas, 800 m, Grant 105! Ozbagu, Kuh-e Safid, Ruttner 241! — **C**: Yazd: In montibus prope Yazd, Buhse.
Turcomania: Gyaurs prope Ashkhabad, Sint. 163. Ashkhabad, Litw. 547. Kazandzhik, Lipsky.
Afghanistan: **NW**: Maimana, 500 m, Hdg. & Wdb. 3602 p. p.! In valle fluvii Hari Rud: Tirphul, Aitch. 187. — **E**: Kabul: Sher Darwasa, 1800 m, Hdg. & Wdb. 2899 p. p.! Logar, Volk 1815 p. p.!, 1826! Kabul, 1800 m, Volk 283 p. p.!, Gilli 1016!, 1017!, 1018!, 1019!, Neub. 3002 p. p.! Farakulum, 2700 m, Koeie 3001! — **NE**: Kataghan: Pul-i Khumri, Volk 460 p. p.! — **C**: Bamian: Darreh-i Shikar, 15 km S Doab, 1500 m, Hdg. & Wdb. 3413! 15 km W Doab, 1450 m, Hdg. & Wdb. 3435 p. p.!

Distr. gen. varietatis: Adhuc incomplete nota: Persia, Turcomania, Afghanistan.

Die unter var. *intermedia* angeführten Belege sind an den vegetativen Teilen ± behaart, nur die Früchte sind fast oder vollständig kahl. Es ist bemerkenswert, daß von den revidierten Belegen immerhin sieben gemischt mit var. *africana* bzw. var. *trichocarpa* vorkamen.

— — var. ***trichocarpa*** (Boiss. & Buhse) Boiss., Fl. Or. 1: 223 (1867).
Syn.: *M. trichocarpa* Boiss. & Buhse, Mem. Soc. Nat. Mosc. 18: 21 (1860).
Typus varietatis: „In deserto Persiae boreali-orientalis prope Djendak", Buhse, G!
Siliquae setis rigidis horizontaliter patentibus siliquae diametro saepe longioribus flavescentibus dense setosae. Petala parva, angusta. Siliqua interdum apice ± clavato-incrassata et tunc stigma brevissimum.

Persia: **S**: Kerm.: In collibus, 2000 m, Bornm. 2115. Kuh-i Tachme, Bornm. 2117. — **E**: Khor.: Ozbagu, Ruttner 89 p. p.! Kuh-e Sefid, Ruttner 392! Kuh-e Neyshabur,

Darreh Abshar supra Akhlamad, 1600 m, Rech. 4496! — **C**: Tehr.: In collibus prope Doshan Tappeh, Bruns. Yazd: Inter Anar et Rafsanjan, Rech. 2884! Jandaq, Buhse 1265. Shahrud, Bge.

Turcomania: Ashkhabad, Sint. 60-c. M. Karanki prope Ashkhabad, 1800 m, Litw. 549.

Afghanistan: **N**: Mazar-i Sharif: Takht-i Rostam prope Haibak, 1200 m, Rech. 16389! — **NW**: Maimana, 500 m, Hdg. & Wdb. 3602 p. p.! Qala Nau, 800 m, Koeie 4143! Obeh, 1700 m, Koeie 3775! — **SW**: Jija, 900 m, Koeie 4142! Herat, Amsel s. n.! — **E**: Kabul: Babur, Volk, 2021!, Manger. In valle Logar, 40 km S Kabul, Neub. 3106! Sher Darwasa, 1800 m, Hdg. & Wdb. 2891!, 2894!, Gilli 1015 p. p.!, 1021!, 1023!, 1024! Kuh-i Asmai, 1900 m, Hdg. & Wdb. 2714! Tang-i Gharu, 1800 m, Hdg. & Wdb. 2774!, 3091! In aggere fl. Sorkhab, Volk K-105! Jabir Ansar, Lindb. 243! Charikar, Neub. 1950/556! — **NE**: Kataghan: 30 km N Doab versus Pul-i Khumri, 1400 m, Hdg. & Wdb. 3450! — **C**: Bamian: Inter Bulola et jugum Shibar, 2600 m, Rech. 16864! Doab, Kitam. Inter Bulola et Doab, Kitam. In valle Ajar W Doab, 1500 m, Rech. 16603!

Pakistan: N.-Wazir.: Miram Shah Fort, Blatt. & Fz. 148, 160, 978. Boya Fort, Fz. 1251. Ad fl. Kurram infra Shewa, Blatt. & Fz. 920 — S.-Wazir.: Khajuri Post, Blatt. & Fz. 419. — Quetta: In jugo Tak, 30 km S Quetta, 2100 m, Rech. 28399!, Lamond 707! Ad radices occid. M. Chiltan inter Dulai et Kanak, 1600 m, Rech. 29108! Sariab, 1700 m, Lamond 907! Infra jugum Bolan, 1500 m, Rech. 28786! Quetta, 1600 m, Koeie 3002!, Lamond 907! — Kalat: 10 km S Kalat, 1900—2200 m, Rech. 28358!, Lamond 688!

Distr. gen. varietatis: Persia, Afghanistan, Pakistan, Amu Darya, Syr Darya, Pamir-Alaj, Tien Shan.

Von den Varietäten der *M. africana* zeigt var. *trichocarpa* am meisten Selbständigkeit. Mit der charakteristischen langen, borstig-abstehenden Behaarung der Früchte sind nämlich anscheinend die Merkmale relativ breiter, stumpflicher ± ganzrandiger oder doch nur kurz und entfernt gezähnter Blätter und kleiner schmaler Petalen korreliert. Auch ist die Varietät deutlich auf den Osten des Areals, und zwar von Ost-Persien ostwärts, beschränkt. Der Prozentsatz der gemischten Aufsammlungen ist lang nicht so groß wie bei var. *intermedia*, nämlich nur 4 von 31. Besondere Beachtung verdient das gelegentliche Auftreten von Formen mit Früchten, die an der Spitze keulig verdickt sind, und zwar: Rech. 28358, 28399, 28786, 29108, Koeie 3002, Hdg. & Wdb. 3602 p. p. und Neub. 3106, in geringerem Maß ausgeprägt auch bei vielen anderen Belegen. Boissier, Fl. Or. 1: 223 (1867) führt dieses Merkmal als charakteristisch für seine var. *trichocarpa* an. Es tritt jedoch nach meinen Beobachtungen fallweise auch bei Exemplaren auf, die in ihrer Behaarung der typischen *M. africana* entsprechen. Die unvollständige Korrelation dieses Merkmals mit den übrigen ist der Grund, warum ich mich nicht zu einer spezifischen Abtrennung entschließen konnte, wie sie z. B. von Vassilczenko, Fl. URSS. 8: 274 (1939), vorgenommen wird.

8. ***M. taraxacifolia*** Balbis, Syn. Pl. Hort. Bot. Taur. app. 4: 10 (1814).
Syn.: *M. runcinata* C. A. Mey., Verz. Pfl. Cauc. 186 (1831). *M. halophila* Gilli, Feddes Repert. 57: 224 (1955).
Typus: Baku, LE.

Planta humilis, 5—15 cm alta, saepe subacaulis, glabra vel pilis sparsis furcatis obsita. Folia ad summum 4×2 cm, saepe minora, oblongo-lanceolata, sinuato- vel obtuse inciso-dentata vel runcinato-pinnatifida, rarius subintegra, in vivo subcarnosa. Pedicelli subnulli. Calyx 2,5—3 mm longus. Petala sublinearia vel anguste obovato-oblonga, albida, calyce paulo longiora. Siliqua (1—) 3—4 cm longa, recta, horizontaliter patens vel ± recurva, interdum ± torta, tetragona, glabra vel parce hirta; stigma breve, conicum.

Iraq: Inter Kut al-Amarah et Badrah, Rech. 9105!
Persia: W: Esf.: Inter Khunsar et Esfahan, Najafabad, 1700 m, Bornm. 2097. Esfahan, Auch. 4167!, Bge. 32 km SE Esfahan, 1700 m, Furse 1363! Khunsar, 2300 m, Bornm. 2096. — S: Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1700—1900 m, Rech. 3221! — E: Khor.: Sarakhs, 260 m, Grant 17184! — C: Tehr.: Inter Tehran et Delijan, Schmid 5166! 20 km E Sahveh, 950 m, Grant 17384! Yazd: Inter Rafsanjan et Kabutar Khan, Rech. 2868-d! Qom, 900 m, Bornm. 2095.
Turcomania: Inter Kazandzhik et Ushak, Sint. 2128-b. Ad fluv. Tedzhen, Litw. 547-a!
Afghanistan: NW: Manghan, 700 m, Jakeš! — E: Kabul: Botkhah, Gilli 1039! Chaman Wazirabad, Gilli 1040! In depressis salsis versus Tang-i Gharu, Gilli 1041!, Kabul, ad canales irrigationis, Gilli 1042! Gilli 1546 (Typus *M. halophilae* Gilli)!
Pakistan: Quetta, 1700 m, Lace 3644! 16 km W Quetta, in limosis salsis, 1700 m, Rech. 29074!

Distr. gen.: Rossia austro-orientalis; Transcaucasia, Persia, Iraq, Afghanistan, Baluchistan.

Über die Variabilität der Art vgl. Vassilczenko in Fl. URSS. 8: 283 (1939). — Die Art variiert habituell und in der Blattform und Blattgröße außerordentlich stark. Sie ist jedoch durch die schmalen, relativ kurzen, weißlichen Petalen eindeutig gekennzeichnet und von sonst recht ähnlichen kahlen Formen der *M. africana* dadurch sowie durch die reichliche, nicht dekreszierende, bis zur Infloreszenz reichende Beblätterung leicht zu unterscheiden. *M. halophila* Gilli ist in typischer Ausbildung eine Kümmerform dürftiger salzreicher Standorte. Normal gewachsene Exemplare aus dem selben Gebiet lassen sich jedoch keinesfalls von *M. taraxacifolia* unterscheiden. Stellenweise, z. B. Quetta, Lace s. n., hb. E, treten Individuen auf, die an Kreuzungen zwischen *M. africana* und *M. taraxacifolia* denken lassen.

9. ***M. scorpioides*** (Bge.) Boiss., Fl. Or. 1: 225 (1867).
Syn.: *Dontostemon scorpioides* Bge., Rel. Lehm. 1, no. 101 (1848).
Icon.: Tab. 24, fig. 1.
Typus: Buchara, Lehm., LE.

Planta (5—) 10—20 (—40) cm alta, pube furcata canescens vel ± glabrescens. Folia oblonga vel lanceolata, omnia petiolata, integra vel rarius parce breviter dentata, basalia usque ad 45 × 10 mm. Pedicelli calyce semper multo breviores, fructiferi ± incrassati. Calyx ± 3 mm longus. Petala rosea, lineari-spathulata, calyce duplo circiter longiora. Siliqua 4—5 cm longa, usque ad 1 mm lata, erecto-, rarius subhorizontaliter patens, subrecta, ± recurva vel saepe circinnato-involuta, glabra vel pilis brevibus furcatis obsita, leviter torulosa; stigma breve, obtusiusculum vel acutiusculum.

Persia: S: Kerm.: 30-40 km SE Zahedan versus Mirjaveh, Grant 15328! Rech. 27248! 14 km W Zahedan, 450 m, Grant 15358! Hamun-e Jaz Murian, Rig Mati, Starm. 131! — E: Khor.: Tabas, Shir Geshk, Ruttner 596! Derenjal prope Deh-i Mohammad, Ruttner 528!
Afghanistan: Vide addenda!
Pakistan: Quetta: 30 km NNE Quetta versus Chaman, 1500 m, Lamond 954-a! Inter Saranan et Qila Abdullah, 1400 m, Lamond 1027! — Kalat: Inter Kolpur et Mach, 900 m, Rech. 28426! Basima prope Jangal, inter Panjgur et Surab, 1350 m, Rech. 28275!, 28294! Nushki: Inter Padag et Nushki, Rech. 27312! — Makran: Panjgur, 1000 m, Rech. 28135!, Lamond 596!, 609! Inter Hoshab et Panjgur, 850 m, Lamond 552! 60 km S Panjgur, 850 m, Rech. 28126! W Hoshab, Lamond 369! 70 km NE Panjgur, 1100 m,

Rech. 28235! 30—50 km NE Panjgur versus Nag, 1100 m, Rech. 28195! Nag inter Panjgur et Surab, 1300 m, Rech. 28256! 8—25 km W Awaran versus Turbat, Rech. 27747! — Baluchistan, Lace 3532!

Distr. gen.: Persia, Afghanistan, Pakistan, Turcomania, Asia centralis.

M. scorpioides ist sehr variabel. Wuchs, Grad der Behaarung und mehr oder minder ausgeprägte Krümmung der Früchte wechseln oft an ein und demselben Standort. *Torularia torulosa* variiert homolog; sie ist, abgesehen von den Gattungsmerkmalen, durch viel kleinere, niemals rosa gefärbte Petalen unterscheidbar.

10. ***M. Toppinii*** O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1088 (1927).
Icon.: Tab. 25, fig. 1.
Typus: Toppin 106, K!

Herba annua (vel biennis?) pluricaulis, usque ad 10 cm alta, internodiis longiusculis sat tenuibus. Indumentum laxiusculum e setis usque ultra 1 mm longis patulis et e pilis brevioribus furcatis compositum. Folia basalia sub anthesi emarcida, caulina petiolata ambitu oblonga, runcinato-pinnatifida, lobis rotundatis utrinque ± 5 ± lobato-crenatis recurvis. Racemus florifer confertus fructifer elongatus laxus. Pedicelli floriferi 1—3 mm longi fructiferi non incrassati, erecto-patentes ± recurvati, usque ad 6 mm longi, crassitudine siliquae semper evidenter longiores. Calyx 3 mm longus. Petala 9 mm longa, purpureo-violacea, lamina anguste oblongo-linearis in unguem calyce longiorum sensim attenuatu. Siliqua (submatura) ± 10 mm longa, ± 2,5 mm crassa, basi subito contracta, apice in stylum acutum 1 mm longum attenuata, horizontaliter patentes, apice interdum leviter sursum curvata; indumentum e setis nitidis patentibus et e pilis brevissimis plurifurcatis consistens.

Pakistan: Chitral: Drosh, 1350 m, Toppin 106!

Distr. gen.: Endem.

M. Toppinii ist auf dem ersten Blick der *M. cabulica* (Boiss.) Hook. f. & Thoms. ähnlich, unterscheidet sich jedoch von dieser sehr wesentlich durch die langen, dünnen Fruchtstiele. Die Frucht ist relativ kurz und horizontal abstehend, an der Spitze oft etwas aufgebogen, wodurch sie etwa an *Goldbachia* erinnert. Die Einziehung der *M. Toppinii* zu *M. cabulica* durch Jafri, Notes Roy. Bot. Gard. Edinb. 22:111 (1956) ist keinesfalls berechtigt, da *M. cabulica* gerade durch die äußerst kurzen, dicken Fruchtstiele und viel längere Früchte gekennzeichnet ist und in diesen Merkmalen nicht variiert.

11. ***M. strigosa*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 70 (1842).
Typus: Auch. 4068, G!

Pumila, plerumque a basi ramosa, ramis crassiusculis rigidis ascendentibus usque ad 6 (—10) cm longis. Indumentum e pilis brevibus ramosis compositum, canescens, scabridum. Folia oblongo-lanceolata, sinuato- vel obtuse repando-dentata, rarius subintegra. Pedicelli brevissimi vel subnulli, fructiferi incrassati. Calyx 3—4 mm longus, anguste tubulosus. Petala oblongo-linearia, calyce ad summum subduplo longiora, alba, flavescentia. Siliqua ± 25 mm longa, horizontaliter patens, basi incrassata, saepe subrecurva tereti-quadrangula, setis longis bifurcis strigosa, pube brevi ramosa immixta; stigma conicum siliquae latitudini aequilongum.

Persia: W: Esf.: Esfahan, Auch. 4068. Inter Abadeh et Daulatabad, Schmid 5328! — S: Kerm.: Kuh Tagh Ali, 2100 m, Bornm. 2094. Inter Mashiz et jugum Khaneh Sorkh, 2000—2500 m, Rech. 3061! Inter Baghin et jugum Sang Bur, 1600—2200 m, Rech. 2988! Nabid inter Kerman et Bam, 2250 m. Rech. 3571! Inter Saidabad et jugum Chah-e Chaghak, 1700—1900 m, Rech. 3088! Bal.: Inter Zahedan et Khash, 1300—1600 m,

Rech. 4240!, 4242-a! — E: Sar Chah, Bge. Inter Birjand et Qayen, 1900 m, Rech. 7510! Inter Quchan et jugum Alam Ali, 1600 m, Rech. 7268-a! Kuh-e Chah Rui, 700—1000 m, Gabr. 148. Ozbagu, Ruttner 374. — C: Qom, Bornm. 2093. Prope Shahrud, Bge. Yazd: Inter Yazd et Kermanshahan, Rech. 2854!
Turcomania: Inter Kazandzhik et Ushak, Sint. 2128.
Afghanistan: E: Kabul: Charikar, Neub. 1950/533! Farakulum, 2800 m, Koelz 2571! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Rech. 32081! Ghazni: Dasht-i Nawar, Okak, 3000 m, Rech. 17683-a! In jugo Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 1410! — NE: Kataghan: Pul-i Khumri, Volk 442! Doab-i Til in valle Andarab, 2600 m, Podlech 11140! — C: Bamian: Band-i Amir, 2900 m, Hdg. & Wdb. 4784!, Rech. 18284! Podlech 12163! In declivibus occidentalibus jugi Shibar, 2500 m, Hdg. & Wdb. 3296! Inter Bamian et Band-i Amir, 2800 m, Rech. 18165-b! Bamian inter juga Unai et Hajigak, 2900 m, Hdg. & Wdb. 4596! — Afghanistan, Griff. Pakistan: Quetta: Inter Bostan et Saran Tangai, 1700 m, Rech. 29186! Inter Qila Abdullah et Sheilabagh, 1600—1900 m, Rech. 29032!, Lamond 1044! Pishin, Lace 3310! Qila Abdullah, Lace 3310! Fort Sandeman, Harsukh 20470. Harnai, Lace. N. Wazir.: Miram Shah, Fz. 305, Blatt. & Fz. 1, 125, 136, 137, 163. Boya, Fz. 902. Datta Khel, Fz. 1195, 1196, 1197, 1198, 1215, Blatt. & Fz. 614, 1351. Ad fl. Volam prope Shewa Post, Blatt. & Fz. 892. — Kalat: Inter Surab et Kalat, 1700—1800 m, Rech. 28346! — Shorawak, Maynard. Akhtarzai, Harsukh 18773. Anghar, Meynell 753-b.

Distr. gen.: Endem.

M. strigosa ist offenbar mit *M. cabulica* und *M. longipetala* nah verwandt, mit denen sie den Habitus gemeinsam hat, nämlich den niedrigen, gedrungenen, starren Wuchs und die kurzgestielten oder fast sitzenden dicken starren, horizontal abstehenden oder etwas herabgebogenen Früchte. Im blühenden Zustand ist sie von jenen Arten durch die relative Kleinheit der Blüten leicht zu unterscheiden. Im Fruchtzustand ist die Unterscheidung oft etwas schwieriger. Dicke des Stengels, Starrheit des Wuchses und Gedrungenheit sind bei *M. strigosa* meist weniger ausgeprägt, auch sind die Früchte der ganzen Länge nach etwas dünner, d. h. ihre Basis ist weniger verdickt. Von den drei Arten hat *M. strigosa* das weiteste Areal. Im allgemeinen schließt es westlich an dasjenige der beiden anderen Arten an; in West-Pakistan deckt es sich teilweise mit denjenigen der *M. cabulica;* im allgemeinen scheint *M. strigosa* höhere Lagen zu bevorzugen.

12. ***M. longipetala*** Gilli, Feddes Repert. 57: 223 (1955).
Typus: Gilli 1032, W!

Planta annua, humilis, conferta, pilis brevissimis ramosis obsita. Folia lanceolata vel oblonga, integra vel repando-angulata. Pedicellus subnullus vel ad summum 1 mm longus, fructifer incrassatus. Calyx 2—3 mm longus. Petala 5—10 mm longa, ungue flavescente exserto; lamina alba, anguste obovata, 1—2 mm lata, calyce 3-plo usque 4-plo longior. Siliqua 1—2 cm longa, patula, subincurva, obtuse tetragona, pilis brevissimis interdum pilis longioribus patentibus immixtis tomentella, rarissime glabra, stylo conico subacuto.

Afghanistan: E: Kabul: Bala Hissar, 1800 m, Rech. 16013! Kabul, Honigberger!, Rech. 17055! Babur, Volk 420! Botkhah, 1770 m, Gilli 1029! Sher Darwasa, 1800 m, Gilli 1030!, 1031!, 1032!, 1033!, 1034!, 1035!, Rech. 16982!, Neub. 50/534! Kuh Khorogh, 1950 m, Gilli 1038! Istalif, 1840 m, Gilli 1036!, Lindb. 58/245! Inter Kabul et Paghman, 1880 m, Gilli 1037! Aliabad, Neub. 50/82!, 51/14! 3110!, Volk 1478 p. p.! Kuh-i Asmai, 2000 m, Hdg. & Wdb. 2715!, 3116!, Lamond 1914! Kabul versus Band-e Kargha, Rech. 31435! Gulbahar, Amsel s. n.! Logar, Volk 1818! Charikar, Kitam. Sheikhabad inter Kabul et Ghazni, 2300 m, Rech. 17260! In jugo Shibar, Lindb. 59/495! Ghazni: Darreh Darang, Lindb. 62/3! Shashgao, Kitam.

Distr. gen.: Endem.

Obwohl sich *M. longipetala* auffällig nur durch die weiße, nicht purpurne Blütenfarbe von *M. cabulica* unterscheidet, handelt es sich bei *M. longipetala* doch offenbar um mehr als eine bloße Farbvariante. Näheres siehe unter *M. cabulica*. Außerdem scheinen sich die Verbreitungsgebiete auszuschließen. Der Artname *M. cabulica* ist offenbar im Sinne von „Regnum cabulicum", also nicht als Orts-, sondern Landschaftsname zu verstehen; ebenso ist die Herkunftsangabe des ältesten Beleges (HONIGBERGER) zu deuten. Der einzige Beleg von *M. cabulica* aus der näheren Umgebung von Kabul, VOLK 1478 p. p. aus Aliabad, ist eine Mischung von *M. longipetala* und *M. cabulica*. Da dies der einzige Mischbeleg ist, und da mir in der Natur niemals Mischpopulationen untergekommen sind, möchte ich annehmen, daß es sich um eine Etiketten- bzw. Fundortsverwechslung handelt, daß *M. cabulica* tatsächlich in der engeren Umgebung von Kabul fehlt und daß sie dort durch *M. longipetala* ersetzt wird.

13. ***M. cabulica*** (BOISS.) HOOK. f. & THOMS., Journ. Linn. Soc. Bot. 5: 156 (1861); BOISS., Fl. Or. 1: 224 (1867).
Syn.: *Strigosella cabulica* BOISS., Diagn. Pl. Or. Nov. Ser. 2, 1: 22 (1853). *M. strigosa* BOISS. var. *macrantha* O. E. SCHULZ, Notizbl. Bot. Gart. Berlin 7: 1087 (1927), e descr. *M. Koelzii* RECH. f., Phyton 3: 64 (1951).
Icon.: Clavis p. 29; RECH. f., Dan. Biol. Skr. 10, 3: 43, fig. 17 (1958).
Typus: Afghanistan: Pushut, GRIFF., G! K.

Planta 3—10 cm alta, humilis, conferta, saepe pluricaulis, caulibus decumbentibus vel ascendentibus brevibus crassiusculis. Indumentum setis patulis dense strigosum, pilis brevibus furcatis immixtis; folia oblonga, sinuato-dentata vel sinuato-lobata. Racemi simplices conferti densiflori. Pedicelli subnulli vel brevissimi, fructiferi ± 1 mm longi, valde incrassati. Calyx ± 4 mm longus; sepala obtusiuscule acuminata, hyaline marginata, purpurascentia. Petala 9—10 mm longa, ungue pallido longe exserto, lamina obovata purpurea. Siliqua 10—14 (—22) mm longa, ± 2 mm crassa, rigida, teres, lineari-conica, dense longe strigosa, rectangulariter patula, leviter recurva, basi crassissima, apicem versus sensim attenuata, pilis brevibus ramosis et setis longis patulis dense obsita. Stylus glaber linearis brevis; stigmatis lobi conniventes.

Afghanistan: **NW:** In valle fluvii Hari Rud: Tirphul, AITCH. 1005. — **E:** Kabul: E Jalalabad in arenosis, 600 m, VOLK 2436!, EDELB. 24! Inter Seh Baba et Nimla, KERST. 617! Jagdalak, 2100 m, KOELZ 11484! (Typus *M. Koelzii* RECH. f.). Inter Sarobi et Darunta, VOLK 1857! Sarobi, 1000 m, VOLK 2458 p. p.!, NEUB. 4124!, 4740!, GILLI 1020! Lataband, 1400 m, VOLK 1857-a!, 1800—2100 m, RECH. 31077! Panjshir, 2000 m, KOELE 3994! 22 km supra Gulbahar, 1750 m, HDG. & WDB. 3006! Aliabad, VOLK 1478 p. p.! Kabul, HONIGBERGER s. n.! Kankarak, LINDB. 1958/201! Hadda, LINDB. 1958/194! Narang, in valle Kunar, LINDB. 1958/183! — Pushut, GRIFF. 1542!
Pakistan: Chitral: Drosh, 1500 m, TOPPIN 106! — Peshawar: In jugo Khyber, KERST. 9196!, HALCRO JOHNSTON 2!, 36!, PODLECH 10180! Attock, STEWART s. n.!, PODLECH 10165! — N. Wazir.: Miram Shah, Fz. 808, BLATT. & Fz. 208, 214, 290, 133. Datta Khel, BLATT. & Fz. 1474, Fz. 1212, 1214, 1230. Boya Fort, Blatt. & Fz. 105, Fz. 905. S. Wazir.: Wana, 1350 m, LACE 632, 654!, DUTHIE 15627. Barwand, 1210 m, DUTHIE 15701, 15716. — Quetta: Fort Sandeman, HARSUKH 20471! 26 km N Fort Sandeman versus Wana, 1500 m, RECH. 29838!, LAMOND 1444! Gumbaz, RECH. 29645! Inter Ziarat et Sanjawi, 1900 m, RECH. 29402! Inter Loralai et Sanjawi, 1600 m, RECH. 29434! Shinghar, 50 km N Fort Sandeman, 2000 m, RECH. 29905-c! — Akambar, LACE 3670!

Distr. gen.: Endem.

M. cabulica scheint in der näheren Umgebung von Kabul nicht vorzukommen und dort durch *M. longipetala* ersetzt zu werden, von der sie sich außer durch die purpurne, nicht weiße Blütenfarbe noch durch eine Reihe von akzessorischen Merkmalen unter-

scheidet, deren Konstanz zu überprüfen bleibt. Die Petalen der *M. cabulica* sind anscheinend vorne durchschnittlich stärker verbreitert, oft auch etwas länger, die Früchte kürzer und dicker, von der Basis gegen die Spitze stärker verjüngt; in der Fruchtbehaarung überwiegen lange, abstehende, weiße Borsten stärker über kurze verzweigte Haare, und die Grundblätter sind durchschnittlich länger, schmäler und häufiger tiefgelappt. Vergleiche auch unter *M. longipetala*. Der Schwerpunkt der Verbreitung der *M. cabulica* liegt im Jalalabad-Becken und im angrenzenden West-Pakistan. Soweit ich feststellen konnte, finden sich zweireihig angeordnete Samen bei *M. cabulica* im Gegensatz zur Originalbeschreibung nur ausnahmsweise. Gelegentlich ist die Zweireihigkeit unvollständig. Dadurch fällt *M. Koelzii* in die Synonymie der *M. cabulica*.

14. ***M. Meyeri*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 71 (1842) et Boiss., Fl. Or. 1:229 (1867).
Syn.: *M. crenulata* (C. A. Mey.) Vassilcz., Fl. URSS. 8: 284 (1939), non *M. crenulata* (DC.) Boiss. (1867). *Hesperis crenulata* C. A. Mey., Verz. Pfl. Cauc., 187 (1831), non DC. (1821).
Typus: Talish, C. A. Mey., LE.

Planta annua, 10—25 cm alta, glabra, dichotome ramosissima. Folia integra, inferiora ovata, breviter petiolata, caulina oblonga, late auriculato-amplexicaulia. Pedicellus calycem aequans. Calyx 5—7 mm longus, profunde bisaccatus. Petala obovata, retusa, 13—15 mm longa. Siliquae 40—60 × 1—1,25 mm, glabrae, erecto-patulae; septum hyalinum subbinerve; stylus siliquae latitudine triplo longior; stigma acutum.

Talish: In glareosis ad rivos, 1200—1500 m, C. A. Mey., Hohen.

Distr. gen.: Transcaucasia.

Ich habe keine Belege aus dem iranischen Florengebiet gesehen.

15. ***M. crenulata*** (DC.) Boiss., Fl. Or. 1: 229 (1867).
Syn.: *Hesperis crenulata* DC., Reg. Veg. Syst. Nat. 2: 456 (1821). *M. glaberrima* Rech. f. & Esfand., Phyton 3: 63 (1951).
Icon.: Tab. 24, fig. 2.
Typus: „Inter Aleppo et Mosul", Olivier, P.

Annua, valida, multicaulis, 5—15 (—20) cm alta; caules crassiusculi, a basi arcuata erecti. Tota planta sparse papillosa valde glabrescens vel ab initio subglabra. Folia inferiora oblonga, usque ad 25—45 × 5—10 cm, subintegra vel crenato-repanda, in petiolum attenuata, caulina oblongo-lanceolata, basi acute auriculata vel rarius rotundata, sessilia, remote subsinuato-denticulata usque subintegra. Pedicelli erecto-patentes calyce breviores, fructiferi incrassati ± 10 mm longi. Calyx (7—) 9—12 (—15) mm longus, purpurascens, profunde bisaccatus. Petala intense rosea, obovata, obsolete retusa, calyce quarta parte vel dimidio vel fere 2/3 longiora, lamina 3—5 × 3 mm, ungue tenui calyce paulo longiore. Siliquae 6—9 (—12) cm longae, ± 2 mm crassae, rectangulariter patentes; septum crassum, spongiosum. Stylus siliquae latitudine longior; stigma subanceps obtusiusculum vel acutiusculum.

Iraq: Kurd.: Arbil: Inter Arbil et Rawandiz, Nab. 1347. In jugo Bazian E Rawandiz, Ludlow-Hewitt 1197. Arbil, Haines s. n.! Barkley 5589! Mosul: Hinnis, 6 km N Ayn Sifni, Thesiger 638! 2 km N Niniveh, Barkley 4616! Mosul, Guest 1282. Sul.: Inter Chamchamal et Sulaymaniyah, Haines s. n.! Sulaymaniyah, Barkley 8478!, Graham. 49 km W Sulaymaniyah, Barkley 4466! — Diyala: Jabal Hamrin, Bornm. 879.
Persia: W: Kermansh.: Kuh-e Qalajeh, Behb. 104 (Typus *M. glaberrimae* Rech. f. & Esfand.)!

Distr. gen.: Palaestina, Syria, Iraq, Persia.

M. crenulata variiert wenig. Sie ist im blühenden Zustand gewissen *Chorispora*-Arten ähnlich. Die von mir ursprünglich auf Grund der an der Basis verschmälerten, nicht spitz geöhrten Blätter spezifisch abgegrenzte *M. glaberrima* läßt sich nicht aufrechthalten, da sich bei nunmehr reichlicher vorliegendem Vergleichsmaterial zeigt, daß bei kümmerlich gewachsenen oder nach Verbiß wieder ausgetriebenen Exemplaren die Neigung zur Reduktion der sonst für die Art charakteristischen spitzen Blattöhrchen besteht.

Species dubia

M. hispida Litw., Trav. Mus. Bot. Acad. Sci. Petersbg. 1: 37 (1902).

Turcomania: Prope Ashkhabad, Litw. 550.

94. *Eremobium*

Eremobium Boiss., Fl. Or. 1: 156 (1867).
Syn.: *Malcolmia* R. Br. Sect. *Eremobium* Cosson, Ill. Fl. Atl. 1: 22, tab. 15, 16 (1882); Comp. Fl. Atl. 2: 133 (1885).

Herba annua, pilis ramosis aspera, ± cinerascens. Folia linearia vel oblonga. Sepala interiora saccata. Filamenta interiora exterioribus latiora.

1. ***E. aegyptiacum*** (Spreng.) Hochreutiner, Ann. Cons. Jard. Bot. Genève 7—8: 159 (1904).
Syn.: *Malcolmia aegyptiaca* Spreng., Syst. 2: 898 (1825). *Cithareloma gedrosiacum* Rech. f. & Esfand., Phyton 3: 63 (1951).
Icon.: Clavis p. 31.
Typus: Aegyptus.

Herba normaliter annua, valde ramosa, ramis prostratis vel diffusis 5—30 cm longis, pilis ramosis aspera, ± cinerascens. Folia linearia vel oblonga. Sepala interiora saccata, sero decidua. Petala anguste spathulata, rosea. Filamenta interiora exterioribus latiora. Siliqua a dorso haud compressa quam pedicellus duplo latior, longitudine valde variabilis, 9—25 mm longa 1,2—1,6 mm lata, inter semina leviter constricta; valvae facile dehiscentes. Stylus brevis; stigma obtusiusculum. Semina exalata, uniseriata.

Persia: **S**: Kerm.: Hamun-e Jaz Murian, in arenosis, 300 m, Popov 51/37! Bal.: Iranshahr, Salavatian 205-E!, Manuch. 5670-E!, 5677-E!, Safavi 6352-E! Hudiyan: Chah Kambar, 850 m, Gabr.
Pakistan: Makran: Panjgur, 900 m, Popov 191!

Distr. gen.: Africa borealis, Arabia, Persia australis, Pakistan.

95. *Hesperis*

auctore František Dvořák, Brno.

Hesperis L., Spec. Plant. 663 (1753) pro max. p. Gen. Plant. ed. 5: 297 (1754) pro max. p.
Syn.: *Deilosma* Andrz. in DC., Reg. Veg. Syst. Nat. 2: 446 (1821) pro syn.; Fuss, Fl. Transsilv. 56 (1866).

Lit.: M. E. Fournier, Bull. Soc. Bot. Fr., Paris, 13: 326—361 (1866). E. Boissier, Flora Orientalis 1: 230—237 (1867). V. Borbás, Magyar Bot. Lapok Budapest 1: 161—167,

196—204, 229—237, 261—272, 304—313, 344—348 et 369—380 (1902); 2: 12—23 (1903). J. Bornmüller, Beihefte zum botanischen Centralblatt 19 (2): 195—270 (1906) et 27 (2): 288—347 (1910). G. E. Post, Flora of Syria, Palestine and Sinai 1: 76—77 (1932). J. Bornmüller, Feddes Repertorium 49: 253—272 (1940). N. N. Tzvelev, Bot. Mat. Herb. Inst. Moskva et Leningrad 19: 114—155 (1959). J. Cullen in P. H. Davis, Flora of Turkey 1: 452—460 (1965). F. Dvořák, Feddes Repertorium 72 (1): 19—24 (1965).

Herbae biennes seu perennes, glabrae seu pilis eglanduliferis et glanduliferis obsitae. Calyx clausus, rarissime apertus; sepala 2 basi saccata, rarissime subaequalia. Petala flava, purpurea, roseo-violacea seu alba, longe unguiculata; petalorum lamina seu obovata abrupte in unguem attenuata seu oblonga sensim in unguem attenuata. Staminum breviorum filamenta cylindrica, longiorum basi dilatata. Stigma cylindricum bilamellatum, lamellis erectis, ovalibus, longioribus quam latis; rarissime stigma globosum, breviter bilobum. Siliquae saepius cylindricae, rarius superne sat longe attenuatae, valvis aut facile aut difficile dehiscentibus usque indehiscentibus nervo mediano valido, nervisque lateralibus tenuibus percursae. Semina uniseralia, notorrhizea. Glandulae nectariferae saepissime tantum laterales. Septum membranaceum e cellulis saepissime transverse elongatis compositum, interdum septum fungosum.

1a. Siliquae maturae contortae, circinnatae ..... 11. *H. thyrsoidea* Boiss.
b. Siliquae maturae cylindricae 2
2a. Siliquae maturae erectae, patentes vel patentissimae 3
b. Siliquae maturae pendulae 9
3a. Siliquae maturae patentes vel divaricatae, superne longiuscule attenuatae, valvis omnino indehiscentibus, pilosae 4
b. Siliquae maturae erectae, superne non attenuatae, valvis dehiscentibus, glabrae (tenerae interdum basi tantum pilosae) 7
4a. Racemi bracteati 5
b. Racemi basi tantum bracteis suffulti 6
5a. Plantae c. 20 cm altae (in regione nostra); caulis plerumque ramosus. Flores numerosi, florendi tempore approximati ..... 7. *H. Novákii* Dvořák
b. Plantae c. 30 cm altae; caulis simplex. Flores pauci, florendi tempore remoti ..... 8. *H. odorata* Dvořák
6a. Folia caulina media et superiora oblonga usque anguste ovata, basi angustata usque contracta sessilia margine integerrima. Petalorum lamina (9—) 10,5 (—12) mm × 3—4 mm ..... 10. *H. nivalis* Boiss. & Hausskn.
b. Folia caulina media et superiora ovata, basi in petiolum brevem alatum contracta seu omnino sessilia, margine grosse dentata. Petalorum lamina oblonga, 15—16×7 mm ..... 9. *H. luristanica* Dvořák
7a. Caulis jam inferne ramosus, nodoso-incrassatus. Calyx apertus ..... 3. *H. leucoclada* Boiss.
b. Caulis superne ramosus; calyx clausus 8
8a. Folia caulina media et superiora ovata usque anguste ovata, basi contracta brevissime petiolata. Planta pilosa seu subglabra basi tantum pilosa ..... 1. *H. hyrcana* Bornm. & Gauba
b. Folia caulina media et superiora ovata basi contracta usque subcordata subamplexicauli sessilia. Planta subglabra; caulis basi glaber, subviolaceus, nitidus ..... 2. *H. Straussii* Bornm.
9a. Planta omnino glabra; folia caulina media et superiora ovata usque anguste ovata. Flores obscure lutei ..... 5. *H. Borbásii* Dvořák

b. Planta pilosa; folia caulina media et superiora oblonga usque anguste ovata. Flores lutei seu obscure purpurei (sicci intense violacei) 10
10a. Flores lutei ..... 4. *H. persica* Boiss.
b. Flores obscure purpurei (sicci intense violacei) .. 6. *H. kurdica* Dvorak & Hadač

Subgen. *Hesperis*

Siliquae maturae cylindricae usque subtetragonae, rarissime dorso compressiusculae. Septum membranaceum e cellulis parenchymaticis parietibus rectis compositum. (Tab. 1, fig. 4 et 3.)

Sect. *Hesperis*

Syn.: *Hesperis* L. sect. *Deilosma* Andrz. in DC., Reg. Veg. Syst. Nat. 2: 448 (1821) p. p. et Prodr. 1: 188 (1824) p. p.; Ledeb., Fl. Ross. 1: 171 (1842); Besser, Enum. Pl. Volhyn. 82 (1822); Fourn., Bull. Soc. Bot. Fr. 13: 336 (1866) p. p.; E. I. Nyárády in Savul., Fl. Rep. Pop. Romane 3: 186 (1955). *Hesperis* L § 1. *Purpureae* Boiss., Fl. Or. 1: 230 (1867); N. Busch, Fl. Cauc. 18: 653 (1910) et Fl. URSS. 8: 243 (1939) pro sect. *Hesperis* L. subgen. *Monticolae* Borbás, Magyar Bot. Lapok 1: 369 (1902).

Petala purpureo-violacea seu alba, petalorum lamina obovata usque subrotundata, abrupte in unguem attenuata. Siliquae erectae usque patentes valvis dehiscentibus; septum membranaceum.

1. ***H. hyrcana*** Bornm. & Gauba, Feddes Repert. 49: 254 (1940).
Syn.: *H. matronalis* L. *β runcinata* Boiss., Fl. Or. 1: 233 (1867) p. p. *H. runcinata* Freyn, Bull. Herb. Boiss. 2: 838 (1902) non Waldst. & Kit. (1805). *H. lapsanifolia* Borbás, Magyar Bot. Lapok 2: 17 (1903) p. p. *H. matronalis* Schmalh., Flora 1: 62 (1895) p. p. et auct. al. Fl. Ross. p. p. non L. (1753).
Typus: „Nördliches Persien: Elburs, in Wäldern des Tschalus-Tales, zwischen Gorgan und Ziarat", Gauba, B!

Perennis, pilosa usque subglabra. Caulis erectus, (30—) 80 (—120) cm altus, basi pilis albis eglanduliferis simplicibus ac pilis glanduliferis articulatis tectus, superne pilis eglanduliferis simplicibus bifurcisque atque pilis glanduliferis supra descriptis vestitus; interdum caulis subglaber, basi tantum pilosus. Folia radicalia et caulina inferiora lyrata, rarius oblonga, longe petiolata; folia cetera ovata usque anguste ovata, etiam summa brevissime petiolata; folia omnia subglabra seu praecipue pilis eglanduliferis simplicibus bifurcisque tecta. Racemi simplices seu basi ramosi. Pedicelli erecto-patentes, in statu fructifero 6—7 mm longi. Sepala 5,5—7,5 mm longa. Petala violaceo-rosea; unguis 10—12 mm longus; lamina obovata, 9—12 mm longa, 7—10 mm lata. Siliquae seu glabrae seu juveniles basi sparse pilosae, (3,2—) 6,8 (—11,1) cm longae. Semina 2—2,5 × 1 mm. Floret IV—V.

Persia: N: Gorg.: In valle Chalus inter Gorgan et Ziarat, 800 m, Gauba 1952. Bandar-i Gaz, Freyn. Prope Ziarat, Gauba 146! Minudasht, Shar. 560!, 581! In montosis Asterabadensibus prope Ziarat, Bge. 64! In silva „Daland", 150 m, Mooney 6515! Maz.: Inter Amol et Zardman, 500—1800 m, Schmid 5847! Wdb. 559! Kalar Dasht, N Takht-, Suleiman, 1800—2200 m, Gauba. 5 km SE Babol Sar, Stutz 1237! 40 km S Chalus, 900 m, Stutz 1170! 16 km S Shahi, 600 m, Furse 2898! Gil.: In montosis prope Manjili Buhse 981 M. Dalak, Auch. 4124! (Typus *H. matronalis* L. *β runcinatae* Boiss. non Waldst. & Kit.). Inter Ardabil et Astara, 600 m, Furse 2477! M. Samam, Buhse. — C: Qazv.: Karaj, planta e seminibus typi culta, Gauba!

Distr. gen.: Persia borealis, Caucasus.

2. ***H. Straussii*** Bornm., Beih. Bot. Centrbl. 27: 299 (1910).
Syn.: *H. matronalis* L. var. *runcinata* Nab., Publ. Fac. Sci. Univ. Masaryk (Brno) 35: 28 (1928) non Waldst. & Kit. ac Boiss. (1867).
Typus: „In monte Noa-Kuh ditionis opp. Kerind", Str., Je!

Perennis. Caulis erectus, glaber seu subglaber, praecipue basi subviolaceo-tinctus. Folia radicalia caulinaque inferiora lyrata usque oblonga, saepissime magna (lamina usque 10×4 cm, petiolus 4—6 cm); folia cetera ovata usque anguste ovato-oblonga, basi contracta usque subcordata subamplexicauli sessilia; folia omnia glabra seu margine pilis praecipue eglanduliferis mollibus tecta. Racemi terminales et laterales. Flores initio densi, demum remoti. Pedicelli erecto-patentes, floriferi (4—) 5 (—6) mm longi, fructiferi 9—10 mm longi. Calyx clausus; sepala basi bisaccata, purpurea (sicca subviolacea), (6—) 8 (—9) mm longa. Petala intense violacea: unguis ± 10 mm longus; lamina 8—13×4—7 mm. Siliquae tenerae seu glabrae seu pilis eglanduliferis puberulae. Stigma globosum, breve bilamellatum. Floret: V—VI.

Iraq: Kurd. Sul.: Kamarspa inter Halabja et Tawilla, Rawi 22262!, 22263! M. Avroman ad confines Persiae in ditione Tawilla, Rech. 10355! N Biyara, Gillett 11816!
Persia: W: Kermansh.: Prope Qasr Shirin supra Rijab, 1700 m, Nab. 1292! Kuh-e Nevoh, 2400 m, Str. Lur.: Dow Rud, 1650 m, Koelz 15771! Kharon, 2200 m, Koeie 1448!

Distr. gen.: Endem.

3. ***H. leucoclada*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 69 (1842) et Fl. Or. 1: 232 (1867) p. p.
Syn.: *Sisymbrium hesperidifolium* Boiss. & Buhse, Mém. Soc. Nat. Mosc. 18: 22 (1860).
Typus: Auch. 4123, W!

Perennis. Caulis jam inferne ramosus, erectus, nodoso-incrassatus, basi subviolaceus, superne albo-tinctus, glaucus, glaber, c. 50 cm altus. Folia radicalia et caulina inferiora lyrato-pinnatifida; folia cetera ovata usque anguste ovata, etiam summa brevissime petiolata; folia omnia glabra, rarius margine tantum pilis eglanduliferis simplicibus sparse ciliata. Pedicelli florendi tempore erecti, glabri seu pilis paucis eglanduliferis simplicibus tecti, c. 5 mm longi. Calyx apertus; sepala 6—8 mm longa. Petala violacea; unguis 9—10 mm longus; lamina c. 10×5 mm. Siliquae erectae, jam juveniles glabrae. Floret: VI.

Persia: W: Lur.: Ilam, Kuh Reno, Mirzayan 25890! Esf.: Esfahan, Auch. 4123! — C: Yazd: In montibus prope Yazd, Buhse.

Distr. gen.: Endem.

Der von Boissier zitierte Beleg „Inter Esfahan et Tehran ad Ssof, Bunge" gehört nicht zur Gattung *Hesperis* L.

Sect. *Pachycarpos* Fourn., Bull. Soc. Bot. Fr. 13: 334 (1866) emend. Tzvelev, Mat. Gerb. Inst. 19: 152 (1959).
Syn.: *Hesperis* L. sect. *Deilosma* Andrz. in DC., Reg. Veg. Syst. Nat. 2: 448 (1821) p. p. et Prodr. 1: 188 (1824) p. p.; Fourn., Bull. Soc. Bot. Fr. 13: 336 (1866) p. p. *Hesperis* L. § 2. *Lividae* Boiss., Fl. Or. 1: 234 (1867) p. p. *Hesperis* L. subgen. *Mediterraneae* Borbás, Magyar Bot. Lapok 1: 346 (1902).

Petala flava seu purpurea (sicca intense violacea). Petalorum lamina oblonga, sensim in unguem attenuata. Siliquae cylindricae, pendulae, valvis indehiscentibus seu difficile neque per longitudinem totam dehiscentibus. Septum dimidio maxime membranaceum.

4. ***H. persica*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 64 (1842). Fl. Or., 1: 236 (1867). Syn.: *Hesperis meda* Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51: 300 (1886). *H. alabadensis* Stapf, Denkschr. Akad. Wiss. 51: 300 (1886). *H. karsiana* N. Busch, Bot. Journ. URSS. 20: 85 (1935).
Icon.: Clavis p. 27.
Typus: Auch. 4103, G.

Perennis. Caulis erectus, simplex seu parum ramosus, pilis eglanduliferis simplicibus albis, 1—2 mm longis, interdum etiam pilis eglanduliferis bifurcis intermixtis ac pilis brevibus glanduliferis articulatis tectus, (28—) 51 (—60) cm altus. Folia radicalia et caulina inferiora oblonga usque lyrata, longius petiolata; folia caulina cetera anguste ovata, sessilia. Folia omnia pilis eglanduliferis simplicibus, interdum etiam bifurcis ± intermixtis atque pilis glanduliferis supra descriptis rarissimis tecta. Racemi simplices seu basi parce ramosi, elongati. Pedicelli florendi tempore (2—) 3,5 (—5) mm longi. Sepala (6—) 9,6 (—12) mm longa. Petala anguste oblonga, sordide lutea; unguis (10—) 11,8 (—13) mm longus; lamina (9—) 12,1 (—17)×(2—) 3 (—4) mm. Siliquae divaricatae usque pendulae, glabrae seu basi ± dense pilis adpressis praecipue eglanduliferis simplicibus tectae, (3,5—) 7,3 (—12) cm longae. Floret: IV—V.

Persia: **N**: Maz.: In valle fluvii Chalus, 2400 m, Furse & Synge 398! Distr. Nur, Kamarband, 2400—2600 m, Rech. 6420! In declivibus borealibus jugi Kandavan, 2700 m, Rech. 482!, 485! Gil.: In montibus supra Rudbar, 200—500 m, Bornm. 6135, Stapf! Inter Kaluraz et Rudbar, Bornm. 6135. In valle fluvii Safid Rud prope Rudbar, 200—500 m, Bornm.!, Rudbar, Pichler! — **W**: Azerb.: M. Karnaru, Knapp! Ser, Knapp!, Gill. Sm. 1519. Zanjireh, Knapp! Kuh-e Mishu Dagh prope Yam, 2000—2200 m, Grossh. Ad lac. Rezaiyeh, Gill.-Sm. 2244. Azerbaijan, Auch. 4103, 4114! Kermansh.: Kuh-e Richab, Str. Kuh Dalahu, Str. Ham.: In montibus supra Tafresh, Str.! M. Rasvand, Str.! Takht-i Suleiman N Hamadan, Str. Yalfan, Pichler! Borujerd, Str.! M. Alvand SE Hamadan, Str. 1894, 1899, 1902! Arak: M. Latetar, Str.! Mowdar, Str.! Kuh-e Safid Khaneh, Str.! Arak, Str. Lur.: Oshtoran Kuh, Str.! Dow Rud, 1700 m, Koelz 15666!; 1800 m, Koelz 17410! M. Saverz, Hausskn.! Safid Kuh, 2400 m, Koelz 17515! Bakht.: Damaver, 3600 m, Koelz 15173! — **S**: Fars.: Persia australis, Ky. 952! Persepolis, Ky. 271.428-a! Kuh Istahbanat, 2360 m, Bobek 33! Kuh-e Barfi prope Shiraz, Stapf 268!, 82! Prope Kazerun, 2000 m, Stapf! Inter Abadeh et Deh Bid, 1800 m, Pravitz 742. Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5339! — **C**: Tehr.: M. Tuchal supra Ferosad, 2000 m, Bornm. 6136. Inter Kan et Solochun, Bruns. Prope Darband, Ky. 136! In valle Hafthauz, 1300—1500 m, Aell. 1067!, 1080! Qazv.: Fashand, Gauba. In montibus ad pagum Kalak, Rech. 95!, Gauba. Gach Sar, 1200—2500 m, Schmid 5683!; 2750 m, Furse! Inter Gach Sar et Chalus, 3000 m, Schmid 5758! Shahr.-Bust.: Shahrud, Bge. Yazd: Deh Bala prope Yazd, Buhse.

Distr. gen.: Persia, Transcaucasia.

5. ***H. Borbasii*** Dvořák, sp. nov.
Typus: Koelz 17939, W!

Planta perennis, omnino glabra. Radix palari-ramosa. Caulis erectus, c. 30 cm altus, glaber. Folia radicalia caulinaque inferiora spathulata, breviter petiolata (petiolus alatus), apice obtusa, margine integerrima; folia media et superiora ellip-

tica usque oblonga, summa etiam anguste ovata, basi angustata usque contracta sessilia, apice acuta, margine integerrima; folia omnia glabra. Pedicelli erecti usque nutantes, florendi tempore (5—) 7 (—9) mm longi, glabri. Sepala glabra, 9—10 mm longa. Petala obscure lutea; petalorum unguis 11—12 mm longus; lamina oblonga, 14—15×5 mm. Siliquae tenerae glabrae. Siliquas maturas ac semina non vidi. Floret V. Grana pollinis: longitudo: $\times \pm 3.s_x$: 30,22 u $\pm$ 3.0,280 μ; $\pm$ s: 2,800 μ; latitudo 28,42 u $\pm$ 3.0,318 μ; 3,188 μ. — Affinitas: Haec species verosimiliter *H. persicae* Boiss. proxima est. Ab *H. persica* pilorum absentia, foliorum forma ac petalorum laminae forma differt.

Persia: W: Bakht.: Gahar, 2700 m, 30. V. 1941, Koelz 17939!

Distr. gen.: Endem.

6. ***H. kurdica*** Dvořák et Hadač, Preslia 36: 307 (1964).
Syn.: *H. podocarpa* Freyn, Bull. Herb. Boiss. 1: 257 (1901), non Boiss. (1842).
Typus: Hadač 2153, PR!

Perennis, pilis longis eglanduliferis simplicibus sparse obsita. Caulis erectus, rarius simplex, saepius ramosus. Folia radicalia caulinaque inferiora lyrata seu oblonga, longe petiolata; folia caulina cetera oblonga usque ovata, basi angustata usque contracta sessilia. Pedicelli (3—) 10 (—12) mm longi, siliquarum maturarum incrassati, deorsum arcuati. Sepala violacea, (7—) 10 (—12) mm longa. Petala obscure purpurea, sicca intense violacea; unguis 10—13 mm longus; lamina 9—12×4—5 mm. Siliquae maturae pendulae, basi apiceque attenuatae, (5—) 8 (—10,1) cm longae. Semina 2—3 mm longa et $\pm$ 1 mm lata.

Iraq: Kurd.: Arbil: In montibus N Rost, 2400—3000 m, Thesiger 927, 933, 986! Sakri Sakran, 2000 m, Hadač & Faisal Kader 5524! In valle Hisar-i Sakran, Hadač & Faisal Kader 5666! Sarcal, pes Algird Dagh, 2200 m, Hadač 2153!; in ripa rivuli dextra, 2200 m, Hadač 2676!, 2189! Sul.: M. Avroman, Haussk.! Mosul: In saxosis cacuminis Zawita, 2100 m, Rech. 10984!
Persia: W: Azerb.: In declivibus borealibus Kuh-e Sahand, 2100 m, Furse & Synge 239! Aq Kan Dagh, 64 km N Rezaiyeh, 2000 m, Furse 2249! Kurd.: Dezh Shahpur, 1500 m, Jacobs 6525! N Sanandaj, 1350 m, Furse 2083! 16 km E Sanandaj, 2000 m, Furse 2066! M. Shahu, Haussk.! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 195-b! — S: Fars.: Firuzabad prope Shiraz, Gauba & Sab. 145!

Distr. gen.: Persia austro-occidentalis, Iraq.

Auf *H. kurdica* beziehen sich auch die folgenden Literaturangaben: *H.* aff. *matronali* Blakelock, Kew Bull. 10: 541 (1955) p. p. *H.* aff. *persicae* Blakelock, Kew Bull. 10: 542 (1955).

Sect. *Diaplictos* Dvořák, sect. nov.

Syn.: *Hesperis* L. Sect. 2. *Pachycarpos* Fourn., Bull. Soc. Bot. Fr. 13: 334 pro min. p. *Hesperis* L. § 2. *Lividae* Boiss., Fl. Or. 1: 234 (1867) p. p.

Bracteae saepe evolutae. Petala flava seu pallide purpurea. Petalorum lamina oblonga, sensim in unguem attenuata. Siliquae patentes, patentissimae usque divaricatae, valvis omnino indehiscentibus, superne longiuscule attenuatae; septum fungosum. — Typus: *H. Novákii* Dvořák.

„Diaplictos" sec. *διαπλίκτριν* originem ducit = ausspreitzen = aussperren; sec. Bischoff, Handb. Bot. Termin. 1: 66 (1833) ausgespreitzt = divaricatus. Verbo latino „divaricatus" uti non possum, quoniam Fournier (1866) hoc verbo sensu diverso utebatur.

7. ***H. Novákii*** Dvořák, Feddes Repert. 72 (1): 22 (1965).
Syn.: *H. rupestris* Boiss. & Noë in Boiss., Fl. Or. Suppl. 46 (1888) pro max. p.; Bornm., Beih. Bot. Centrbl. 27 (2): 300 (1910) p. p.; Cullen in Davis et al. Fl. Turkey 1: 458 (1965).
Typus: „In dumetis supra Terek", Haussk., W!

Perennis, pilis praecipue eglanduliferis simplicibus ac glanduliferis articulatis adpressis ± copiosis tecta. Caulis ± ramosus, (14—) 24 (—38) cm altus. Folia radicalia et caulina inferiora oblonga usque lyrata, longe petiolata; folia cetera bracteaeque ovatae, basi lata subcordata subamplexicauli sessilia. Racemi bracteati, praecipue corymbosi. Pedicelli florendi tempore 11—17 mm longi, siliquarum maturarum patentissimi, incrassati. Sepala (8—) 9 (—11) mm longa. Petala pallide lutea usque fusco-lutea, venis saturatius coloratis; unguis 9—10 mm longus; lamina 8—12×4—6 mm. Siliquae patentes usque patentissimae, superne longiuscule attenuatae, valvis omnino indehiscentibus, puberulae, (4,5—) 8,5 (—18) cm longae.

Iraq: Kurd.: Arbil: Haji Omran, Polunin 5050!; Emberger, Guest, Schwarz, Long & Serkahia 15507! „Kurdish Hills", Low 210!

Distr. gen.: Anatolia austro-orientalis, Iraq.

8. ***H. odorata*** Dvořák, sp. nov.
Syn.: *H. rupestris* Bornm., Beih. Bot. Centrbl. 27 (2): 300 (1910) p. p. non Boiss. & Noë (1854).
Typus: Jacobs 6486, holotypus: W!, isotypus: E!

Perennis, pilosa usque subglabra. Caulis simplex, basi saepe purpurascens usque subviolaceus, pilis albis eglanduliferis simplicibus 1,5—3 mm longis tectus; caulis superne pilis albis c. 1 mm longis eglanduliferis simplicibus ac pilis adpressis glanduliferis articulatis (interdum etiam pilis eglanduliferis bifurcis intermixtis) tectus. Caulis (7—) 30 (—41) cm altus. Folia radicalia et caulina inferiora lyrata, longe petiolata; folia cetera elliptica, ovata usque anguste ovata, basi contracta seu subcordata subamplexicauli sessilia; folia seu subglabra seu aequalibus pilis ut in caule tecta. Racemi bracteati. Pedicelli florendi tempore erecti, (8—) 14 (—22) mm longi. Sepala (7—) 10 (—12) mm longa. Flores fragrantissimi (e collectore). Petala sordide lutea seu subfusca, venis saturatius purpureo- seu violaceo-coloratis; unguis 10—14 mm longus; lamina 12—13×6—7 mm. Stigma subglobosum, breviter bilobum. Siliquae diffusae usque divaricatae, superne longiuscule attenuatae, valvis omnino indehiscentibus, pilis simplicibus eglanduliferis ac pilis glanduliferis supra descriptis ± intermixtis puberulae, (4—) 9 (—13) cm longae. Semina ± 3×2 mm. Grana pollinis: longitudo: $x \pm 3.s_x$: 35,11 $\mu \pm$ 3.0,306 μ; ± s: 3,068 μ latitudo: 33,38 $\mu \pm$ 3.0,370 μ; 3,704 μ. — Affinitas: Haec species *H. Novákii* Dvořák proxima est, a qua *H. odorata* caule non ramoso, inflorescentiae forma altitudineque differt.

Iraq: Kurd.: Sul.: Prope Penjwin in glareosis serpent., 1400 m, Rech. 12283! M. Avroman ad confines Persiae prope Tawilla in saxosis calc., 1800—2000 m, Rech. 10356! Penjwin, Rawi 8832!, 22562! Pira Magrun supra Qarachitan, Gillett 7765! Pira Magrun, Haussk.! M. Avroman N Halabja, Rawi 22059! Amoret prope Qaradagh, Haines 1136! — M. Hamara Barza, Rawi 29509!
Persia: W: Kurd.: Dezh Shahpur, 1900 m, Jacobs 6486! Kermansh.: Kuh-i Parrow, Str. Bernaj, Str. Ham.: Nahavand ad basim Kuh-e Garri, Str. Lur.: Oshtoran Kuh, Str.! Arak: M. Latetar, Bornm.! — Kuh-i Tarikha ditionis fluvii Saimerre, Str.!

Distr. gen.: Iraq, Persia austro-occidentalis.

9. ***H. luristanica*** Dvořák, Ann. Nat. Mus. Wien 69: 29 (1966).
Typus: Koelz 17186, W!

Planta perennis, pilis praecipue glanduliferis phragmiferis articulatis tecta, interdum autem subglabra. Caulis c. 30—50 cm altus, a parte media ramosus. Folia radicalia caulinaque inferiora oblonga usque lyrata, longe petiolata; folia caulina cetera ovata, basi in petiolum brevem alatumque contracta seu omnino sessilia, margine grosse dentata. Racemi simplices, bracteae servatae seu racemi omnino ebracteati. Pedicelli erecti, florendi tempore (6—) 8 (—12) mm longi. Sepala (7—) 9 (—10) mm longa. Petala fusca, venis saturatius coloratis; unguis ± 15 mm longus, lamina oblonga, 15—16 mm longa et c. 7 mm lata, apice emarginato. Siliquae pilis tectae.

Persia: W: Lur.: Dow Rud, 2400 m, 5. 4. 1941, Koelz 17186!, 17417!

Distr. gen.: Endem.

10. ***H. nivalis*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 45 (1888).
Typus: „Kuh-e Sawers", Haussk., G, isotypi: W!, JE!

Perennis. Caulis erectus usque ascendens, (14—) 25 (—30) cm altus, simplex, dense pilis adpressis praecipue glanduliferis articulatis ac pilis eglanduliferis bifurcis aequilongis obsitus. Folia radicalia caulinaque inferiora oblonga, petiolata; folia caulina oblonga usque anguste ovata, basi angustata usque contracta sessilia, integerrima; folia omnia dense pilis adpressis eglanduliferis bifurcis dichotomisque, basi etiam pilis glanduliferis supra descriptis intermixtis hirta. Racemi simplices seu basi parce ramosi, basi bracteati. Pedicelli (3—) 5 (—7) mm longi, fructiferi incrassati, (3—) 7,3 (—12) mm longi. Sepala (8—) 10 (—12) mm longa. Petala anguste ovata, viridi-fusca, venis saturarius coloratis; unguis (9—) 11 (—13) mm longus; lamina (9—) 10,5 (—12) × 3—4 mm. Siliquae divaricatae usque patentissimae, superne satis longe attenuatae, nervo mediano valido, nervis lateralibus tenuibus percursae, (3—) 4,9 (—6,6) cm longae, dense pilosae. Semina 2,5 × 2 mm.

Persia: W: Ham.: Takht-i Suleiman, Str.! Bakht.: Prope Chashmeh Kuh Rang, 2500 m, Wdb. 961!, 953! Kuh-e Safid, Mart.-Escal. Lur.: Oshtoran Kuh, Bornm.! Kuh-e Saverz, Haussk.! Kuh-i Nur, 2700—3000 m, Haussk.! — S: Fars.: Kuh Bungi, Stapf! Kuh Bil, Stapf!

Distr. gen.: Endem.

Subgen. *Contorta* Dvořák, subgen. nov.

Siliquae maturae contortae, circinatae, dorso compressae, margine utrinque sulcatae. Septum membranaceum ex cellulis parenchymaticis parietibus curvatis usque sigmoideis compositum. — Typus subgeneris: *H. thyrsoidea* Boiss.

11. ***H. thyrsoidea*** Boiss., Fl. Or. 1: 234 (1867).
Syn.: *H. cappadocica* Cullen in Davis, Fl. Turkey 1: 455 (1965) pro max. p. non Fourn. (1866).
Typus: „In dumetis... M. Berytdagh Cataoniae", Haussk., W!

Biennis, copiose fere solum pilis glanduliferis articulatis tecta. Caulis erectus, (30—) 38 (—43) cm altus, saepe a basi ramosus; rami patentes 10—20 cm longi, corymbosi. Folia radicalia lyrata; folia caulina inferiora anguste oblonga; folia caulina media superioraque ovata, basi lata subcordato-amplexicauli sessilia. Pedicelli florendi tempore 3—6 mm longi. Sepala 6—8 mm longa. Petala ovata, purpurea;

unguis 9—10 mm longus; lamina c. 9 mm longa, 4 mm lata. Siliquae maturae contortae, circinatae, a dorso compressae, torulosae, nervo mediano valido nervisque lateralibus tenuibus percursae, (4,5—) 5,7 (—6,8) cm longae, c. 6 mm latae.

Persia: W: Arak: M. Latetar, Str.!

Distr. gen.: Anatolia orientalis, Persia.

96. *Micrantha*

auctore František Dvořák, Brno.

Micrantha Dvořák, gen. nov.

Calyx basi subaequalis usque levissime bisaccatus, initio clausus, demum laxus. Petala anguste lineari-subcuneata usque lineari-subspathulata. Staminum breviorum ac longiorum filamenta basi dilatata. Stigma subrotundatum, subbilobum. Siliquae basi attenuatae, apice compressae subrotundatae, valvis indehiscentibus, nervo mediano valido nervisque lateralibus tenuibus percursae. Indumentum e pilis eglandulosis dichotomis et eglandulosis stipitatis globosis compositum. Cotyledones notorrhizae. — Genus novum *Hesperidi* ac *Clausiae* verosimiliter proximum est. Ab *Hesperide* calyce demum laxo, basi subaequali seu levissime bisaccato, petalorum forma, stigmate subrotundato subbilobo, siliquarum forma ac glandulis stipitatis globosis, a *Clausia* cotyledonibus notorrhizis siliquarumque forma praecipue differt.

1. ***M. multicaulis*** (Boiss.) Dvořák, comb. nov.

Syn.: *Hesperis multicaulis* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 10 (1845); Fl. Or. 1: 236 (1867); Fl. Or. Suppl. 46 (1888).

Icon.: Clavis p. 27.

Typus: Ky. 428, W!

Planta perennis, pilis eglanduliferis dichotomis ac glandulis stipitatis globosis tecta. Caulis erectus, jam basi ramosus, (14—) 26 (—38) cm altus. Folia anguste obovata, radicalia in petiolum brevem attenuata, caulina basi angustata sessilia; folia omnia obtusiuscula, margine integerrima, pilis ac glandulis supra descriptis canescentia. Racemi simplices, elongati, pauciflori. Pedicelli initio patentes, demum nutantes, (3—) 5 (—7) mm longi, siliquarum maturarum pedicelli tenues. Sepala 4—5 mm longa. Petala livida, nervis violaceis percursa, 7—8 mm longa. Siliquae basi attenuatae, 1—3 seminibus remotis, inter semina parum constrictae, intus spongiosae, pilis ac glandulis supra descriptis tomentosae, (2,4—) 2,9 (—3,3) cm longae. Floret: V—VI.

Persia: W: Lur.: Kuh-e Saverz, 3000 m, Haussk.! Ad nives Kuh-i Nur, 3600 m, Haussk.! — S: Fars.: Kuh Abbas Ali, 3200—3600 m, Stapf 265! In rupestribus Kuh-e Sabz Pushan prope Shiraz, Ky. 428!

Distr. gen.: Endem.

97. *Clausia*

auctore František Dvořák, Brno.

Clausia Korn.-Tr., Ind. Sem. Horti Kazan. (1834).

Lit.: P. Kornuch-Trocky, Ind. Sem. Horti Kazan. (1834). V. I. Lipsky, Contrib. ad Fl. Asiae Mediae II, Acta Horti Petrop. 23: 1—247 (1904). I. T. Vassilczenko, Fl. URSS. 8: 251—256 et 641 (1939).

Herbae annuae seu perennes. Indumentum e pilis simplicibus et glandulis stipitatis globosis compositum, Sepala erecta, basi saccata. Petala unguiculata, purpurea,

subviolacea seu alba. Glandulae nectariferae laterales, subannulatae. Stigma bilobum. Siliquae teretes seu plano-compressae, valvis dehiscentibus, nervo mediano conspicuo nervisque lateralibus, tenuibus percursae. Septum e cellulis transversaliter elongatis, parenchymaticis et e stratura transversali e cellulis fibrosis copiosis composita consistens. Semina plana, marginata. Cotyledones pleurorrhizeae.

1a. Caulis foliatus. Siliquae subteretes, rectae, 5—10 cm longae ..... 1. *C. turkestanica* Lipsky

b. Folia omnia basalia. Siliquae plano-compressae, saepe curvatae, 2—4 cm longae ..... 2. *C. Podlechii* Dvořák

1. ***C. turkestanica*** Lipsky, Acta Horti Petrop. 23: 41 (1904).
Syn.: *Diptychocarpus hispidus* Regel, Acta Horti Petrop. 5, 1: 230 (1877) p. p. *D. seravschanicus* Komar., Tr. Sib. Obsc. Jest. 26: 84 (1896). *Hesperis khorasanica* Rech. f. & Aell., Phyton 3: 65 (1951). *Pseudoclausia turkestanica* (Lipsky) Vassilcz. in Pavlov, Pl. Kazakhst. 4: 244 (1961).
Icon.: Clavis p. 19.
Typus: Pamir-Alaj, LE.

Planta perennis, glandulis stipitatis globosis et ciliis eglanduliferis simplicibus satis raris obsita. Folia radicalia caulinaque inferiora oblonga, petiolata; folia caulina media anguste ovato-oblonga, basi contracta sessilia. Racemi simplices. Pedicelli florendi tempore (4—) 6 (—8) mm longi, demum paulo incrassati. Sepala 8—9 mm longa. Petala subviolacea, nervis saturatioribus percursa; unguis ± 10 mm longus; lamina oblonga, sensim in unguem attenuata, 4—6 mm longa, ± 3 mm lata. Siliquae subteretes, erectae, (5—) 6,7 (—8,5) cm longae, glabrae seu glandulis stipitatis globosis (var. *glandulosissima* Lipsky) ± dense obsitae.

Persia: E: Khor.: M. Hazar Masjed, 2000—2500 m, Rech. 5062! Inter Gifan et Bojnurd, 1500 m, Gauba 160!
Afghanistan: NW: Maimana: Darreh Zang prope Belchiragh, 1400 m, Hdg. & Wdb. 3733! — E: Ghazni: Inter Miradina et jugum Ghoutch Kol N Sang-i Masha, 3300 m, Rech. 17634! — NE: Kataghan: Paigah Kotal SE Samangan, 1350 m, Hdg. & Wdb. 4022! In valle Andarab: Darrah-i Shu, 2500 m, Podlech 11057! N Sarab, 2400 m, Podlech 11150! 10 km W jugi Khawak, 2800 m, Podlech 11218! S Doab-i Til in valle Andarab, 2700 m, Podlech 11198-a. Darrah-Kasan, in declivibus australibus Kotal-i Yawnu, 2800 m, Podlech 11705. — C: Bamian: Kargana-tu ad viam inter Bamian et Band-i Amir, 3100 m, Hdg. & Wdb. 4736! Band-Shoi inter Panjao et Behzud, 2800 m, Hdg. & Wdb. 5020! Panjao, 2700 m, Hdg. & Wdb. 4907!

Distr. gen.: Persia orientalis, Afghanistan et per totam Asiam mediam late dispersa.

2. ***C. Podlechii*** Dvořák, sp. nov.
Typus: Podlech 11718, M! Isotypus W!

Perennis, caespitosa, collo residuis petiolorum dense comoso, tota dense glandulis stipitatis globosis brevibus obsita. Caulis simplex, erectus usque ascendens, (3—) 13 (—22,5) cm altus. Folia omnia ad basin caulis dense conferta, ambitu oblonga, pinnatifida usque pinnatiparita. Racemi elongati, saepe basi caulis incipientes. Pedicelli erecti usque erecto-patentes, florendi tempore (6—) 8 (—9) mm longi. Sepala (7—) 8 (—9) mm longa. Petala pallide violascentia (in sicco!); unguis c. 10 mm longus; lamina sensim in unguem attenuata, obovata, 9—10 mm longa, c. 5 mm lata. Siliquae planae, saepe ± curvatae, valvis dehiscentibus, dense glandulis stipitatis globosis brevibus obsitae, (2,2—) 3,5 (—3,7) cm longae, usque ad 2,5 mm latae.

Afghanistan: NE: Kataghan: Khost-o Fereng, in declivibus NE Kotal-i Yawnu, 3200 m, Podlech 11718! Khost-o Fereng, in valle Echani, 3800 m, Podlech 11855! In parte superiore vallis Andarab, Darrya-i Til S Doab-i Til, in fissuris rupium silic., 2800 m, 7. VI. 1965, Podlech 11167!

Distr. gen.: Endem.

98. *Atelanthera*

Atelanthera Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 129 (1861).

Herba annua, perpusilla, pilis appressis bicuspidatis obsita. Folia linearia, integra. Sepala erecta, angusta, interiora non saccata. Filamenta libera, filiformia; antherae staminum breviorum bilocularia, minutissima, ovata, obtusiuscula; antherae staminum longiorum unilocularia, duplo maiora, acutiuscula. Siliqua linearis.

1. ***A. perpusilla*** Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 138 (1861).
Syn.: *A. contorta* Gilli, Feddes Repert. 57: 225 (1955). *A. pentandra* Jafri, Notes Roy. Bot. Gard. Edinb. 22: 101 (1956) fide Hedge.
Icon.: Clavis p. 29.
Typus: „In Himalaya occidentali temperata ad Zanskar", T. Thomson, K.

Herba annua, perpusilla, pilis appressis bicuspidatis obsita, glabrescens. Folia linearia, integra. Racemi pauciflori; pedicelli breves. Sepala erecta, angusta, interiora non saccata. Petala alba, demum violacea, anguste spathulata, emarginata, tenuiter venulosa. Filamenta libera, filiformia; antherae staminum breviorum bilocularia, minutissima, ovata, obtusiuscula; antherae staminum longiorum unilocularia, duplo maiora, acutiuscula. Ovarium 24-ovulatum; stylus distinctus; stigma depresso-capitatum, subemarginatum. Siliqua linearis, a dorso subcompressa; valvae indistincte uninerviae. Semina uniseriata.

Afghanistan: E: Kabul: In valle Logar: Sub cacumine M. Sebroderakan prope Shewaki, 2500 m, Gilli 1209 (Typus *A. contortae* Gilli)! — C: Parwan: In jugo Shibar, 2600 m, Hdg. & Wdb. 3315.

Distr. gen.: Afghanistan, Pamir-Alaj, Kashmir, Tibet.

99. *Cryptospora*

Cryptospora Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 161 (1842).
Syn.: *Trichochiton* Komar., Trav. Soc. Nat. Petersbg. 26: 113 (1896).

Lit.: V. Botschantzev, Generis Cryptosporae Kar. & Kir. revisio, Notulae Systematicae 22: 144—149 (1963).

Herbae annuae. Folia tenuia sessilia. Pili furcati longitudine diversi, fragiles. Sepala suberecta, interiora non saccata. Petala alba, emarginata. Filamenta libera. Antherae ovatae, obtusiusculae. Ovarium 3—7-ovulatum. Stylus brevissimus. Stigma bilobum, lobis erectis. Siliqua teres, indehiscens, inter semina leviter constricta. Semina uniseriata, majuscula, non mucilaginosa. Embryo notorrhizus.

1a. Planta ± valida, basi ramosa. Sepala 3 mm longa. Petala sepalis plus quam duplo longiora. Siliqua 5—7-sperma ..... 1. *C. falcata* Kar. & Kir.
b. Planta tenuis subsimplex. Sepala 1,5 mm longa. Petala sepalis vix dimidio longiora. Siliqua 3—5-sperma ..... 2. *C. inconspicua* (Komar.) O. E. Schulz

1. ***C. falcata*** Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 161 (1842).
Icon.: Clavis p. 31.
Typus: Pribalch Regio fluvii Lepsky, LE.

Planta annua, 10—40 cm alta, erecta, a basi ramosa. Folia tenuia, lanceolata, dentata, sessilia. Racemi. elongati; pedicelli breves, incrassati. Tota planta pilis inaequalibus ramosis fragilibus aspera. Sepala 3 mm longa, erecta, interiora non saccata. Petala quam sepala plus quam duplo longiora, alba, obovata, emarginata, venulosa. Ovarium ± 7-ovulatum. Stylus perbrevis; stigma bilobum, lobis erectis. Siliqua teres, 5—7-sperma, acuminata, recurva, indehiscens, inter semina leviter constricta, pilis bicuspidatis appressis obsita. Semina uniseriata, majuscula, non compressa.

Persia: E: Khor.: In jugo Allah Akbar inter Quchan et Lotfabad, 1800 m, Rech. 1734! Turcomania: Ashkhabad, Litw. 603! Prope Gyaurs, Sint. 54.
Afghanistan: N: Mazar-i Sharif: Haibak, 1200 m, Hdg. & Wdb. 3562! Kuh Baz, Lindb. 471! — NW: Maimana: Darreh Zang prope Belchiragh, 1400 m, Hdg. & Wdb. 3729! Maimana, 500 m, Hdg. & Wdb. 3601! — E: Ghazni: Qala Nau, 1000 m, Koelz 4150! — NE: Kataghan: Karkar, Volk 2692! In jugo Kalifgan, 1520 m, Furse 6483! 16 km N Doshi, 760 m, Furse 5973!, 5974! 32 km N Doshi, 760 m, Furse 5999! 5 km S Ishkamish, 1150 m, Podlech 10739! Taliqan, 720 m, Podlech 20302! In valle Namakab W Taqcha Khaneh, 1500 m, Podlech 11495! Badakhshan: Mashhad versus Faizabad, 1520 m, Furse 6078! Distr. Faizabad, 1060 m, Furse 6220!

Distr. gen.: Asia centralis, Turcomania, Afghanistan, Persia boreo-orientalis.

Die Mehrzahl der Belege entspricht der *C. omissa* Botsch. l. c. 145, die sich jedoch meiner Meinung nach spezifisch von *C. falcata* Kar. & Kir. kaum abtrennen läßt.

2. ***C. inconspicua*** (Komar.) O. E. Schulz in Engler, Natürl. Pflanzenfam. ed. 2, 17b: 573 (1936).
Syn.: *Trichochiton inconspicuum* Komar., Trav. Soc. Nat. Petersbg. 26: 113 (1896).
Typus: Pamir-Alaj, LE.

Planta 10—25 cm alta, gracilis, simplex vel pauciramosa. Folia oblongo-lanceolata, subintegra. Racemi pauciflori, laxi. Pedicelli breves. Tota planta pilis pauciramosis vel furcatis laxe obsita. Sepala 1,5 mm longa. Petala sepalis vix dimidio longiora. Siliqua 3—5-sperma, inter semina leviter constricta, pilis retrorsis laxe obsita.

Turcomania: M. Ludsch prope Ashkhabad, Litw. 562.
Afghanistan: C: Parwan: In declivibus orientalibus jugi Shibar, 2600 m, Hdg. & Wdb. 3318!

Distr. gen.: Pamir-Alaj, Syr Darya, Turcomania, Afghanistan.

100. *Sterigmostemum*

Sterigmostemum M. B., Fl. Taur.-Cauc. 3: 444 (1819).
Syn.: *Sterigma* DC., Reg. Veg. Syst. Nat. 2: 579 (1821).

Herbae annuae. Indumentum e pilis ramosis consistens, pilis brevibus glanduliferis vel glandulis sessilibus interdum immixtis, rarius plantae ± glabrescentes. Sepala suberecta, non saccata. Petala flava vel rarius alba vel purpurea, in unguem latum attenuata. Filamenta longiora per paria ad 2/3 longitudinis connata. Antherae oblongae, obtusae. Ovarium lineare, 16—20-ovulatum. Stylus brevis vel longiusculus; stigma bilobum, lobis carpidialibus decurrentibus. Siliqua linearis, subteres, inter semina saepe ± constricta, indehiscens, demum in articulos dispermos diffracta. Semina parum compressa.

1a. Petala alba, rosea vel purpurea 2
b. Petala flava 3
2a. Siliqua usque ad 5 cm longa, glandulis sessilibus sparse obsita, ceterum ± glabra ..... 2. *St. rhodanthum* Rech. f., Aell. & Esfand.
b. Siliqua 13—20 mm longa, sparse stellato-pubescens, eglandulosa, gracillima ..... 1. *St. purpurascens* (Boiss.) Parsa
3a. Stylus longissimus, siliquae latitudine sesqui- usque duplo longior, lobis elongatis 4
b. Stylus brevis, siliquae latitudine paulo usque ad summum sesquilongior, lobis brevibus 6
4a. Siliqua glanduloso-setosa ..... 5. *St. ramosissimum* (O. E. Schulz) Rech. f.
b. Siliqua glandulosa 5
5a. Folia oblonga, integra. Pedicellus florem aequans. Siliqua tomentosa, setis longis rigidis copiose immixtis ..... 4. *St. acanthocarpum* Fisch. & C. A. Mey.
b. Folia anguste lanceolata, sinuato-pinnatifida. Flores subsessiles. Siliqua tomentosa, eglandulosa ..... 3. *St. longistylum* (Boiss.) Bornm.
6a. Caulis glaberrimus. Pedicellus dimidium calycem aequans. Siliqua 3 cm longa, stellato-tomentosa, eglandulosa ..... 6. *St. laevicaule* Bornm.
b. Caulis tomentosus. Pedicellus calycem aequans vel eo longior 7
7a. Siliqua non glandulosa 8
b. Siliqua praeter pubem stellatam glandulis breviter stipitatis obsita ..... 7. *St. incanum* M. B.
8a. Petala 7—10 mm longa. Siliquae rectae vel curvatae ..... 8. *St. sulphureum* (Banks & Soland.) Bornm.
b. Petala minora. Siliquae arcte circinnato-contortae, 19—21 mm longae ..... 9. *St. contortuplicatum* (Boiss.) Bornm.

1. ***St. purpurascens*** (Boiss.) Parsa, Fl. de l'Iran 1: 682 (1952).
Syn.: *Sterigma purpurascens* Boiss., Fl. Or. 1: 241 (1867).
Typus: Inter Kerman et Yazd, Bge.

Caulis 7—15 cm altus. Planta indumento denso canescens. Folia oblonga, lyrato-pinnatifida. Siliqua 15—20 mm longa, tenuissima, circinata, pube stellata sparse obsita. Pedicellus flore minuto longior. Stylus siliquae latitudine sesquilongior, lobis brevissimis.

Persia: S/C: Inter Kerman et Yazd, Bge.
Afghanistan occidentalis, Bge.

Distr. gen.: Endem.

2. ***St. rhodanthum*** Rech. f., Aell. & Esfand., Phyton 3: 66 (1951).
Typus: Rech. 3140, W!

Caulis (8—) 20—40 (—60) cm altus, prope basin longe ramosus vel subsimplex, inferne pilis stellatis brevibus canescens, superne cum pedicellis et siliquis ± glabrescens, rarius ab initio ± glaber. Folia basalia 5—7 × 1 cm, pinnatisecta vel pinnatilobata vel ± integra, superiora sensim minus dissecta decrescentia; folia omnia pilis stellatis contextis canescenti-tomentosa. Pedicelli jam floriferi calyce usque ad triplo longiores, tenues, laxe stellato-pilosi ± glabrescentes, demum aliquantum incrassati, fructiferi patentes, usque ad 12 mm longi. Petala in vivo alba vel rosea, in sicco expallescentia vel violascentia, calyce plus quam duplo longiora. Siliqua usque ad 5 cm longa, vix 1 mm lata, compressa, praeter glandulas sessiles rarissimas ± laxe

stellato-pilosa, ± glabrescens, leviter torulosa, erecto- vel subhorizontaliter patens, subrecta vel leviter curvata. Stylus 2—3 mm longus; stigma ramis brevibus 0,5 mm longis recurvis.

Persia: S: Kerm.: 30—40 km SE Zahedan versus Mirjaveh, Rech. 27225 p. p.! Zahedan, Manuch. 5840-E p. p.! Saravan, Salavatian 5681-E! Jandaq-Biyabanak, Hauz Patil, 800 m, Gabr. 89! Inter Saidabad et jugum Chah Chaghak, in arenosis, 1700—1900 m, Rech. 3140! Inter Baghin, 1670 m, et jugum Sang Bur, 2200 m, Rech. 2969-a! Lar.: Tang-e Dalan inter Lar et Bandar Abbas, Gauba 168! — C: Lut: Nay Band, Ruttner 510!
Pakistan: Makran: 60 km S Panjgur, 850 m, Rech. 28080! 20 km W Hoshab, Rech. 28025!, Lamond 515! Inter Awaran et Turbat, in alveo lapidoso, Rech. 27753! Inter Hoshab et Panjgur in arenosis ad meridiem planitiei Balgathar, 600 m, Lamond 542!

Distr. gen.: Endem.

Die Art ist durch die Tendenz des Verkahlens der Infloreszenzregion, die sehr langen, dünnen Blüten- und Fruchtstiele und die von Anbeginn weißen oder rosafarbenen Blüten sehr charakteristisch. Im Habitus und in der Blattform ist sie äußerst variabel. Möglicherweise ist die Art von dem bisher in seiner Variationsbreite unvollständig bekannten *St. purpurascens* (Boiss.) Parsa nicht spezifisch verschieden.

3. ***St. longistylum*** (Boiss.) Bornm., Beih. Bot. Centrbl. 28,2: 110 (1911).
Syn.: *Sterigma longistylum* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 387 (1842).
Typus: Auch. 4169, G.

Caulis 5—30 cm altus, saepe basi ramosus; tota planta indumento densiusculo canescens. Folia lanceolata, inferiora usque ad 4 cm longa, 1 cm lata, forma valde variabilia, aut subintegra aut leviter sinuata aut ± interrupte pinnatifida. Pedicelli perbreves calyce multo breviores, fructiferi incrassati. Siliquae 20—25 mm longae, tenues, patentes vel recurvae, tomentosae, parce glandulosae. Stylus tenuissimus, 2—3 mm longus, stigmatis ramis elongatis recurvis 1—2 mm longis.

Persia: W: Esf.: Gav Khuni, Stapf 89! Nejafabad, 1800 m, Bornm. 2252. Esfahan, Bge. — S: Kerm.: Inter Kerman et Yazd, Bge. In deserto prope Khabis, Bge. Kuh Jebal Barez inter Bam et Jiroft in declivibus australibus, 1600 m, Rech. 3818! Inter Bahramabad et Kabutar Khan, Rech. 2911! Tahrud inter Kerman et Bam, 1500 m, Rech. 3587 p. p.! Inter Baghin, 1600 m et jugum Sang Bur, 2200 m, Rech. 2969-b! Hormozabad, 1800 m, Bornm. 2250. Fars.: Shiraz, Auch. 4169. — C: Qazv.: Soltanabad prope Qazvin, Linds. 87, 165, 166. Yazd: Inter Anar et Bahramabad, Rech. 2879! Bambis inter Esfahan et Yazd, Bornm. 2251!

Distr. gen.: Endem.

4. ***St. acanthocarpum*** Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 1: 38 (1835).
Syn.: *Sterigma acanthocarpum* Boiss., Fl. Or. 1: 242 (1867).
Icon.: Clavis p. 31.
Typus: Nachitschewan, LE.

Caulis 5—30 cm altus, saepe prope basin ramosus. Planta indumento laxiusculo canescenti-viridis. Folia inferiora usque ad 3,5 cm longa, 7 mm lata, omnia integra, obtusiuscula, prope basin congesta. Racemi fructiferi laxi. Pedicelli calycem ad summum aequantes. Siliquae ± 3 cm longae, patulae vel recurvae, praeter indumentum breve appressum setis rigidis patentibus diametrum siliquae ± aequantibus obsitae. Stylus siliquae diametro subduplo longior; stigmatis rami elongati recurvati.

Persia: N: Gil.: Manjil, 400 m, Bornm. 6175. — W: Azerb.: Marand, 1300 m, Grossh. Azerbaijan, Szöv., Auch. 4107. — C: Qazv.: Karaj, in montibus prope Kalak, 1600 m,

Rech. 970! Prope Nazirabad, Rech. 636! Prope Vessieh, Rech. 387! Karaj, Gauba. Pachenar, 500 m, Bornm. 6172. Shahr.-Bust.: Sharud, Bge. Inter Mayamey et Shahrud, Rech. 5318! Inter Abbasabad et Mayamey, Rech. 5350-b!

Distr. gen.: Transcaucasia meridionalis, Armenia, Persia.

5. ***St. ramosissimum*** (O. E. Schulz) Rech. f., comb. nov.
Syn.: *Anchonium ramosissimum* O. E. Schulz, Englers Bot. Jahrb. 66: 97 (1933).
Icon.: Clavis p. 31.
Typus: Sint. 1762, B †, E, W, Isotypus!

Canescenti-virescens, glanduloso-viscosa, 20—60 cm alta, a basi iteratim divaricate ramosa. Folia lanceolata, acuta, integra vel remote argute serrata. Pedicelli floriferi calyce breviores usque eum subaequantes, fructiferi crassiusculi patuli, 5—8 mm longi. Calyx 5—6 mm longus. Petala flava, calyce subduplo longiora. Siliqua stylo incluso 10—15 mm longa, patula vel saepius recurva, bis vel ter irregulariter constricta ± moniliformis, pilis stellatis appressis albido-tomentella, insuper setis glanduliferis patentibus grossis brunneo-flavescentibus crebre obsita. Stylus (2—) 3 (—4) mm longus; stigma profunde bilobum, lobis arcte recurvatis.

Persia: C: Shahr.-Bust.: In jugo Khash Aylan 70 km E Shahrud, 2000—2200 m, Rech. 5409!
Turcomania: Kizyl Arvat, Kara Kala, in monte Sundsodagh, Sint. 1762!

Distr. gen.: Endem.

Haec species monente amico I. Hedge in genus *Sterigmostemum* translata est. — Die Originalbeschreibung von O. E. Schulz ist ganz unzureichend. Möglicherweise ist *Anchonium sterigmoides* Lipsky, Fl. URSS 8: 322 (1939) (mit russischer Beschreibung) synonym.

6. ***St. laevicaule*** Bornm., Mitt. Thür. Bot. Ver. N. F. 27: 23 (1910); Beih. Bot. Centrbl. 28/2: 110 (1911).
Typus: Bornm. 2128, B †.

Caulis 45 cm altus, singulus, erectus, crassiusculus, cum ramis glaberrimis multiramosus. Folia integerrima, infima petiolo inclusa 5 cm longa, 8 mm lata, superiora 15×2—4 mm, densissime stellato-sublepidoto-cana. Racemi laxi. Pedicelli glabri, dimidium calycem ± aequantes. Petala flava, calyce subdimidio longiora. Siliqua c. 3 cm longa, stellato-tomentosa eglandulosa. Stylus breviusculus; stigmatis rami breves vel brevissimi.

Persia: S: Kerm.: Kuh Tagh Ali prope Kerman, 2200 m, Bornm. 2128.

Distr. gen.: Endem.

Die Art erinnert nach Bornmüller durch die gelblichen, glänzend kahlen Zweige und den geraden, aufrechten Wuchs an *Isatis;* sie ist besonders durch die Kahlheit der Stengelteile und durch die kaum mit bloßem Auge sichtbare, fast schülferige, äußerst dichte Sternhaarbekleidung der völlig ganzrandigen Blätter vorzüglich gekennzeichnet.

7. ***St. incanum*** M. B., Fl. Taur.-Cauc. 3: 444 (1819).
Syn.: *St. torulosum* (M. B.) Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 50: 301 (1885). *Cheiranthus torulosus* M. B., Fl. Taur.-Cauc. 2: 121 (1808) non Thunberg (1800). *Sterigma torulosum* DC., Reg. Veg. Syst. Nat. 2: 580 (1821).
Typus: Iberia, Stev.

Bienne, canescens, 30—50 cm altum. Indumentum totius plantae e pilis stellatis et glandulis stipitatis longioribus consistens. Folia usque ad 50×15 mm, lanceolata,

pinnatifida vel dentata. Pedicellus calycem aequans vel superans. Petala flava, 6—9 mm longa, calyce duplo longiora. Siliqua gracilis, 3—5 cm longa, valde tortuosa vel fere circinata, prater pubem stellatam glandulis breviter stipitatis scabra. Stigmatis lobi 0,5 mm longi.

Talish: Swant, Hohen., C. A. Mey.
Persia: W: Azerb.: 94 km N Khvoy, inter Shahabad et Maku, 1000 m, Rech. 32731! Bazargan, 2000 m, Grant 16214! Tabriz, Gill.-Sm. 1818, 1819, 1820. Sufian, 1450 m, Grossh. Azerbaijan, Auch. 4108! Ham.: Borujerd, Str. Aq Bolagh-e Aqdaq, Rioux & Golv. 168! Arak: Golpayegan, Str. — C: Qom, Str. Yazd: In montibus prope Yazd, Deh Bala, Buhse.
Turcomania: Kara Kala, M. Sundsodagh, Sint. 1762.

Distr. gen.: Transcaucasia, Anatolia centralis et orientalis, Talish, Persia, Turcomania.

8. ***St. sulphureum*** (Banks & Soland.) Bornm., Beih. Bot. Centrbl. 28/2: 110 (1911).
Syn.: *Cheiranthus sulphureus* Banks & Soland. in Russell, Nat. Hist. Aleppo 257 (1794). *Sterigma sulphureum* DC., Reg. Veg. Syst. Nat. 2: 212 (1821).
Icon.: Clavis p. 31.
Typus: Aleppo, Russell.

Planta biennis valida, 20—50 cm alta, crebre ramosa, ramis ascentibus, crebre foliatis. Indumentum stellatum, canescens. Folia lanceolata, inferiora 6×1 cm, in petiolum distinctum attenuata, sinuato-dentata vel pinnatiloba, superiora anguste lanceolata, subintegra vel serrata. Pedicelli calyce ± duplo longiores. Petala flava, 7—10 mm longa, calyce duplo longiora. Siliquae 4—5 cm longae, rectae vel curvatae, crassiusculae, non glandulosae. Stigmatis lobi 1,25—1,5 mm longi.

Iraq: Kurd.: Kirkuk, 9 km a Kirkuk versus Altin Köprü, Erdtman & Goedemans in Rech. 15495! Kirkuk, Guest 1493. Altin Köprü versus Arbil, 260 m, Nab. 1299. Arbil: 10 km a Arbil versus Koi Sanjaq, Exsicc. Univ. Baghdad 153! Arbil, Bornm. 868!, Guest 2169. Mosul, Guest 1335.
Talish: Hohen.
Persia: W: Azerb.: Szov., Auch. 4104-A. Kermansh.: Bisotun, Str. Kurd.: Saqqez, Haghighi 6262-E! Ham.: Borujerd, Str. Esf.: Esfahan, Auch. 185, 202. Inter Esfahan et Abadeh, 2000 m, Schmid 5409! Inter Delijan et Esfahan, 2000 m, Schmid 5187! Arak: Golpayegan, Str. M. Alvand, 2000 m, Furse 1479! Inter Khomeyn et Golpayegan, 2000 m, Furse 1729! Inter Tehran et Delijan, Schmid 5146! — S: Fars.: Jahrom, Koelz 14561! Rahdar prope Bushehr, Ky. 130! Pasargadae 15 km N Saadatabad, 2000 m, Grant 15823! 16 km W Abarqu, 1600 m, Grant 15403! 13 km W Shiraz, 1600 m, Grant 15623! 48 km S Abadeh, 2100 m, Stutz 787! Inter Abadeh et Dowlatabad, 1500 m, Schmid 5330! — C: Qazv.: 10 km W Karaj, 1500 m, Stutz 669! Shahrud, Bge. Qom, 1200 m, Bornm. 2253, Str. — Persia australis, Auch. 4169.

Distr. gen.: Anatolia, Armenia, Syria, Mesopotamia, Talish, Persia.

Die Bestimmung mancher nicht fruchtender Belege ist zweifelhaft.

9. ***St. contortuplicatum*** (Boiss.) Bornm., Feddes Repert. 40: 775 (1936).
Syn.: *Sterigma contortuplicatum* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 387 (1842).
Typus: Azerbaijan, Auch., P.

E collo multicaule, caulibus procumbentibus parum ramosis; tota planta canescens. Folia lanceolata pinnatifida. Pedicellus florem aequans. Petala minuta, flava.

Racemi fructiferi elongati. Siliqua vix 19—21 mm longa, lateraliter subcompressa, arcte circinato-contorta, in stylum brevem attenuata.

Persia: W: Azerb.: Tabriz, Knapp. Shur Daraq inter Tabriz et Khvoy, Knapp. Dizeh Siamek prope Rezaiyeh, Knapp. — Azerbaijan, Auch.

Distr. gen.: Endem.

101. *Anchonium*

Anchonium DC., Reg. Veg. Syst. Nat. 2: 578 (1821).

Lit.: J. Bornmüller, Bulletin de l'Herbier Boissier 4: 1265 (1904). J. Bornmüller, Beihefte zum botanischen Centralblatt 28: 109 (1911). J. Bornmüller, Repertorium Specierum novarum Regni vegetabilis. Beiheft 89, 1: 39 (1936). M. J. E. Coode & J. Cullen in P. H. Davis, Flora of Turkey 1: 463 (1965).

Herbae perennes. Indumentum e pilis ramosis consistens, glandulis sessilibus interdum intermixtis. Folia lanceolata vel oblonga, integra vel obsolete dentata, basalia rosulata. Sepala erecta non saccata. Petala unguiculata. Filamenta interiora per paria connata. Antherae oblongae, obtusae. Siliqua angulato-costata oblongo- vel lineari-conica teres, irregulariter constricta, indehiscens, medullosa, demum inter semina in articulos dissolata. Semina oblonga majuscula, notorrhiza. Stigma ± capitatum, leviter bilobum.

1. ***A. elichrysifolium*** (DC.) Boiss., Fl. Or. 1: 240 (1867).
Syn.: *Sterigma elichrysifolium* DC., Reg. Veg. Syst. Nat. 2: 581 (1821).
Icon.: Clavis p. 27.

Perenne, caudice brevi lignescente rosulas steriles numerosas emittente. Caules floriferi erecti, 4—40 cm alti. Folia integra, canescentia, oblanceolata, in petiolum longum sensim attenuata. Petala aurea, 10—13 mm longa. Pedicelli erecto-patuli raro deflexi. Siliquae 10—30 mm longae, pubescentes. Stigmatis lobi divergentes. Species polymorpha.

Distr. gen.: Caucasus, Anatolia, Persia, Iraq.

In regione Florae Iranicae subspecies sequentes occurrunt:

1a. Caules simplices, plerumque scaposi ..... subsp. *elichrysifolium*
b. Caules superne ramosi, plerumque foliati ..... subsp. *persicum* (DC.) Cullen & Coode

— — subsp. ***elichrysifolium.***
Syn.: *A. Tournefortii* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 386 (1842).
Typus (Syntypi) subspeciei: Armenia, Tournef.; Ghilan, Gmelin.

Iraq: Kurd.: Arbil: Chiya-i Mandau prope Rawandiz, 2700 m, Guest & Ludlow-Hewitt 2708. Algurd Dagh, 3660 m, Sia Kuh, 3654 m, Ludlow-Hewitt 1528. Algurd Dagh, 3000—3800 m, Rech. 11442! M. Qandil, in saxosis calc. 3300—3600 m, Rech. 11162! M. Sakri Sakran prope Rawandiz, Bornm. 880!
Persia: W: Azerb.: Kuh-e Mishu Dagh prope Yam, Grossh. — S: Bal.: Sarhad: Kuh-e Taftan, 1500 m, Gabr. Kuh-e Bazman, 2000—3000 m, Gabr. 78. — C: Tehr.: M. Tuchal, 3700—3800 m, Bornm. 6160. Qazv.: Gardaneh Bary prope Asadbar in valle Loura in faucibus prope Junesar, 2600 m, Bornm. 6174.

Distr. gen. subspeciei: Anatolia australis et orientalis, Iraq, Persia.

— — subsp. ***persicum*** (DC.) Cullen & Coode, Notes Roy. Bot. Gard. Edinb. 26: 193 (1965).

Syn.: *Matthiola persica* DC., Reg. Veg. Syst. Nat. 2: 168 (1821). *Anchonium elichrysifolium* var. *persicum* (DC.) Bornm., Feddes Repert. Beih. 89, 1: 39 (1936).
Typus: Persia, Pall.

Persia: N: Maz.: In jugo Kandavan, 2700—3000 m, Furse & Synge 361! Gilli s. n.! Wdb. 2085! Rech. 496! Bornm. 6173! Kojur: M. Uloj, 3200—3400 m, Rech. 6536! — C: Tehr.: M. Damavand supra Polur, 2800 m, Gauba 143! In jugo Nasserou M. Damavand, 2100 m, Ky. 347! Qazv.: Gach Sar 80 km N Karaj, 2400 m, Furse 2746! M. Hazarband, 2900 m, Gauba 144!

Distr. gen. subspeciei: Anatolia orientalis, Persia borealis.

102. *Goldbachia*

Goldbachia DC., Reg. Veg. Syst. Nat. 2: 576 (1821); Prodr. 1: 212 (1824).

Lit.: K. H. Rechinger fil. in M. Koeie & K. H. Rechinger fil., Beiträge zur Flora Südwest-Irans in Dansk Botanisk Arkiv 15, 4: 13 (1954). V. Botschantzev, Notulae Systematicae 22: 135—143 (1963) et Nov. Syst. Plant. Vascul. 1965: 124 (1965).

Sepala erecta acutiuscula, anguste scarioso-marginata, interiora sublatiora, basi excavata. Petala albida vel lilacina, anguste spathulata, apice rotundata. Filamenta exteriora anguste, interiora late linearia. Antherae ovatae, acutiusculae. Ovarium 2—3-ovulatum. Siliqua indehiscens, breviter oblonga, plerumque ± sursum curvata, verrucoso-subquadrangularis, medio constricta, ibique demum diffracta. Semen majusculum, ellipsoideum, sublaeve.

1a. Planta gracilis. Pedicellus siliqua 2—3-plo longior .... 1. *G. verrucosa* Komar.
b. Planta valida. Pedicellus siliquam ± aequans..... 2. *G. laevigata* (M. B.) DC.

1. ***G. verrucosa*** Komar., Trav. Soc. Nat. Petersbg. 26: 98 (1896).
Icon.: Clavis p. 9.
Typus: M. Seravshan, LE.

Herba tenuis 10—30 cm alta ramis subfiliformibus. Folia inferiora lyrata, pinnatilobata, caulina non amplexicaulia. Pedicelli tenues, quam fructus 2—3-plo longiores. Nervatura petalorum non anastomosans. Fructus 4—5 mm longus, unilocularis, valvis tenuibus nervatura et tuberculi vix prominentes; rostrum brevissimum.

Afghanistan: SW: Jija, 1000 m, Koeie 4170! — C: Bamian: Darreh-i Shikar inter Doab et Bulola, 1600 m, Rech. 16724!, Wdb. 3377! In faucibus Paimuri, 2700 m, Wdb. 4685! Bamian, 2800 m, Gilli 1062!
Pakistan: Quetta: Inter Bostan et Saran Tangai, 1800 m, Rech. 29172! In jugo W Ziarat, 2200 m, Rech. 29311! Ad radices occidentales montium inter Dulai et Kanak, 1600 m, Rech. 29103! Quetta, Lace s. n.!

Distr. gen.: Asia centralis, Afghanistan, Pakistan.

2. ***G. laevigata*** (M. B.) DC., Reg. Veg. Syst. Nat. 2: 577 (1821).
Syn.: *Raphanus laevigatus* M. B., Fl. Taur.-Cauc. 2: 129 (1808). *G. torulosa* DC., Reg. Veg. Syst. Nat. 2: 576 (1821). *G. tetragona* Ledeb., Fl. Ross. 1: 215 (1842). *G. laevigata* (M. B.) DC. var. *adscendens* Boiss., Fl. Or. 1: 243 (1867). *G. reticulata* (O. Kuntze) Vassilcz., Fl. URSS. 8: 241 (1939). *G. laevigata* (M. B.) DC. var. *adscendens*

f. *reticulata* O. Kuntze (1887). *G. laevigata* (M. B.) DC. subsp. *torulosa* (DC.) Bornm. in Feddes Repert. 39: 82 (1935). *G. papulosa* Vassilcz., Fl. URSS. 8: 643 (1939). Icon.: Clavis p. 9 et 17.

Typus: „Habitat in arena mobili circa Astrachan, rarius in deserto Cumano obvius."

Annua. Planta valida, 15—40 cm alta. Folia oblonga, infima basin versus attenuata, sinuato-dentata, cetera basi hastata sessilia, denticulata. Pedicelli fructiferi deflexi, siliquam plerumque ± aequantes. Siliqua oblonga, forma ac magnitudine variabilis, (1) —2 (—3)-locularis, oblonga vel botuliformis, ± distincte pluricostata et rugoso-tuberculata, interdum ± constricta, glabra vel puberula, rostro (1)—2 (2,5) mm longo, plerumque ascendens.

Talish: Swant: Tatuni, 1500 m, Hohen.

Persia: N: Persia borealis, Szov. — W: Azerb.: Tabriz, Gill.-Sm. 1343, 1367, 1396. In collibus S Tabriz, Gill.-Sm. 1427, 1576. Khvoy, Knapp. Mahabad, 1500 m, Furse 2203! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 177! Bahar, Babai 6342-E! Shahr Chaman, Sab. in Gauba 139! Hamadan, Stapf. Esf.: Inter Delijan et Esfahan, Schmid 5191! Najafabad, Bornm. 2133. Esfahan, Bornm. 2130. Arak: 48 km E Arak, 1360 m, Furse 5234! Inter Arak et Mowdar, Str. Lur.: Azna, 1800 m, Furse 1515! Borj, 2000 m, Koelz 1447! — S: Fars.: Persepolis, Ky. 227! Shiraz, 1600 m, Grant 15625! Jahrom, Auch. 4132! Kerm.: Inter Saidabad et Chah-e Chaghak, 1700 m, Rech. 3160! Kerman, Bornm. 2129. Kuh Tagh Ali, Bornm. 2134. 30—40 km SE Zahedan versus Mirjaveh, Lamond 127! Bal.: Inter Zahedan et Khash, 1300 m, Rech. 4209! Sangan in ditione M. Taftan, Rech. 7362! Iranshahr, Damin, Shar. 216-E! Khash, Shar. 211-E! Persia australis, Ky. 227. — E: Khor.: Ozbagu, Ruttner 233! Tabas, Shir Geshk, Ruttner 605! Inter Chanaran et Quchan, 1200 m, Rech. 4722! — C: Tehr.: Qeshlaq inter Tehran et Semnan, 900 m, Rech. 2761! W Firuzkuh, 1800 m, Furse 3080! Qazv.: Qazvin, Bornm. 6178; 1500 m, Jacobs 6203!, Stapf, Schmid 5027! Sultanabad prope Qazvin, Linds. 45, 69. Pachenar, Stapf. Karaj, 1400 m, Rech. 264!, Gauba. Inter Manjil et Pachenar, 400—500 m, Bornm. 6177. Shahr.-Bust.: Inter Mayamey et Shahrud, Rech. 5300-d! Qom, Bornm. 2130-b, Str. Inter Qom et Arak, Bornm. 2132. Yazd, Aqda, Bornm. 2131.

Turcomania: Ashkhabad, Michelson 303, Litw. 565, Lipsky 1192, Sint. 61. Inter Annaju et Gyaurs, Sint. 61-a. Kazandzhik, Lipsky.

Afghanistan: NW: 30 km W Maimana, 500 m, Hdg. & Wdb. 3646! Qala Nau, 700 m, Koelz 4154! In valle fluvii Hari Rud: Tirphul, Aitch. 162, 1015. Inter confines Persiae et Herat, 300 m, Furse 5372! — SW: Jija, 1400 m, Koelz 4152! — SE: Kalat-i Ghilzai, Kerst. 158! — E: Kabul: Arghandeh versus Ghazni, 1900 m, Rech. 17215!, Gilli 1059! In valle Logar, 1800 m, Gilli 1060! Istalif, 1700 m, Gilli 1054! Kabul, 1800 m, Neub. 3037!, 4754!, Gilli 1055!, 1057!, 1058!, Hdg. & Wdb. 2834! Panjeshah, Neub. 51/37! Darulaman, Volk 94-D! Versus Lataband, Wdb. 3034! Tang-i Gharu, Wdb. 3094! Botkhah, 1700 m, Rech. 1056! Sharenau, Gilli 1061! 64 km N Ghazni, 2740—3100 m, Furse 5679! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Lamond 2501!, Rech. 32079! Jaji: Inter Ali Khel et Mundar, 2600 m, Rech. 32212! — NE: Badakhshan: In valle fluvii Warduj, 1360 m, Furse 6279! Kataghan: Inter Haibak et Pul-i Khumri, 1500 m, Rech. 16457! Banu, in valle Andarab, 1550 m, Podlech 10914. Farkhar, 1250 m, Podlech 1048! Taliqan: 3 km N Taliqan, Baghak, Podlech 10355. Taliqan, 720 m, Podlech 10301. — C: Bamian: 16 km S Doab, 1600 m, Rech. 16652! Naiak inter Band-i Amir et Panjao, 2600 m, Hdg. & Wdb. 4823! Band-i Amir ad lacum Band-i Panir, 2800 m, Rech. 18374! Inter Bamian et Band-i Amir, 2800 m, Rech. 18184! — Afghanistan, Griff. 1414!

Pakistan: Peshawar: In jugo Khyber, Halcro Johnston 38! — N. Wazir.: Razani, J. L. Stewart. — Quetta: Inter Bostan et Khanozai, 1600 m, Rech. 29157! Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 28981! Sariab, 1700 m, Rech. 28834!, Lamond 925! In jugo Tak, 2100 m, Rech. 28397! Sanjawi, 1500 m, Rech. 29580!, La-

mond 1317! Yaro prope Bostan, 1450 m, Rech. 28934! Pishin, Lace 3500! Quetta, Lace 3468! M. Sulaiman: Mekhtar, 1500 m, Rech. 29772! — Kalat: Surab, 69 km a Kalat versus Khuzdar, 1700 m, Rech. 27368!, Lamond 185! In collibus Harboi, H.-B. 19513. Inter Surab et Kalat, 1800 m, Lamond 678-a! 40 km N Kalat versus Mastung, 2000 m, Lamond 692!, Rech. 28375! 10—30 km S Khuzdar, Rech. 27417!, Lamond 202! — Baluchistan, Stocks 727, Lace.

Distr. gen.: Rossia austro-orientalis, Anatolia, Syria, Caucasus, Armenia, Talish, Persia, Afghanistan, Pakistan, Turcomania, Sibiria.

Eine sehr vielgestaltige Art. Eine systematische Gliederung wurde mehrfach versucht, führte aber bisher zu keinem auf das gesamte Verbreitungsgebiet der Art anwendbaren Ergebnis. Im Gebiet der Flora Iranica überwiegen bei weitem Formen, die der *G. torulosa* DC. im engeren Sinn entsprechen. Man vergleiche diesbezüglich meine Ausführungen in Dansk Bot. Arkiv 15, 4: 13 (1954). — Besonders auffällig ist Rech. 27417 und Lamond 202 durch gerade herabhängende, an der Spitze nicht aufgebogene (nicht wie üblich horizontal abstehende, an der Spitze aufgebogene) Früchte; der Wuchs ist niedrig, ziemlich steif aufrecht und die Verzweigung pyramidal. Die systematische Abgrenzung dieser auffälligen Form wird durch mehrfaches Auftreten von Übergangsformen unmöglich gemacht.

✓ 103. *Erysimum*

auctoribus A. Polatschek, Wien, et K. H. Rechinger, Wien[1])

Erysimum L., Spec. Plant. 2: 660 (1753); Gen. Plant. ed. 5: 296 (1754).

Lit.: P. W. Ball, Erysimum in Flora Europaea 1: 270—275 (1964). J. Cullen in P. H. Davis, Flora of Turkey 1: 466—478 (1965). E. Boissier, Flora Orientalis 1: 186—209 (1867).

Herbae annuae, biennes, perennes vel suffruticosae. Pili plerumque appressi, bifidi usque plurifidi, rarissime patuli dendroideo-ramosi. Folia lanceolata vel linearia, sinuato-dentata vel integra. Nectaria mediana evoluta. Petala unguiculata, flava, rarissime purpurea. Siliqua valvis ± distincte uninerviis, indumento ab eo foliorum saepe diverso. Stigma subsessile vel stylus distinctus.

Große Bedeutung kommt offenbar der Verteilung der einzelnen Haartypen auf den Grund- und Stengelblättern und auf der Frucht zu. Die Behaarung des Stengels scheint nur ausnahmsweise systematisch verwertbar zu sein. Sehr wesentlich ist überdies die Wuchsform, die Lebensdauer und das Vorhandensein oder Fehlen einer Tunika (Blattstielreste am Wurzelhals). Zu wenig beachtet wurde bisher, daß sich die charakteristische Behaarung der Frucht und die bis zu einem gewissen Grad endgültige Griffellänge bereits im Blütenstadium erkennen lassen. Die terminalen Blüten bleiben in ihren Dimensionen oft wesentlich hinter den Maßen normal entwickelter Blüten zurück; dies gilt bei vielblütigen Infloreszenzen in höherem Maß als bei armblütigen. Häufig treten bei den Früchten Fehlentwicklungen auf, wodurch sie nicht die normale Länge und Richtung (Stellung zur Achse) erreichen. Die Blütenfarbe verändert sich bei herbarmäßiger Präparation oft stark und sollte daher an der lebenden Pflanze notiert werden. Auch Vorhandensein oder Fehlen eines Duftes verdient beachtet zu werden. Die angegebenen Schotenlängen umfassen durchaus Griffel und Narbe.

1a. Plantae annuae 2
b. Plantae biennes vel perennes 4
2a. Siliqua pilis omnibus bifidis obsita ..... 40. *E. sisymbrioides* C. A. Mey.
b. Siliqua pilis bi- et trifidis obsita 3

[1]) Vorarbeiten von James Cullen, Liverpool.

3a. Pedicelli ± 2 mm longi. Siliqua 40—60 mm longa ..... 38. *E. repandum* L.
b. Pedicelli 0—1 mm longi. Siliqua 15 (—30) mm longa ..... 39. *E. Griffithianum* Boiss.
4a. Petala in sicco rubro-violacea ..... 2. *E. oleifolium* J. Gay
b. Petala in sicco flava 5
5a. Indumentum tomentosum, pilis pro parte quidem patulis crispatis dendroideo-ramosis ..... 1. *E. gaudanense* Litw.
b. Indumentum omnino appressum, e pilis bi- vel plurifidis consistens 6
6a. Plantae suffruticoso-caespitosae 7
b. Plantae biennes vel perennes nec autem suffruticoso-caespitosae 20
7a. Folia inferiora sinuato-dentata. Siliquae 12—17 mm longae, torulosae. Planta laxe caespitosa, elata, ultra 30 cm alta ..... 20. *E. nuristanicum* Polatschek & Rech. f.
b. Folia omnia integra. Siliquae longiores, si breves, non torulosae. Plantae dense caespitosae, 10—25 cm altae 8
8a. Petala 11—20 mm longa. Stylus 2—4,5 mm longus 9
b. Petala breviora. Stylus brevior 11
9a. Pili omnes bifidi. Indumentum argenteum .... 12. *E. argyrocarpum* N. Busch
b. Pili bi- et plurifidi. Indumentum canescens vel virescens 10
10a. Pili bi- et trifidi. Surculi steriles elongati, apice tantum foliiferi, collo tunicati ..... 3. *E. caespitosum* DC.
b. Pili bi-, tri- et quadrifidi. Surculi steriles non elongati, collo vix truncati ... 10. *E. alpestre* Ky. ex Boiss.
11a. Pili omnes bifidi 12
b. Pili bi- et plurifidi 13
12a. Folia setaceo-filiformia, gramineo-convoluta. Stylus ± 1 mm longus. Pedicellus 3—5 mm longus ..... 13. *E. filifolium* Boiss. & Hausskn.
b. Folia lanceolata, plana. Stylus 2 mm longus. Pedicellus 6—7 mm longus ... 15. *E. Szovitsianum* Boiss.
13a. Pili siliquarum omnes bifidi 14
b. Pili siliquarum bi- et plurifidi 15
14a. Folia in tertia parte superiore breviter 2—4-dentata. Pedicelli floriferi 1—2 mm longi. Calyx 4—6 mm longus ..... 5. *E. nanum* Boiss. & Hohen.
b. Folia integra. Pedicelli floriferi 2—3 mm longi. Calyx 3—4 mm longus .... 7. *E. hakkiaricum* Cullen
15a. Pili bi- et trifidi, nonnullis quidem quadrifidis immixtis 16
b. Pili bi- et trifidi tantum 17
16a. Caules floriferi numerosi. Stylus 2—4 mm longus. Pili quadrifidi in foliis rosularibus et in siliquis evoluti. Folia lanceolata usque oblongo-spathulata. Semina vix 2 mm longa ..... 11. *E. pulchellum* (Willd.) J. Gay
b. Caules floriferi pauci. Stylus 1,5—2 mm longus. Pili in foliis rosularibus plurimi bifidi, trifidis paucis immixtis. Folia anguste linearia. Semina ± 4 mm longa ..... 14. *E. macrospermum* Cullen & Rech. f.
17a. Stylus 1—2 mm longus 18
b. Stylus 2—3 mm longus 19
18a. Folia lineari-spathulata. Pedicelli usque ad 1 mm longi. Siliquae 15—20 mm longae ..... 9. *E. nasturtioides* Boiss. & Hausskn.
b. Folia linearia usque oblongo-linearia. Pedicelli usque ad 2 mm longi. Siliquae 24—32 mm longae ..... 8. *E. persepolitanum* Boiss.

19a. Folia oblongo-spathulata. Pedicelli 2—3 mm longi. Folia et siliquae pilis plurimis bifidis obsitae, trifidis paucioribus immixtis.. 4. *E. elbrusense* Boiss.
b. Folia oblanceolata. Folia et siliquae pilis plurimis trifidis obsitae. Pedicelli 1,5—2 mm longi ..... 6. *E. Griffithii* (Hook. f. & Thoms.) Jafri
20a. Folia rosularia pilis 5—7-radiatis obsita. Plantae crassicaules flavescentes . 21
b. Folia rosularia pilis 2—5-radiatis obsita. Plantae tenuicaules virides 22
21a. Pili septemfidi etiam in siliquis evoluti. Stylus ± 1 mm longus. Calyx 6—8 mm longus. Petala 10—12 mm longa ....30. *E. Stocksianum* (Boiss.) Boiss.
b. Pili siliquarum usque ad quinque-(sex-)fidi. Stylus 1,2—2 mm longus. Calyx 8—13 mm longus. Petala 13—21 mm longa.. 29. *E. crassicaule* (Boiss.) Boiss.
22a. Pili foliorum rosulariorum omnes bifidi 23
b. Pili foliorum rosulariorum bi- usque ad quinquefidi 30
23a. Plantae perennes 24
b. Plantae biennes 29
24a. Pili siliquarum omnes bifidi 25
b. Pili siliquarum bi- et plurifidi 26
25a. Folia lanceolata. Stylus 2 mm longus. Pedicelli 6—7 mm longi. Petala 13—15 mm longa ..... 15. *E. Szovitsianum* Boiss.
b. Folia setaceo-linearia. Stigma subsessile. Pedicelli 1—3 mm longi. Petala 8—9 mm longa ..... 23. *E. crassipes* Fisch. & C. A. Mey.
26a. Pili siliquarum bi-, tri- et quadrifidi 27
b. Pili siliquarum bi- et trifidi 28
27a. Folia anguste elliptica, remote dentata. Stylus ± 1 mm longus. Pedicelli 2—3,5 mm longi. Calyx 8—9 mm longus. Petala 12—15 mm longa ..... 22. *E. uncinatifolium* Boiss.
b. Folia oblongo-spathulata. Stylus 1,5—2 mm longus. Pedicelli 1—1,5 mm longi. Calyx 4 mm longus. Petala ± 8 mm longa ..... 21. *E. frigidum* Boiss. & Hausskn.
28a. Siliquae quadriangulato-alatae. Stylus ± 1 mm longus ..... 31. *E. gladiiferum* Boiss. & Hausskn.
b. Siliquae non distincte angulatae, numquam alatae. Stylus 1,5—2,5 mm longus ..... 27. *E. salangense* Polatschek & Rech. f.
29a. Folia lanceolata integra vel subintegra. Siliquae pilis bi-, tri- et quadrifidis obsitae ..... 28. *E. Aitchisonii* O. E. Schulz.
b. Folia oblonga, sinuato-dentata. Siliquae pilis bifidis obsitae ..... 37. *E. Badghysi* (Korsh.) Lipsky
30a. Pili foliorum rosulariorum bi- et trifidi 31
b. Pili foliorum rosulariorum tri- et (vel) plurifidi 33
31a. Folia lanceolato-spathulata. Pili siliquarum bi- et trifidi ..... 25. *E. Koelzii* Polatschek & Rech. f.
b. Folia linearia. Pili siliquarum bi-, tri- et quadri-(quinque-)fidi 32
32a. Stylus 1,5—2 mm longus. Pedicelli 2 mm longi. Calyx 6 mm longus. Petala 10—11 mm longa. Semina ± 4 mm longa ..... 14. *E. macrospermum* Cullen & Rech. f.
b. Stylus 2—3 mm longus. Pedicelli 4—10 mm longi. Calyx 7—9 mm longus. Petala 12—15 mm longa. Semina multo minora ..... 36. *E. Melicentae* Dunn
33a. Pili foliorum rosularium omnes tri- vel plurifidi; pili bifidi nulli 34
b. Pili foliorum rosulariorum bi-, tri- et plurifidi 36
34a. Stylus 2—5 mm longus. Pedicelli 2—7 mm longi 35

b. Stylus 1,5—2 mm longus. Pedicelli 6—9 mm longi ..... 35. *E. collinum* (M. B.) Andrz.
35a. Siliquae ancipite alatae. Petala 9—13 mm longa ..32. *E. cuspidatum* (M.B.) DC.
b. Siliquae non alatae. Petala usque ad 25 mm longa..33. *E. ibericum* (Adams)DC.
36a. Pili foliorum rosulariorum bi-, tri- et quadrifidi, quinquefidi nulli 37
b. Pili foliorum rosulariorum bi- usque ad quinquefidi. Stylus 1,3—2,5 mm longus. Petala 11—12 mm longa ..... 16. *E. ischnostylum* Freyn & Sint.
37a. Pili quinquefidi in siliquis evoluti 38
b. Pili quinquefidi in siliquis nulli 41
38a. Planta perennis (in dubiis conf. etiam *E. afghanicum*) ..... 17. *E. leucanthemum* (Steph.) B. Fedtsch.
b. Plantae biennes 39
39a. Stylus ultra 1,5 mm longus. Siliqua 20—30 cm longa..34. *E. passgalense* Boiss.
b. Stylus brevior. Siliqua longior 40
40a. Siliquae 46—53 mm longae. Stylus 0,8—1,2 mm longus ..... 26. *E. afghanicum* Kitam.
b. Siliquae usque ad 45 mm longae. Stylus 0,5—0,8 mm longus ..... 18. *E. subulatum* J. Gay
41a. Pedicellus ± 1 mm longus. Siliquae 25—30 mm longae. Stylus 1,5—2,5 mm longus. Petala 6,5—8,5 mm longa .....19. *E. ghaznicum* Cullen & Rech. f.
b. Pedicellus 2—4 mm longus. Siliquae 10—25 mm longae. Stylus ± 1 mm longus. Petala 10 mm longa .....24. *E. kurdicum* Boiss. & Hausskn.

1. ***E. gaudanense*** Litw., Trav. Mus. Bot. Acad. Sci. Petersbg. 1: 33 (1902).
Typus: Litw. 518, WU!

Suffrutex valde lignosus, 20—80 cm altus. Rami floriferi numerosi, 7—13 cm alti, erecti, dense foliati. Indumentum totius plantae albo-tomentosum. Folia 10—15×1,3—1,6 mm, longitudinaliter plicata, obtusiuscula, integra, superiora non decrescentia; indumentum e pilis bifidis appressis paucis et e pilis numerosis patulis crispulis simplicibus consistens, tomentosum. Racemi primum subcapitati, fructiferi valde elongati, laxi. Pedicelli 5—6,5 mm longi, fructiferi vix elongati, albo-tomentosi. Sepala 3,5—4 mm longa, ovata, obtusiuscula. Petala 5—6 mm longa. Siliqua 25 (—50)×2 mm (sec. N. Busch); indumentum e pilis paucis bifidis appressis et e pilis numerosis patulis dendroideo-ramosis consistens, albo-tomentosum.

Turcomania: In declivibus herbosis montium prope Gaudan, Litw. 518!
Afghanistan: SE: Katawaz, Neub. 49/1387!

Distr. gen.: Endem.

Das filzige Indument der Art, an den Blättern einfache gewellte, abstehende Haare, an den Früchten baumartig verzweigte, abstehende Haare zwischen den spärlichen, angedrückten zweiteiligen Haaren, ist, soweit uns bekannt, innerhalb der Gattung einzigartig. V. Botschantzev, Nov. Syst. Pl. Vasc. (Leningrad) 1966: 125 (1966) hat diese Art zur Gattung *Prionotrichon* Botsch. & Vved. übertragen: *P. gaudanense* (Litw.) Botsch.

2. ***E. oleifolium*** J. Gay, Erys. 6 (1842).
Syn.: *Strophades linearis* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 83 (1842).
Typus: Auch. 4169-I, G.

Perenne, caespitosum. Indumentum totius plantae appressissimum, argenteum, e pilis bifidis compositum. Caules ascendentes vel erecti, 20—40 cm alti, simplices vel pauciramosi, inferne paucifoliati. Folia omnia anguste linearia, acuta, integerrima.

Racemi floriferi conferti, fructiferi valde elongati, laxi. Pedicelli subnulli crassi. Calyx 6—7 mm longus. Petala roseo-violacea, calyce subduplo longiora. Siliquae 25—30 mm longae, maturitate horizontaliter patentes, apicem versus in stylum longissime attenuatae, valvis indistincte costato-carinatis. Stylus 5—6 mm longus. Stigma minutum, lobis divergentibus.

Persia: W: Khuz.: 25 km NE Haft Gel, in collibus gypsiferis, Bent & Wr. 503—408! Masjed-i Soleyman, Furse 1205! — S: Lar.: Lar, 1000 m, Gauba 125!, Soltani 6391-E! Prov. Lar., Auch. 4169, 4199-L. Fars.: In jugo Kotal-e Pireh Zan prope Kazerun, Gauba 126! Jahrom, Koelz 14610! Kumaraj, substr. gyps., Stapf 236! Shiraz, Firuzabad, Gauba s. n.!

Distr. gen.: Endem.

Die einzige nicht gelbblühende Art des iranischen Florengebietes. Die Schoten verschmälern sich allmählich in den langen Griffel.

3. ***E. caespitosum*** DC., Reg. Veg. Syst. Nat. 2: 497 (1821).
Syn.: *E. macrostigma* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 81 (1842), syn. nov. *E. Aucheri* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 78 (1842). *E. fruticulosum* J. Gay, Erys. 5 (1842). *E. caespitosum* DC. var. *brachycarpum* Boiss., Fl. Or. 1: 203 (1867). *E. persepolitanum* Boiss. var. *dumulosum* Bornm., Beih. Bot. Centrbl. 32,2: 355 (1914). *E. caespitosum* DC. var. *pumilum* Gilli, Feddes Repert. 46: 43 (1939).
Icon.: Clavis p. 27.
Typus: In montibus Samamicis prov. Gilan, Gmelin.

Dense suffruticoso-caespitosum, surculis sterilibus elongatis basi aphyllis numerosis, indumento canescens. Caules floriferi usque ad 5—10 cm, fructiferi usque ad 30 (—40) cm alti, semper simplices, usque ad 2/3 foliati. Folia ± anguste oblanceolata usque linearia, acuta, integra vel remote paucidentata, saepe longitudinaliter plicata, pilis bifidis, paucis trifidis immixtis, obsita. Pedicelli floriferi 2—3 mm, fructiferi 3—5 mm longi. Sepala 6—9 mm longa. Petala 11—16 mm longa. Siliquae 27—40 (—52) mm longae, axi ± appressae, pilis bifidis canescentes, pilis trifidis raro immixtis. Stylus 2—4,5 mm longus. Semina ± 1,8 mm longa.

Persia: N: Gorg.: Ketul, Shar. 553! Inter Gorgan et Shahrud, Bge. Maz.: In valle fluvii Talar E Gaduk, 2300 m, Aell. 991!, 996! M. Alamut, Auch. 4111! (Typus *E. Aucheri* Boiss.) In declivibus borealibus jugi Kandavan, 3000 m, Gilli s. n., Gauba 134! Wdb. 2100! In valle fluvii Chalus, 2400 m, Rech. 933! Nur: Kamarband, 2600 m, Rech. 6405! Kojur: M. Uloj, 3400 m, Rech. 6535! Gil.: In alpibus Gilani, Gmelin. — W: Azerb.: 30—50 km E Tabriz versus Mianeh, Rech. 32632-a p. p.! Takht-i Bilqis, Knapp. Azerbaijan, Auch. 4106 (Typus *E. macrostigmatis* Boiss.). Kermansh.: Kuh-e Richab, Str. (Typus *E. dumulosi* Bornm.) „Kuh-e Schiris", Str.! — C: Tehr.: Damavand, 2900—4000 m, Gilli s. n.!, Wdb. 1676!, Grant 16524! M. Tuchal, Ky. 164! In jugo inter Lavasan et vallem Lar, 3000 m, Bruns. Qazv.: In jugo Kharzan, 1800 m, Bornm. 6166. In jugo Kandavan prope Gach Sar, 3000 m, Bornm. 6171. Damgh. — Semn.: Kuh-e Nizwa, 2900 m, Wdb. 1255!; N Jashm, 2200—2600 m, Behb. 5665-E!, Aell. 1008!, 1009!, 1071! Shahr.-Bust.: M. Shahvar, 3300—3900 m, Rech. 6011!, 6225! Kuh-i Kakashan, 3000 m, Koelz 16359!

Distr. gen.: Anatolia orientalis, Persia.

Eine vielgestaltige Art, kenntlich am rasigen Wuchs und den zahlreichen, am Grund blattlosen sterilen Sprossen. Schon aus dem Vergleich der Originaldiagnosen von *E. caespitosum* und *E. macrostigma* ergibt sich eine weitgehende Übereinstimmung, die sich bei Vergleich des Typus von *E. macrostigma* mit den zahlreichen, in neuerer Zeit hinzugekommenen Belegen von *E. caespitosum* bestätigt.

4. ***E. elbrusense*** Boiss., Fl. Or. 1: 202 (1867).
Syn.: *E. caespitosum* DC. var. *latifolium* Bornm., Bull. Herb. Boiss. Ser. 2, 4: 1262 (1904).
Typus: „In regione alpina M. Totschal supra Derbent", Ky. 164, W!

Suffrutescenti-caespitosum, pluricaule. Caules floriferi 10 (—20) cm alti, foliati. Folia inferiora oblongo-spathulata, obtusiuscula, usque ad 6 mm lata, longe petiolata, superiora oblongo-lanceolata, acuta, quam rosularia majora; indumentum foliorum e pilis bifidis et trifidis consistens, laxiusculum. Pedicelli 2—3 mm longi. Sepala 4,5—5,5 mm longa. Petala 9—11 mm longa. Siliquae 24—31 mm longae, axi appressae, indumento e pilis pro maxima parte bifidis paucis trifidis immixtis canescentes. Stylus 2—3 mm longus.

Iraq: Kurd.: Sul.: M. Avroman, Haussk.
Persia: W: Kurd.: M. Shahu, Haussk. — C: Tehr.: Supra Darband, Ky. 164! M. Tuchal supra Emamzadeh Dawud et jugum Lädd, 2800—3100 m, Bornm. 6172.

Distr. gen.: Endem.

E. elbrusense und die folgenden Arten, nämlich *E. nanum*, *E. Griffithii*, *E. hakkiaricum* und *E. caespitosum* bilden offenbar eine Gruppe zunächst miteinander verwandter Arten, die niedrigen, rasigen Wuchs, Tunikabildung, Vorkommen in der Hochgebirgsstufe, 2- und 3-teilige Haare auf den Blättern, und 2- bzw. 2- und 3teilige Haare auf den Schoten gemeinsam haben.

5. ***E. nanum*** Boiss. & Hohen. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 23 (1849).
Typus: „In summis alpibus Hasartschal montis Elburs occidentalis", Ky. 487, W!

Dense caespitosum. Caules floriferi 3—8 cm longi, foliati, ascendentes. Folia minuta, 2—3 mm lata, oblongo-spathulata, obtusa, subintegra vel in tertia parte anteriore utrinque denticulo unico raro binis provisa, superiora oblongo-lanceolata vel linearia, acutiuscula; indumentum e pilis plurimis bipartitis trifidis paucis interdum immixtis consistens. Pedicelli 1—2 mm, fructiferi usque ad 3 mm longi. Sepala 4—6 mm longa. Petala 7—12 mm longa. Siliquae (juveniles) 10—15 mm longae, strictae, pilis bifidis canescentes. Stylus 2—3 mm longus.
Persia: N: Maz.: Hazarchal, 3000 m, Ky. 487! Prope Piaschal et Hazarchal, 3700—4000 m, Bornm. 6167. — W: Azerb.: Kuh-e Sahand, 2400—2700 m, Buhse 569. — C: Tehr.: M. Damavand, 3800 m, Bornm. 6168; 4000 m, Wdb. 1676!

Distr. gen.: Endem.

6. ***E. Griffithii*** (Hook. f. & Thoms.) Jafri, Notes Roy. Bot. Gard. Edinb. 22: 107 (1956).
Syn.: *Cheiranthus Griffithii* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 137 (1861). *Erysimum Hookeri* Boiss., Fl. Or. 1: 203 (1867). *E. Koeiei* Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 5 (1954).
Typus: Kuh-i Baba, 4200—4500 m, Griff. s. n., K.

Suffrutescens caespitosum, caudicibus residuis petiolorum dense comosis. Caules floriferi pumili, 2—5 cm longi, folia basalia saepe paulo superantia. Folia basalia anguste oblanceolata, acuta, petiolo incluso 15—20×2—3 mm, laete viridia, pilis in pagina superiore pro majore parte bifidis, in pagina inferiore trifidis; folia caulina angustiora, subsessilia. Pedicelli floriferi 1,5—2 mm longi. Sepala ± 5 mm longa. Petala sepalis vix duplo longiora. Siliquae juveniles pilis pro majore parte trifidis canescentes. Stylus ± 2,5 mm longus. Stigma capitatum.
Afghanistan: C: Bamian: Kuh-i Baba, 3800 m, Koeie 2626!; 4200—4500 m, Griff. s. n.

Distr. gen.: Endem.

7. ***E. hakkiaricum*** Cullen, Notes Roy. Bot. Gard. Edinb. 26: 195 (1965).
Typus: Turcia, Prov. Hakkari: Cilo Dagh, Davis 24160, E!

Planta suffrutescens pulvinato-caespitosa. Caules floriferi 5 mm, fructiferi 10—12 cm longi. Folia basalia rosulantia, anguste oblanceolata-spathulata, indumento e pilis bifidis trifidis paucis immixtis consistente canescentia; folia caulina usque ad 5. Pedicelli floriferi 2—3 mm, fructiferi usque ad 4 mm longi. Sepala 3—4 mm longa. Petala 7—9 mm longa. Siliquae usque ad (10—) 13 (—20) mm longae, patulae, indumento e pilis bifidis consistente canescentes. Stylus 2—3 mm longus.

Iraq: Kurd.: Arbil: Algurd Dagh, in saxosis schist., 3000—3800 m, Rech. 11447! M. Qandil, in saxosis calc., 3500—3700 m, Rech. 11164!

Distr. gen.: Anatolia austro-orientalis, Iraq.

Cullen unterscheidet seine Art durch dichten rasigen Wuchs und kleinere, blässere Blüten von *E. nanum* Boiss. & Hohen. Nach unserer Meinung sind die angegebenen Merkmale zu einer spezifischen Unterscheidung kaum ausreichend. (Polatschek & Rechinger).

8. ***E. persepolitanum*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 11 (1845).
Typus (Lectotypus): Ky. 261, W!

Perenne, caespites parvos formans, caulibus pluribus tenuibus ascendenti-erectis simplicibus vel parce ramosis 15—25 cm altis. Folia 15—25 × 1—2 mm, rosularia numerosa conferta, linearia vel oblongo-linearia, integra, saepe longitudinaliter complicata, caulina angustiora acutiora; indumentum e pilis bipartitis, trifidis apicem folii versus raro immixtis compositum, canescens. Pedicelli 0,5—1,5 (—2) mm longi, fructiferi patuli. Sepala 4,5—5 mm longa. Petala ± 8 mm longa lamina angusta, flava. Siliquae 24—32 mm longae (immaturae tantum notae) erecto-patulae, tenuissimae, pilis bi- et trifidis canescentes. Stylus 1—2 mm longus.

Persia: N: Gorg.: Ketul, Shar. 554-b! — W: Azerb.: Shahr Chay, Knapp! Khosrava, Knapp! 64 km SE Tabriz, 1800 m, Furse 2378! Ham.: Kuh-e Garri, Str. Kermansh.: Harsin, Str. Karand, Str. Kuh-e Richab, Str. Esf.: Soh inter Esfahan et Tehran, Bge. Lur.: Oshtoran Kuh, Str. — S: Fars.: Dasht-e Arzhan, Stapf 237! 56 km W Shiraz, 2000 m, Furse 1277! Prope Persopolis, Ky. 261!, Auch. 165. Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5316! — E: Khor.: In jugo S Bezg, 1800 m, Aitch. 867. — C: Tehr.: Damavand, 2700 m, Buhse; 2900 m, Wdb. 1412! — Damgh.-Semn.: Kuh-i Nizwa, Orim, 2100 m, Wdb. 1045!
Turcomania: Kopet Dagh, 2000—3000 m, Litw. M. Ludsch prope Ashkhabad, 2000 m, Litw. 516-a. Risarash prope Firyuza, 3000 m, Litw. 517.

Distr. gen.: Endem.

Die Art ist mit *E. caespitosum* und *E. macrospermum* in vielen vegetativen Merkmalen und im Habitus übereinstimmend.

9. ***E. nasturtioides*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 40 (1888).
Typus: „Ad nives regionis alpinae montium Kellal et Ssebsekuh ditionis Bachtiaris Persiae occidentalis", Haussk., G.

Suffrutescens, caespitosum; caules tenues, fructiferi 10—15 cm alti, fere a basi siliquiferi. Planta pilis bipartitis appressissimis obsita, pilis paucis trifidis immixtis, pallide virens. Folia surculorum radicalium usque ad 25 mm longa, apice 5—7 mm lata, conferta; folia caulina sparsa, omnia anguste lineari-spathulata, acuta, subcanaliculata. Racemi pauciflori, fructiferi breves, laxi. Pedicelli calyce subbreviores.

Petala longe unguiculata, calyce duplo longiora. Siliquae 15—20 mm longae, erecto-patulae, rigidae, nervo mediano valvae prominente. Stylus tenuis, siliquae latitudine sublongior.

Persia: W: Bakht.: Kuh-e Kukalar, Haussk. Lur.: Sabzekuh, Haussk.

Distr. gen.: Endem.

Vermutlich wurde die Art seit ihrer Entdeckung nicht mehr gesammelt. Die von Blakelock. Kew Bull. 1948: 387 von Iraq, Algurd Dagh, 3000—3300 m, Guest 3046, 3061, erwähnten Exemplare gehören vermutlich zu *E. hakkiaricum* Cullen.

10. ***E. alpestre*** Ky. ex Boiss., Fl. Or. 1: 202 (1867).
Syn.: *E. Sintenisianum* Bornm., Feddes Repert. Beih. 89, 1: 32 (1936).
Typus: In reg. alp. distr. Kassan Oglu Ciliciae kurdicae prope Gorumse, Ky. 92, W!

Densissime suffruticoso-caespitosum, radice et caudicibus crasse lignosis, virescens. Caules numerosi, simplices, 5—18 cm alti, usque ad medium circiter foliati. Folia rosularia infima spathulata distincte petiolata, integra, sequentia et folia caulina lineari-lanceolata, acuta, integra, omnia pilis bi- et trifidis obsita, pili quadrifidi rarissime immixti. Racemi simplices, fructiferi vix elongati. Pedicelli floriferi 2 mm, fructiferi usque ad 4 mm longi. Sepala (4—) 7—9 mm longa. Petala (12—) 13—17 mm longa. Siliquae 15—25 mm longae, pilis bi-, tri- et quadrifidis obsitae. Stylus (2—) 3—4 mm longus; stigma emarginatum.

Persia: W: Azerb.: Kuh-i Bilqis, Knapp.

Distr. gen.: Anatolia, Persia occidentalis.

Die Art ist durch außerordentlich dichtrasigen Wuchs, sehr starkes Verholzen und sehr schwache Tunikabildung ausgezeichnet.

11. ***E. pulchellum*** (Willd.) J. Gay, Erys. 10 (1842).
Syn.: *Cheiranthus pulchellus* Willd., Spec. Plant. 3 (1): 523 (1800). *E. lazistanicum* (Rupr.) Lipsky, Fl. Kavk. 223 (1899).
Typus: Cappadocia.

Perenne, caespites parvos formans, tota planta viridis. Radix simplex, surculos breves collo tunicatos proferens. Caules plures, simplices, 5—15 (—30) cm alti, tota longitudine foliati. Folia rosularia lanceolata, distincte petiolata, lamina obtusiuscula, oblongo-spathulata, sublobato-dentata, lobis interdum incisis; pili bi-, tri- raro quadrifidi. Folia caulina lanceolata, acuta, in petiolum sensim attenuata, leviter sinuato-dentata; pili bi-, tri- et quadrifidi. Inflorescentia florifera capitata, fructifera quoque densa. Pedicelli floriferi 2—3 mm, fructiferi 3—4 mm longi. Sepala 5—6 (—9) mm longa. Petala 10—12 (—18) mm longa. Siliqua 20—25 mm longa, pilis plurimis 4—5-fidis obsiti, ± tetragona, axi ± appressis. Stylus 2—3 (—4) mm longus.

Persia: N: Maz.: In valle Haraz, inter Emarat et Zardman, 500 m, Wdb. 452! — C: Damgh.-Semn.: Kuh-i Nizwa, Orim, 2100 m, Wdb. 1045! — Rustamabad, Pichler!

Distr. gen.: Anatolia, Persia.

Die Lage des Fundortes von Pichler ist nicht bekannt. Der Beleg befindet sich im Wiener Universitätsherbar und war bisher unbestimmt.

12. ***E. argyrocarpum*** N. Busch, Fl. URSS. 8: 108, 638 (1939).
Typus (Syntypi): In saxosis et lapidosis Geladara in Suvant, Matveev. Schonatschola, Gurvicz, LE.

Suffrutex pluricaulis; caules 10—20 cm alti, graciles. Tota planta pilis bifidis dense obsita. Folia linearia vel lanceolato-linearia, acutata. Pedicelli fructiferi 3—5 mm longi, erecto-patuli. Sepala 9—10 mm longa. Petala 18—20 mm longa. Siliquae 25—40 mm longae, densissime argenteo-sericeae. Stylus 3—4 mm longus. Semina 2,5 mm longa, 0,5 mm lata, oblonga, brunnea.

Talish: Swant, Geladara, Matveev. Schona-tschola, Gurvicz.

Distr. gen.: Endem.

13. ***E. filifolium*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 41 (1888).
Icon.: Clavis p. 27.
Typus: In rupestribus calcareis montis Avroman Kurdistaniae Persicae, 5—6000', Haussk., G, W!

Herba perennis, caespitosa. Tota planta indumento e pilis bipartitis appressissimis consistente canescens. Caules numerosi, 15—40 cm alti. Folia surculorum sterilium 20—40 mm longa, setaceo-filiformia, convoluta, confertissima; folia caulina similia, perpauca. Racemus fructifer elongatus, valde laxus. Pedicelli fructiferi 3—5 mm longi, patuli, incrassati. Petala calyce sesquilongiora, lamina obovata. Siliquae (3—) 4—6,5 cm longae, 1,5 mm crassae, erecto-patentes, canescentes. Stylus conicus, siliquae latitudine vix longior; stigma capitato-retusum.

Iraq: Kurd.: Sul.: M. Avroman, 1500—1800 m, Haussk. Mosul: In saxosis calc. supra Sirsang, 1200 m, Rech. 11648!; 1350 m, O. Polunin 5079! Jabal Khantur prope Sharanish, 1200 m, Rech. 10787!

Distr. gen.: Endem.

Die Art fällt durch ihre äußerst schmalen, glauken, fast grasartigen, stark eingerollten Blätter und die dichten, sterilen Blattbüschel auf.

14. ***E. macrospermum*** Cullen & Rech. f., sp. nov.
Typus: Rech. 18231, W!
Icon.: Tab. 30, fig. 1.

Perenne, collo residuis petiolorum squarroso. Caules 15—30 cm alti, rarius singuli, tenues, in dimidio inferiore tantum foliati, simplices vel inferne tenuiter pauciramosi. Indumentum caulis pilis bifidis canescens. Folia basalia numerosa, rosulas confertas formantia, 2—3 cm longa, ± 1,5 mm lata, anguste linearia, saepe recurva et longitudinaliter complicata, in petiolum brevem sensim attenuata, acuta, pilis minutis pro magna parte bifidis trifidis raro immixtis canescentia; petioli basi dilatati, pallidi, emarcidi persistentes. Folia caulina anguste linearia, breviora, sessilia. Racemi fructiferi laxi. Pedicelli floriferi brevissimi usque ad 2 mm longi, fructiferi usque ad 3 mm longi, paulo incrassati, patuli. Calyx 6 mm longus; sepala obtusiuscula, anguste scarioso-marginata. Petala 10—11 mm longa, flava; lamina obovata, 3 mm longa. Siliquae 25—40 mm longae, ± 1,5 mm latae, anguste lineares, valvis convexis, apice breviter attenuatae, pilis minutis bi-, tri- et quadrifidis canescentes, erecto-patulae. Stylus 1,5—2 mm longus. Stigma truncato-capitatum. Semina maxima, ± 4 mm longa, vix 1 mm lata, superne late membranaceo-marginata.

Afghanistan: C: Bamian: Band-i Amir, in declivibus aridis calc., 2800—2900 m, 13.—14. VII. 1962, Rech. 18231! Band-i Amir, 2900 m, Hdg. & Wdb. 4744!, 4769! Ad lacum Band-i Zolfikar, 2900 m, Rech. 18427!; 2950 m, Gilli 942!; 3200 m, Volk 2746! Deh Kundi, 3000 m, Edelb. 1947!

Distr. gen.: Endem.

Die Art fällt vor allem durch die ungewöhnliche Größe der Samen auf. Sie hat mit *E. frigidum* Boiss. & Hausskn. Form und silbrige Behaarung der Blätter gemeinsam. Schoten- und Griffellänge unterscheiden sie jedoch deutlich. Die größte Affinität besteht jedoch zu *E. caespitosum*, das sich durch die vorwiegend zweispaltige Behaarung der Schoten und durch die nur 1,8 mm langen Samen von *E. macrospermum* unterscheidet.

15. ***E. Szovitsianum*** Boiss., Fl. Or. 1: 198 (1867).
Icon.: Fl. Armen. 5, tab. 52 (1966).
Typus: „In saxosis montium prope lacum Ourmiah", Szov., G.

Perenne. Caules e collo crassiusculo squamoso plures, 10—30 cm alti. Indumentum totius plantae e pilis bifidis consistens. Folia radicalia numerosa, lanceolata, longiuscule petiolata, utrinque attenuata, acuta; folia caulina breviora. Pedicelli floriferi 6—7 mm longi. Calyx 8 mm longus. Petala 13—15 mm longa. Siliquae 42—60 mm longae, erecto-patulae, flexuosae, tenues, apice attenuatae. Stylus 2 mm longus. Stigma bilobum.

Persia: W: Azerb.: In saxosis montium prope lacum Rezaiyeh, Szov.

Distr. gen.: Caucasus, Armenia, Persia borealis.

16. ***E. ischnostylum*** Freyn & Sint., Bull. Herb. Boissier Ser. 2, 3: 570 (1903).
Typus: „Turcomania, Kizil Arwat, Kara Kala, in monte Sundsodagh", Sint. 760, W!

Herba perennis, saepe pluricaulis. Caulis erectus, 20—45 cm altus, subsimplex vel pauciramosus, ad medium usque circiter foliatus. Folia rosularia 15—30 (40) mm longa, usque ad 3 (—5) mm lata, anguste lanceolata, integra, raro subdentata, acuta, manifeste petiolata, caulina anguste lineari-lanceolata, sessilia; indumentum foliorum e pilis bi- et trifidis paucis quadri-, paucissimis quinquefidis immixtis consistens, canescens. Racemi ab initio laxiusculi, fructiferi valde elongati. Pedicelli floriferi 1—2 mm, fructiferi usque ad 4 (—5) mm longi, paulo incrassati, erecto-patuli. Sepala 6—7,5 mm longa. Petala 11—12 mm longa. Siliquae 20—30 mm longae, axi ± appressae vel erecto-patulae. Stylus (1—) 1,3—2,5 mm longus.

Persia: E: Khor.: Kuh-e Neyshabur: Darreh Abshar prope Akhlamad, Rech. 4592! Kopet Dagh: Inter Quchan, 1800 m, et jugum Alam Ali, 1600 m, Rech. 7253! — C: Shahr.-Bust.: Khash Aylan, 70 km E Shahrud, Rech. 5429!
Turcomania: Kizyl-Arvat, Kara Kala, Sundsodagh, Sint. 1760! M. Ludsch prope Ashkhabad, Litw. 516-a! Prope Suluklü, Sint. 836!
Afghanistan: SW: Herat, 1100 m, Koelz 3548! — C: Bamian: Panjao, 2700 m Hdg. & Wdb. 4905! — Doavi, Lindb. 693!

Distr. gen.: Endem.

E. ischnostylum, *E. persicum* und *E. leucanthemum* bilden eine Gruppe zweijähriger bis ausdauernder, zunächst mit einander verwandter Arten, wobei sich *E. ischnostylum* durch den deutlich längeren Griffel, etwas größere Petalen und die in der Beschreibung angegebenen Unterschiede im Anteil der verschiedenen Haartypen von den beiden anderen Arten abhebt. Die beiden übrigen Arten stehen einander wesentlich näher und zeigen als Hauptmerkmale Unterschiede in der Lebensdauer und in der Behaarung der Rosettenblätter, während sich Griffellänge, Länge der Pedizellen und Petalengröße nicht wesentlich unterscheiden bzw. decken. Die Areale überschneiden einander.

Auf Grund der Behaarungsmerkmale ließen sich die folgenden, im übrigen nicht typischen Belege hier einordnen: Persia: W: Bakht.: Shahr Kord, 2200 m, Furse 1394! — S: Fars.: 58 km W Shiraz, 1600 m, Grant 15603! 13 km W Shiraz, 1600 m, Grant 15624! Pasargadae, 15 km N Saadatabad, Grant 15793!

17. ***E. leucanthemum*** (Steph.) B. Fedtsch., Acta Horti Petrop. 23: 413 (1904).
Syn.: *Cheiranthus leucanthemum* Steph. in Willd., Spec. Plant. 3: 521 (1800).
Typus: Persia borealis, B.

Herba perennis. Caules erecti, usque ad 60 cm alti, plerumque ramosi. Folia rosularia integra vel interdum breviter sinuato-dentata, caulina lineari-lanceolata integra, indumento canescente e pilis bi- et trifidis raro quadrifidis consistente. Pedicelli 2—3 (—4,5) mm longi. Sepala 4,5—6 mm longa. Petala 8—10 mm longa. Siliquae (2—) 3—4 cm longae, erecto-patulae, indumento e pilis bi-, tri- et quadrifidis rarissime quinquefidis consistente. Stylus 0,5 (—1,5) mm longus.

Afghanistan: E: Kabul: SE Sarobi, 1500 m, Gilli 936! Kabul, 1800 m, Koelz 11411!, 11457! Dar-ul Fanun, Volk 42!, 561!, 623!, 2069! Kuh-i Asmai, 1900 m, Lamond 1922! Kotal-e Takht, 2250 m, Hdg. & Wdb. 4447! In montibus Sher Darwasa et Chelsotun, 2000 m, Gilli 931!, 932!, 938! In valle fluvii Pech prope Pechalam, 1000 m, Kerst. 706! Istalif, 1700 m, Lindb. 58/241!, Gilli 939!, Neub. 4052! Jaji: Inter Dre Kalla et Qasim Khel, Rech. 32278! In valle Logar, Volk 1839 p. p.! In declivibus occidentalibus jugi Lataband, 1900 m, Lamond 1957! Nuristan: Pashki, 2300 m, Edelb. 2126! — C: Bamian: Koh-i Baba, 2900—4000 m, Gilli 933!, 934!, 940!, 941! — Locus ignotus, Koeie 3021!

Distr. gen.: Rossia meridionalis, Caucasia, Persia, Turcomania, Afghanistan, Sibiria, sec. Fl. URSS. 8: 117 (1939).

18. ***E. subulatum*** J. Gay, Erys. 8 (1842).
Syn.: *E. persicum* Boiss., Ann. Scienc. Nat. Ser. 2, 17:79 (1842).
Typus: Auch. 4105, G.

Bienne, (20—) 40—60 cm altum, a basi vel a tertia parte inferiore ramosum. Folia basalia oblongo-linearia, lamina remote sinuato-dentata, acuta, in petiolum sensim longe attenuata, in parte superiore 4—6 mm lata; folia caulina anguste linearia, integra, acuta; indumentum foliorum e pilis plurimis bipartitis paucis trifidis paucissimis quadrifidis immixtis consistens. Racemus ab initio laxiusculus. Pedicelli patuli, floriferi 1—3 mm, fructiferi 2—4 (—5,5) mm longi, incrassati. Sepala 5—6 (—7) mm longa. Petala 8—10 mm longa. Siliquae (2,5—) 3—4 (—4,5) cm longae, patentes, pilis (bi-) tri-, quadri- et perpaucis quinquefidis obsitae. Stylus 0,5 (—0,8) mm longus.

Iraq: Kurd.: Sul.: M. Avroman prope Tawilla, 1600 m, Rech. 10315! 2100 m, Rech. 10378! Penjwin, 1600 m, Rech. 10499!, Rech. 1222!
Persia: W: Azerb.: Jolfa, Grossh. Azerbaijan, Auch. 4105. Tabriz, Gill.-Sm. 21, 22, 1729, 1817. Dasht-e Moghan, 160—500 m, Schmid 6576! Lur.: Khorramabad, 2100 m, Koeie 1412! Dow Rud, 1650 m, Koelz 15577! — C: Qazv.: Karaj, Kuh Safid, 1500 m, Rech. 608! — Hissar, Pichler!
Afghanistan: SW: Herat, Amsel s. n.! — E: Kabul: 10 km N Kabul, 2000 m, Rech. 31125!, Podlech 11638! Pul-i Alam, 2100 m, Koelz 11860! Kotal-e Takht inter Kabul et Ghazni, 2300 m, Rech. 17223! Sher Darwasa, 1900 m, Rech. 16994!, Podlech 10832!, Gilli 937! Band-e Kargha, 2050 m, Rech. 21229! Kabul, Honigberger! Istalif, Rech. 31189! — NE: Kataghan: Paigah Kotal inter Haibak et Pul-i Khumri, 1500 m, Rech. 16439!

Distr. gen.: Endem.

19. ***E. ghasnicum*** Cullen & Rech. f., sp. nov.
Icon.: Tab. 29, fig. 1.
Typus: Rech. 17765, W!

Bienne. Caulis 40—60 cm altus, in parte inferiore vel media longe virgato-ramosus, in tertia vel dimidia parte inferiore foliatus. Indumentum caulis e pilis bifidis consistens. Folia basalia fructificationis tempore jam emarcida, ut videtur anguste lanceolata, longissime tenuiter petiolata obtusiuscula, pilis bi-, tri- et perpaucis quadrifidis obsita. Folia caulina usque ad 7 cm longa, 4 mm lata, lineari-lanceolata, basi ± longe attenuata sessilia, acuta, integra; indumentum foliorum pro maxima parte e pilis trifidis bi- et quadrifidis immixtis consistens. Racemi fructiferi 20—30 cm longi, valde elongati, laxi. Pedicelli floriferi ± 1 mm longi, fructiferi paulo incrassati, usque ad 2—3 (—5) mm longi. Calyx 5 mm longus; sepala acutiuscula, anguste scarioso-marginata. Petala sepalis 6,5—8,5 mm longa, flava, lamina parva obovato-cuneata. Siliquae 2,5—3 cm longae, 1—1,5 mm latae, crassae, anguste lineares, subteretes apice attenuatae, erecto-patulae, pilis minutis tri- et quadrifidis canescentes. Stylus (1,5—) 2 (2,5) mm longus. Stigma truncatum. Semina 1,7 mm longa, 0,8—0,9 mm lata, assymetrice alata.

Afghanistan: E: Ghazni: Okak, NE altoplanitiei Dasht-e Nawar, 33° 50′ N, 67° 55′ E, 3000 m, in declivibus siccis saxosis, 4. VII. 1962, Rech. 17765! Distr. Malestan: Inter Miradina et jugum Ghoutch Kol N Sang-i Masha, 3300 m, Rech. 17623! Inter jugum Kotal-e Kechru et pagum Miradina, NW Sang-i Masha, 2700—3200 m, Rech. 17565! In declivibus saxosis gneiss. vallis fluvii Arghandab prope Sang-i Masha, 2400 m, Rech. 17498!

Distr. gen.: Endem.

Die Art läßt sich auf Grund ihrer Merkmale an *E. leucanthemum* und *E. persicum* anschließen.

20. ***E. nuristanicum*** Polatschek & Rech. f., sp. nov.
Icon.: Tab. 28, fig. 2.
Typus: Rech. 32452, W!

Suffrutescens, laxe caespitosum pluricaule, 25—35 cm altum, simplex vel pauciramosum. Caules tenues, teretes, densiuscule usque ad inflorescentiam foliati, basi residuis petiolorum flavido-albidis membranaceis leviter comosi. Indumentum totius plantae canescens, opacum, e pilis bifidis appressis consistens. Folia inferiora 30—50 × 35—45 mm; petiolus distinctus, tertiam partem laminae attingens; lamina anguste lanceolata, acuta, ± distincte remote sinuato-dentata; indumentum e pilis bifidis appressis consistens. Folia caulina lineari-lanceolata, acuta, integra, raro dente uno alterove remoto provisa; indumentum e pilis plurimis bifidis consistens, trifidis in pagina inferiore apicem versus ± immixtis; costa mediana in pagina inferiore prominens. Racemus simplex, florifer subcapitato-confertus, fructifer valde elongatus, laxus. Pedicelli floriferi 1—1,5 mm, fructiferi 2—4 mm longi, tenues, patuli. Sepala 4—5 mm longa, lanceolata, obtusa, membranaceo-marginata, pilis bifidis obsita. Petala 7—8,5 mm longa, in unguem latiusculum sensim attenuata, ut videtur pallide flava. Siliqua 12—17 mm longa, 1 mm crassa, torulosa, ± teres, pilis plurimis bifidis, trifidis ± copiose immixtis canescens. Stylus 0,7—1 (—1,5) mm longus, a siliqua bene distinctus. — Species nova habitu laxo suffruticoso, foliis inferioribus remotissime sinuato-dentatis, pedicellis tenuibus, siliquis brevibus torulosis, floribus parvis valde insignis, haud cum specie alia comparanda.

Afghanistan: E: Nuristan: Kandai, 16. VII. 1965, Rech. 32452! In quercetis (*Q. Baloot*) inter Asmar et Barikot, 840 m, Gilli 935! Asmar, 1000 m, Neub. 4559!, 1. VI. 1964!
Pakistan: Chitral: Drosh, 1270 m, Bowes Lyon 716!

Distr. gen.: Endem.

Die neue Art hat in den Blüten eine auffallende Ähnlichkeit mit dem einjährigen *E. cheiranthoides* L. Abgesehen von den kurzen Schoten ähnelt *E. nuristanicum* der Artengruppe *E. ischnostylum*, *E. leucanthemum*, *E. persicum*.

21. ***E. frigidum*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 39 (1888).
Typus: In rupestribus frigidis montis Saverz (sphalm. Sawus) Persiae occidentalis, 10—12.000 ped., Haussk., G, W!

Perenne. Caules 8—10 cm alti, ascendentes, tenues, simplices. Folia rosularum 20—25 × 2—3 mm, oblongo-spathulata, saepe longitudinaliter plicata, in petiolum longum attenuata; indumentum e pilis bipartitis consistens; caulina usque ad 6, linearia. Racemi fructiferi laxi. Pedicelli fructiferi 1—1,5 mm longi. Sepala 4 mm longa. Petala calyce duplo longiora. Siliquae 15—25 mm longae, anguste lineares, pilis bi-, tri- et quadrifidis canescentes. Stylus 1,5 (—2) mm longus.

Persia: W: Lur.: Kuh-e Saverz, 3000—3600 m, Haussk.!

Distr. gen.: Endem.

Die Art ist seit ihrer Entdeckung nicht mehr gesammelt worden. Sie gehört wohl in die weitere Verwandtschaft des *E. caespitosum*.

22. ***E. uncinatifolium*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 5: 23 (1856).
Typus: Maimansour inter Baibourt et Erzurum, Huet, K!, W!

Herba perennis. Caulis erectus, 8—15 cm altus. Folia inferiora aliquantum reflexa, anguste elliptica, remote dentata vel integra, petiolis longis tenuibus; folia caulina linearia, apicibus uncinatis, folia omnia pilis bifidis usque quadrifidis canescentia. Pedicelli floriferi 2—3,5 mm longa. Sepala 8—9 mm longa, saccata. Petala 12—15 mm longa, flava. Siliquae 25 mm longae, tetragonae, patulae, flexuosae, pilis bi- usque quadrifidis canescentes. Stylus 1 mm longus.

Persia: W: Ham.: Distr. Silakhor, Str. Arak: Golpayegan, Str. M. Alvand, Str. Arak, Str. Lur.: Oshtoran Kuh, Str. — C: Tehr.: M. Tuchal, Manzariyeh, 1800—2200 m, Žumer 704!

Distr. gen.: Anatolia, Armenia, Persia occidentalis.

Die Angabe „biennis" in der Originalbeschreibung ist offenbar irrtümlich.

23. ***E. crassipes*** Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 1: 27 (1835).
Icon.: Clavis p. 27; Fl. Azerbaidzhana 4, tab. 42 (1953).
Typus: Talish, C. A. Mey., LE (photo E!).

Herba perennis. Caules 30—60 cm alti, erecti, tenues, teretes. Folia inferiora plerumque lineari-setacea, integra, 1 (—2) mm lata, caulina linearia, omnia pilis bifidis canescentia. Pedicelli 1 (—3) mm longi, patentes. Sepala 4—6 mm longa. Petala 8—9 mm longa. Siliquae 35—45 mm longae, patulae, pilis bifidis canescentes. Stigma subsessile, capitato-emarginatum.

Talish: Swant prope Tatuni, 1200 m, Hohen. Talish, Hohen.
Persia: N: Gil.: Supra Rudbar, 500—600 m, Bornm. 6148. — Persia borealis, Ky., Buhse. — W: Azerb.: 22 km W Khvoy, 1600 m, Grant 16183! 30 km NW Khvoy, 1700 m, Rech. 32675! 30—50 km E Tabriz versus Mianeh, Rech. 32632-a p. p.! M. Sahand, Buhse. Einal Zeinal prope Tabriz, Grossh. 23 km W Rezaiyeh, 1700 m, Grant 16126! Kurd.: 64 km N Sanandaj, 1650 m, Furse 2112! Wdb. 1852! Lur.: Dow Rud, 1500 m, Koelz 15602!, 17334! Bisheh, 1200—1400 m, Rech. 5724! Ham.: Yalfan, Pichler! Haydere prope Hamadan, Pichler! Azna, 1800 m, Koeie 1411! — C: Tehr.: Darband,

Ky. 142! Inter Tehran et fluvium Jaji Rud, 1600 m, Aell. 1057! Ab Ali, 2000 m, Schmid 5607! Qazv.: Inter Karaj et Gach Sar, 1400—2500 m, Schmid 5688! Kalak, Rech. 107! Qazvin, Bornm. 6162. Inter Bibersin et Pak Deh, Buhse 131, 339. Prope Karaj, 1500 m, Gauba. Soltanabad prope Qazvin, Lindsay 170.

Distr. gen.: Syria, Anatolia, Armenia, Talish, Persia borealis.

24. ***E. kurdicum*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 38 (1888).
Icon.: Clavis p. 31.
Typus: In graminosis montis Shahu Kurdistaniae, Haussk., W, Lectotypus!

Bienne. Caulis 50—70 cm altus, erectus vel ascendens, subalato-angulatus, a tertia parte inferiore ramosus. Folia basalia rosulata mox emarcida, caulina subintegra vel remote dentata, obovato-oblonga, breviter petiolata; indumentum e pilis plurimus trifidis, paucis bi- et quadrifidis immixtis consistens. Racemi multiflori, fructiferi quoque densiusculi stricti. Pedicelli 2—4 mm longi, fructiferi erecto-patuli, incrassati. Sepala 5 mm longa. Petala 10 mm longa, lamina suborbiculari. Siliquae axi ± appressae, (10—) 15—25 mm longae, erecto-patulae quadrangulae pilis plurimis bifidis, nonnullis tri- et quadrifidis immixtis. Stylus vix 1 mm longus, breviter conicus, crassiusculus. Stigma subcapitatum, indistincte bilobum, quam siliqua matura evidenter angustius.

Iraq: Kurd.: Mosul: Jabal Khantur prope Sharanish, in saxosis calc., 1480 m, Rech. 12046! Arbil: M. Qandil supra Pushtashan, 1800—2000 m, Rech. 11072! Algurd Dagh supra Nowanda, 2000—2600 m, Rech. 11367! Sul.: M. Avroman prope Tawilla, 1800—2000 m, Rech. 10329! M. Avroman, Haussk.
Persia: W: Azerb.: 30—50 km E Tabriz versus Mianeh, Rech. 32632! Kurd.: M. Shahu, Haussk.

Distr. gen.: Endem.

Die Art fällt durch die im Vergleich zu ihrer Größe kleinen Blüten und kurzen Schoten auf.

25. ***E. Koelzii*** Polatschek & Rech. f., sp. nov.
Icon.: Tab. 30, fig. 2.
Typus: Koelz 17456, MICH!

Bienne vel potius perenne, omnino viride, collo residuis petiolorum modice comoso. Caulis singulus, 28—35 cm altus, usque ad medium foliatus, in medio pauciramosus, pilis bifidis obsitus, ex axillis foliorum inferiorum ramos abbreviatos verosimiliter serius florentes emittens. Folia basalia infima exteriora lanceolato-spathulata, in petiolum ± subito attenuata, interiora oblongo-lanceolata obtusiuscula, integra, denticulis remotis paucis vix conspicuis, pilis bifidis obsita. Folia caulina sursum decrescentia anguste lanceolata acuta, superiora basin versus vix attenuata sessilia; indumentum e pilis bifidis consistens, pilis trifidis perrare immixtis. Racemi ab initio laxiusculi. Pedicelli floriferi 2,8—5,5 mm, fructiferi 6—10 mm longi. Sepala 7—9 mm longa, lanceolata acutiuscula, angustissime scarioso-marginata; indumentum laxum, e pilis bifidis consistens. Petala 11,5—13 mm longa, distincte unguiculata; lamina spathulata, apice truncata, in vivo citrina (e collectore). Siliqua juvenilis; indumentum prope basin pilis plurimis bifidis, apicem versus trifidis numerosis immixtis consistens. Stylus 2—3 mm longus. Stigma capitatum. — Differt ab *E. passgalense* Boiss. radice verosimiliter perenni, caule a medio nec a basi ramoso, foliis valde decrescentibus, basi latiusculis apice acutis, pilis omnibus fere bifidis.

Persia: W: Lur.: Dow Rud, 8. V. 1941, Koelz 17456! Kharon, 2200 m, Koelz 1413!

Distr. gen.: Endem.

26. ***E. afghanicum*** Kitam., Act. Phytotax. Geobot. 16: 140 (1956); Kitam., Fl. Afgh. 149, fig. 54 (1960).
Typus: Trokikorl, Kitam. s. n., KYO.

Bienne vel perenne; radix pluriceps, collo residuis petiolorum comoso. Tota planta laxiuscule pilosa. Caulis 50—55 cm altus, simplex, angulato-striatus, usque ad 2/3-foliatus. Folia rosularia lanceolata, distincte petiolata, ± integra, denticulis paucis remotis; pilis bi-, tri- et quadrifidi. Folia caulina lanceolata, acuta, integra, pilis bi-, tri- et quadrifidis. Racemi fructiferi valde elongati. Pedicelli fructiferi 4—6 mm longi. Siliquae 46—53 mm longae, leviter quadrangulae, pilis tri-, quadri- et quinquefidis obsitae. Stylus 0,8—1,2 mm longus, cum stigmate quam siliqua manifeste tenuior.

Afghanistan: E: Nuristan: Trokikorl, 1500 m, Kitam.
Pakistan: Chitral: Barum Gol, Shokor Shal, 3500 m, Wdb. s. n. Ojor Gol, 3000 m, Bowes Lyon 848!

Distr. gen.: Endem.

Die Identifizierung der vorliegenden Pflanzen aus Chitral, nach der die obige Beschreibung angefertigt wurde, ist nicht ganz sichergestellt. Die Originalbeschreibung lautet auf ausdauernd, die Abbildung läßt eher die Deutung zweijährig zu. Die Stengelblätter werden in der Beschreibung als „obtusa" bezeichnet, nach der Abbildung wären sie jedoch mindestens spitzlich. Als Griffellänge gibt Kitamura 1,5—2 mm an. Da jedoch nach unseren Erfahrungen gewisse Schwankungen in der Griffellänge bei manchen Arten vorkommen, bildet dieser Widerspruch keinen absoluten Ausschließungsgrund. Die Wendelbo'sche Pflanze war vom Sammler als *E. hieracifolium* L. bezeichnet worden.

27. ***E. salangense*** Polatschek & Rech. f., sp. nov.
Icon.: Tab. 28, fig. 1.
Typus: Rech. 31733, W!

Verosimiliter perenne, plerumque pluricaule, a basi fere fructiferum, virescens. Caulis e basi saepe arcuata erectus, 20—40 cm altus, in parte infima angulato-striatus, foliatus. Folia fere omnia rosularia, lanceolata, integra vel valde remote sinuato-dentata, in petiolum brevem sensim attenuata, pilis omnibus bifidis. Racemi primum conferti, mox valde elongati. Pedicelli floriferi 3,5—4,5 mm, fructiferi, 5,5—7,5 mm longi. Sepala 7—7,5 mm longa, prope apicem distincte membranaceo-marginata, lanceolata, acutiuscula; indumentum e pilis densiusculis bifidis consistens. Petala (10—) 14—15 mm, manifeste unguiculata, lamina spathulato-rotundata, basi subito contracta. Siliqua 3,5—5 cm longa, 1 mm crassa, pilis bi- et trifidis obsita, erecto-patens. Stylus 1,5—2,5 mm longus. Stigma capitatum. — Species nova caule a basi fere fructifero, foliis plurimis basalibus una cum indumento e pilis bifidis consistente et stylo longiusculo insignis haud cum specie alia in regione florae iranicae occurente comparanda.

Afghanistan: NE: Kataghan: In declivibus borealibus jugi Salang, 1100—2000 m, 1. VII. 1965, Rech. 31733!; 2600—3300 m, Rech. 31618!, 37047!, Lamond 2220! In valle Andarab, substr. serpentin. 1100 m, Rech. 31704! Paigah Kotal SE Samangan, 1350 m, Hdg. & Wdb. 3559!

Distr. gen.: Endem.

Die Zugehörigkeit des folgenden, nicht vollständigen Beleges ist zweifelhaft: Badakhshan: Distr. Khash, 3000 m, Koelz 12972!

28. ***E. Aitchisonii*** O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1080 (1927).
Typus: Aitch. 298, DD, K.

Herba biennis. Caulis 40—70 cm altus, validus, erectus, saepe a basi fere ramosus. Folia basalia usque ad 8 cm longa, 10 mm lata, lanceolata, acuta, integra vel subintegra, petiolo dimidiam laminam vix aequante; folia caulina in dimidio inferiore caulis tantum evoluta, angustiora, brevius petiolata vel sessilia; indumentum foliorum e pilis bifidis compositum. Pedicelli floriferi 1,5—3 mm longi, fructiferi subrectangulariter patentes, ± incrassati. Sepala 7,5 (—9) mm longa. Petala 11—16 mm longa. Siliquae usque ad 5,5 cm longae, lineares, rectangulariter patentes, pilis bi-, tri- et quadrifidis obsitae. Stigma subsessile, leviter emarginatum.

Persia: **E**: Khor.: Inter Birjand et Qayen, 1900 m, Rech. 4170! In montibus serpentinicis Robat-i Safid inter Mashhad et Torbat-e Heydariyeh, 1700 m, Rech. 1546!, 4449! Torbat-e Heydariyeh, 1300 m, Rech. 4315! In montibus serpentinicis inter Torbat-e Heydariyeh et Assadabad, Rech. 4411! Kuh Sangi prope Mashhad, 1000 m, Rech. 4864! Afghanistan: **NW**: Maimana, 500 m, Hdg. & Wdb. 3624! Polat, Koelz 13950! Herat: Obeh, 1700 m, Koeie 3607! In collibus Badghiz prope Nowruzabad sec. Fedtsch. In valle fluvii Hari Rud, Tirphul, Aitch. 298. — **E**: Kabul: Kuh-i Asmai, 1900 m, Hdg. & Wdb. 2708!, 3123! Sher Darwasa, 1800 m, Hdg. & Wdb. 4302! Gulbagh, 1840 m, Gilli 1206! Kuh-i Nanagak S Gulbagh, 1800 m, Hdg. & Wdb. 3190! — **NE**: Kataghan: In jugo Argana 20 km W Kunduz, 600 m, Rech. 16117! Takhar: Khost-o Fereng NE Kotal-e Yawnu versus vallem Kala, 3000 m, Podlech 10724! In valle Andarab 6 km W jugi Khawak, 2800 m, Podlech 11216! Darrah-i Til, 2700 m, Podlech 1196!

Distr. gen.: Endem.

29. ***E. crassicaule*** (Boiss.) Boiss., Fl. Or. 1: 199 (1867).
Syn.: *Cheiranthus crassicaulis* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 45 (1842).
Icon.: Tab. 26, fig. 1 et 2.
Typus: Esfahan, Auch. s. n.

Planta biennis. Caulis 30—40 cm altus, crassus, glaber, plerumque a medio ramosus. Folia basalia usque ad 10×2 cm, rosulata, lanceolata, acuta, integra, nervis lateralibus inferioribus cum costa mediana ± parallelis, petiolo lato brevi, caulina in tertia parte inferiore latissima, basi attenuata sessilia, acuta, integra; indumentum canescens stellatum, pilis quinque-, sex- et septemfidis. Racemi floriferi, conferti, fructiferi elongati. Pedicelli 2—6,5 mm longi, fructiferi paulo incrassati, patuli. Sepala 8—13 mm longa. Petala pallide flava, 13—21 mm longa. Siliquae 30—47 cm longae, subteretes, torulosae, flexuoso-patulae, pilis quadri-, quinque- (et sex)fidis canescentes, in stylum brevem crassiusculum glabrum sensim attenuatae. Stylus 1,2 mm longus. Stigma bilobum lobis brevibus valde divaricatis.

Persia: **W**: Esf.: Inter Delijan et Esfahan, Schmid 5189! Inter Esfahan et Abadeh, 2000 m, Schmid 5354! Jolfa, ad sepulcrum Aucheri in lapidosis siccis, 1600 m, Rech. 2687! Esfahan, Auch. 32 km SE Esfahan, 1700 m, Furse 1358! Khuz.: 16 km W Abarqu, 1600 m, Grant 15409! — **S**: Fars.: Abadeh, Pravitz 728! Kerm.: In jugo Sang Bur, 2200 m, Rech. 2967! 58 km NW Bam, 1300 m, Grant 15392! — **E**: Khor.: Tabas, Jalgeh. Ruttner 545! In montibus serpentinicis E Sabzevar, Rech. 1312! Khorasan, Bge. Birjand, 1400 m, Gauba 280! — **C**: Shahr.-Bust.: In desertis arenosis inter Damghan et Sabzevar prope Mayamey, Rech. 1290! Yazd: Prope Anarak, Buhse 1278.

Distr. gen.: Endem.

E. crassicaule und *E. Stocksianum* haben den zweijährigen Wuchs, den ungewöhnlich dicken, kahlen Stengel, die starke Verzweigung, die breiten, im unteren Teil parallel-

nervigen Blätter, die bis zu 7-teiligen Sternhaare, die im jugendlichen Stadium oft verbogenen, zwischen den Samen unregelmäßig eingeschnürten Früchte und die tiefe zweilappige Narbe gemeinsam. Sie sind durch die Gesamtheit dieser Merkmale von den übrigen *Erysimum*-Arten so weit verschieden, daß ihre Abtrennung mindestens als eigene Untergattung gerechtfertigt wäre. Die Unterscheidung zwischen den beiden Arten sind rein quantitiver Natur, wie aus den Beschreibungen hervorgeht. Die Areale überlappen sich jedoch nur geringfügig (Kerman und Khorasan).

30. ***E. Stocksianum*** (Boiss.) Boiss., Fl. Or. 1: 199 (1867).
Syn.: *Cheiranthus Stocksianus* Boiss., Diagn. Pl. Or. Nov. Ser. 2, 1: 19 (1854).
Typus: Baluchistan superior, Stocks, G, Lectotypus.

Planta biennis vel monocarpica, 20—50 cm alta. Caulis crassus, glaber, saepe a basi ramosus. Folia basalia rosulata, usque ad 70×10 mm, lanceolata, acuta, petiolo lato a lamina vix distincto, nervis lateralibus inferioribus cum costa mediana ± parallelis, integra vel remote subdentata. Folia caulina e basi latiore apicem acutam versus sensim longe attenuata, integra; indumentum laxiusculum canescens, pilis quinque-, sex- et septemfidis. Racemi floriferi ± conferti, fructiferi valde elongati. Pedicelli floriferi 2,5—4,5 mm longi, fructiferi haud elongati, paulo incrassati, patuli. Sepala 6—8 mm longa. Petala 10—12 mm longa. Siliquae 25—40 cm longae, teretes, torulosae, patulae, pilis (quadri-), quinque- et sexfidis canescentes, in stylum glabrum ± 1 mm longum sensim attenuatae. Stigma manifeste bilobum, lobis longiusculis divaricatis.

Persia: **S**: Kerm.: Kuh-e Jebal Barez, Deh Bakri, 2100 m, Rech. 3819! — **E**: Khor.: In montibus serpentinicis E Sabzevar, Rech. 5277!
Afghanistan: **SW**: Farah, 800 m, Koeie 3604! — **SE**: Kandahar: Inter Kalat-i Ghilzai et Kandahar, Kerst. 190!, Lindb. 58/329! — Afghanistan, Griff.
Pakistan: Quetta: Spin Karez, 1800 m, Rech. 29253! Inter Bostan et Saran Tangai, 1800 m, Lamond 1120! Yaro prope Bostan, 1400 m, Rech. 28945!, Lamond 999! Quetta, Duthie 8590! In valle fluvii Pishin, Lace. Saran, Harsukh 20462. Khanozai, Harsukh 18767. — Kalat: Inter Surab et Kalat, 1800 m, Rech. 28321! — Baluchistan, 1500 m, Stocks. — Yarii Karez, 1540 m, Lace 3477!

Distr. gen.: Endem.

31. ***E. gladiferum*** Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 40 (1888).
Icon.: Tab. 27, fig. 1 et 2.
Typus: „In graminosis calcareis montis Pir Omar Gudrun Kurdistaniae Persicae 3000—6000'", Haussk., G, W!

Herba perennis pluricaulis. Caules 10—25 cm alti, simplices, crassi, pumili, erecti vel ascendentes. Tota planta indumento e pilis bifidis consistente viridis vix canescens. Racemi floriferi conferti, fructiferi elongati. Folia radicalia longe petiolata, omnia oblongo-lanceolata, sinuato-dentata repanda, caulina angustiora subsessilia. Pedicelli 3—5 mm longi demum incrassati. Calyx 6—8 mm longus. Petala 13—16 mm longa, calyce dimidio longiora, oblonga. Siliquae 4,5—5 (—8) cm longae, 2,5 mm crassae, patentissimae, tetragonae, angulis late alatis, apice sensim attenuatae, pilis bi- et trifidis obsitae. Stylus latitudine siliquae longior. Stigma truncatum, emarginatum.

Iraq: Kurd.: Sul.: Qara Dagh prope Sulaymaniyah, 1400 m, Haines in Rech. 15808! M. Avroman, 900—1800 m, Haussk.! Pira Magrun, Haussk. Sulaymaniyah, Thesiger 399!, 433!, 435!, 409!

Distr. gen.: Endem.

Durch die gewissermaßen geflügelten und längsgefurchten, breiten, starren Früchte sehr auffällig.

32. ***E. cuspidatum*** (M. B.) DC., Reg. Veg. Syst. Nat. 2: 493 (1821).
Syn.: *Cheiranthus cuspidatus* M. B., Fl. Taur.-Cauc. 2: 1200 (1808). *Syrenia cuspidata* Reichenb., Fl. Germ. Excurs. 689 (1832); Icon. Fl. Germ. II, tab. 71 (1832). *Syreniopsis cuspidata* (M. B.) H. P. Fuchs, Acta Bot. Acad. Sci. Hung. 5: 52 (1959). *Acachmena cuspidata* (M. B.) H. P. Fuchs, Taxon 9: 55 (1960).
Icon.: Fl. URSS. 5, tab. 52 (1953).
Typus: Tauria, M. B., LE (Photo E!).

Herba biennis. Caulis erectus usque ad 80 cm altus, striatus, dense foliatus. Folia rosularia oblonga vel oblongo-spathulata, dentata usque subintegra. Folia caulina cauli appressa, oblanceolata, dentata, basi subhastato-auriculata semiamplexicaulia. Indumentum omnium foliorum e pilis quadri- et quinquefidis pilis trifidis immixtis consistens. Pedicelli 2—5,5 mm longi, cum siliquis axi appressi. Sepala 5—7 mm longa. Petala 9—13 mm longa. Siliquae 17—30 mm longae, lateraliter compressae quasi bialatae, axi appressae, canescentes, alis viridibus; pilis minutissimis tri-, quadri- et quinquefidis. Stylus 3—5 mm longus tenuis.

Talish: C. A. Mey.
Persia: N: Maz.: Neyriz-Bastam, Sab. 186! Kojur: Inter Nemasieh et Zanus, 2800 m, Rech. 6546-a! In valle Haraz: Darli, supra Panjab, 2000 m, Wdb. 1601! In declivibus borealibus jugi Kandavan, 2400 m, Bornm. & Gauba 1379. Gil.: Ispili, Linds. 1131. Manjil, Buhse. M. Samam, Buhse. Persia borealis, Auch. 4112. — W: Ham.: Kuh-e Garri, Str. Haydere, Pichler!

Distr. gen.: Peninsula Balcanica, Rossia australis, Caucasus, Anatolia, Talish, Persia borealis.

33. ***E. ibericum*** (Adams) DC., Reg. Veg. Syst. Nat. 2: 498 (1821).
Syn.: *Cheiranthus ibericus* Adams in Web. & Mohr, Beitr. Naturk. 1: 61 no. 29 (1805).
Typus: Kaischaur, LE.

Bienne. Planta virens. Caulis erectus, simplex, 30—50 cm altus, dense foliatus, striatus. Folia oblongo-lanceolata, sinuato-denticulata rarius runcinata, pilis plurimis trifidis paucis quadrifidis obsita, basi subhastato-auriculata semiamplexicaulia. Racemus demum valde elongatus. Pedicelli 4,5—7 mm longi, cum siliquis axi arcte appressi. Sepala 10—12 mm longa. Petala usque ad 25 mm longa, lamina usque ad 8 mm lata, flava. Siliquae 30—40 mm longae, acute tetragonae, angulis glabrescentes, pilis plurimis quadri- et quinquefidis paucis trifidis canescentes. Stylus 2—2,5 mm longus.

Persia: N: Maz.: In valle fluvii Chalus, 2200 m, Rech. 862! — W: Azerb.: Azerbaijan, Auch. 4113! Shahpur, M. Gelosa, Knapp!

Distr. gen.: Caucasus, Persia borealis.

34. ***E. passgalense*** Boiss., Fl. Or. 1: 198 (1867).
Typus: Ky. 753 (Lectotypus) G, W!

Herba biennis. Caules singuli vel plures, 20—60 cm alti, e basi arcuata erecti. Folia omnia integra, lanceolata, acuta; indumentum laxiusculum, e pilis (bi-), tri- et quadrifidis consistens. Pedicelli 2,5—6,5 mm longi. Sepala 5—6 mm longa. Petala 8—12 mm longa. Siliqua 20—30 mm longa, axi appressa, pilis (tri-), quadri- et quinquefidis canescenti-virens. Stylus 1,5—2 mm longus.

Persia: N: Gil.: Supra Rudbar, 500 m, Bornm. 6163. — W: Azerb.: Saidabad prope Tabriz, Bge. Lur.: Kuh-e Saverz, 2400 m, Haussкn. Bakht.: Gahar, Koelz 17904! — C: Tehr.: Darband prope Tehran, Ky. 710! Prope Pas Qaleh, Ky. 753! 16 km N Firuzkuh, 2700 m, Furse 2964! Qazv.: In valle Loura prope Gach Sar, 2200 m, Bornm. 6164, Gauba 1362 p. p.

Distr. gen.: Armenia, Transcaucasia, Persia borealis et occidentalis.

35. ***E. collinum*** (M. B.) Andrz. in DC., Prodr. 1: 198 (1824).
Syn.: *Cheiranthus collinus* M. B., Fl. Taur.-Cauc. 2: 119 (1808).
Typus: „In collibus herbidis ad fluvium Terek, prope Cosaccorum oppidulum Galugai", LE.

Bienne. Caulis erectus, 70—120 cm altus, simplex vel parce ramosus. Folia inferiora oblongo-lanceolata, subintegra vel remote minute denticulata, caulina 20—40×5—7 mm, crebrius et acutius dentata, indumento e pilis minutis tri- et quadrifidis consistente. Racemus fructifer elongatus. Pedicelli 6—9 mm longi, graciles, erecto-patuli. Sepala 8 mm longa. Petala 12—15 mm longa. Siliquae 25—35 mm longae, indumento e pilis quadri- et quinquefidis consistente, virentes. Stylus gracilis, 1,5—2 mm longus.

Talish, Hohen. Swant, Hohen.

Distr. gen.: Caucasus, Talish.

Wir haben keine Belege aus dem iranischen Florengebiet gesehen.

36. ***E. Melicentae*** Dunn, Kew Bull. 1920: 336 (1920).
Syn.: *E. Parkeri* O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1083 (1927). *E. odoratum* Hook. f. & Anders., Fl. Brit. Ind. 1, 1: 154 (1872), non Ehrh. (1792).
Typus (Syntypi complures): Kashmir.

Herba biennis, 30—100 cm alta. Caulis plerumque simplex, acutangulus, dense foliatus. Folia basalia sub anthesi fere desiccata, linearia, obtusiuscula, utrinque basin versus dentibus triangulatis sinuato-lobata. Folia caulina sessilia, linearia vel anguste lanceolata, integra vel remote dentata, omnia pilis bipartitis paucis trifidis immixtis dense obsita. Racemi multiflori, demum elongati. Pedicelli 4—10 mm longi, fructiferi rectangulariter patentes. Sepala 7—9 mm longa. Petala 12—15 mm longa. Siliquae 35—60 mm longae, 1,2 mm crassae, ascendentes pilis plurimis tri- et quadrifidis nonnullis bi- et quinquefidis immixtis obsitae. Stylus 2—3 mm longus.

Pakistan: Swat: Inter Mahodan et Dishei, 2800 m, Honda 93. Inter Dishei et Taka Taki, 3000 m, Ogino 88.

Distr. gen.: Kashmir, Swat.

Es erscheint fraglich, ob die von Jafri, Notes Roy. Bot. Gard. Edinb. 22: 108 (1955) unterschiedenen Varietäten tatsächlich zu dieser Art gehören.

37. ***E. Badghysi*** (Korsh.) Lipsky ex N. Busch., Fl. URSS. 8: 123 (1939).
Syn.: *E. verrucosum* Boiss. var. *Badghysi* Korsh., Fragm. Fl. Turkest. 1: 413 (1898).
Icon: Tab. 29, fig. 2.
Typus: Badghiz, Kushk.

Bienne, tota planta pilis bifidis appressis canescens. Caulis crassiusculus, interdum purpurascens, superne ramosus. Folia oblonga, margine indistincte remote sinuato-dentata; folia basalia petiolata, caulina subsessilia. Racemi floriferi conferti, fructiferi elongati. Sepala 6—9 mm longa. Petala (13—) 15—17 (—19) mm longa, lamina

5—6 mm lata ovato-rotundata, in unguem tenuem attenuata. Pedicelli 2—4 mm longi. Siliquae 30—70 (—75) mm longae, 1,5—1,75 mm crassae, indumento e pilis bi- et trifidis canescentes, squarroso-patentes; stigma subcarnosum, subsessile. Semina 1—2 × 0,5—0,6 mm, brunnescenti-flava.

Afghanistan: NW: Badghiz, Kushk, coll. ign. — Vide addenda!
Turcomania: Secus fluv. Kushka versus Margunovskoe, Zukerwanik 66!

Distr. gen.: Endem.

38. ***E. repandum*** L., Demonstr. Pl. (1753).
Icon.: Clavis p. 29.
Typus: Planta in horto bot. Uppsaliensi culta.

Herba annua. Caulis erectus, 5—25 (—40) cm altus, simplex vel a basi ramosus. Folia linearia usque anguste elliptica, repando-dentata vel subintegra pilis, plurimis bifidis nonnullis trifidis immixtis obsita. Sepala 4—5 mm longa. Petala 6—7 mm longa. Pedicelli floriferi ± 2 mm longi, fructiferi vix elongati sed paulo incrassati. Siliquae (30—) 40—60 mm longae, torulosae, maturitate erecto-patentes, indumento e pilis plurimis bi- et trifidis consistente, pilis trifidis plerumque nonnullis prope stylum immixtis. Stylus brevissimus.

Iraq: Sul.: Palegawra, 1000 m, Helbaek 679! Arbil: Salah ad-Din inter Arbil et Shaqlawa, 1000 m, Helbaek 679! Shaqlawa, Guest 2017. Arbil: Diana, Guest 719.
Talish: Swant, Hohen.
Persia: N: Gil.: Rudbar, 200—300 m, Bornm. 6169. Lahijan, Linds. 932. Persia borealis, Szov. — W: Azerb.: Khvoy, Knapp. Tabriz, Knapp! Ad radices australes M. Sabalan, 2100 m, Furse 2434! Kurd.: Dezh Shahpur, 1350 m, Jacobs 6514! Kermansh.: Bisotun, 1300—1600 m, Jacobs 6334!, Bent & Wr. 406—401! Qalapain, 1300 m, Bent & Wr. 401—108! Inter Kermanshah et Shahabad, Bent & Wr. 514—105! Ham.: Hamadan, Pichler! M. Karaghan N Hamadan, Str. Esf.: Esfahan, Stapf 238!, s. n.! Lur.: Oshotran Kuh, 1800 m, Furse 1768! Dow Rud, Koelz 17166! Arak: Golpayegan, Str. — S: Fars.: Inter Kazerun et Shiraz, Furse 1255! Shiraz, Hausskn. s. n.! Inter Khorramabad et Kermanshah, 2000 m, Furse 1870! — C: Tehr.: Evin, Bruns, Esfand. 6760-E! Tajrish, Bruns, Qazv.: Karaj, Gauba. Qazvin, Schmid 5006!; 1400 m, Bornm. 6170, Zumer 407! Soltanabad prope Qazvin, Linds. 18.
Afghanistan: NW: In valle fluvii Hari Rud, Tirphul, Aitch. 195. — SW: Herat: Obeh, 1700 m, Koeie 3768! — Afghanistan, Griff. 1392/1!
Pakistan: Kurram: Kurram, Aitch. 67. — Quetta: Sheila Bagh, Duthie 8589. — Quetta, 1700 m, Lace 3632! Kalat: In collibus Harboi, H.-B. 19528.

Distr. gen.: Europa fere omnis, Asia austro-occidentalis.

E. repandum, *E. Griffithianum* und *E. sisymbrioides* bilden eine Gruppe zunächst mit einander verwandter Arten, deren Unterscheidung oft schwierig ist. Ihr systematischer Wert bleibt zu überprüfen.

39. ***E. Griffithianum*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 1: 28 (1854).
Typus (Lectotypus): Griff. 300, G.
Syn.: *E. iranicum* Bornm., Verh. Zool.-Bot. Ges. Wien 48: 551 (1898). *E. Griffithianum* var. *iranicum* Bornm., l. c.

Annuum. Caulis simplex, 4—10 cm altus, erectus, simplex, raro basi in caules plures ascendentes divisus, foliatus. Folia inferiora oblongo-lanceolata vel oblongo-linearia, obtusa, petiolata, omnia integra vel caulina inferiora sinuato-dentata, rarius superiora integra, in bracteas transientia. Racemi conferti vel rarius ± elongati. Pedicelli subnulli vel ad summum 1 mm longi, crassi. Sepala (3—) 4 mm longa.

Petala 5—7 mm longa, sepalis circiter dimidio longiora lamina anguste obovata. Siliquae 1,5 (—3) cm longae. Stylus brevissimus.

Persia: W: Kermansh.: Qalapain 22 km E Kermanshah, 1270 m, Bent & Wb. 401—122! Esf.: Khunsar inter Hamadan et Esfahan, 2200 m, Bornm. 2069 (Typus *E. iranici* Bornm.)! Kuhpayeh, 1700 m, Rech. 2713! Inter Esfahan et Kuhpayeh, 1600 m, Rech. 2715! Najafabad prope Esfahan, 1800 m, Bornm. 2070. — S: Fars.: Inter Shiraz et Persepolis, Stapf 241! 20 km SW Saadatabad, 1800 m, Grant 15439! Kerm.: Inter Mashiz, 2000 m, et Khaneh Sorkh, 2500 m, Rech. 3075! Inter Baghin, 1600 m et jugum Sang Bur, 2200 m, Rech. 15883! Maskun, 2400 m, Koelz 14366! Bal.: Khash, Sohrahabad, Mirzayan 217-E! — C: Tehr.: Tehran, 1200 m, Schmid 5103! Yazd: Shir Kuh prope Taft, 1900 m, Bornm. 2068. Yazd, Bge. Deh Bala prope Yazd, Buhse.
Afghanistan: SW: Jija, 900 m, Koelz 4157! — E: Kabul: Logar, Volk 1816! Kabul, 1700 m, Neub. 50/558!, Gilli 927!, 928! Guzar Gah, Neub. 51/3!, Neub. 51/30! Sher Darwasa, 1800 m, Gilli 929! Inter Kabul et Tang-i Gharu, 1700 m, Gilli 926! Aliabad, Neub. 3004! Qaleh Eslam, 25 km S Kabul, 1800 m, Hdg. & Wdb. 3211!
Pakistan: Quetta: Surab, Griff. 300. Quetta, Lace 3632! Inter Quetta et Ziarat, 2200 m, Lamond 1168! — Bal.: Nichara, Stocks 909.

Distr. gen.: Endem.

40. ***E. sisymbrioides*** C. A. Mey. in Ledeb., Fl. Alt. 3: 150 (1831).
Typus: Saisan-Nor, LE.

Herba annua. Caulis 5—30 (—40) cm altus. Folia oblongo-spathulata vel linearilanceolata, integra, indumento e pilis bifidis paucis trifidis immixtis consistente. Pedicelli brevissimi, crassi, vel subnulli. Sepala circiter 2,5—4 mm longa. Petala 3—4 mm longa. Siliquae 20—25 mm longae, axi appressae, maturitate extus curvatae, subtorulosae, indumento laxiusculo e pilis bifidis consistente. Stylus a siliqua bene distinctus, c. 1 mm longus.

Persia: W: Azerb.: Khvoy, Knapp! Ad fluvium Aras, Buhse 142! Azerbaijan, Szov. Esf.: 96 km E Esfahan, Furse 1350! — S: Fars.: Shiraz, Haussk.! Inter Abadeh et Dowlatabad, 1500—2000 m, Schmid 5326! Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1900 m, Rech. 3158! Prope Khabis et Kerman, Bge. Lar.: Bandar Abbas, Rech. 15889! — C: Tehr.: Inter Tehran et Esfahan. Shahrud, Bge.
Turcomania: Ashkhabad, Litw. 515!, 515-a, Sint. 124!
Afghanistan: SW: In valle fluvii Hari Rud, Aitch. — E: Kabul: Sharenau, Gilli 925! Kabul, Volk 67!, 1410! In jugo Unai, 3200 m, Hdg. & Wdb. 4566! Pol-e Charkhi, 1800 m, Hdg. & Wdb 3043! Ghazni: Dasht-i Nawar, 3000 m, Kasy 62!, Rech. 17683-b!, 17726! Panjshir: Auz Anjuman, 3400 m, Hdg. & Wdb. 5472! — NE: Wakhan, Roemer in Neub. 4401! Kataghan: Baghlow in valle Andarab, 8 km W jugi Khawak, 2800 m, Podlech 11220! Takhar, Kotal-e Yawnu versus vallem Kala, 3200 m, Podlech 11720! In latere boreali jugi Salang, 3000 m, Neub. 4487! Badakhshan: In valle Rakui, 3750 m, Podlech 12782! — C: Parwan: In declivibus occidentalibus jugi Shibar, 2500 m, Hdg. & Wdb. 3300! Bamian: Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18164! Panjao, 3150 m, Hdg. & Wdb. 5001! Baraki Chaidan versus Band-i Amir, 2800 m, Hdg. & Wdb. 4714!
Pakistan: Quetta: Sheilabagh in jugo Khojak, Duthie 8589! Quetta, Duthie 8388!

Distr. gen.: Anatolia, Syria, Transcaucasia, Armenia, Turcomania, Persia, Afghanistan, Pakistan.

104. *Gynophorea*

Gynophorea Gilli, Feddes Repert. 57: 226 (1955).

Planta humilis perennis verosimiliter caespitosa pluricaulis. Caulis basi tantum foliatus. Indumentum foliorum e pilis appressis bi- et tripartitis consistens. Racemus pauciflorus. Sepala erecta, interiora saccata. Pistillum stipitatum. Ovarium c. 18-ovulatum. Stigma capitatum, bilobum. Semina uniseriata. Glandulae nectariferae medianae evolutae.

Closely allied to *Erysimum* and apparently differing only in the stipitate fruits.

1. ***G. Weilerl*** Gilli, Feddes Repert. 57: 226 (1955).
Icon.: Clavis p. 27.
Typus: H. Weiler in Gilli 943, W!

Caudex residuis petiolorum anni praecedentis squamatus. Caulis flexuosus, fructifer usque ad 8 cm altus. Folia 10—15 × 1 mm, anguste lanceolata, obtusiuscula, integerrima, in petiolum attenuata. Pedicelli fructiferi erecti, 1—5 mm longi. Sepala 4—5 mm longa. Petala 6—7 × 2 mm, aurea, lamina obovato-cuneata, ungue lamina longiore. Siliquae immaturae 15—40 × 0,5—1 mm, lineares, curvatae rarius rectae, a latere vix compressae, inter semina leviter constrictae, valvis convexis, nervo mediano vix distincto, pilis 2—5-fidis obsitae; gynophorum 1—4 mm longum; septi cellulae longitudinaliter elongatae, parallelae. Stylus 1 mm longus. Stigma stylo latius, bilobum.

Afghanistan: C: Bamian: Koh-i Baba supra Zard Darreh, 4000 m, Weiler in Gilli 943!

Distr. gen.: Endem.

105. *Maresia*

Maresia Pomel, Nouv. Mat. Fl. Atl. 228 (1874).
Syn.: *Sisymbrium* L. subgen. *Malcolmiastrum* Fourn., Recherch. Crucif. 135 (1865) p. p. *Malcolmia* sect. *Sisymbrioideae* Boiss., Fl. Or. 1: 221 (1867), excl. *M. parviflora*. *Malcolmia* sect. *Maresia* Prantl in Engler & Prantl, Natürl. Pflanzenfam. III. 2: 200 (1891).

Annua, humilis, pilis ramosis obsita, habitu *Malcolmiae* simillima. Caulis ramosus. Folia spathulata, paucidentata. Racemi non foliati. Sepala erecta, exteriora linearia, apice obtusa, interiora latiora, saccata. Petala rosea, oblongo-obovata, obtusa, in unguem attenuata. Filamenta basi vix dilatata; antherae ovatae. Ovarium cylindricum; stylus distinctus; stigma depresso-capitatum, subbilobum. Siliquae lineares, teretes, mox dehiscentes; stylus tenuis; valvae costa mediana crassa carinatae, nervis lateralibus distinctis. Semina uniseriata.

1a. Pube stellata brevi molli cinerea. Pedicellus calyce basi subaequali sublongior. Stylus cylindricus; stigma subcapitatum ..... 1. *M. nana* (DC.) Battand.
b. Pube stellata canescens. Pedicellus calyce basi bisaccato 2—3-plo longior. Stylus subclavatus; stigma bilobum ..... 2. *M. pygmaea* (Del.) O. E. Schulz

1. ***M. nana*** (DC.) Batt. in Batt. & Trabut, Fl. Algér. (Dicot.) 68 (1890).
Syn.: *Sisymbrium nanum* DC., Reg. Veg. Syst. Nat. 2: 486 (1821) excl. patr. *Maresia binervis* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 71 (1842). *Malcolmia nana* Boiss., Fl. Or. 1: 222 (1867).
Icon.: Clavis p. 31.
Typus: Origo typi propter confusionem loci natalis incerta videtur.

Herba tenuis pube stellata canescens. Caulis 5—25 cm altus, subsimplex vel basi ramosus, foliatus. Folia minuta, inferiora oblongo-spathulata, longiuscule petiolata, superiora oblongo-lanceolata, subsessilia. Calyx 3 mm longus. Petala obovata, rosea, calyce vix duplo longiora. Siliqua ± 20 mm longa, vix 1 mm lata, torulosa. Stylus cylindricus. Stigma subcapitatum.

Talish: Lenkoran, Hohen.
Persia: N: Maz.: Prope Mahmudabad in arenosis litoreis, Wdb. 604! Litus caspicum, 37° 15′ N, 49° 30′ E, Jacobs 6177! Chalus, in arenosis litoreis, Furse 1092! Shahi, Mirzayan, 5849-E! Babol Sar, Gauba 154!, Mooney 6540! Kenar Darya 30 km N Sari, Grant 17358! Gil.: Bandar-e Pahlevi, Bornm. 6144, Linds. 697, Buhse, Stapf, Lipsky.

Distr. gen.: Regio Mediterranea, Anatolia, Persia borealis, Talish.

Die Angabe von Iraq: Diyala: Jabal Hamrin, Anthony, ist sicher irrtümlich, da die Art in ihrem Vorkommen streng an Küsten gebunden ist.

2. ***M. pygmaea*** (Delile) O. E. Schulz in Engler, Pflanzenr. IV, 105: 210 (1924).
Syn.: *Hesperis pygmaea* Delile, Fl. Aegypt. Illustr. 19, 596, tab. 63 (1813), suppl. fig. 15. *Malcolmia pygmaea* Boiss., Fl. Or. 1: 222 (1867).
Icon.: Clavis p. 29.
Typus: Aegyptus.

Herba tenuissima, caulibus 5—10 cm longis filiformibus diffusis vel ascendentibus subaphyllis. Folia plerumque prope basin congesta, pube stellata canescenti-viridia, oblonga vel oblongo-lanceolata, sinuato-pinnatiloba, petiolata. Calyx 3—4 mm longus. Petala pallide rosea, calyce duplo longiora. Siliqua ± 30 mm longa, 1 mm lata, minute torulosa. Stylus siliquae latitudine paulo longior. Stigma subclavatum bilobum.

Persia: S: Fars.: In insulae Khark, Bornm. 57! Baghmani prope Bushehr, Bornm. 58. Bushehr, in arenosis litoreis, Koeie 128!

Distr. gen.: Aegyptus, Persia australis.

106. *Zerdana*

Zerdana Boiss., Ann. Scienc. Nat. Ser. 2, 17: 84 (1842).

Caespitosa, pilis ramosis et glanduliferis tomentosa. Sepala erecta, non saccata. Filamenta staminum longiorum per paria usque ad medium connata. Siliqua oblonga, inter semina paulum constricta. Semina uniseriata oblonga. Embryo notorrhizus. — Genus monotypicum.

1. ***Z. anchonioides*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 84 (1842).
Syn.: *Z. anchonioides* Boiss. var. *stenophylla* Boiss., Fl. Or. Suppl. 46 (1888).
Icon.: Clavis p. 27; tab. 31, fig. 1.
Typus: Auch. 253, G.

Humilis, caespitosa, caudice crasso lignoso, pilis ramosis glanduliferis et tomentosa. Caules floriferi humiles, 4—10 cm alti. Folia omnia basalia rosulata, usque ad 10×3 cm, lanceolata, acuta, petiolata. Sepala erecta, non saccata. Petala flava vel rosea, oblonga, longe unguiculata. Filamenta staminum longiorum per paria usque ad medium connata. Stylus 3 mm longus tenuis; stigma bilobum, quam stylus latius. Siliqua ± 3 cm longa, oblonga, linearis, subapplanata, inter semina paulum

constricta, bivalvis, dehiscens; valvae tenues, trinerviae, nervo mediano crassiore; septum crassiusculum. Semina uniseriata oblonga. Embryo notorrhizus.

Persia: W: Bakht.: Zard Kuh, Auch. 253. Lur.: Kuh-i Nur, 3600 m, Haussk. — S: Fars.: Kuh-e Dinar, Ky. 758.

Distr. gen.: Endem.

Tribus Sisymbrieae

auctore I. Hedge, Edinburgh

Pili simplices vel furcati, raro deficientes. Fructus siliqua, raro silicula. Radicula incumbens. — Genera 107—126.

107. *Alliaria*

Alliaria Scop., Fl. Carn. ed. 1: 515 (1760).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Sisymbrieae, 86 (IV. 105): 20—25 (1924).

Herba biennis pilis simplicibus. Folia basalia simplicia, cordata, longe petiolata. Sepala non saccata. Petala alba. Glandulae nectariferae medianae evolutae. Ovarium 3—18-ovulatum. Siliqua linearis, ± 4—angulata, non rostrata, dehiscens; valvae trinerviae. Radicula incumbens.

1. ***A. petiolata*** (M. B.) Cavara & Grande, Boll. Orto Bot. Napoli 3: 418 (1913). Syn.: *Arabis petiolata* M. B., Fl. Taur.-Cauc. 2: 126 (1808). *Alliaria officinalis* Andrz. ex M. B., Fl. Taur.-Cauc. 3: 445 (1819).

Icon.: Clavis p. 21.

Typus: „Hab. in Iberia", Stev.

Biennis. Caulis 20—80 cm altus. Folia basalia reniformia, remote sinuato-dentata, caulina triangulari-ovata, breviter petiolata. Inflorescentia brevis, fructifera elongata. Petala 7—8 mm longa. Pedicelli fructiferi breves, crassi, 2—8×1 mm. Fructus erectus vel erecto-patens, 50—70×c. 2 mm, apice acutus; stylus 1—3 mm longus. Semina c. 16.

Iraq: Kurd.: Sul.: M. Avroman prope Tawilla, Susakan, 1200 m, Rech. 10154! Arbil: Rayat, ad viam E Rawandiz, Thesiger! Warta, 900 m, Rawi 28776!, 28795!

Talish: Kisilagach, Lenkoran, Astara, Hohen., C. A. Mey.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1505. Gorgan, Shar. 564! In silva Golestan, 56 km ENE Gonbad-e Kavus, Furse 5088! 9 km W Shah Pasand, 75 m, Grant 17343! Maz.: In valle Haraz E Emarat, 900 m, Wdb. 219! In declivibus borealibus jugi Kandavan, 2400 m, Gauba 137! 25 km S Shahi, 300 m, Grant 17367! 40 km S Chalus, Furse 1086! Gil.: Rasht, Buhse. Lahijan, Linds. 922! — Persia borealis, Szov. — W: Azerb.: Shahpur, M. Karnaru, Knapp. Bakht.: Gahar, Koelz 18011! In valle Bazoft, Mart.-Escal. Lur.: Dow Rud, Koelz 15917!, 17351! 25 km E Khorramabad, 1900 m, Koelz 542! — E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4638! — C: Tehr.: Emamzadeh Hashem, Lipsky. Ad fluvium Jaji Rud, Emarat-i Lashkarak, Bruns. Qazv.: Kuh Dashteh prope Karaj, 1800 m, Rech. 285! Elburz: In valle fluvii Ardineh, Bruns.

Turcomania: Firyuza, Ashkhabad, Litw. 222.

Afghanistan: E: Kabul: In valle Paghman, 2300—2800 m, Rech. 17176!, Neub. 4089. Tang-i Gharu, 1750 m, Gilli 957! Nuristan: In valle fluvii Pech, 1350—1380 m, Kerst. 745. Waziri, Volk 2539! Wama, Edelb. 351, 1128; 2200 m, Edelb. 434. Pashki, 2300 m, Edelb. 598. Kushtos, 1850 m, Neub. 4532.

Pakistan: Chitral, Harriss 15890! — Swat: Kalam, 2000—2500 m, Lamond 1821! In valle Jabba E Kolalai, 1600—2200 m, Rech. 30715. Inter Madyan et Kolalai, Rech. 30680. — Kurram: Shalozan — Habibkala, Aitch. Karman ad radices M. Safed Kuh, Afendi 93. — S. Wazir.: Masidanala N Razmak, Fz. 1820. E Razmak, Fz. 1911. Razmak, Fz. 2316. — Quetta: Ziarat, Crookshank 214!

Distr. gen.: Eurasia temperata, Africa borealis.

Varying considerably in size according to habitat.

108. *Sobolewskia*

Sobolewskia M. B., Pl. Rar. Ross. Merid., 2 tab. 19 (1810). Fl. Taur.-Cauc. 3: 421 (1819).

Lit.: N. Busch, Revision der Gattung Sobolewskia, Bull. Jard. Bot. St. Petersb. 5: 68—73 (1905). O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Sisymbrieae 86 (IV. 105): 20—25 (1924).

Herbae perennes pilis brevibus tuberculiformibus vel glabrae. Folia basalia simplicia, cordata, longe petiolata. Sepala non saccata. Petala alba vel flavescentia. Ovula 4. Fructus clavatus, oblongus, teres, indehiscens. Radicula incumbens.

1. ***S. clavata*** (Boiss.) Fenzl in Tchihatch., Asie Mineure, Bot. 1: 348 (1866).
Syn.: *Parlatoria clavata* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 73 (1842).
Icon.: Clavis p. 9 et 17.
Typus (Syntypi): Turkey, Lazistan, Auch. 134, G; Syria, Aleppo, Auch. 183, G.

Herba perennis 25—50 cm alta. Folia plurima basalia reniformia, cordata, utrinque lobis 5—8 rotundatis. Petala 3—4,5 mm longa. Pedicelli fructiferi 5—10 mm longi, crassi, reflexo-recurvi, ad articulationem attenuati. Siliqua curvata 5—7 mm longa. Semen 1.

Distr. gen.: Anatolia occidentalis, australis et orientalis, Transcaucasia, Syria.

In flower, *Sobolewskia* can readily be confused with *Parlatoria* but in fruit they are clearly different.

No specimens have been seen from our area but its presence very close to the Persian frontier east of Ordubad suggests that it may grow in N Azerbaijan; conf. Grossheim, Fl. Kawk. ed. 2, 4, tab. 174 (1950).

109. *Parlatoria*

Parlatoria Boiss., Ann. Scienc. Nat. Ser. 2, 17: 72 (1842).
Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Sisymbrieae, 86 (IV. 105): 42—44 (1924).

Herbae annuae floribus albis, glabrae vel sparse simpliciter pilosae. Folia basalia simplicia, cordata, longe petiolata. Sepala non vel vix saccata. Filamenta basi leviter dilatata. Glandulae nectariferae medianae evolutae. Ovula 4—6. Fructus oblongus vel linearis, indehiscens, 1—6-spermus. Radicula incumbens. — Species duo in Asia austro-occidentali.

1a. Fructus 10—15 mm longus, oblongus, tetragonus, rectus vel curvatus ..... 1. *P. cakiloidea* Boiss.
b. Fructus 20—50 mm longus linearis, teres, ± falcatus .... 2. *P. rostrata* Boiss.

1. ***P. cakiloidea*** Boiss., Ann. Scienc. Nat. Ser. 2, 17: 72 (1842).
Icon.: Clavis p. 9 et 17.
Typus: Assyria, Namkou, Auch. 199, G.

Herba annua, 30—50 cm alta. Folia basalia ovata, cordata, acute dentata. Inflorescentia elongata. Petala 4—5 mm longa. Pedicelli fructiferi partem basalem fructus crassitudine aequantes, 3—7 mm longi, ± horizontaliter patentes. Fructus rectus vel leviter curvatus. Semina 1—2, c. 5 mm longa.

Iraq: Kurd.: Sul.: M. Avroman ad confines Persiae in ditione pagi Tawilla, 1200 m, Susakan, Rech. 10135! M. Avroman N Biyara, 1800 m, Gillett 11791! M. Avroman,

Haussk. Penjwin, 1400 m, Rawi 8809! Pira Magrun, Haussk. Supra Qarachitan, 1050 m, Gillett 7740! Qara Dagh, Poore 605! Mosul: In ditione pagi Sharanish, Jabal Khantur, 1300 m, Rech. 12060! Jabal Khantur, 1400 m, Rawi 8790!, 8588! Arbil: Shaqlawa, Haines 387! Chiya-i Marmarut, Guest 2071. Kuh Safin, E Arbil, 1400 m, Bornm. 882.
Persia: W: Kurd.: Dezh Shahpur, 1600—1700 m, Jacobs 6554! M. Shahu, Haussk. Kermansh.: Kinisht, Str. In montibus supra Rijab prope Qasr Shirin, 1600 m, Nab. 1343. Inter Kermanshah et Shahabad, Bent & Wr. 524—116! Karand in Kuh-e Dalahu, Str. Kuh-i Girdell, Sorkheh Dizeh, Str. Lur.: Kuh-e Pariz, Koelz 15892! Dow Rud, Koelz 17453! Bisheh, 1200 m, Koeie 662! Bakht.: Taleh, Koelz 15207!

Distr. gen.: Anatolia austro-orientalis, Iraq borealis, Persia occidentalis.

2. ***P. rostrata*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 8: 22 (1849).
Icon.: Clavis p. 13 et 21.
Typus: Ky. 236, G.

Herba annua 20—40 cm alta. Habitu praecedenti similis sed differt characteribus fructus in clavi indicatis.

Persia: W: Ham.: Silakhor, Str. M. Karaghan, Str. Arak: Girdu prope Arak, Str. Kuh Shahsinde, Str. — S: Fars.: Shiraz versus Kazerun, Gauba & Sab. — C: Tehr.: In jugo Kandavan, 2700 m, Rech. 492! M. Tuchal prope Shahrestanak, 2200 m, Bornm. 6179! In valle Loura, 2200 m, Bornm. 6181. In faucibus supra Ferosad, 1900—2200 m, Bornm. 6180! Inter Darband et Pas Qaleh, 1600 m, Rech. 2609! Hafthauz, Aell. 1087! 56 km E Tehran, Furse 1668! Prope Darband, Ky. 236. Qazv.: Fashand, Gauba. Gach Sar, 80 km NE Karaj, Furse 2665!

Distr. gen.: Endem.

The records of *P. rostrata* from SW and S Persia need confirmation; they may refer to *P. cakiloidea* Boiss.

110. *Sisymbrium*

Sisymbrium L., Spec. Plant. 657 (1753). Gen. Plant. ed. 5: 296 (1754).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae - Sisymbrieae 86 (IV. 105): 46—157 (1924).

Herbae annuae, biennes vel perennes, pilis simplicibus obsitae, rarius glabrae, foliis lyrato-pinnatifidis raro simplicibus. Sepala plerumque apice cucullata, non vel vix saccata. Petala pallide vel intense flava, plerumque lamina obovato-spathulata, ungue angusto, raro oblonga. Glandulae nectariferae medianae cum lateralibus concretae. Siliqua tenuis, dehiscens, recta vel curvata; valvae trinerviae. Semina numerosa. Radicula incumbens.

1a. Flores inferiores quidem axillares, solitarii, subsessiles ..... 11. *S. runcinatum* Lag. ex DC.
b. Flores in racemos ebracteatos dispositi, plerumque manifeste pedicellati 2
2a. Siliqua ± conica, basi latissima, sursum sensim attenuata 3
b. Siliqua linearis marginibus parallelis 4
3a. Siliqua axi appressa, 11—17 mm longa ..... 13. *S. officinale* (L.) Scop.
b. Siliqua erecto-patula, 20—40 mm longa ..... 12. *S. erysimoides* Desf.
4a. Folia integra, consistentia tenui ..... 2. *S. integerrimum* Rech. f. & Aell.
b. Folia ± pinnatisecta 5

5a. Pedicelli fructiferi siliquas crassitudine aequantes 6
b. Pedicelli fructiferi quam siliquae tenuiores 8
6a. Folia caulina summa integra vel si pinnata, lobo terminali oblongo vel lanceolato. Sepala exteriora apice non cucullata ..... 10. *S. orientale* L.
b. Folia caulina summa pinnata, lobo terminali filiformi vel lineari. Sepala exteriora apice cucullata 7
7a. Petalorum lamina late obovata 10—15×5—7 mm; pedicelli fructiferi 3—5 mm longi; stylus 3—5 mm longus ..... 9. *S. septulatum* DC.
b. Petalorum lamina anguste obovata, 9—12×4—4,5 mm; pedicelli fructiferi 5—12 mm longi; stylus 1—2 mm longus ..... 8. *S. altissimum* L.
8a. Siliquae juveniles flores et alabastra superantes 9
b. Siliquae juveniles flores et alabastra non superantes 10
9a. Planta sparse pilosa vel subglabra. Siliquae glabrae ..... 5. *S. Irio* L.
b. Planta hirsuta. Siliquae hirsutae ..... 6. *S. damascenum* Boiss. & Gaill.
10a. Herbae annuae vel biennes 11
b. Herbae perennes 12
11a. Petalorum lamina late ovata, unguis angustus; stigma profunde bilobum; siliqua 10—35 (—50) mm longa ..... 7. *S. Loeselii* L.
b. Petalorum lamina angusta, in unguem transiens; stigma depresso-capitatum; siliqua 38—105 mm longa ..... 1. *S. brassiciforme* C. A. Mey.
12a. Sepala concreta. Siliqua 60—130 mm longa, non vel vix torulosa ..... 3. *S. gamosepalum* Hedge
b. Sepala libera. Siliqua 40—75 mm, irregulariter torulosa ..... 4. *S. Gaubae* Rech. f. & Bornm.

1. ***S. brassiciforme*** C. A. Mey. in Ledeb., Fl. Alt. 3: 129 (1831).
Typus: Altai, ad latera montium Arkaul, C. A. Mey., LE.

Herba annua vel biennis glauca glabra (raro pilis nonnullis simplicibus obsita). Caulis erectus, 30—80 (—100) cm altus, saepe inferne violaceus. Folia inferiora breviter petiolata, lyrato-pinnatisecta raro integra; superiora linearia, integra, omnia ± carnosa. Petala flava, 6—8×1,5 mm, lamina et ungue angusto. Pedicelli fructiferi 5—8 mm longi. Siliqua vario modo patula vel recurva, 38—100×0,5—1 mm, substipitata. Semina numerosa, uniseriata. Radicula incumbens vel accumbens.

Turcomania: Ashkhabad, M. Karanki, 2000 m, Litw. 542.
Afghanistan: E: Panjshir: Shanez, 2550 m, Hdg. & Wdb. 5341! In valle Porandeh prope Basarak, Gilli 1004! Kabul: In jugo Shibar, Volk 2809! In jugo Unai, 3000 m, Hdg. & Wdb. 4535! Panjao, 2700 m, Koeie 4133! Hauz-i Mahiha, 2500 m, Koeie 2352! In faucibus inter Mollah Jakub et Dahan-e Siah Darreh 4 km E Panjao, 2800 m, Rech. 18723! Khost: In declivibus austro-orientalibus jugi Sata Kandao, 2200—2800 m, Rech. 32125!, Lamond 2450! Jaji: Inter Doband et Shinkai, in faucibus calc. Rech. 32381! Ghazni: Okak, NE altoplanitiei Dasht-i Nawar, 3000 m, Rech. 17723! — NE: Wakhan: In valle Futur, 2700 m, Roemer 55! Wakhan, 2900 m, Giles 127! Munjan: In jugo Pajuka prope Munjan, Frey 166! — C: Bamian: Inter Bulola et jugum Shibar, 2000 m, Hdg. & Wdb. 4174! Rech. 16706! In valle Ajar W Doab, 1200 m, Hdg. & Wdb. 4097! Darreh-e Shikar, inter Doab et Bulola, 1500—2000 m, Rech. 16728!, Hdg. & Wdb. 3403! 16 km S Doab, 1600 m, Rech. 16686! Bulola, 2600 m, Gilli 1007!; 2780 m, Gilli 1008! Bamian, Gulgola, 2500 m, Gilli 1005!, 1006! Doab, Volk 2687! In declivibus australibus Kuh-i Baba, Thesiger 30! ENE Bamian, 2800 m, Gilli 1009!
Pakistan: Chitral, Toppin 371! — Swat: Ushu, 2400 m, Rech. 19505!, Inter Kalam et Ushu, R. R. Stewart 25399! — Quetta: Ziarat, Lace 3952!

Distr. gen.: Asia centralis, Afghanistan, Pakistan occidentalis.

2. ***S. integerrimum*** Rech. f. & Aell., Phyton 3: 67 (1951).
Typus: Rech. f. 4521, W!

S. brassiciformi valde affine, ab eo foliis integris consistentia tenuibus, pedicellis 5—7 mm longis, siliqua (juvenili) usque ad 150 mm longa diversum.

Persia: E: Khor.: Kuh-e Neyshabur, Darreh Abshar prope Akhlamad in declivibus saxosis umbrosis ad rivum, 1600—1800 m, Rech. f. & Aell 4521!

Distr. gen.: Endem.

In the original description the type is wrongly cited as 5421. — Possibly only a shade form of *S. brassiciforme* but further material is needed.

3. ***S. gamosepalum*** Hedge, sp. nov.
Icon.: Tab. 32 et 33.
Typus: Hdg. & Wdb. 4213, holotypus E!, isotypus BG.

Herba perennis usque ad 1 m alta, glauca, glabra vel ad basin caulis, ad petiolos et ad paginam inferiorum foliorum pilis simplicibus obsita. Folia caulina inferiora pinnatifida vel subintegra, basi hastata, petiolata, superiora petiolata, lineari-triangularia, hastata; omnia ± carnosa. Sepala concreta, saepe persistentia, late ovata. Petala flava, 10—14×4—5 mm lamina lata, ungue angusto. Pedicelli fructiferi 6—21 mm longi. Siliqua (60—) 90—130×1,5 mm, vario modo ascendens vel recurvata. Semina numerosa. Radicula incumbens.

Afghanistan: E: Kabul: In jugo Altimur inter Kabul et Gardez, 2600—2800 m, Lamond 2396!, 2414! Safed Kuh: In montibus E jugi Altimur, Rech. 32002! In faucibus declivium boreo-occidentalium W jugi Altimur, 2600—2700 m, Rech. 31934! Farakulum, 2700 m, Koelz 2537! — C: Bamian: Inter Bamian et Band-i Amir, 2800—3000 m, Rech. 18152! Band-i Amir, ad lacum Band-i Panir, 2800 m, Rech. 18353! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16845! In declivibus occidentalibus jugi Shibar, 3000 m, Hdg. & Wdb. 4213!

Distr. gen.: Endem.

Most closely related to *S. Gaubae* Rech. f. & Bornm. but differing in the characters given in the key, the thick textured leaves and the less torulose siliquae.

4. ***S. Gaubae*** Rech. f. & Bornm., Feddes Repert. 48: 34 (1940).
Icon.: Clavis p. 13.
Typus (Syntypi): Rech. 1176!, 304!, W!

Herba perennis usque ad 1 m alta, glabra, glauca. Folia caulina inferiora consistentia tenuia, irregulariter runcinato-pinnatipartita, petiolata, superiora breviter petiolata, lineari-triangularia, hastata. Sepala libera, oblongo-elliptica, acuta vel apice cucullata. Petala c. 10×3—4 mm; lamina in unguem sensim attenuata. Pedicelli fructiferi 8—13 mm longi, erecti vel erecto-patuli, quam siliquae tenuiores. Siliqua (30—) 40—75×1,5 mm, erecto-patula, irregulariter torulosa; stigma depresso-capitatum. Semina numerosa. Radicula incumbens.

Persia: C: Tehr.: In declivibus australibus M. Tuchal NW Tehran, 1300—1500 m, Aell. 1078! Qazv.: In ditione oppidi Karaj in montibus Kuh Dashteh, 1800 m, Rech. 304!, Gauba 133! Damgh.-Semn.: Inter Firuzkuh et jugum Bashm, 1900—2200 m, Rech. 1176!

Distr. gen.: Endem.

5. ***S. Irio*** L., Spec. Plant. 659 (1753).

Lit.: T. N. Khoshoo, Biosystematics of Sisymbrium Irio Complex, Caryologia 11 & 12, pts. 1—8 (1958—1960).

Icon.: Clavis p. 15.

Typus: „Hab. in Europae cultis".

Herba annua, 15—50 cm alta, glabra vel pilis brevibus simplicibus obsita. Folia basalia petiolata, pinnatilobata, lobo terminali hastato, quam lateralia in paribus 2—3 disposita majore; folia caulina similia. Petala 2,5—4×0,5—1 mm, anguste oblonga. Pedicelli fructiferi erecto-patuli, 5—11 mm longi. Siliqua 30—45×1 mm, recta vel curvata; valvae trinerviae, glabrae; stylus 0,5 mm longus; stigma bilobum; septum tenue. Semina leviter papillosa.

Iraq: Kurd.: Sul.: M. Avroman ad confines Persiae in ditione pagi Tawilla, 1000 m, Rech. 10392! — Diyala: Khanaqin, Rech. 9017!

Talish, Hohen.

Persia: N: Gil.: Kaluraz, Lipsky. — W: Ham.: M. Alvand, 1800 m, Mird. 279! Esf.: Jolfa, in aula monasterii armeniaci, 1500 m, Rech. 2663! Khuz.: In ruinis ad Shush, Nab. 1333, 1391. Shah Dasht, Esfand. 116-E! — S: Lar.: Parabedin, Parsa recte Gauba 245! Fars.: Bushehr, Bornm. 54, Horner 9! Prope Dalaki inter Bushehr et Shiraz, Ky. 150! Shiraz, Haussk.! Kerm.: Tomagoa, Koelz 14327! Kerman, 1900 m, Bornm. 2075; 1700 m, Rech. 2957! Baghin, 1900 m, Bornm. 2070. Sabzvaran, 900 m, Starm. 314! Bal.: Iranshahr, Rech. 4047-b! — E: Sistan, Shar. 5641-E! — C: Tehr.: Shimran, Pravitz 144. Qazv.: Pachenar, Pichler! Yazd: Shir Kuh, 1900 m, Bornm. 2073. Qom, 900 m, Bornm. 2074. — Miavaran, 2000 m, Pravitz 208.

Turcomania: Ashkhabad, Litw. 536!, Sint. 168.

Afghanistan: N: Mazar-i Sharif: In faucibus SE Tashkurghan versus Haibak, 600—700 m, Rech. 16370!, Hdg. & Wdb. 3970! — SW: Herat, Furse 5411! — SE: Kandahar, 1020 m, Gilli 996!, Lindb. 356!, Kerst. 346!, Kitam. — E: Kabul, 1750 m, Rech. 17059!, 18019! Jalalabad, 600 m, Volk 2429!, Gilli 994! Nuristan: Gusalak, 1000 m, Edelb. 133! — NE: Badakhshan: Distr. Barak, Furse 6419! Kataghan: 8 km N Doshi, Furse 5954! — C: In valle Salatin prope Pshang W Doab, 1700 m, Gilli 995!

Pakistan: Peshawar: In jugo Khyber, Halcro Johnston! — N. Wazir.: Miramshah Fort, Blatt. & Fz. 26, 91, 126, 138, 282, 450, 522, 524. — Quetta: Quetta, Jafri & Akhar 1700!, Crookshank 134! — Baluchistan, Stocks.

Distr. gen.: Europa, Asia austro-occidentalis et centralis.

A common weed throughout much of our area.

6. ***S. damascenum*** Boiss. & Gaill. in Boiss., Diagn. Pl. Or. Nov. Ser. 2, 6: 11 (1859).

Typus: In hortis circa Damascum, Gaill., G!

Herba annua vel biennis usque ad 60 cm alta, pilis simplicibus inaequilongis patulis et retrorsis totam plantam sepalis inclusis tegentibus. Folia inferiora runcinato-pinnatifida, petiolata, superiora multo minora, breviter petiolata. Petala c. 7×2 mm, lamina late obovata, ungue tenui. Pedicelli fructiferi 5—10 mm longi, patuli vel ascendentes. Siliqua 30—50× c. 1 mm, pilis simplicibus dense obsita.

Persia: W: Kermansh.: Karand versus Kermanshah, in jugo Kuh Milleh Michan, Str.

Distr. gen.: Syria, Lebanon, Persia.

A little known species closely related to *S. Irio* and probably only a local variant of it but with a fairly dense indumentum over whole plant and a thicker septum. The Persian record requires confirmation.

7. ***S. Loeselii*** L., Cent. Plant. 1: 18 no. 49 (1755).
Syn.: *S. hastifolium* STAPF, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51, 2: 299 (1886). *S. glabratum* O. E. SCHULZ in ENGLER, Pflanzenr. 86 (IV. 105): 99 (1924).
Icon.: Clavis p. 21.
Typus: Europa orientalis: „Hab. in Borussia, Gedani, in montanis Aequicolor".

Herba annua vel biennis usque ad 1 (—1,75) m alta, caule pilis simplicibus retrorsis obsito vel glabro. Folia basalia lyrato-pinnatipartita, lobo terminali magno triangulari vel hastato, lobis lateralibus in paribus 2—3; folia caulina similia. Petala aurea, 5—7 × 2,5—3,5 mm, lamina late ovata, ungue longo tenui. Pedicelli fructiferi 6—12 mm longi, erecto-patuli. Siliqua 10—35 (—50) × c. 1 mm, suberecta; stylus 0,5 mm longus; stigma profunde bilobum. Semina papillosa.

Iraq: Kurd.: Arbil: Chiya-i Mandau prope Walza, 2000 m, GUEST 2684!, 2730! Algurd Dagh prope Nowanda, 1800 m, GUEST 2811!
Talish: Arkewan, Kisilagach, Lenkoran, Swant, HOHEN. Sallian versus Lenkoran, C. A. MEY.
Persia: N: Gorg.: Bandar-i Gaz, SINT. 1320, 1390. Maz.: Kalar Dasht, 1400 m, GAUBA 277! Babol, GAUBA 131!, 278! 32 km SE Chalus, FURSE 2869! Persia borealis, SZOV. — W: Azerb.: Khosrava prope Shahpur, KNAPP. Tabriz, BUHSE, GILL.-SM. 1318!, 1474!, 1705!, 1706!, 1810! 64 km SE Tabriz, FURSE 2374! 6 km S Shahpur, 1400 m, GRANT 16170! Ad fl. Talkehh Rud N Tabriz, 1450 m, AELL. 1064! Ad lacum Rezaiyeh, 1300 m, JACOBS 6884! Bakht.: Gahar, KOELZ 17897! Kermansh.: Kermanshah, BENT & WR. 514—201! Ham.: Hamadan, STAPF. Lur.: Khorramabad, BENT & WR. 411—111! — S: Fars.: Jahrom, KOELZ 14651! Kerm.: Kerman, BORNM. 2076, 2078! — E: Khor.: Mashhad, RECH. 7515! — C: Tehr.: In valle Shahrestanak, 2200 m, BORNM. 6152. M. Damavand, 2640 m, GILLI! 7 km N Polur, 2500 m, GRANT 16510! Tehran, FURSE 1712! Qazv.: Karaj, RECH. 379!, AELL. 1075!, GAUBA. Inter Rudehen et fluvium Delichay, 40—60 km E Tehran, 1800 m, AELL. 1060! Kashan: Qamsar, MANUCH. Yazd: Taft in montibus Shir Kuh, 1900 m, BORNM. 2077. Yazd, BUHSE. Qom: Rahjerd, 1200 m, KOEIE 1444.
Turcomania: Ashkhabad, SINT. 2073!, LITW. 539. Saandak, LITW. Kopet Dagh, LITW. 541! Firyuza, SINT. 537, LITW. Sundsodagh, SINT. 1919-a. Karakala, SINT. 1919-b.
Afghanistan: N: Mazar-i Sharif: Balkh, RECH. 16153! Shibarghan: Tukzar, KOELZ 13976! — NW: Maimana: Belchiragh, 1200 m, HDG. & WDB. 3772! — S9W: Herat AMSEL! — E: Kabul: Hauz-i Mahiha, 2600 m, KOEIE 3018. Kabul: GILLI N97!, 998!, 999!, 1000!, 1001!, NEUB. 528!, SCHEIBE 47!, KERST. 435, 580, VOLK 302, MAPGER 129, HDG. & WDB. 3228! In collibus ad septentriones urbis, 1800 m, RECH. 17081! aghman,, KOELZ 12074!, RECH. 17166!, CHAW.-MUST.! Behzud, 2800 m, RECH. 18623! Pul-i Alam, KOELZ 11828. Qala-e Wazir inter Sar-i Chashma et jugum Unai, 2900 m, RECH. 18058! In declivibus australibus jugi Salang, 1700 m, LAMOND 2043!, RECH. 31323! In jugo Shibar, VOLK 2808! Farakulum, KOEIE 3017! Sarobi, KITAM. In valle Panjshir, FAIRSERVIS! Ghazni: Sar-i Ab, 40 km NW Ghazni, 2500 m, RECH. 17674! Sang-i Masha, 2500 m, RECH. 17451! Ghazni, GRIFF.! — NE: Badakhshan: Hazratsaid, KOELZ 12864. Jurm, KOELZ 12899. — C: Bamian: Inter Bulola et Doab, KITAM. Kamard, KOELZ 13568! Pakistan: Kurram: In valle Kurram, Shalozan, AITCH. 216! — Quetta: Ziarat prope Quetta, JAFRI & AKHAR, 2069!

Distr. gen.: Europa, Asia austro-occidentalis et centralis.

8. ***S. altissimum*** L., Spec. Plant. 659 (1753).
Syn.: *S. pannonicum* JACQ., Icon. Pl. Rar. 1: 12 tab. 123 (1781—86).
Icon.: Clavis p. 21.
Typus: „Hab. in Italia, Gallia, Sibiria".

Herba annua vel biennis usque ad 1 m alta, ad basin caulis et ad folia pilis rigidis simplicibus obsita, superne ± glabrescens. Folia caulina inferiora runcinato-pinnatifida, lobis lateralibus in paribus 6—8. Petala flava, (6—) 9—12×4—4,5 mm. Pedicelli fructiferi 5—12 mm longi, crassi, oblique erecti. Siliqua c. 80—110×1 mm, recta, aequo angulo ac pedicellus patens; valvae glabrae, crassae; stylus 1—2 mm longus.

Iraq: Kurd.: Arbil, Guest 622!
Talish: Swant, Hohen. Lenkoran, C. A. Mey.
Persia: N: Maz.: In valle Haraz supra Gaznak, 1750 m, Wdb. 1461! Gil.: Rudbar, Bornm. 6154. Persia borealis, Olivier, Ky. 423. — W: Azerb.: Hasara prope Ardabil, Buhse. Tabriz, Gill.-Sm. 1363! 1421!, 1516!, 1727!, Knapp. Khvoy, Knapp. Kermansh.: In valle Jamnasu, Str. Kurd.: 100 km N Kermanshah, 1300 m, Wdb. 1882. Hamadan, Stapf. Arak: Malayer, Str. Lur.: Dehloran, Posht-e Kuh, Nab. 1370. Dow Rud, Koelz 15488!, 17722! Bisheh, 1200 m, Koeie 1450. Inter Dehloran et Shush, Nab. — E: Khor.: Inter Mashhad et Chanaran, 1100 m, Rech. 4686! — C: Tehr.: In valle Shahrestanak, 2200 m, Bornm. 6155. 38 km NNE Tehran, Furse 3114! In faucibus Dosdarreh Ky. 423!, 736! In declivibus australibus M. Tuchal, Aell. 1081! Qazv.: Karaj, Gauba. Karaj, Rech. 541! Damgh.-Semn.: Qomrud Bala 60 km E Firuzkuh, 2500 m, Aell. 995!
Turcomania: Nephton prope Ashkhabad, Sint. 218. Suluklü, Sint. 1005! Ashkhabad, Litw. 535. Cheirabad, Litw. 535-a.
Afghanistan: SE: Kandahar, Kerst. 346. — E: Kabul: Tang-e Gharu, 1800 m, Hdg. & Wdb. 3092! SE Sarobi, 1050 m, Gilli 1003! Shibar, Volk 2809, Kitam. Charikar, Neub. 4087! In valle Bagrami, 1900 m, Neub. 4606! In declivibus australibus jugi Salang, 1900—2200 m, Rech. 31295! In valle Panjshir: Mukeni, 2500 m, Hdg. & Wdb. 5124! Gulbahar, 1700 m, Gilli 1002! Nuristan: Wama, 1300 m, Edelb. 451. In valle Rangul prope Pushol, 2300 m, Kerst. 1109. — NE: Munjan: Miyan Deh, 2550 m, Edelb. 2160! Badakhshan: Faizabad, Furse 6198!
Pakistan: Chitral, Toppin 268!

Distr. gen.: Europa orientalis et centralis, Asia austro-occidentalis et centralis.

9. ***S. septulatum*** DC., Reg. Veg. Syst. Nat. 2: 471 (1821).
Syn.: *S. pannonicum* Boiss., Fl. Or. 1: 217 (1867) p. p. *Brassica* (sect. *Polakia*) *erucastroides* Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51: 306 (1886). *S. erucastroides* (Stapf) Bornm., Bull. Herb. Boiss. 4, 12: 1263 (1904). *S. bilobum* (C. Koch) Grossh., Beih. Bot. Centrbl. 44, 2: 214 (1927).
Typus: Syria: Circa Aleppum, Russell, BM.

Herba annua 20—50 cm alta, glabra vel inferne pilis simplicibus patulis longioribus, superne pilis brevioribus obsita. Folia basalia petiolata, rosulata, pinnatipartita, loborum paribus 5—7 saepe recurvis; folia caulina summa segmentis linearibus. Petala 10—14×5—7 mm. Pedicelli fructiferi 3—5 mm longi, patuli vel oblique erecti. Siliqua 20—80×1—2,5 mm, recta, aequo angulo ac pedicellus patens.

Iraq: Kurd.: Arbil: Shaqlawa, 900 m, Bornm. 881! Rayat, Thesiger 1037! Arbil, Guest 1462!, Haines! Kirkuk: Tuz Khormatu, Rogers 1361! Jarmo, Helbaek 397!, 697! Hawija, Gillett 10685! Kirkuk, Rogers 0496! Tainal, 800 m, Gillett & Rawi 11655! Mosul: Sharifa prope Amadiyah, O. Polunin 5145! Mosul, Hand.-Mzt. 1261. Sirsang, Haines! Sul.: In ditione pagi Penjwin, 1200 m, Rech. 10439! M. Avroman, Kanispit inter Tawilla et Halabja, 1000 m, Rech. 10392! In planitie Sulaymaniyah, Thesiger 402! Diyala: Khanaqin, Rech. 9021!, Haines.
Talish: Swant, Hohen.
Persia: N: Gil.: Ispili, Yehlah, Linds. 1099-a!, 1099-b! Inter Manjil et Pachenar, 400—500 m, Bornm. 5158! — W: Azerb.: 64 km SE Tabriz, Furse 2377! Tabriz, Buhse, Gill.-Sm. 421!, 1363!, 1421!, 1516!, 1727! Inter Jolfa et Marand, Grossh. Kurd.: 100 km

N Kermanshah, 1300 m, Wdb. 1882! 6 km NW Bisotun, Bent & Wr. 406—402! Sarab-e Nilufar, 25 km W Kermanshah, Bent & Wr. 404—101! Inter Arak et Kangavar, Str. Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 190!, 191! 64 km E Hamadan, Cowan & Darlington 543! Bahar, Babai 6700-E! Esf.: Inter Esfahan et Abadeh, 1500—2500 m, Schmid 5392! Lur.: Khorramabad, Bent & Wr. 410—108! Dow Rud, Koelz 17357! Oshtoran Kuh, Azna, Furse 1819! Dehloran, Nab. 1370. Inter Shush et Dehloran, Nab. Shah Bazan, Koeie 343. Khuz.: Masjed Soleyman, McMillan 28! — **S**: Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1800 m, Rech. 3198! Fars.: Shiraz, Hausskn.; 1600 m, Grant 15451! Kuh Bamu, Archibald 1384! — **E**: Khor.: Robat-e Safid inter Mashhad et Torbat-e Heydariyeh, Gauba 132!, Rech. 1544-a!, 1544-b! Mashhad, Rech. 4868! Hizomeh N Kavir, 1200 m, Gabr. 49. — **C**: Qazv.: Inter Karaj et Fashand, Gauba. Sultanabad prope Qazvin, Linds. 17. Pachenar, 550 m, Bornm. 6157!, Pichler. Yazd: Soh, Bge.!

Turcomania: Ashkhabad, Litw. 534! Nephton, Sint. 215!, 218. Badghiz: Kushka, Zukerwanik 43!

Afghanistan: **NW**: Qala Nau, 800 m, Koeie 3807. Obeh, 1700 m, Koeie 3767!, 4139. — **SW**: Herat: Hari Rud, Aitch. 222!, 223! Herat, Amsel!, Furse 5411!

Distr. gen.: Asia austro-occidentalis et centralis.

Closely related to *S. altissimum* L. but usually smaller in stature and with shorter fruiting pedicels. A variable species in which O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 121—122 (1924) recognised two geographical races: prol. *rigidulum* (Decne.) O. E. Schulz and prol. *bilobum* (C. Koch) O. E. Schulz. These were based on characters of the lower leaves. With the fairly abundant material now available, there is complete intergradation between them and no reason for recognition of subspecific taxa.

10. ***S. orientale*** L., Cent. Plant. 2: 24 (1756).

Syn.: *S. Columnae* Jacq., Fl. Austr. 4: 12 (1776).

Typus: „Hab. in Oriente".

Herba annua usque ad 60 cm alta, pilis simplicibus mollibus longitudine variis obsita. Folia basalia ± rosulata, ante florendum emarcida, caulina lobo terminali lineari-hastato. Petala 8—10×2—4 mm, pallide flava. Pedicelli fructiferi oblique erecti, 3—6 mm longi. Siliqua 30—100×1 mm, pilosa, maturitate glabrata, recta; valvae crassae, trinerviae; stylus 1—3,5 mm longus, clavatus.

Iraq: Kurd.: Kirkuk: Kifri, Gillett & Rawi 7433!

Persia: **W**: Kermansh.: Kuh-e Nevoh, NW Karand, 1340 m, Archibald 1919!

Turcomania: Ashkhabad, Sint. 125, Litw. 534. Kizyl Arvat, Sint. 1656.

Distr. gen.: Europa australis, Asia austro-occidentalis.

Possibly only an introduced weed in our area.

11. ***S. runcinatum*** Lag. ex DC., Reg. Veg. Syst. Nat. 2: 478 (1821).

Typus: „Hab. in locis ruderatis Hispaniae Orcelin", Lag.

Herba annua usque ad 50 cm alta, foetida, a basi ramosa, omnino glabra vel pilis simplicibus obsita. Folia basalia rosulata, runcinato-pinnatifida, petiolata, caulina petiolata. Inflorescentia inferne bracteata. Petala 2,5—3,5 mm longa, pallide flava. Pedicelli fructiferi 1—1,5 mm longi, crassi, axi appressi. Siliqua 15—35×1—2 mm, basi quam apice latior, recurva; stylus 1—2 mm longus, siliquam crassitudine subaequans.

Iraq: Diyala: Khanaqin, Rech. 9020!, Rogers 0185!

Persia: **N**: Gorg.: Dasht-e Gorgan, Shar. 562! Maz.: Inter Amol et Zardman, 500—800 m, Schmid 5844! — **W**: Azerb.: Tabriz, Knapp. — **E**: Khor.: Gonbad-e Kavus: Besh Abbas, Mirzayan 5848-E!

Distr. gen.: Europa austro-occidentalis, Caucasus, montes Turcomaniae, Iraq, Persia.

12. ***S. erysimoides*** Desf., Fl. Atlant. 2: 84 (1799).
Icon.: Tab. 31, fig. 2.
Typus: „Hab. in arenosis prope Kerwan apud Tunetas", Desf.

Herba annua, 20—70 cm alta, glabra vel pilis simplicibus obsita. Folia basalia lyrato-pinnatifida, petiolata, caulina similia. Petala 2,5×1 mm, anguste spathulata, flavescenti-albida vel flava. Pedicelli fructiferi 1,5—3 mm longi, patuli vel erecto-patuli. Siliqua 20—40× c. 1 mm, basi latissima, apicem versus attenuata, patula vel erecto-patula; valvae 1-nerviae; stylus brevissimus.

Persia: W: Bakht.: Gatvand, Mart.-Escal. — S: Lar.: Hajjiabad prope Tarom, 900 m, Rech. 3499! Fars.: Dalaki, Ky. 180. Chenar Rah Dar, Staff 192! Kerm.: Jiroft, Hamun-e Jaz Murian, Kahnuj, 400 m, Starm. 94!
Pakistan: Kohat: Inter Kohat et Thal, 675 m, Lamond 1556! — Quetta: Inter Gumbaz et Barkhan, 1000 m, Lamond 1351! Shinghar, 50 km N Fort Sandeman, 2050 m, Lamond 1471-A! Gumbaz, Rech. 29653! — Baluchistan, Lace 3392! — Makran: Pierce! 8—25 km W Awaran, Rech. 27736! 20 km W Hoshab, Rech. 28031! 10 km W Hoshab, 100—200 m, Lamond 379!

Distr. gen.: Regio Mediterranea, Macaronesia, Persia, Pakistan occidentalis.

When the fruit is mature, there is almost always a slight but appreciable difference in the basal and apical width of the siliqua. In immature fruits, however, this characteristic feature is not always apparent.

13. ***S. officinale*** (L.) Scop., Fl. Carn. 2: 26 (1772).
Syn.: *Erysimum officinale* L., Spec. Plant. 660 (1753).
Icon.: Clavis p. 21.
Typus: „Hab. in Europae ruderatis".

Herba annua, caule 20—80 cm alto, rigide erecto, ramoso, pilis rigidis simplicibus retrorsis obsita. Folia basalia petiolata, rosulata, pinnatisecta, lobo terminali ± rotundato; caulina lobo terminali late lineari-hastato. Petala 3—4×1 mm, cuneato-obovata. Pedicelli fructiferi 2—4 mm longi, axi appressi, crassi. Siliqua 11—17 mm longa, conica, basi 1—1,5 mm crassa, sursum attenuata; valvae hispidae, raro glabrae; stylus c. 0,5 mm longus.

Iraq: Kurd.: Arbil: Shaqlawa, Haines 388! Kuh Safin supra Shaqlawa, Gillett 8078! In faucibus prope Rawandiz, Helbaek 809! Mosul: Ad pagum Mar Yakub supra pagum Simel, 900 m, Nab. 1383.
Talish: Kisilagach, Hohen. Lenkoran, Hohen., C. A. Mey. Sallian, C. A. Mey.
Persia: N: Maz.: In arenosis maritimis prope Babol Sar, Gauba & Sab. 169! Gil.: In montibus prope Manjil, Buhse. Yehlah, Linds. 879! — W: Lur.: Shah Bazan, 500 m, Koelz 362!

Distr. gen.: Per totam Europam et partem occidentalem Asiae austro-occidentalis.

Naturalised in many temperate parts of both hemispheres.

111. *Microsisymbrium*

Microsisymbrium O. E. Schulz in Engler, Pflanzenr., Cruciferae-Sisymbrieae 86 (IV. 105): 159—163 (1924).

Plantae annuae tenues foliis pinnatifidis, floribus albis minutis, pilis minutis appressis stellatis vel bifurcatis. Sepala obtusa, non saccata. Pedicelli fructiferi quam siliquae tenuiores, plerumque tenues, vario modo patuli vel deflexi. Siliqua linearis, polysperma. Semina humiditate non mucilaginea. Radicula incumbens.

1. ***M. minutiflorum*** (Hook. f. & Thoms.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 160 (1924).
Syn.: *Sisymbrium minutiflorum* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 158 (1861).
Icon.: Clavis p. 29.
Typus (Syntypi): Afghania, Griff., K! Tibetia occidentalis, prov. Zanskar, Thoms., K.

Herba annua, 3—10 cm alta, plerumque multiramosa, flexuosa. Folia basalia petiolata, pinnatisecta, lobis 1—2 integris linearibus. Folia caulina breviter petiolata, lobis linearibus elongatis. Racemi laxi, fructiferi elongati. Petala 1,5—2×0,5—1 mm, alba vel pallide lilacina. Pedicelli fructiferi 2—8 mm longi, tenues. Siliqua (9—) 11—18 (—25)×0,5 mm, patula vel ascendens, glabra vel laxe rarius dense pilosa (var. *dasycarpum* O. E. Schulz), curvata vel recta; stylus nullus. Semina c. 1 mm longa.

Persia: S: Fars.: In jugum inter Deh Now et Sichani, Behb. 988-E! — C: Tehr.: In glareosis alpinis M. Tuchal, 2900—3000 m, Bornm. 6159!
Afghanistan: E: Kabul: Farakulum, 2900 m, Koelz 2563! In jugo Unai, Volk 1629!, Neub. 513!; 3100 m, Gilli 985!; 2800 m, Volk! Kuh-i Qhalandaran, 3800 m, Hdg. & Wdb. 4509! Qala-e Wazir inter Sar-i Chashma et jugum Unai, 2900 m, Rech. 18101! In declivibus australibus jugi Salang, 2700—3300 m, Rech. 31430!, Lamond 2097! In valle Panjshir: Darreh Rastagal supra Mukeni, 3400 m, Hdg. & Wdb. 5161! Ghazni: Dasht-i Nawar, Kasy 59! Baraki Nawar, Neub. 12! Gardez: W jugi Altimur, 2700 m, Rech. 31976! — In glareosis alpinis ad collum Erak, Griff.! — C: Bamian: In jugo Shibar, Furse 6651! Kuh-i Baba, 3780 m, Gilli 986!
Pakistan: Chitral, Barum Gol, supra Shokor Shal, 3600 m, Wdb.

Distr. gen.: Tibet occidentalis, Persia, Afghanistan, Chitral.

Possibly an undercollected species in our area. Differing from the typical and not very variable species is the following variety:

— — var. ***brevipedicellatum*** Hedge, var. nov.
Typus: Hdg. & Wdb. 4957, holotypus E!; isotypus BG!

Differt a planta typica pedicellis fructiferis c. 2 mm longis, crassitudine siliquas aequantibus.

Afghanistan: C: Bamian: W Panjao, Kotal-e Nalgis, 3100 m, Hdg. & Wdb. 4957! Band-e Amir ad lacum Band-e Panir, 2800 m, Rech. 18382! Bamian inter jugum Unai et jugum Hajigak, 2950 m, Hdg. & Wdb. 4594!

Distr. gen. varietatis: Afghanistan.

112. *Murbeckiella*

Murbeckiella Rothm., Bot. Not. 1939: 468 (1939).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Sisymbrieae 86 (IV. 105): 169—175 (1924) sub Phryne. W. Rothmaler, Murbeckiella Rothm., Ein neuer Gattungsname, Botaniska Notiser 1939: 467—476 (1939).

Perennis foliis pinnatis, floribus albis, indumento e pilis brevibus appressis stellatis et longioribus simplicibus consistente. Sepala inaequalia, leviter saccata. Siliqua elongata compressa. Semina uniseriata numerosa. Radicula oblique incumbens.

1. ***M. Huetii*** (Boiss.) Rothm., Bot. Not. 1939: 472 (1939).
Syn.: *Cardamine Huetii* Boiss., Fl. Or. 1: 957 (1867). *Arabidopsis Huetii* (Boiss.) N. Busch in Fl. Cauc. Crit. 3, 4: 461 (1909). *Phryne Huetii* (Boiss.) O. E. Schulz

in Engler, Pflanzenr. 86 (IV. 105): 172 (1924). *Arabis araratica* Azn., Magyar Bot. Lapok 17: 2 (1919)!

Icon.: Clavis p. 27.

Typus (Syntypi): Anatolia boreo-orientalis: Tachköprü, Huet, Djimil, Balansa, G.

Perennis, 8—30 cm alta, erecta vel ascendens. Folia ± rosulata, pinnatipartita, longe petiolata. Caulina pauca, petiolata vel ± amplexicauli-auriculata. Petala 4,5—6×2—3 mm. Pedicelli fructiferi 5—12 mm longi. Siliqua 17—49×1 mm, torulosa, glabra.

Persia (sec. Fl. URSS. 8: 56 [1939]).

Distr. gen.: Anatolia boreo-orientalis et Transcaucasia a 2000 usque ad 2300 m.

113. *Arcyosperma*

Arcyosperma O. E. Schulz in Engler, Pflanzenr. Cruciferae-Sisymbrieae 86 (IV. 105): 182 (1924).

Herba perennis pumila, foliis obovatis confertis basalibus, glabra vel pilis simplicibus obsita, foliis caulinis parvis oblongis, floribus albis, roseis vel purpureo-albis. Sepala non saccata. Petala leviter emarginata. Siliqua dehiscens, late linearis, torulosa. Semina biseriata, numerosa, testa reticulata. Radicula oblique incumbens. — Genus monotypicum.

1. ***A. primulifolium*** (Thoms.) O. E. Schulz in Engler, Pflanzenr. Cruciferae-Sisymbrieae, 86 (IV. 105): 182 (1924).

Syn.: *Sisymbrium primulaefolium* Thoms. in Hook., Journ. Bot. 5: 18 (1853). *Eutrema primulaefolium* (Thoms.) Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 164 (1861).

Icon.: Clavis p. 13 et 21; Hook., Journ. Bot. 4, tab. 10 (1852). Engler, Pflanzenr., Cruciferae-Sisymbrieae l. c. fig. 35 (1924).

Typus: „Hab. in monte Hattu Himalayae occidentalis, alt. 10000 ped., in rupibus madidis", Thoms., K.

Herba perennis, radice crasse lignosa, collo residuis petiolorum comoso. Folia plurima basalia, obovata, lamina 3—10 cm longa, in petiolum latum attenuata, glabra vel margine pilis simplicibus ciliata, integra vel minute dentata; folia caulina pauca vel nulla, oblongo-ovata, c. 0,5—1 cm longa, sessilia vel semiamplexicaulia. Racemi floriferi et fructiferi ± densi. Petala c. 7×2 mm alba vel purpurascentia. Sepala et petala sub fructu juvenili persistentia. Pedicelli fructiferi tenues, 4—8 mm longi, vario modo patentes. Siliqua 15—24×1,5—2 mm.

Pakistan: Dir, 3350 m, Harriss 15908! — Swat: Supra Bashigram, 3350 m, R. R. Stewart 25021!

Distr. gen.: Sikkim, Nepal, montes Himalaya boreo-occidentalis usque ad Swat et Dir.

A curious monotypic genus without any close allies.

114. *Dielsiocharis*

Dielsiocharis O. E. Schulz in Engler, Pflanzenr., Cruciferae-Sisymbrieae 86 (IV. 105): 184 (1924).

Herbae perennes caespitosae humiles, pilis ramosis, foliis simplicibus, floribus flavis. Sepala non saccata. Filamenta basi dilatata; ovula 6—12. Siliquae breves, sectione transversali orbiculari, dehiscentes. Stylus brevis. Radicula incumbens. — Genus monotypicum.

Distr. gen.: In montibus Turcomaniae, Amu Darya, Kizyl Kum, Balkhash, Persia orientalis, Afghanistan occidentalis.

Usually growing on sand, *S. desertorum* has the unusual character among members of *Sisymbrieae* of medifixed hairs.

116. *Torularia*

Torularia O. E. Schulz in Engler, Pflanzenr., Cruciferae-Sisymbrieae 86 (IV. 105): 213 (1924).

Lit.: O. E. Schulz, l. c. 213—226.

Herbae annuae, biennes vel perennes, foliis simplicibus lyrato-pinnatifidis, omnino pilis simplicibus et ramosis obsitae, raro glabrae. Sepala non saccata. Petala alba vel lilacina. Glandulae nectariferae medianae deficientes. Ovarium multiovulatum. Siliqua elongata, dehiscens, teres vel applanata, recta vel vario modo curvata. Semina numerosa, humiditate non mucilaginea. Radicula incumbens.

1a. Siliqua axi ± appressa 2
b. Siliqua erecto-patula vel recurva 3
2a. Petala c. 3,5 mm. Siliqua 6—11 mm longa. Planta usque ad 25 cm alta ... . 5. *T. tetracmoides* (Boiss. & Hausskn.) O. E. Schulz
b. Petala 4,5—6 mm. Siliqua 10—15 (—28) mm longa. Planta usque ad 40 cm alta ..... 6. *T. dentata* (Freyn & Sint.) Kitam.
3a. Pedicelli fructiferi c. 1 mm longi. Petala 2—4 mm longa, alba .... 1. *T. torulosa* (Desf.) O. E. Schulz
b. Pedicelli fructiferi usque ad 6 mm longi. Petala 3—10 mm longa, alba vel lilacina 4
4a. Stylus subnullus, aequa latitudine ac stigma .... 2. *T. contortuplicata* (Willd.) O. E. Schulz
b. Stylus evolutus, stigma stylo latius 5
5a. Indumentum e pilis simplicibus consistens vel nullum 6
b. Indumentum e pilis ramosis tantum vel e pilis ramosis et simplicibus consistens 7
6a. Petala 7—10 (—14) mm longa. Pedicelli fructiferi 1—10 mm longi .... 8. *T. afghanica* (Gilli) Hedge
b. Petala 3—4 mm longa. Pedicelli fructiferi 1—4 mm longi .... 7. *T. aculeolata* (Boiss.) O. E. Schulz
7a. Pedicelli fructiferi vix incrassati. Racemi ± bracteati. Petala c. 3 mm longa ..... 9. *T. humilis* (C. A. Mey.) O. E. Schulz
b. Pedicelli fructiferi manifeste incrassati. Racemi non bracteati. Petala c. 4 mm longa 8
8a. Folia late oblonga. Siliquae stylus tenuis .... 3. *T. Korolkowii* (Regel & Schmalh.) O. E. Schulz
b. Folia linearia. Siliquae stylus crassus. . 4. *T. sumbarensis* (Lipsky) O. E. Schulz

1. ***T. torulosa*** (Desf.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 214 (1924).
Syn.: *Sisymbrium torulosum* Desf., Fl. Atlant. 2: 84 (1798—1800). *Malcolmia torulosa* (Desf.) Boiss., Fl. Or. 1: 225 (1867).
Icon.: Clavis p. 29 et 31.
Typus: „Tunisia, in cultis prope Shibam", Desf.

1. ***D. Kotschyi*** (Boiss.) O. E. Schulz in Engler, Pflanzenreich 86 (IV. 105): 184 (1924).
Syn.: *Alyssopsis Kotschyi* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 14 (1845).
Icon.: Clavis p. 25; tab. 34, fig. 2.
Typus (Syntypi): Ky. 334, 760, G!, E!

Herba perennis, 2—5 cm alta. Folia plurima basalia, aggregata, lanceolata vel obovata, integra, in petiolum attenuata, utrinque dense stellato-tomentosa, residua petiolorum saepe persistentia. Racemi c. 15-flori. Petala 3—4×2—3 mm. Siliqua 4—7×1—2 mm, recta vel curvata, tomentosa; pedicelli fructiferi 5—10 (—12) mm longi; stylus 0—0,5 mm. Semina 3—12.

Persia: W: Ham:. Nahavand, Str. Kuh-i Garri, Str. Kuh-e Safid Khaneh, Str. Bakht.: Tang-i Sirdan, 4100 m, Archibald 3046! Gahar, Koelz 17924! 24 km NE Shahr Kord, Furse 1405! Arak: Kuh Safid, Str. Kuh Gasavand, Str. Golpayegan, Str. Golpayegan versus Damaneh, Kuh-e Darreh Bid, Furse 1753! Lur.: Kuh-e Saverz, Haussкn.! — S: Fars.: Kuh Bamu prope Shiraz, Stapf 233! Kuh, „Bilam Lee", Stapf 232! Kuh-e Barfi et Kuh-e Dinar, Ky. 334!, 760! Kerm.: Kuh-e Sirj et Kuh-e Nasr, Bornm. 2186. Kuh-e Jupar, 3800 m, Bornm. 2187. — E: Khor.: Kuh-e Hazar Masjed, 2800 m, Rech. 5120! — C: Tehran: Ab Ali, 2400—2900 m, Schmid 3642! In regione alpina M. Kandavan, 2300 m, Bornm. 6132! In valle Shahrestanak, Bornm. 6132-b! Shahr.-Bust.: M. Shahvar, 3500—3900 m, Rech. 6025! In jugo Khash Aylan, 70 km ab oppido Shahrud orientem versus, 2000 m, Rech. 5441! Inter Gorgan et Shahrud, Bge.
Turcomania: M. Ludsha, Ashkhabad, Litw. 578! M. Risarash, Firyuza, Litw. 579!

Distr. gen.: Endem.

A rock crevice species growing between 2300 and 3900 m. Referable by O. E. Schulz's system to the *Sisymbrieae* on account of the incumbent radicle but allied to *Alyssopsis* Boiss. in the *Arabideae*. Bornmüller described a tall growing shade form as var. *major* based on a Strauss gathering from Hamadan, M. Alvand; Beih. Bot. Centrbl. 19, 2: 204 (1906).

115. *Streptoloma*

Streptoloma Bge., Arb. Naturf. Ver. Riga 1: 155 (1847).

Herbae annuae tenues, pilis mediofixis appressis, foliis simplicibus, petalis minutis albis vel roseis. Sepala patula, inferiora non saccata. Petala emarginata. Stigma minutum, compresso-capitatum. Siliqua elongata, leviter compressa, torulosa. Radicula incumbens. — Genus monotypicum.

1. ***S. desertorum*** Bge., Arb. Naturf. Ver. Riga 1: 155 (1847).
Icon.: Clavis p. 29.
Typus: Kizyl Kum, Lehmann, LE.

Herba annua usque ad 25 cm alta, a basi ramosa. Folia plurima basalia, linearia vel oblonga, integra vel dentata, petiolata. Racemi fructiferi elongati. Petala 2,5—3,5×1,5 mm. Siliqua 15—23×0,5 mm, recta vel circinnata (var. *circinnata* Freyn & Sint.), pilis mediofixis obsita; pedicelli crassitudine siliquas aequantes. Semina numerosa, oblonga.

Persia: E: Khor.: Inter Mashhad et Herat, ad confines Afghaniae, Furse 5338!
Turcomania: Ashkhabad inter Annaju et Gyaurs, Sint. 56! Prope Ashkhabad, Litw. 221. Prope Repetek, Litw. 564!
Afghanistan: SW: Herat, 900—1100 m, Koelz 3743! Inter confines Persiae et Herat, Furse 5347! Hari Rud, Aitch. 161!

Herba annua, florifera 3—10 cm alta, demum usque ad 30 cm elongata, a basi ramosa, caulibus prostratis vel ascendentibus. Folia basalia rosulata, lineari-oblonga, pinnatifida vel sinuato-dentata, petiolata; caulina lineari-oblonga, sessilia. Petala 2—4×1—1,5 mm, alba, truncata. Pedicelli fructiferi c. 1 mm crassae. Siliqua 15—50×0,5—1 mm, torulosa, suberecta, recurva vel contorta, hispida vel raro glabra. Stylus deficiens.

Iraq: Kurd.: Kirkuk: Jarmo, Helbaek 314!, 445! Kirkuk, Bornm. 876. Arbil: Gau Kossik ad fl. Zab, Gillett 10523! — Diyala: Jabal Hamrin, Haines, Bornm. 873, 874, 875. Inter Shahraban et Jalula, Rech. 14233! Inter Diltawah et Jabal Hamrin, Guest 526. 30—60 km SE Badrah, Rech. 9124!, 14031!, 14067! As Sadiyah, Evans! Khanaqin, Rech. 14105! — Amarah: 70 et 60 km N Amarah, Rech. 8873!, 14163!, 14172!

Persia: N: Gorg.: Dasht-e Gorgan, Shar. 578! Maz.: In valle Haraz supra Panjab, 1300 m, Wdb. 654! Gil.: Inter Kaluraz et Rudbar, Pichler. Manjil, 400 m, Bornm. 6141. — W: Azerb.: Tabriz, Gill.-Sm. 1466!, 1503!, 1816! Ad lacum Rezaiyeh, 1300 m, Jacobs 6623! Inter Khvoy et Var, Knapp. Azerbaijan, Auch. 4169. Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 169!, 170! Hamadan, Stapf. Arak: Golpayegan, M. Alvand, Furse 1480! Esf.: 60 km W Esfahan, Cowan & Darlington 693! Inter Delijan et Esfahan, 1000—2000 m, Schmid 5195!, 5220! Najafabad prope Esfahan, 1700 m, Bornm. 2102!, 2103. Esfahan, Auch. 4166. In stepposis prope Golunabad, 1600 m, Bornm. 2101! Khuz.: Ad pagum Sellelat prope Shushtar, Nab. 1306. Andimeshk prope Ahvaz, Gauba & Sab. 124! N Ahvaz, Wdb. 17. — S: Fars.: Ad pagum Hawize prope Bushehr, Nab. 1377. Inter Bushehr et Shiraz prope Gere, Ky. 71! Dalaki prope Shiraz, Ky. 126!, 180; Shiraz, Ky., Hausskn.! Kuh-e Barfi, Ky. Persepolis, Schmid 5432!, 1700 m, Rech. 15184!, 15185! Kerm.: In collibus prope Kerman, 2000 m, Bornm. 2120. Inter Kerman et Yazd, Bge. Tahrud inter Kerman et Bam, 1500 m, Rech. 3595! Inter Baghin et jugum Sang Bur, 2200 m, Rech. 2995!, 7511! M. Jebal Barez inter Bam et Jiroft, in declivibus borealibus Deh Bakri, 1800 m, Rech. 3668! Inter Zahedan et Khash, 1300—1600 m, Rech. 4204! 30—40 km E Zahedan, Lamond 128! Inter Saidabad et jugum Chah-e Chaghak, 1800 m, Rech. 3121! Bal.: In ditione M. Taftan prope Sangan, 1600 m, Rech. 4086! — E: Khor.: In montibus serpentinicis a Sabzevar orientem versus, Rech. 7516! — C: Tehr.: In semidesertis lapidosis inter Tehran et Varamin, 1000 m, Rech. 2751! Aliabad inter Qom et Tehran, Bornm. 2100. Tehran, Bornm. 2099. Hashemabad prope Tehran, Bruns. Qazv.: Karaj, in montibus prope Kalak, 1600 m, Rech. 2739! Qazvin, 1500—1550 m, Jacobs 6991! Sultanabad prope Karaj, Linds. 16!, 40! Karaj, Rech. 527!, Gauba. Pachenar, 500—600 m, Bornm. 6139!, 6140. Yazd: Deh Bala in montibus Shir Kuh, 1900 m, Bornm. 2119. In montibus prope Yazd, Buhse 1265. Yazd, Bge. Inter Anar et Bahramabad, Rech. 2902! Inter Yazd et Kermanshahan, Aell. 2853-a! Qom, Bornm. 2104, 2105!

Turcomania: Gyaurs prope Ashkhabad, Sint. 55a, 55b, Litw. 555. Kizyl Arvat, Becker, Sint. 2129! Inter Kazandzhik et Ushak, Sint. 1606! Ashkhabad, Litw. 552!

Afghanistan: SW: Jija, Koelz 4138!, 4147!, 4158, 4172. Hari Rud, Aitch. 185!, 260! Sistan: In valle fluvii Helmand, McMahon 25/74! — SE: Kandahar: Jamal Baba, S Kandahar, 1000 m, Gilli 1043! Kandahar versus Kalat-i Ghilzai, 1100 m, Kerst. 230, 237! — E: Kabul: In jugo Unai, 2000 m, Volk 1651! Guzar Gah prope Kabul, Neub. 9. In valle Logar, Volk 2084! Pul-i Alam, Koelz 11845!

Pakistan: Peshawar: In jugo Khyber, Halcro Johnston 51! — Quetta: Spin Karez prope Quetta, 1800—1900 m, Lamond 1149!, Rech. 29228! Inter Quetta et Chaman, 1500 m, Lamond 954! 30 km NNE Quetta versus Pishin, 1500 m, Rech. 28862! Sheilabagh in jugo Khojak, Lace 3532! Quetta, Lace 3640!, Duthie 8573!, Schmid 1626!, Rech. 28802! Infra jugum Bolan, 1500 m, Rech. 28799! — Kalat: 40 km N Kalat versus Mastung, Lamond 691!, Rech. 28365!, 28374! 10 km S Kalat, 1900—2000 m, Rech. 28351! In collibus Harboi, H.-B. 19543. Chehel Tun, Stocks 1037!

Distr. gen.: Africa borealis, Asia austro-occidentalis et centralis.

A widespread and variable species. The fruits are frequently spirally inrolled, curved or straight. Sometimes all three conditions will occur in the same specimen. In var. *scorpiuroides* (Boiss.) O. E. Schulz the fruits and the upper part of the plant are glabrous.

2. ***T. contortuplicata*** (Willd.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 219 (1924).
Syn.: *Cheiranthus contortuplicatus* Steph. ex Willd. in Willd., Spec. Plant. ed. 4, 3 (1): 521 (1800). *Sisymbrium contortuplicatum* (Willd.) DC., Prodr. 1: 195 (1824). *Malcolmia Ledebourii* Boiss., Fl. Or. 1: 224 (1867).
Typus: „Hab. in Sibiria versus Caucasum", Steph.

Herba annua, 10—30 cm alta, a basi multiramosa. Folia basalia ± rosulata, oblonga, runcinata-pinnatifida, pilis ramosis et simplicibus obsita. Petala 5—8 × 2—3 mm, alba vel rosea, emarginata. Pedicelli fructiferi 3—6 mm longi, crassi, erecto-ascendentes. Siliqua 25—40 × c. 1 mm, recta, spiraliter contorta vel recurva, hispida, raro glabra.

Persia: N: Gorg.: Dasht-e Gorgan, Shar. 574! Gonbad Malek Tappeh, Shar. 5682-E! Gonbad-e Kavus, Grant 17328! Gharaghir, Mirzayan, 5851-E! — Karasu, Szov.
Turcomania: Ashkhabad, Sint. 2056. Kizyl Arvat, Becker.

Distr. gen.: Caucasus, Anatolia orientalis, Aralo-Caspia, Persia borealis.

Similar in facies to the preceding species but with larger rose-coloured flowers and longer pedicels.

3. ***T. Korolkowii*** (Regel & Schmalh.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 220 (1924).
Syn.: *Sisymbrium Korolkowii* Regel & Schmalh., Acta Horti Petrop. 5: 240 (1877).
Typus: „In Turkestaniae tractu Dolon", Korolkow, LE.

Herba annua vel biennis, usque ad 30 cm alta, multiramosa, pilis plurimis ramosis, nonnullis simplicibus. Folia basalia oblonga. Inflorescentia fructifera valde elongata. Petala c. 4 mm longa, alba, fauce rosea, obovata, antice truncata, basi cuneata. Pedicelli fructiferi 4—5 mm crassi, suberecti. Siliqua 15—18 × 0,8 mm, applanata, hispida, recurva; stylus 0,5 mm longus.

Turcomania: Kopet Dagh sec. Fl. URSS. 8: 62 (1939).

Distr. gen.: Asia centralis.

4. ***T. sumbarensis*** (Lipsky) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 220 (1924).
Syn.: *Sisymbrium sumbarense* Lipsky, Acta Horti Petrop. 26, 2: 120 (1910).

Typus: „Transcaspien, am Flusse Sumbar, bei Jagli-olum", Radde 475, LE.

Valde affine *T. Korolkowii* sed folia angustiora et ovula minus numerosa.

Turcomania: Kopet Dagh sec. Fl. URSS. 8: 62 (1939).

Distr. gen.: Endem.

No specimens have been seen but from the description it is scarcely different from *T. Korolkowii* (Regel & Schmalh.) O. E. Schulz.

5. ***T. tetracmoides*** (Boiss. & Haussk.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 222 (1924).
Syn.: *Sisymbrium tetracmoides* Boiss. & Haussk. in Boiss., Fl. Or. Suppl. 43 (1888).
Typus: „In deserto Mesopotamiae ad fluvium Chabur", Haussk., G!

Herba annua, erecta, usque ad 25 cm alta, caule plerumque singulo. Folia basalia oblonga usque spathulata, subintegra vel lyrata, pilis longis simplicibus et brevibus ramosis. Racemi rigide erecti. Sepala saepe violacea. Petala lilacina vel alba ungue brevissimo purpureo, c. 3,5×2 mm, lamina late ovata emarginata. Pedicelli fructiferi axi ± appressi, 2—5 mm longi, crassi. Siliqua 6—11×0,5—1 mm, dense hispida, raro glabra, recta, leviter torulosa. Stigma profunde bilobum.

Iraq: Kurd.: Kirkuk: Baba Gurgur, Guest. Eig & Zohary 5102! Inter Kirkuk et Baba Gurgur, 300 m, Guest 1364! 13 km N Kirkuk, Gillett & Rawi 10567!, 10568! Mosul: Mosul, Rawi 5637! — Diyala: Khanaqin, Rech. 14115! Jabal Hamrin, Haines 840!

Distr. gen.: Endem.

Related to but clearly distinct from *T. dentata* (Freyn & Sint.) Kitam.

6. ***T. dentata*** (Freyn & Sint.) Kitam., Fl. Afgh. 165 (1960).
Syn.: *Cryptospora dentata* Freyn & Sint., Bull. Herb. Boiss. 2, 3: 693 (1903). *Sisymbrium adpressum* Trautv., Acta Horti Petrop. 9, 1: 367 (1884) non Turcz. (1854). *Torularia adpressa* (Trautv.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 221 (1924).
Typus: Sint. 54-c.

Herba annua usque ad 40 cm alta, late ramosa, pilis brevissimis appressis ramosis. Folia basalia rosulata, obovata, subintegra vel dentata, petiolata, canescentia. Petala 4,5—6×1,5—3 mm, interdum emarginata, alba vel lactea, exsiccando lilacina. Pedicelli fructiferi 1,5—3 (—5) mm longi, crassi, axi appressi. Siliqua 10—15 (—28)× c. 1 mm, axi appressa, scabrida, torulosa, recta vel apice recurva vel spiraliter contorta. Stylus 0,5—1 mm longus.

Persia: E: Khor.: In montibus serpentinicis ditionis Robat-i Safid, 1900 m, Rech. 4431!, 7338! Inter Chanaran et Quchan, 1200 m, Rech. 4706! In valle fluvii Atrak prope Bojnurd, Gauba & Sab. 159! — C: Shahr.-Bust.: Inter Naudeh et Shahrud, 1000—2000 m, Schmid 6157!, 6158!
Turcomania: Kizyl Arvat, Becker. Khodzhakala, Radde 298. Ad pagum Gaudan versus Kurd-Ssu, Litw. 544! Kopet Dagh, Ashkhabad, Sint. 54-c.
Afghanistan: NW: Herat: Qala Nau versus Sauzak, 1200 m, Koelz 3977! — SW: Hari Rud, Aitch. 240!, 177!
Pakistan: Quetta: Inter Quetta et Chaman, 30 km NNE Quetta, 1500 m, Lamond 975! Rech. 28901! — Kalat: Inter Surab et Kalat, 1700 m, Rech. 28337!, 28343!, Lamond 675!

Distr. gen.: Endem.

7. ***T. aculeolata*** (Boiss.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 223 (1924).
Syn.: *Sisymbrium aculeolatum* Boiss., Ann Scienc. Nat. Ser. 2, 17: 75 (1842). *Malcolmia aculeolata* (Boiss.) Boiss., Fl. Or. 1: 226 (1867). *Microsisymbrium pulchellum* Rech. f. & Koelz, Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954, 7: 6 (1954), syn. nov.
Icon.: Tab. 36, fig. 1.
Typus: Auch., locus non designatus.

Herba annua, 4—15 (—30) cm alta, caule simplici, siliquis exceptis glabra. Folia basalia interdum rosulata, petiolata, lyrato-pinnatifida vel oblanceolato-spathulata, dentata. Racemi pauci, 3—6-flori, fructiferi elongati. Petala 3—4 mm longa, anguste oblanceolata, alba, exsiccando lilacina. Pedicelli fructiferi 1—4 mm longi, crassi, maturitate ± horizontaliter patentes. Siliqua 30—50×1 mm, recurva, pilis simplicibus retrorsis obsita.

Persia: W: Esfahan, Auch. 1452. — S: Fars.: S Deh Bid, Archibald 1227! Kerman: Inter Khabis et Kerman, Bge! — E: Khor.: Sar Chah, Bge.! — C: Yazd: Jandaq et Yazd in montibus prope Shir Kuh et Mehriz, Buhse 1396/1! Shahr.-Bust.: Shahrud, Bge.!
Afghanistan: SW: Jija Sarai, 900 m, Koelz 3598! (Typus *Microsisymbrii pulchelli*) — E: Kabul: Sher Darwasa, Neub. 543!, Gilli 1044!, 1045! Kuh-e Chelsotun, 2200 m, Gilli 1046! Aliabad, Volk 12!, Volk 1560!
Pakistan: Quetta: Sheila Bagh, in jugo Khojak, Duthie 8612! In jugo Khojak, 2300 m, Rech. 29042! Quetta, Duthie 8609! — Kalat: Inter Surab et Kalat, 2050 m, Lamond 683! 10 km S Kalat, 1900—2200 m, Rech. 28359! — Baluchistan: Nichara, Stocks 907! Makran: 20 km W Hoshab, Lamond 528!

Distr. gen.: Sinai, Persia, Afghanistan, Pakistan occidentalis.

8. ***T. afghanica*** (Gilli) Hedge, comb. nov.
Syn.: *Sisymbrium afghanicum* Gilli, Feddes Repert. 57: 228 (1955). *S. pakistanicum* Jafri, Notes Roy. Bot. Gard. Edinb. 22: 116 (1956). *Torularia aculeolata* (Boiss.) O. E. Schulz var. *grandiflora* Gilli, Feddes Repert. 69: 166 (1964), syn. nov.
Icon.: Clavis p. 21; tab. 36, fig. 2.
Typus: Gilli 1010, W!

Herba annua, 4—30 cm alta; caulis simplex vel ramosus, pilis usque ad 1,5 mm longis simplicibus patulis vel reflexis obsitus. Folia ± carnosa, lyrato-pinnatisecta, glabra vel parce pilosa. Petala (7—) 10—14 × 2—4,5 (—6) mm, obovata, unguiculata, antice rotundata, alba vel rosea. Pedicelli fructiferi 1—10 mm longi, crassi, maturitate ± horizontaliter patentes. Siliqua 40—60 × c. 1,5 mm, recurva, glabra vel pilis brevibus simplicibus obsita. Stylus 1—3 mm longus. Radicula accumbens vel incumbens.

Afghanistan: SE: Kandahar: Chongulak, Lindb. 382! — E: Kabul: SE Sarobi, 1430 m, Gilli 1010! (Typus *Sisymbrii afghanici*), Sarobi, Volk 1881!, 2494!, Neub. 4737! Gilli 1047! Jalalabad, 600 m, Edelb. 26! Tang-e Gharu, Neub. 4111!; 1500—1750 m, Hdg. & Wdb. 2775!, 2814!, Volk 1487!, Kerst. 552!, Gilli 1048! Gardez: Waza, 1700—2000 m, in silvis *Quercus Baloot*, Volk 2523! Nuristan: Gusalak, 1000 m, Edelb. 232!, 238!
Pakistan: Peshawar: In jugo Khyber, Vicary, Stewart, Nath 15454, Halcro Johnston 79! Cherat SE Peshawar, Lamond 1577! Peshawar, Deane! — Wazir.: Shagai, Lowndes 700!

Distr. gen.: Afghanistan orientalis et Pakistan boreo-occidentalis.

9. ***T. humilis*** (C. A. Mey.) O. E. Schulz in Limpricht, Reise Chin. Ost.-Tib. in Feddes Repert. Beih. 12: 390 (1922).
Syn.: *Sisymbrium humile* C. A. Mey. in Ledeb., Icon. Pl. Fl. Ross. 2: 16 (1830) et C. A. Mey. in Ledeb., Fl. Alt. 3: 137 (1831).
Typus: Altai. „Hab. in siccis sterilissimus subsalsis ad fl. Kerlyk, Kan, Jebagen et Tschuja; in ripis argilloso-salsis fl. Tschuja in deserto Kuraico. Fl. Mai ad Jul.", LE.

Herba annua, biennis vel perennis, prostrata vel ascendenti-erecta, pilis ramosis obsita, interdum pilis longioribus ad basin caulis immixtis. Folia basalia interdum rosulata, lineari-oblonga, petiolata, dentata vel integra, caulina petiolata. Inflorescentia compacta, fructifera elongata. Petala 3 mm longa, colore variabilia, alba usque purpurea, oblongo-elliptica, subemarginata, breviter unguiculata. Pedicelli fructiferi 2—6 mm longi, suberecti. Siliqua 12—24 × 0,8 mm, erecta, pilosa, recta vel curvata, torulosa; stylus 0,5—0,75 mm longus.

Afghanistan: **NE**: Wakhan, 2850 m, GILES 79. M. Noshaq, 3800—4000 m, YOSII 607.

Distr. gen.: Sibiria, Asia centralis, Himalaya, Afghanistan boreo-orientalis.

A very widespread and variable species in the Himalaya but only known in our area from the cited gatherings.

Species pro regione nostra dubia

T. brevipes (KAR. & KIR.) O. E. SCHULZ in ENGLER, Pflanzenr. 86 (IV. 105): 222 (1924).

This E Turkestan species has been recorded from S Persia by BORNMÜLLER. Beih. Bot. Centrbl. 28, 2: 108 (1911) and l. c. 59, 2: 290 (1939). No specimens have been seen. The determinations are doubtful.

117. *Braya*

Braya STERNB. & HOPPE, Denkschr. Bayer. Bot. Ges. Regensb. 1, 1: 65 (1815).

Lit.: O. E. SCHULZ in ENGLER, Pflanzenr. 86 (IV. 105): 226—239 (1924).

Plantae nanae caespitosae perennes, foliis simplicibus, floris albis vel sulfureis saepe violaceo-suffusis. Indumentum e pilis simplicibus et ramosis consistens. Folia plurima basalia, subcarnosa, integra. Sepala non saccata, late membranaceo-marginata, apice cucullata, sub fructu persistentia. Petala obovata, basi cuneata, persistentia. Glandulae nectariferae laterales prominentes, medianae deficientes. Ovarium 4—20-ovulatum. Stigma depresso-capitatum. Fructus dehiscens, breviter linearis, oblongus, ellipticus vel ovatus. Semina biseriata. Radicula incumbens.

High alpine species in the Arctic, Europe, C Asia and the Sino-Himalayan region.

1. ***B. oxycarpa*** HOOK. f. & THOMS., Journ. Linn. Soc. Bot. 5: 169 (1861).
Syn.: *Aphragmus oxycarpus* (HOOK. f. & THOMS.) JAFRI, Notes Roy. Bot. Gard. Edinb. 22: 96 (1956).
Icon.: Clavis p. 17 et 25.
Typus: „Hab. in Tibetia occidentali subalpina, Piti prope Lara, alt. 12000—13000 ped., T. THOMS.", K.

Herba humilis perennis, 2—5 cm alta; residua petiolorum persistentia. Caules pilis simplicibus minutissimis et irregulariter furcatis obsiti. Folia basalia congesta, anguste oblonga, 5—10 mm longa, glabra; folia caulina pauca, lineari-oblonga, sessilia. Sepala saepe violacea, 2 mm longa, glabra. Petala 4—4,5 mm longa, alba, demum rosea vel violacea. Pedicelli fructiferi erecti, 1—4 mm longi. Silicula elliptica, 4—6 × 1,5—2 mm, glabra; stylus 0,5—1 mm.

Afghanistan: **NE**: In jugo Munjan, 4100 m, KOELZ 12749! Wakhan: In valle Badjens, 4600 m, inter *Carices*, *Primulas* et *Leontopodia* in locis humidis, ROEMER 357!

Distr. gen.: Afghanistan boreo-orientalis, Pamir-Alaj, Tibet, Montes Himalaya boreo-occidentalis, Sina austro-occidentalis (?).

118. *Nasturtiicarpa*

Nasturtiicarpa GILLI, Feddes Repert. 57, 3: 228 (1955).

Herba annua tenuis ramosa, foliis caulinis simplicibus sagittatis, floribus flavis, pilis ramosis. Sepala non saccata. Silicula breviter elliptica, dehiscens. Septum cellulis paralleliter dispositis. Semina 7—20, subbiseriata, humiditate mucilaginea. Radicula incumbens.

1. ***N. notorrhiza*** Gilli, Feddes Repert. 57, 3: 228 (1955).
Icon.: Clavis p. 25; tab. 34, fig. 2.
Typus: Gilli 946, W!

Annua, 2—10 cm alta, caulibus simplicibus vel ramosis erecto-ascendens. Folia basalia petiolata, lanceolata; caulina lineari-oblonga. Petala 2—3 × 1—1,5 mm. Pedicelli fructiferi (2—) 4—6 (—8) mm longi, horizontaliter vel erecto-patentes. Silicula 2,5—5 × 1—2 mm, reticulato-nervosa, stellato-pilosa; stylus 0,5 mm longus.

Afghanistan: E: Kabul: Inter Kabul et Tang-i Gharu, 1710 m, Gilli 946!, Neub. 3134. Chaman Wazirabad, 1760 m, Gilli 945! Pol-e Charkhi, 20 km a Kabul versus Tang-i Gharu, 1800 m, Hdg. & Wdb. 3044! Kabul, Volk 1547!, Kitam. Ghazni: Dasht-i Nawar, 3000 m, Neub. 977!, Kasy 60.50 km SW Ghazni versus Mukur, 2100 m, Rech. 34486.

Distr. gen.: Endem.

A distinct monotypic genus without any close allies.

119. *Arabidopsis*

Arabidopsis Heynh. in Holl & Heynh., Fl. Sachs. 1: 538 (1842).

Lit. O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae — Sisymbrieae 86 (IV. 105): 268—285 (1924). N. Hylander, Cardaminopsis suecica (Fries) Hiitonen, A Northern Amphidiploid Species, Bulletin du Jardin Botanique de l'Etat à Bruxelles 27: 591—604 (1957).

Herbae annuae, biennes vel perennes. Folia simplicia. Pili ramosi et simplices vel plantae glabrae. Sepala non saccata. Petala alba, lilacina vel flava, interdum deficientia. Stamina 4—6. Ovarium multi-ovulatum. Siliqua elongata, anguste linearis, dehiscens. Semina numerosa. Radicula incumbens.

1a. Planta glabra, petala deficientia ..... 1. *A. parvula* (Schrenk) O. E. Schulz
b. Planta pilosa, petala evoluta 2
2a. Stamina 4. Valvae siliquae pilis mediofixis bifidis appressis tantum obsitae; septum deficiens ..... 10. *A. eseptata* Hedge
b. Stamina 6. Valvae siliquae glabrae vel pilis ramosis vel stellatis obsitae; septum evolutum 3
3a. Folia caulina cuneata, sessilia vel breviter petiolata 4
b. Folia caulina amplexicaulia, sagittata vel basi dilatata, sessilia 6
4a. Siliqua 10—17 mm longa 5
b. Siliqua 50—70 mm longa ..... 3. *A. Wallichii* (Hook. f. & Thoms.) N. Busch
5a. Annua. Sepala libera, non persistentia. Siliqua glabra, erecto-ascendens ... . 2. *A. Thaliana* (L.) Heynh.
b. Perennis. Sepala connata, persistentia; siliqua pilis ramosis obsita, subrecurva ..... 9. *A. gamosepala* Hedge
6a. Sepala 3—4 mm longa. Petala 6—8 mm longa apice truncata .... 8. *A. toxophylla* (M. B.) N. Busch
b. Sepala quam 2,5 mm breviora, petala quam 5 mm breviora apice rotundata 7
7a. Petala flava, 2,3 mm longa. Siliqua apice obtusa. Herba annua .... 4. *A. pumila* (Steph.) N. Busch
b. Petala alba, lactea, rosea vel lilacina, 2—4 mm longa. Siliqua apice attenuata. Herba biennes vel perennes 8

8a. Racemi usque ad apicem bracteati ... 7. *A. himalaica* (EDGEW.) O. E. SCHULZ
b. Racemi ebracteati vel basi tantum bracteati 9
9a. Folia caulina basi dilatata, sessilia ..... 6. *A. stricta* (CAMB.) N. BUSCH
b. Folia caulina sagittato-amplexicaulia .....
..... 5. *A. mollissima* (C. A. MEY.) N. BUSCH

Arabidopsis as defined by O. E. SCHULZ in the Pflanzenreich, is in need of detailed re-investigation. With the fairly abundant material now available, especially from the W Himalaya, where the crux of the problem appears to lie, a review of all the species throughout their ranges would be most valuable. In particular, the demarcation line between *Arabis* and *Arabidopsis* is in need of re-definition. Some species of *Arabidopsis* are closer to *Arabis* than to other species of *Arabidopsis*. SCHULZ's delimitation of the genus has been accepted in the absence of a more satisfactory treatment.

1. ***A. parvula*** (SCHRENK) O. E. SCHULZ in ENGLER, Pflanzenr. 86 (IV. 105): 269 (1924).
Syn.: *Diplotaxis? parvula* SCHRENK apud FISCH. & C. A. MEY., Bull. Acad. Sci. Petersbg. 2: 199 (1844).
Icon.: Clavis p. 13.
Typus: Ters Akkan in Central Asia.

Herba annua, glabra, multiramosa, 8—15 cm alta. Folia lineari-oblonga, sessilia, carnosa. Caules fructiferi saepe angulato-flexuosi. Pedicelli fructiferi erecto-ascendentes, 3—5 mm longi. Siliquae 8—17×1—2 mm; stylus 0,5 mm longus. Semina sub-biseriata.

Turcomania: Ashkhabad sec. NIKITIN, Fl. Ashkhabad 160 (1965).

Distr. gen.: Rossia austro-orientalis, Asia austro-occidentalis et centralis.

2. ***A. Thaliana*** (L.) HEYNH. in HOLL & HEYNH., Fl. Sachs. 1: 538 (1842).
Syn.: *Arabis Thaliana* L., Spec. Plant. 665 (1753). *Sisymbrium Thalianum* (L.) GAY & MONNIER, Ann. Scienc. Nat. Ser. 1, 7: 399 (1826).
Icon.: Clavis p. 31.
Typus: „Hab. in Europae septentrionalis sabulosis".

Herba annua, 5—50 cm alta. Folia basalia rosulata, elliptico-lanceolata, integra vel dentata, pilis ramosis et simplicibus obsita; caulina pauca, sessilia, oblonga. Inflorescentia subglabra. Petala alba vel lactea, 3—4×c. 1 mm. Pedicelli fructiferi erecto-ascendentes, tenues, 4—12 mm longi. Siliquae ascendenti-erectae, glabrae, 10—16×1 mm, apice acutae; stylus 0,5 mm longus. Semina numerosa, humiditate mucilaginosa, uniseriata.

Talish: Lenkoran, HOHEN.
Persia: N: Gorg.: Bandar Gaz, SINT. 1436. Maz.: In valle Haraz supra Panjab, 1300 m, WDB. 665! Farahabad, 24 km NW Sari, 30 m, FURSE 5184! Gil.: Bandar-e Pahlavi, LIPSKY, BORNM. 6156. Lahijan, LINDS. 739! — Persia borealis, BGE. — W: Azerb.: Qareh Dagh, BUHSE.
Afghanistan: E: In valle Panjshir, in declivibus occidentalibus jugi Anjuman, 3700 m, HDG. & WDB. 5489! Nuristan: Gusalak, 1000 m, EDELB. 27! — NE: Badakhshan: Ad lacum Shiva, Jiruj, Mian Kuh, LINDB. 852!, Baqi, LINDB. 906! — Otipore, GRIFF.!
Pakistan: Chitral: Dam Gol, TOPPIN 22! — Swat: Manghaur, R. R. STEWART 27500! Makran: Nagak, NE Turbat, HOTSON 138-a (determinatio dubia sec. auct.).

Distr. gen.: Eurasia temperata, Africa borealis.

3. ***A. Wallichii*** (Hook. f. & Thoms.) N. Busch, Fl. Cauc. Crit. 3, 4: 457 (1909).
Syn.: *Sisymbrium Wallichii* Hook. f. & Thoms., Journ. Linn. Soc. Bot. 5: 158 (1861). *Arabis taraxacifolia* Andrss. in Hook., Fl. Brit. Ind. 1: 136 (1875), syn. nov. *A. tibetica* Hook. f. & Thoms. var. *bucharica* Lipsky, Acta Hort. Petrop. 18, 1: 4 (1900), syn. nov. *Arabidopsis campestris* O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1059 (1927), syn. nov. *Arabis bucharica* (Lipsky) Nevski, Act. Inst. Bot. Acad. Sci. URSS. Ser. 1: 4: 301 (1937); Komarov, Fl. URSS. 8: 188, 640 (1939), syn. nov. *Microsisymbrium angustifolium* Jafri, Notes Roy. Bot. Gard. Edinb. 22: 113 (1956), syn. nov.
Icon.: Clavis p. 29.
Typus (Syntypi): Kumaon, Wall. Cat. 4784 *(Arabis? leptocarpa* Wall.). In Himalaya occidentali temperate, Kumaon, alt. 5000—7000 ped., Blinkworth, Strachey & Winterbottom. Kashmir et Kishtwar et Chamba, alt. 5000—7000 ped., Thomson. Afghanistan, alt. 7000 ped. Griff.

Herba biennis vel annua, pilis longis simplicibus et ramosis. Folia basalia rosulata, breviter petiolata, lyrato-pinnatifida vel runcinato-lyrata, dense stellato-pilosa; caulina pauca, summa simplicia sessilia, lineari-oblonga, integra vel dentata. Racemi laxe corymbosi, fructiferi expansi, ramos longos elegantes formantes. Petala rosea, lilacina vel alba, 3—4,5 × 1 mm, anguste oblongo-spathulata. Pedicelli fructiferi tenues, vario modo patentes, saepe recurvi, 8—15 (—25) mm longi. Siliquae glabrae, interdum breviter stipitatae 50—75 × c. 1 mm, vario modo patulae, plerumque demum recurvae; stylus 0—1 (—1,5) mm longus, apicem versus valde vel non attenuatus. Semina uniseriata, numerosa, humiditate leviter mucilaginosa. Radicula incumbens vel oblique incumbens.

Persia: E: Khor.: Bezg, 1000 m, Aitch. 1008! M. Kopet Dagh inter Quchan et jugum Alam Ali, 1600 m, Rech. 7236! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, in fissuris rupium, Rech. 4666! — C: Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 2500 m, Rech. 5897!
Turcomania: Kopet Dagh sec. Pavlov, Fl. Centr. Kazakhstana 4: 10 (1961). Ashkhabad sec. Nikitin, sub *Arabis taraxacifolia* Anders.
Afghanistan: E: Kabul: Inter Gulbahar et Sarobi, 3310 m, Gilli 916! SE Sarobi, 1050 m, Gilli 907! Sarobi, Volk 106! Paghman, Chaworth-Musters!, Hay 346!, Meinertzhagen!, Neub. 529! In valle Paghman, 2300—2800 m, Rech. 17174!, Gilli 912!, 913!, 914!, Volk 345!, Hdg. & Wdb. 2863! Kabul, Sher Darwasa, 1800 m, Hdg. & Wdb. 2887!, Gilli 909!, Neub. 70!, Gilli 910! Babur, 1700 m, Kerst. 32-a! Tang-e Gharu, 1500 m, Hdg. & Wdb. 2810!, Neub. 4048! Volk 1512! Kuh-i Asmai, 1900 m, Hdg. & Wdb. 2723! Aliabad, Neub. 118! Kabul versus Gardez, in jugo Altimur, 2800 m, Lamond 2412! Inter Mollah Jakub et Dahan-e Siah Darreh, 4 km E Panjao, 2800 m, Rech. 18655! In valle Porandeh prope Basarak, 2800 m, Gilli 915! In declivibus australibus jugi Salang, 1900—2200 m, Rech. 31288! Panjshir, Neub. 3095! Gardez: E Altimur, 2900 m, Rech. 32006! W Altimur, 2700 m, Rech. 31822!, 31918! Jaji: Inter Dre Kalla et Qasim Khel, Rech. 32275! Nuristan: In jugo Farajghan, 3040 m, Koelz 11720! Inter jugum Ashpi et Kushtos, 3400—2500 m, Neub. 654! Prope Kamdesh, 2100 m, Gilli 911! — NE: Wakhan: In valle Qasideh, M. Noshaq, 3200 m, Yoshi 582. Kataghan: In jugo Salang, 1800—2000 m, Lamond 2261!, Rech. 31706! — C: Bamian: In valle Ajar a Doab occidentem versus, 1400—1500 m, Rech. 16607! Panjao, 2700 m, Koeie 2695! — Otipore Griff.!
Pakistan: Chitral: Shokor Shal, 3500 m, Wdb. s. n.! — Swat: In valle Jabba E Kolalai, 1600—2000 m, Rech. 30732!, Lamond 1771! Inter Barikot et Mingora, 900 m, Rech. 30475! Inter Madyan et Kolalai, Rech. 30687! Inter Khawazakhiela et Shangla, 1300—1900 m, Rech. 30590! Utror, 2200 m, Rech. 30814! Peshawar: In jugo Khyber, Halcro Johnston 104!, Macdonald (typus *Microsisymbrii angustifolii* Jafri). — Kohat:

Cherat, SW Peshawar, 950 m, Rech. 30255! In declivibus borealibus jugi Kohat, 900 m, Lamond 1534! — Kurram: Peiwar versus M. Sikaram, Aitch. 74!, 385! Alizai, Aitch. 12!, 200!, 209! — N. Wazir.: Lowargi Narai, Blatt. & Fz. 1306, 1314. — S. Wazir.: Razmak, Blatt. & Fz. 1778!. Fz. 3149! N. Razmak, Maridenala, Blatt. & Fz. 1857! E Razmak, Blatt. & Fz. SW Razmak, Blatt. & Fz. — Quetta: Ziarat, Crookshank 208!, 245!, Jafri & Akhar 2097!, 2151! Lamond 1200!, 1201!, 1202!; 2300 m, Monro (typus *Arabidopsis campestris* O. E. Schulz — phot.!), Rech. 29377!

Distr. gen.: M. Himalaya occidentalis, Pamir-Alaj, Afghanistan, Pakistan occidentalis, Kopet Dagh, Khorasan.

Study of abundant material showed that there were no reasons for recognising more than one variable species. Although much of the cited material had been identified as *Arabis bucharica* or *A. taraxacifolia*, all these specimens had clearly incumbent radicles which is in contrast to all other *Arabis* species in our area which have accumbent radicles (except *A. tenuisiliqua* Rech. f. & Koelz). The specimens are very variable in leaf shape, indumentum, siliqua length and the length of the style. The last character is, at first inspection, a possible means of recognising two taxa but when examined in more detail there is a complete intergradation from very short, almost sessile styles to slender pointed, up to 2 mm long, styles. The main problem is the correct genus to which the species should be assigned. It has certain points of resemblance to *Arabis* — habit, indumentum, siliqua — but differs in the smaller flowers and the radicle character. As the genus *Arabidopsis* is at present defined there are no clear reasons for not accepting it here and until a general revision of the genus is undertaken it is best regarded as a link species between *Arabis* and *Arabidopsis*.

A. Kneuckeri (Bornm.) O. E. Schulz in Engler, Pflanzenr. l. c.: 277 is very closely related to *A. Wallichii* and was recorded from Kabul by Bornmüller (Babur, 2100 m, Manger 106!). Examination of this rather inadequate specimen showed that it agreed perfectly with other material from Afghanistan named *A. Wallichii*. The type specimen of *A. Kneuckeri* is from Sinai (Kneucker 108!).

4. ***A. pumila*** (Steph.) N. Busch, Fl. Cauc. Crit. 3, 4: 457 (1909).
Syn.: *Sisymbrium pumilum* Steph. apud Willd., Spec. Plant. ed. 4, 3, (1): 507 (1800). *S. Griffithianum* Boiss., Diagn. Pl. Or. Nov. Ser. 2, 1: 23 (1853). *Drabopsis orontica* Stapf, Denkschr. Akad. Wiss. Wien, Math.-Nat. Kl. 51, 30: 298 (1886). *Arabidopsis Griffithiana* (Boiss.) N. Busch, Fl. Cauc. Crit. 3, 4: 457 (1909). *Microsisymbrium Griffithianum* (Boiss.) O. E. Schulz in Engler, Pflanzenr. 86 (IV. 105): 159—163 (1924).
Typus: „Hab. in Persia boreali".

Herba annua, 4—50 cm alta, caulis primarius plerumque singulus. Folia basalia aut rosulata aut non rosulata, obovata, integra vel dentata vel pinnatifida; folia caulina oblonga, amplexicauli-sagittata. Racemi fructiferi valde elongati. Petala 2—3 mm longa, flava. Pedicelli fructiferi tenues, 2—6—8 mm longi. Siliquae (10—) 15—35 × 1 mm, erectae vel deflexae, stellato-pubescentes; stylus quam 1 mm brevior. Semina numerosa, uniseriata, humiditate mucilaginosa.

Iraq: Kurd.: Mosul: Aqra, Rawi 11452! Arbil: In montibus N Rost, Thesiger 944! Persia: N: Gorg.: Gorgan, Shar. 566-! Galand Rud, Sab.! Maz.: In valle Haraz supra Panjab, 1300 m, Wdb. 325. W Zardman, 700 m, Wdb. 421! 48 km S Amol, 900 m, Furse 5059! — Persia borealis, Bge. — W: Azerb.: Chahriq inter Rezaiyeh et Shahpur, M. Karnaru, Knapp. Tabriz, Gill.-Sm. 1376!, 1412!, 1811! Esf.: Jolfa, in aula monasterii armeniaci, 1500 m, Rech. 2660! Inter Delijan et Esfahan, Schmid 5150! Esfahan, Auch. 4169! Ham.: M. Karaghan, Pichler (typus *Drabopsis orontica* Stapf). — S: Fars.: Persepolis, Ky. 816! Kerm.: Kuh Tagh Ali, Bornm. 2086-c! In alveo lapidoso

supra Nabid inter Kerman et Bam, 2250 m, Rech. 3575! — E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4541! Mashhad, 1210 m, Furse 5257! — C: Tehr.: Hashemabad prope Tehran, Bruns. Tehran, Ky. 46!, 786! Qazv.: In jugo Kharzan, Bornm. 151! Kalak, 1700 m, Gauba 127! Qom, Bornm. 2092. Yazd: Jandaq, Buhse. Prope Yazd, Buhse 1390. M. Shir Kuh prope Taft, 1900 m, Bornm. 2086!, 2086-b.

Turcomania: In montibus prope Gaudan, Litw. 527-a. In salsis prope Ashkhabad, Litw. 529!, 530! In herbidis ad Gyaurs, Sint. 58! Ashkhabad, Litw. 527, 528!, Sint. 126.

Afghanistan: NW: Maimana: Darreh Zang prope Belchiragh, 1400 m, Hdg. & Wdb. 3745! Herat: Khwajachisht, Koelz 3612! Tirphul, Aitch. 163!, 189! — SW: Herat, 1000 m, Koelz 4135! — SE: Kandahar, 1200 m, Gilli 960! Girishk, 880 m, Gilli 959! — E: Kabul: Sher Darwasa, Kerst. 48, Gilli 965!, 966!, Hdg. & Wdb. 2901! Kabul: Hdg. & Wdb. 2827!, 3253!; Gilli 961!, 963!, 964!; Neub. 531!, 535!, 557!; Volk 280!, 1418, 2026. Pul-e Sorkh prope Charikar, Neub. 548! Kuh-i Asmai, 2000 m, Neub. 3019! Darulfanun, Neub. 547! Logar, Volk 1815-A! Paghman, 2470 m, Gilli 967! Sarobi, Volk 2449 p. p.! Barbur, 1700 m, Kerst. 120. Khotshe Mullah, Volk 2007. Nuristan: Inter Wama et Chetras, Edelb. 542! Gusalak, 1000 m, Edelb. 191, 192, 207. — NE: Badakhshan: In valle Zebak, 2400 m, Furse 6372! — C: Bamian: In montibus NE Bamian, 3140 m, Gilli 968! In declivibus occidentalibus Shibar, 2490 m, Hdg. & Wdb. 3303! Inter Bulola et jugum Shibar, 2700 m, Rech. 16789-b!, 16760! 16 km S Doab, 1600 m, Rech. 16698! Darreh-i Shikar, 15 km S Doab, Hdg. & Wdb. 3401!, 3415! Bamian, 2400 m, Neub. 4681!, 4683!

Pakistan: Swat: In valle Jabba E Kolalai, 1600—2000 m, Rech. 30755! — Quetta: Prope Urak, 1800 m, Lamond 184! Quetta versus Ziarat, 2200 m, Lamond 1163! In jugo Tak, 2100 m, Rech. 28389! In jugo W Ziarat, in juniperetis, 2200 m, Rech. 29314! Spin Karez, 1800—1900 m, Lamond 1134!, Rech. 29256! Quetta, Lace (?)!, Jafri 2885!, Lamond 894! In jugo Bolan, 1500 m, Lamond 716! Quetta versus Chaman, 1400 m, Lamond 1026! Shinghar 50 km N Fort Sandeman, 2000 m, Rech. 29861!, Lamond 1471! In jugo Khojak, Duthie 8583!, 8584!, Stocks 1112!

Distr. gen.: Rossia centralis et australis, Asia centralis et austro-occidentalis.

Very variable in all characters. Many varieties have been described (cf. Schulz l. c.).

5. ***A. mollissima*** (C. A. Mey.) N. Busch, Fl. Sib. et Or. Extr. 1:136 (1913).
Syn.: *Sisymbrium mollissimum* C. A. Mey. in Ledeb., Fl. Alt. 3: 140 (1831).
Typus: „Hab. in insulis atque ripis fl. Tschuja" (Altai).

Herba perennis; caulis erectus, 20—40 cm altus, pilis simplicibus longis et stellatis brevioribus obsita. Folia basalia ± rosulata, spathulata vel oblonga, subintegra; caulina anguste lanceolata, acuta, subamplexicaulia, sagittata, folia omnia canescenti-pilosa. Inflorescentia fructifera valde elongata. Petala 3—5 × 1—1,5 (—2) mm, alba vel rosea. Pedicelli fructiferi 2—15 mm longi, validi. Siliquae erectae vel erecto-patentes, rectae, 20—45 × 0,5—1,5 mm longae.

Afghanistan: E: Parvan: In valle Panjshir, Darreh Rastagal 3700 m, Hdg. & Wdb. 5235! Nuristan: Pashki, 2700 m, Edelb. 992. In jugo Urura, 3900 m, Neub. 572! In valle Shuk inter jugum Mamgel et Atershuker, 2500—3000 m, Kerst. 991! In jugo Donda, 3000 m, Kerst. 1257. — Afghanistan, Griff. 1470! Khelenmargh, 3500 m, Neub. s. n.! Pakistan: Chitral: Shishi, Bowes Lyon 134! — Swat: Bashigram, R. R. Stewart 24949!

Distr. gen.: Passim per Asiam a Sina austro-occidentali usque ad regionem himalayensem.

Closely related to *A. himalaica* and in herbaria often confused with it. In the following specimens, the cauline leaves are scarcely amplexicaul. Both are inadequate gatherings and their identification is uncertain: Afghania, GRIFF. (var. *afghanica* O. E. SCHULZ); Afghanistan E: Bharowal, GRIFF. (var. *Griffithiana* [BOISS.] O. E. SCHULZ).

6. ***A. stricta*** (CAMB.) N. BUSCH, Fl. Cauc. Crit. 3, 4: 457 (1909).
Syn.: *Malcolmia stricta* CAMB. in JAQUEM., Voy. Ind. 4: 16 (1844). *Sisymbrium strictum* (CAMB.) HOOK. f. & THOMS., Journ. Linn. Soc. Bot. 5: 161 (1861).
Typus: „In montibus Himalaya prope pagum Semla (Simla). Floret Junio". JACQUEM.

Herba annua, 30—50 cm alta, stricte erecta, pilis furcatis et stellatis obsita. Folia basalia oblongo-spathulata, apice dentata, basi cuneata, hispida; caulina superiora linearia, integra vel dentata, sessilia. Petala rosea, 3 mm longa. Siliquae 20—40 mm longae.

Pakistan: Swat: Shangla, 2100 m, LAMOND 1734!, RECH. 30655! — Kurram: Shend Toi, AITCH. 210, 251!

Distr. gen.: Montes Himalaya occidentalis, Pakistan occidentalis.

Allied to *A. mollissima* and differing in the characters given in the key and the stiff habit.

7. ***A. himalaica*** (EDGEW.) O. E. SCHULZ in ENGLER, Pflanzenr. 86 (IV. 105): 283 (1924).
Syn.: *Arabis himalaica* EDGEW., Trans. Linn. Soc. 20: 31 (1846). *Sisymbrium himalaicum* (EDGEW.) HOOK. f. & THOMS., Journ. Linn. Soc. Bot. 5: 160 (1861).
Icon.: Clavis p. 27.
Typus: „Hab. in glareosis Himala, alt. ped. 10000—11000. Mana. Sept.—Oct." EDGEW.

Herba biennis vel perennis. Caulis erectus, 20—60 cm altus, pilis longis simplicibus et brevioribus stellatis obsitus; caulina inferiora oblongo-elliptica, petiolata, integra vel dentata, superiora oblonga, sessilia, basi dilatata vel subhastata, in folia floralia transientia; folia omnia canescenti-pilosa. Inflorescentia fructifera valde elongata. Petala 3—3,5 × 1—1,5 mm, rosea vel alba. Pedicelli fructiferi 2—7 mm longi, validi. Siliquae 10—23 × 1 mm.

Distr. gen.: Montes Himalaya occidentales.

No specimens have been seen from our area but its presence in NE Afghanistan, Chitral and Swat would not be unexpected.

Although *A. himalaica* is said to differ from *A. mollissima* in the bracteate inflorescences and shorter pedicels, there appear to be transitions between the two species.

8. ***A. toxophylla*** (M. B.) N. BUSCH, Fl. Cauc. Crit. 3, 4: 457 (1909).
Syn.: *Arabis toxophylla* M. B., Fl. Taur.-Cauc. 3: 448 (1819).
Typus: Non designatus.

Herba biennis vel perennis, 10—40 cm alta, inferne stellato-pilosa, superne glabrescens. Folia basalia oblonga, integra vel subruncinata, longe petiolata, utrinque stellato-pilosa; caulina superiora longe linearia, manifeste sagittata. Inflorescentia fructifera valde elongata. Petala 6—8 mm longa, alba. Pedicelli fructiferi tenues, suberecti, 15—25 mm longi. Siliquae substipitatae, 15—27 × 0,75 mm, glabrae; stylus 0,75 mm longus. Semina biseriata.

Distr. gen.: Rossia europaea, Siberia occidentalis, Asia centralis.

In Fl. URSS. 8: 79 (1939) this species is recorded as occurring in Afghanistan but no specimens have been seen from our area.

9. ***A. gamosepala*** Hedge, sp. nov.
Icon.: Tab. 35, fig. 1.
Typus: Podlech 12379, holotypus M!; isotypus W!

Perennis caulibus numerosis simplicibus erectis 5—16 cm altis, indumento omnino e pilis numerosis ramosis paucis longioribus simplicibus immixtis consistens. Folia plurima basalia, spathulato-oblonga, subintegra vel pinnatifida, petiolata. Folia caulina lineari-oblonga, integra, in petiolum attenuata. Inflorescentia ebracteata. Sepala non vel vix saccata, gamosepala, fructificationis tempore persistentia. Petala 3×c. 1 mm, alba, apice truncato-rotundata, basi attenuata. Pedicelli 1,5—4 mm, validi. Siliquae 12—17×1 mm, subrecurvae, indumento e pilis ramosis consistente. Stylus 0,5 mm longus. Stigma depresso-capitatum. Radicula incumbens. — Differt a ceteris speciebus generis combinatione characterum sequentium: habitu perenni, racemis ebracteatis, sepalis coalitis, pedicellis fructiferis crassis, siliquis brevibus subrecurvis.

Afghanistan: NE: Munjan: In parte superiore valli Anjuman prope pagum Anjuman, 3100 m, 14. VIII. 1965, Podlech 12379!

Distr. gen.: Endem.

Although this species has no clear ally in *Arabidopsis* and clearly differs from all the other members of the genus in the combination of characters given in the diagnosis, it has all the technical characters of *Arabidopsis* with the single exception of not having median honey glands.

10. ***A. eseptata*** Hedge, sp. nov.
Icon.: Tab. 35, fig. 2.
Typus: Podlech 12164, holotypus M!

Herba annua, tenella, usque ad 6 cm alta, plerumque irramosa, flaccida. Folia pauca, petiolata, anguste oblongo-ovata, integra vel subintegra, indumento e pilis plerumque 4-fidis stellatis consistente, in ambobus faciebus foliorum. Racemi pauciflori. Sepala c. 1 mm longa. Petala alba (?) oblonga, 1—1,5 mm longa, integra. Stamina 4 (2+2); antherae muticae. Pedicelli fructiferi patuli, ascendentes vel deflexi, c. 4 mm longi, tenues. Siliquae 10—13×0,5 mm, enerviae; indumentum e pilis appresso-patulis mediofixis bifidis consistente (pilis stellatis nullis); septum nullum; stylus quam 0,5 mm brevior; semina uniseriata, humiditate non mucilaginosa; radicula incumbens; funiculus brevis, crassiusculus.

Afghanistan: NE: Kataghan: In parte superiore vallis Andarab infra Doab-i Til, ad viae margines, Podlech 11141! — C: Bamian: Band-i Amir, ad ripam austro-orientalem lacus intermedii infra rupes impendentes, 2850 m, 31. VII. 1965, Podlech 12164! Ad lacum Band-i Panir, 2800 m, Rech. 18359! Bulola, 2200 m, Rech. 16736! Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16789-a!

Distr. gen.: Endem.

This is a distinct species recognised by the annual, flaccid habit, the very small petals, the four stamens, the medifixed hairs on the fruit valves and the absence of a septum. It clearly differs from all the other species in the genus both in facies and in the characters of the stamens and fruit. It also differs from all other members of the genus in the non-mucilaginous seeds. Although there are reasons for regarding it as a separate genus, I prefer in the meantime to regard it as a distinct and very reduced species of *Arabidopsis*.

120. *Cymatocarpus*

Cymatocarpus O. E. SCHULZ in ENGLER, Pflanzenr., Cruciferae-Sisymbrieae 86 (IV. 105): 300 (1924).

Lit.: l. c.: 300—302.

Herbae annuae foliis simplicibus petiolatis; indumentum e pilis simplicibus imprimis prope basin caulis densissimis et longissimis consistens. Sepala late hyaline marginata, interiora leviter saccata. Petala sulfurea, lamina late obovata, ungue brevi. Ovarium 10—30-ovulatum. Siliqua elongata, dehiscens, torulosa, inter semina constricta. Radicula incumbens. — Species 3, 2 in Asia centrali, 1 in Transcaucasia indigenea.

1. ***C. pilosissimus*** (TRAUTV.) O. E. SCHULZ in ENGLER, Pflanzenr. 86 (IV. 105): 300 (1924).
Syn.: *Sisymbrium pilosissimum* TRAUTV., Acta Horti Petrop. 9, 1: 369 (1884).
Icon.: Clavis p. 21.
Typus: Kizyl Arvat, BECKER, LE.

Herba erecta annua, 20—50 cm alta, caulis basi pilis usque ad 5 mm longis. Folia basalia obovata vel elliptica, in petiolum latum cuneato-attenuata, irregulariter dentata; caulina minora, breviter petiolata, omnia ± membranacea. Racemi floriferi condensati, fructiferi elongati. Petala 4—6 mm longa. Siliqua 25—50 × 1,5—2 mm.

Persia: N: Gorg.: Dasht-e Gorgan, SHAR. 567!
Turcomania: Mekrow, Ashkhabad, SINT. 129! In collibus Ak Tepe, LITW. 537! Prope Kizyl Arvat, BECKER. Keltezinar, LITW. 538!
Afghanistan: NW: Herat: Hari Rud, AITCH. 276!

Distr. gen.: Kizyl Kum, in montibus Turcomaniae, Persia borealis, Afghanistan boreo-occidentalis.

121. *Christolea*

Christolea CAMB. in JACQUEM., Voy. Part. Bot. 4: 17 (1844).
Syn.: *Koelzia* RECH. f., Phyton 3: 59 (1951).

Lit.: S. M. H. JAFRI, Christolea: With Special Reference to the Species in NW Himalayas, W Pakistan and Afghanistan, Notes from the Royal Botanic Garden Edinburgh 22: 49—59 (1955). V. BOTSCHANTZEV, De Cruciferis Notae Criticae, Not. Syst. Leningrad 17: 176—177 (1955). A review of Jafri's paper on Christolea in Bot. Zhurn. URSS. 41: 728—732 (1956).

Herba perennis pilis simplicibus obsita vel glabra, foliis simplicibus carnosis, basi cuneatis superne dentatis, petalis flavis. Sepala patentia, non saccata. Siliqua late linearis, compressa dehiscens. Radicula incumbens.

1. ***C. crassifolia*** CAMB. in JACQUEM., Voy. Part. Bot. 4: 17, tab. 17 (1844).
Syn.: *C. incisa* O. E. SCHULZ, Notizbl. Bot. Gart. Berlin 9: 1073 (1927). *Koelzia afghanica* RECH. f., Phyton 3: 59 (1951). *Christolea afghanica* (RECH. f.) RECH. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 1954: 64 (1954).
Icon.: Clavis p. 13 et 21.
Typus: W. Tibet: „Ad jugum vulgo Houkio-ghauti ad fines provinciae Kanaor et Tartariae sinensis. Floret Augusto", JACQUEM., K!

Herba perennis, 8—30 cm alta, valde ramosa, pubescens, raro glabra. Folia magnitudine et forma valde variabilia, ovata usque spathulata, superne plerumque

triangulari-dentata, interdum integra. Racemi ebracteati. Petala 6—7 × 2,5—3,5 mm, flava vel albescentia, interdum basi purpureo-suffusa. Stigma profunde bilobum, subsessile. Ovarium 10-ovulatum. Racemi fructiferi usque ad 8 cm longi. Pedicelli fructiferi 5—10 mm longi. Siliqua 11—15 × 2—2,5 mm, pubescens; septum centro tenue. Semina 5—10.

Afghanistan: NE: Wakhan: M. Noshaq, 3200 m, Yosii 582. In jugo Munjan, 3600 m, Koelz 12723! Badakhshan, 3000—3600 m, Giles 238!, 245! — C: Bamian: Band-e Amir, 2900 m, Hdg. & Wdb. 4782!

Distr. gen.: In regionibus Himalayae boreo-occidentalibus, Afghanistan, Asia centralis.

A very variable species often growing on bare slopes. The cited specimen from Bamian differs from the others in the broader, contorted fruits (possibly due to insect attack) and smaller petals. It is from a lower altitude than the other specimens and is the most westerly record of the species.

122. *Camelina*

Camelina Crantz, Stirp. Austr. 1: 17 (1762).

Lit.: N. Zinger, Über die im Lein auftretenden Camelina und Spergula-Arten und ihre Abstammung. Traveaux du Musée botanique de l'Académie Imperiale des Sciences de Russie, St. Petersbourg 6: 1—234 (1909). O. Tedin, Vererbung, Variation und Systematik in der Gattung Camelina, Hereditas 6: 275—386 (1925).

Herbae annuae vel biennes, foliis simplicibus, floribus albis, lacteis vel flavis. Indumentum e pilis simplicibus et ramosis consistens. Folia caulina sessilia amplexicaulia sagittata. Sepala non saccata. Stamina plerumque tribus longitudinibus inaequalibus. Fructus silicula dehiscens, latisepta, obovoidea vel pyriformis, valvis convexis validis. Septum corrugatum. Semina numerosa, mucilaginea. Radicula incumbens (in *C. sativa* raro accumbens).

1a. Caules fructiferi angulato-flexuosi. Flores aurei ..... 1. *C. laxa* C. A. Mey.
b. Caules fructiferi stricti. Flores albi, lactei vel flavi 2
2a. Axis inflorescentiae pilis simplicibus et furcatis obsita ... 2. *C. hispida* Boiss.
b. Axis inflorescentiae glabra vel subglabra 3
3a. Racemi fructiferi laxi. Fructus inferiores inter se magis remoti quam superiores, apice acuminati ..... 5. *C. rumelica* Velen.
b. Racemi fructiferi ± densi. Fructus omnes aequidistantes, apice rotundati . 4
4a. Indumentum e pilis simplicibus et furcatis consistens. Silicula 2,5—5 mm longa. Pedicelli fructiferi tenues, 4—10 mm longi ... 4. *C. microcarpa* Andrz.
b. Indumentum e pilis stellatis tantum consistens. Silicula 7—9 mm longa. Pedicelli fructiferi validi, 10—20 mm ..... 3. *C. sativa* (L.) Crantz

Taxonomically a troublesome genus. With the exception of *C. laxa* and *C. hispida*, the species are most variable and tend to merge into each other. They often occur as weeds in flax fields.

1. ***C. laxa*** C. A. Mey., Verz. Pfl. Cauc. 193 (1831).
Typus: C. A. Mey., LE.

Herba annua, 20—40 cm alta, multiramosa, inferne scabrida, superne subglabra. Folia basalia rosulata oblongo-lanceolata, integra vel irregulariter dentata; folia caulina auriculis prominentibus triangularibus. Petala 4—7 mm. Pedicelli fructiferi 11—16 mm longi, tenues, erecto-ascendentes. Silicula obpyriformis, 4—6 × c. 3 mm; stylus 1,5—2 mm. Semina 5—8.

Talish: Swant, prope Tatuni, HOHEN. Lenkoran, BGE.! Talish, C. A. MEY.
Persia: W: Azerb.: Inter Tabriz et Tehran, BGE. — C: Qazv.: Pachenar, 550 m, BORNM. 6265.

Distr. gen.: Anatolia centralis et orientalis, Talish, Persia borealis.

Easily recognised by the bright yellow flowers and the zig-zag inflorescence axis.

2. ***C. hispida*** BOISS., Ann. Scienc. Nat. Ser. 2, 17: 176 (1842).
Typus: Armenia turcica, AUCH. 359, G!

Herba annua usque ad 30 cm alta, pilis simplicibus et furcatis vel stellatis obsita. Folia basalia non rosulata, oblongo-lanceolata. Petala intense flava, 5—8 mm longa. Pedicelli fructiferi 2—4 mm longi, angulo 45—90° patentes. Silicula obovata, c. 3×2—3 mm, valvis glabris, stylus 2,5—3 mm.

Persia: W: Azerb.: Ad lacum Rezaiyeh, 1300—1400 m, JACOBS 6657! Ham.: Bahar, BABAI s. n.!

Distr. gen.: Syria, Anatolia, Azerbaijan.

Represented in our area only by the type variety which differs from the other varieties in the glabrous and more or less spreading fruits. The long style and hispid inflorescence axis are characteristic of the species.

3. ***C. sativa*** (L.) CRANTZ, Stirp. Austr. 1: 17 (1762).
Syn.: *Myagrum sativum* L., Spec. Plant. 641 (1753).
Typus: „Hab. in Europa inter *Linum*".

Herba annua vel biennis, 30—60 cm alta, non vel vix ramosa, subglabra vel pilis simplicibus et ramosis obsita. Folia basalia oblongo-lanceolata, caulina linearioblonga, auriculis acutis prominentibus. Petala flava, 5 mm longa. Inflorescentia fructifera ± densa. Pedicelli fructiferi 10—20 mm longi, ascendentes. Silicula obovoidea, 7—9×4—5 mm; stylus 1,5—2 mm longus.

Distr. gen.: Europa centralis, Rossia australis.

A weed of flax and corn fields. No specimens have been seen from our area but it may occur as an introduced weed. GROSSHEIM records *C. pilosa* (DC.) ZING., Trav. Mus. Bot. Acad. Sci. Petersbg. 6: 23 (1909), a narrow segregate of *C. sativa*, from the Talish, Fl. Kawk. ed. 2, 4, tab. 190 (1950). It differs from the typical form of the species in the dense pilose indumentum.

4. ***C. microcarpa*** ANDRZ. in DC., Reg. Veg. Syst. Nat. 2: 517 (1821).
Syn.: *C. sativa* (L.) CRANTZ subsp. *microcarpa* (ANDRZ.) E. SCHMID in HEGI, Ill. Fl. Mitteleur. 1, 4: 370 (1919).
Icon.: Clavis p. 25.
Typus: Podolia.

Herba annua vel biennis, 30—50 cm alta, pilis simplicibus et furcatis vel stellatis obsita. Folia basalia oblongo-lanceolata. Petala flavescenti-albida, 6—8 mm longa. Pedicelli fructiferi 4—9 mm longi, erecto-ascendentes vel fere horizontales, tenues. Silicula obovata, 2,5—5×2—3,5 mm; stylus 2,5—3,5 mm.

Talish: sec. GROSSH., Fl. Kawk. ed. 2, 4: tab. 189 (1950).
Persia: N: Gil.: In montibus Elbursensis supra Pak Deh, BUHSE. — C: Yazd: In montibus Shir Kuh prope Yazd, BUHSE 204, 1363-a.
Turcomania: Kizyl Arvat, BECKER.

Distr. gen.: Europa centralis et australis, Africa borealis, Anatolia, Caucasus, Talish, Persia (?), Asia centralis.

No specimens have been seen from our area and some of those cited may be referable to anomalous forms of *C. rumelica* Velen. (cf. below).

5. ***C. rumelica*** Velen., Sitz.-Ber. Böhm. Ges. Wiss. 1887: 448 (1887).
Syn.: *C. sylvestris* Waller. var. *albiflora* (Ky.) Boiss., Fl. Or. 1: 312 (1867).

Lit.: K. Fritsch, Zur Kenntnis der Camelina rumelica, Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften in Wien, Mathematisch-naturwissenschaftliche Klasse 138, 1: 347—370 (1929).

Icon.: Clavis p. 17.
Typus: Rumelia.

— — subsp. ***rumelica***

Herba annua 20—60 cm alta. Caulis simplex vel raro a basi ramosus, inferne pilis simplicibus rigidis obsitus, in regione inflorescentiae subglaber. Folia basalia ± rosulata, oblonga usque ad lanceolata, integra vel irregulariter dentata; caulina oblonga, acuta, amplexicaulia auriculis triangularibus. Sepala pilis longis simplicibus obsita. Petala 6—7 mm longa, flavescenti-albida. Pedicelli fructiferi 7—10 mm longi, angulo 45—90° patentes. Silicula obovata, 6—8×4—5 mm; stylus 2—3 mm longus; Semina 18—20.

Talish: sec. Grossh., Fl. Kawk. ed. 2, 4: tab. 189 (1950).
Persia: N: Gorg.: Inter Naudeh et Shahrud, 1000—2000 m, Schmid 6155! Maz.: In declivibus septentrionalibus jugi Kandavan, 2400 m, Gauba. Pol-e Zanguleh, 1800 m, Gauba 1178; 2200—2600 m, Rech. 6328! Gil.: Ad fluvium Safid Rud prope Rudbar, 300 m, Bornm. 6267. — W: Azerb.: Ad lacum Rezaiyeh, 1300 m, Jacobs 6634! S Tabriz, Gill.-Sm. 1434, 1526, 1808. Tabriz, Grossh. Kermansh.: „In monte Kuh-i Tarikha", Str. Lur.: Oshtoran Kuh, Azna, Furse 1771! Dow Rud, Koelz 15743! Bisheh, 1200 m, Kotschy 614! — S: Fars.: Kuh-e Barfi, Shiraz, Stapf 222! — E: Khor.: Inter Mashhad et Torbat-e Heydariyeh, 1700 m, Rech. 1545! In collibus ad Torbat-e Heydariyeh, 1300 m, Rech. 4317! (ad *C. microcarpam* vergens). M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 4907! Ardak, Rech. 5222! M. Kopet Dagh inter Quchan et Lotfabad in jugo Allah Akbar, 1800 m, Rech. 1740! (ad *C. microcarpam* vergens). — C: Tehr.: M. Damavand ad Ab-e Garm, Bruns. Damavand, Furse 2538! Qazv.: Sultanabad prope Qazvin, Linds. 72! Inter Qazvin et Karaj, 1650 m, Gauba & Sab. 187! Kuh Dashteh, 1600 m, Rech. 747! In collibus prope Khur et Fashand, Rech. 679! Damgh.-Semn.: Kuh-i Nizwa S Taru, 2800 m, Wdb. 1138-b! Shahr.-Bust.: In jugo Khash Aylan 70 km a Shahrud orientem versus, 2000 m, Rech. 5485!
Turcomania: Kizyl Arvat, Sint. 1657. Supra Nephton prope Ashkhabad, Sint. 619-a. Gyaurs prope Ashkhabad, Sint. 619-b. Firyuza, Litw. 589! Ashkhabad, Litw. 587!
Afghanistan: NW: Herat: Obeh, 1700 m, Kotschy 3779! — SW: 48 km S Herat, 1220 m, Furse 5426! — E: Kabul: Istalif, 1840 m, Neub. 3475!, 4336; Gilli 1109! 22 km supra Gulbahar, 1750 m, Hdg. & Wdb. 3003! In declivibus australibus jugi Salang, 1900 m, Rech. 31292! In valle Ghorband, 2560 m, Furse 5807! Panjshir: In valle inter Dasht-i Rewat et Deh Khawak, 2300 m, Hdg. & Wdb. 5311! Nuristan: Wama, 1400 m, Edelb. 526! — NE: Badakhshan: Mashhad, 900 m, Furse 6102! Kataghan: Ishkamish, 1150 m, Podlech 10666! In valle Andarab: Taganak, 2250 m, Podlech 11024. Supra Sarab, 2600 m, Podlech 11214-a. — C: Bamian: Darreh-i Shikar, 1500 m, Hdg. & Wdb. 4147!, Rech. 16681!
Pakistan: Ojor Gol, 3050 m, Bowes Lyon 839!

Distr. gen.: Europa, Asia australis, occidentalis et centralis.

A very variable taxon often forming ± distinctive local populations. It is characterised by the white or very pale yellow flowers, a hispid indumentum of simple hairs

only, loose fruiting racemes, the lowermost fruiting pedicels longer and more widely separated than the upper and generally a more pointed fruit apex. Exceptions to these characters are frequent and some of the variants closely approach *C. microcarpa*.

— — subsp. ***transcaspica*** (Fritsch) Hedge, comb. et stat. nov.
Syn.: *C. transcaspica* Fritsch, Sitz.-Ber. Akad. Wiss. Wien 138, 1: 365 (1929). *C. rigidula* Bornm. & Gauba, Feddes Repert. 39: 84 (1935), syn. nov.
Typus: Sint. 164!

Differt a subsp. *rumelica* indumento e pilis ramosis et simplicibus consistente.

Persia: C: Tehr.: M. Elburz prope Firuzkuh, 1800 m, Rech. 5573! Qazv.: Shahabad prope Karaj, 1250 m, Gauba 188!, 215! Karaj, in montibus Kuh Safid, 1500 m, Rech. 611! Damgh.-Semn.: Kuh-i Nizwa, 2600 m, Behb. & Aell. 1011! Shahr.-Bust.: Sefid Khok, 2400 m, Schmid 5940!
Turcomania: Ashkhabad, Gyaurs, Sint. 164!

Distr. gen.: Endem.

In addition to the main distinguishing character of the indumentum, subsp. *transcaspica* differs from the type subspecies in the slightly sturdier, more or less equally spaced fruiting pedicels of similar length and in the more rounded fruit apices. In the specimens cited there is a marked variation in the length of the fruiting pedicels: in Sint. 164, they are c. 12 mm whereas in Rech. 5573 they are c. 20 mm.

123. ***Descurainia***

Descurainia Webb & Berth., Phyt. Canar. 1: 72 (1836—40).

Lit.: O. E. Schulz in Engler, Das Pflanzenreich, Cruciferae-Sisymbrieae, 86 (IV. 105): 305—346 (1924).

Herbae annuae vel perennes foliis bi- vel tripinnatisectis; indumentum laxum e pilis brevibus ramosis et simplicibus consistens, interdum deficiens. Sepala non saccata. Petala lactea vel flava. Fructus siliqua elongata dehiscens. Semina uniseriata, numerosa, humiditate mucilaginosa. Radicula incumbens.

1. ***D. Sophia*** (L.) Webb & Berth. in Engler & Prantl, Natürl. Pflanzenfam. 3, 2: 192 (1891).
Syn.: *Sisymbrium Sophia* L., Spec. Plant. 659 (1753).
Icon.: Clavis p. 15, 21 et 29.
Typus: „Hab. in Europae, maceriis, muris, tectis".

Herba annua vel biennis, usque ad 80 cm alta; indumentum in parte inferiore plantae e pilis ramosis et simplicibus consistens superne glabrescens vel planta omnino glabra. Folia basalia longe petiolata, 2—3-pinnatisecta, segmentis linearibus; folia caulina subsessilia. Petala 2,5—4 × 0,5—1 mm, quam sepala paulo longiora vel paulo breviora. Pedicelli fructiferi patentes vel erecto-ascendentes, (5—) 10—15 mm longi. Siliqua 15—35 × 0,5—1 mm, recta vel curvata, ± torulosa; stylus brevissimus.

Iraq: Kurd.: Arbil: Rayat E Rawandiz, Thesiger 1036! Hajji Omran, 1750 m, Chapman 12277. Mosul: Zawita, 900 m, Guest 4537. Amadiyah, Haines!
Talish: Archivan, Kisilagach, Lenkoran, Swant, ad ripam fluvii Araxes, Hohen.
Persia: N: Maz.: In valle Haraz, Zardman, 600 m, Wdb. 422! 48 km S Amol, Furse 5060! — W: Azerb.: Tabriz, Gill.-Sm. 1323, 1344. Kurd.: 5 km W Sanandaj inter Sanandaj et Dezh Shahpur, Bent & Wr. 519—1103! Ham.: Kuh-e Garri, Arak versus Kermanshah, Str. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 189! Bakht.: Shahr Kord, Furse 1392! Lur.: Dow Rud, Koelz 17355! Shah Bazan, 500 m, Koelz

1442. — S: Kerm.: Tomagoa, Koelz 14312! Baghin, 1900 m, Bornm. 2081. Kerman, 1900 m, Bornm. 2083, Rech. 2956! Inter Kerman et Saidabad, inter Mashiz et jugum Khaneh Sorkh, 2300 m, Rech. 3020! Jiroft, Sabzavaran, 700 m, Rech. 3709! Kavir: Jandaq versus Biyabanak, Gabr. 75. Fars.: Shiraz, Koelz 14521!, Grant 15450. Jahrom, Koelz 14549! Bal.: Khash, Shar. 214-E! Makran: Bazman prope Ziarat, Gabr. 89. — E: Khor.: Ozbagu: Kuh-e Safid, Ruttner 364! Chistu, Ruttner 286! — C: Tehr.: Inter segetes ad Garmsar inter Tehran et Semnan, 900 m, Rech. 2673! M. Tuchal prope Lashkarak, Bruns. Kan, Bruns. Damavand, 2640 m, Gilli! NE Firuzkuh, Furse 2961! 7 km N Polur in juniperetis, 2500 m, Grant 16512. Tehran, Bruns. Qazv.: Karaj, Rech. 2732-a! Alangeh, Gauba. Qazvin, 1500 m, Jacobs 6200!, Stapf. Shahr.-Bust.: M. Shahvar prope Nokarman, 2500 m, Rech. 5996! Yazd: M. Shir Kuh prope Taft, Bornm. 2079. Aqda, inter Esfahan et Yazd, Bornm. 2082.
Turcomania: Ashkhabad, Litw. 533.
Afghanistan: NW: Hari Rud, Aitch. 218. — SW: Herat, Amsel! — SE: Kandahar, 1020 m, Gilli 988! — E: Kabul: Chaman Wazirabad, Gilli 989! Sher Darwasa, Gilli 991! 36 km N Kabul. Podlech 10206. In planitie Darulfanun versus Paghman, 1700 m, Kerst. 127, Volk 94, 326, 1417, 1656. Sarobi, Volk 1892, 2465! Istalif, 1840 m, Gilli 992!, Neub. 4329. Kabul, Hdg. & Wdb. 2825!, Neub. 515!, Gilli 990!, Koelz 11479! Volk 284! Behzud, 2800 m, Rech. 18622! Shashgao, Kitam. Ghazni: Distr. Malestan inter jugum Kotal-e Kechru et pagum Miradina NW Sang-i Masha, 2700 m, Rech. 17547! 64 km N Ghazni, Furse 5678! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17946! Behzud, Thesiger 150! Jalalabad, 600 m, Gilli 987! Panjshir: Parian, 2700 m, Podlech 12304. Nuristan: Gusalak, 1000 m, Edelb. 39! — NE: Badakhshan: Faizabad, 1066 m, Furse 6221! In parte superiore vallis Zebak, 2285 m. Furse 6386! Hazratsaid, Koelz 12864-a! Kataghan: Taliqan, 720 m, Podlech 10288. Farkhar, 1250 m, Podlech 10479. Ishkamish, 1150 m, Podlech 10665. In valle Andarab: Banu, 1550 m, Podlech 10937. — C: Bamian: In valle c. 16 km S Doab, 1600 m, Rech. 16685! Prope Naiak, Band-i Amir versus Panjao, 2600 m, Hdg. & Wdb. 4835! Band-i Amir, 2900 m, Gilli 993!
Pakistan: Peshawar: In jugo Khyber, Halcro Johnston 26! — Kurram: In valle Kurram versus Habibkala, Aitch. 149, 157. — N.-Wazir.: In valle Miram Shah, Blatt. & Fz. 637, 969. Miram Shah Fort, Blatt. & Fz. 141. Boya Fort, Fz. 1205, 1223. Datta Khel Fort, Blatt. & Fz. 1393. — S. Wazir.: Wana Duthie 15646. — Quetta: Qila Abdullah, Duthie 8582. Shinghar, 2050 m, 50 km N Fort Sandeman, Rech. 29875, Lamond 1476! Fort Sandeman, Harsukh 18776, 20466. Sariab S Quetta, 1700 m, Rech. 28843, 28855! Ziarat, Lamond 1197! Spin Karez, 1800 m, Rech. 29250. Kirani, H.-B. 17306, 18898. Quetta, Lace 3637!, Lamond 903! Distr. Pishin. Gaz. 353. — Kalat: Mastung, H.-B. 17167, Hotson 395. Surab versus Kalat, c. 20 km a Surab, 1800 m, Lamond 670!, Rech. 28338, 28323. In collibus Pab, Jhalowan, H.-B. 19492. In collibus Harboi, H.-B. 19527. Makran: Khudabadan N Panjgur, Hotson M 181.

Distr. gen.: Per Eurasiam et Africam borealem late dispersa.

A variable species in which O. E. Schulz, l. c. recognised several infraspecific taxa. Much of the SW Asiatic material falls within var. *persica* (Schrad.) O. E. Schulz with the long petal dimensions as above in contrast to European specimens in which the petals scarcely exceed the sepal length.

124. *Sophiopsis*

Sophiopsis O. E. Schulz in Engler, Pflanzenr., Cruciferae-Sisymbrieae 86 (IV. 105): 346 (1924).

Herbae biennes foliis pinnatisectis, floribus flavis vel albis, pilis ramosis et simplicibus. Sepala late oblonga, antice rotundata, non saccata. Ovarium pyriforme, siliqua linearis; semina uniseriata, numerosa, humiditate mucilaginea. Radicula incumbens. — Species quattuor Asiam centralem inhabitantes.

1. ***S. flavissima*** (Kar. & Kir.) O. E. Schulz in Engler, Pflanzenr., 86 (IV. 105): 346 (1924).
Syn.: *Sisymbrium flavissimum* Kar. & Kir., Bull. Soc. Nat. Mosc. 1841: 382 (1841).
Icon.: Clavis p. 29.
Typus: „In rupestribus montium Tarbagatai ad torrentes Dschanybek et Terekty, Kar. & Kir., anno 1840, 95!", LE.

Herba biennis vel annua, 30—50 cm alta, superne ramosa vel simplex. Folia pinnatisecta, pubescentia. Racemi floriferi condensati, fructiferi elongati. Petala intense flava, emarginata, 3 mm longa. Siliqua 8—10 mm longa; pedicelli 6—10 mm longi, suberecti vel patuli, tenues.

Pakistan: Chitral: Yarkhun, 3200 m, Bowes Lyon 978! Chitral, Toppin 474!

Distr. gen.: Dsungaro-Tarbagatai, Amu Darya, Chitral.

125. *Smelowskia*

Smelowskia C. A. Mey. in Ledeb. Fl. Alt. 3: 165 (1831).
Syn.: *Chrysanthemopsis* Rech. f., Phyton 3: 51 (1951).

Lit.: O. E. Schulz in Engler, Pflanzenreich, Cruciferae-Sisymbrieae 86 (IV. 105): 352—359 (1924).

Herba perennis, foliis pinnatisectis floribus albis, indumento e pilis simplicibus et ramosis consistente. Sepala non saccata, late hyaline marginata. Ovarium c. 10-ovulatum. Silicula brevis, ellipsoidea, dehiscens; valvae carinatae. Radicula incumbens.

1. ***S. calycina*** (Willd.) C. A. Mey. in Ledeb., Fl. Alt. 3: 170 (1831).
Syn.: *Lepidium calycinum* Willd., Spec. Plant. ed. 4, 3 (1): 433 (1800). *Chrysanthemopsis Koelzii* Rech. f., Phyton 3: 51 (1951). *Smelowskia Koelzii* (Rech. f.) Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 7: 63 (1954).
Icon.: Clavis p. 25.
Typus: Altai, Kolywani mountains, Stephan in Willd. herb. no. 11809, B.

Perennis, caespitosa caudice crasso lignoso. Caules floriferi 15—20 cm alti. Folia plurima basalia, petiolata, indumento canescenti-albida; residua petiolorum persistentia. Inflorescentia densa, fructifera paulo elongata. Petala 5,5—6,5 × 3—3,5 mm, lamina lata obovata, ungue tenui. Sepala et petala post anthesin persistentia. Pedicelli 5—8 mm longi, erecto-ascendentes. Silicula 5—6,5 × 2 mm; stylus 1 mm longus; stigma capitatum. Semina 4—5.

Afghanistan: NE: Nuristan: In jugo Munjan, Koelz 12767! Wakhan: In valle Futur, 3900 m, Roemer 88. In montibus Pamir minoribus, usque ad 4600 m, Roemer obs. Badakhshan: In declivibus orientalibus jugi Anjuman, 4200 m, Hdg. & Wdb. 5485!, In declivibus borealibus jugi Chamar, Thesiger 1386! Kataghan: In valle Echani, Khost-o Fereng, 3900 m, Podlech 11821.
Pakistan: Chitral: In jugo Dorah, 3900 m, Giles A 201! Inter jugum Dorah et Gabur, 4300—4500 m, Kerst. 1538! In valle Lutko, 4200 m, Stainton 3249! In jugo Chumarkhan E Mastuj, 3800 m, Stainton 2914!

Distr. gen.: Afghanistan boreo-orientalis, Chitral, Asia, Siberia orientalis et occidentalis, Mongolia, America occidentalis.

A high alpine species with a very interesting distribution. An account of the W American varieties of this species is given in Rhodora 54: 97—107 (1952).

126. *Robeschia*

Robeschia Hochst. ex Fourn., Thèse Crucif. 146 (1865).

Lit.: O. E. Schulz in Engler, Pflanzenreich, Cruciferae-Sisymbrieae 86 (IV. 105): 359—361 (1924).

Herba annua tenuis foliis pinnatisectis, floribus albidis, indumento brevi ramoso. Sepala oblonga, non saccata. Ovarium c. 20-ovulatum. Stylus subnullus; stigma minutissimum, capitatum. Siliqua longe linearis, teres, dehiscens, apice acuta, costa mediana carinata; pedicelli fructiferi incrassati. Radicula incumbens.

1. ***R. Schimperi*** (Boiss.) O. E. Schulz in Engler, Pflanzenreich l. c. 360.
Syn.: *Sisymbrium Schimperi* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 76 (1842). *Arabidopsis Schimperi* (Boiss.) N. Busch, Fl. Cauc. Crit. 3, 4: 457 (1909).
Icon.: Clavis p. 29.
Typus: M. Sinai, Schimper 170, E!, G.

Herba annua erecta, 5—15 cm alta. Folia inferiora petiolata, bipinnatisecta, lobis angustis oblongis integris vel dentatis; folia superiora similia, breviter petiolata. Inflorescentia fructifera elongata. Petala 4,5—5,5 × 1—1,5 mm, albida vel flavescentia, demum rosea vel violascentia. Pedicelli fructiferi 1—2,5 × 1 mm. Siliqua 25—35 × 1—1,5 mm, rigida, suberecta; septum undulatum; semina uniseriata, numerosa; valvae glabrae vel pilis ramosis obsitae.

Persia: W: Ham.: M. Karaghan, Str. Esf.: Inter Esfahan et Kerman, Bge. Chehel Dokhtaran Kuh, 3000 m, Wdb. 1780! Bakht.: Kuh Rang, 2400 m, Wdb. 984! Lur.: Oshtoran Kuh, Azna, Furse 1769! — S: Fars.: Kuh-e Barfi, prope Shiraz, Ky. 337! In collibus W Khaneh-ye Zenyan, inter Shiraz et Kazerun, 2000 m, Merton 3826! Deh Bid, Archibald 1217! Kerm.: Inter Khabis et Kerman, Bge. Inter Kerman et Saidabad, inter Mashiz et jugum Khaneh Sorkh, 2300 m, Rech. 3076! M. Jebal Barez inter Bam et Jiroft, Deh Bakri, 2400 m, Rech. 3764! Kuh-e Jupar, 2900 m, Bornm. 2084! — C: Yazd: Shir Kuh prope Taft, 1900 m, Bornm. 2085. Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman supra Raheh, 2700—3000 m, Rech. 5967!
Pakistan: Quetta: In jugum Khojak, Duthie 8611!, Griff. Sheila Bagh, Lace 3330! Quetta versus Ziarat, 2200 m, Lamond 1176!, Rech. 29316! Baluchistan, Stocks!

Distr. gen.: Sinai, Syria, Persia, Pakistan.

Addenda

9. *Crambe*

2. ***C. Kotschyana*** Boiss.

Afghanistan: N: Mazar-i Sharif: In faucibus 21 km W Tashkurghan versus Haibak, 600 m, Rech. 34035! — NE: Kataghan: In jugo Paigah Kotal inter Pul-i Khumri et Haibak, 1500 m, Rech. 33907!

16. *Savignya*

1. ***S. parviflora*** (Delile) Webb.

Afghanistan: SE: Kandahar: In arenosis deserti Registan prope Bhagat, 600 m, Rech. 34632! In margine deserti Registan, 4—5 km SW Safer, Rech. 34599! In margine deserti Dasht-i Margo SW Qala Bist, 820 m, Rech. 34511! In deserto Dasht-i Margo, 20 km NNW Darweshan, Rech. 34695!

20. *Spryginia*

1. ***S. Winkleri*** (Regel) M. Pop.

Typus: „E Buchara in montibus Taschbulak ad latus sinistrum fluvii Kafirnagan sitis ad 5—6000 ped., Regel; prope Baldschuan ad 3—4000 ped., nec non prope Saiat atque Sarai ad fl. Pandsch ad alt. 1000 ped.", Regel, LE.

Afghanistan: NW: Herat: 52 km E Kisil Islam Qaleh in arenosis versus Herat, 750 m, Rech. 33277!

Since this account was prepared, V. Botschantzev has published a revision of the genus in Novitates Systematicae Plantarum Vascularium, 126—139 (1966). In it, he recognises six species of which two are in our area: *S. Winkleri* (Regel) Pop. var. *araneosa* Botsch., l. c. 131 from Kopet Dagh and *S. afghanica* Botsch., l. c. 131 from C. Afghanistan, based on Hedge & Wendelbo 3445 and cited above as *S. Winkleri*. The other specimens cited above have not been seen by Botschantzev.

In addition to describing five new species and two new subspecies, Botschantzev, with much C. Asiatic material for study, reached the conclusion that the genus *Spryginia* should be removed from tribe *Brassiceae* and transferred to tribe *Hesperideae* near such genera as *Hesperis* and *Clausia*.

23. *Lepidium*

1. ***L. Aucheri*** Boiss.

Afghanistan: SE: Kandahar: 20 km S Kandahar, ad margines deserti Registan, 1000 m, Rech. 35308!

2. ***L. sativum*** L. subsp. ***sativum***

Afghanistan: NW: Bala Murghab, Jakeš s. n.!

10. ***L. persicum*** Boiss.

b) — — subsp. ***arianum*** Hedge

Folia caulina oblongo-lanceolata, textura tenui. Pedicelli fructiferi 4—6 mm longi, flaccidi, patuli vel ascendentes. Semina non alata.

c) — — subsp. ***macrocarpum*** Hedge

Differt a subspeciebus ceteris indumento deficiente, foliis majoribus integris, siliculis majoribus, 3—4 × 2—3 mm metientibus.

d) — — subsp. ***trifidum*** Hedge

Differt a ceteris subspeciebus habitu pumilo, caule in statu fructifero ad summum 10 cm alto, foliis caulinis deficientibus, foliis basalibus apice tridentatis, indumento denso e pilis simplicibus composito, siliculis 3 × 2,5 mm metientibus.

26. *Winklera*

1. ***W. afghanica*** (Rech. f. & Koie) Hedge

Afghanistan: E: Ghazni: In saxosis jugi inter Sar-i Ab et Dasht-i Nawar, 3100 m, Rech. 37259! — C: Panjao: 12 km E Panjao, 2650—2800 m, Rech. 36174! 20 km SW Panjao, in saxosis (Tonschiefer) versus jugum Waras, 2500 m, Rech. 36549! Deh Kundi: 14 km S jugi Waras, in saxosis granit., 2400 m, Rech. 36712!

2. ***W. silaifolia*** (Hook. f. & Thoms.) Korsh.

Afghanistan: C: Bamian: In jugo Shahtu inter Panjao et Naiak, 3350 m, Rech. 36311! Deh Kundi: In summo jugo Khonak, 3300 m, Rech. 36658!

28. *Isatis*

8. ***I. Koelzii*** Rech. f.

Afghanistan: C: Deh Kundi: In declivibus australibus jugi Waras, substr. granit., 2400—2900 m, Rech. 36686!, 36704! 30—43 km a Shahrestan versus jug. Khonak, substr. Tonschiefer, 2200 m, Rech. 36725!

13. ***I. Boissieriana*** Reichenb.

Afghanistan: N: Mazar-i Sharif: 21 km SE Tashkurghan versus Haibak, ad versuras, 600 m, Rech. 34050!

15. ***I. minima*** Bge.

Afghanistan: SW: Farah: Farah Rud inter Shindand et Dilaram, 1150 m, Rech. 33414! — SE: Kandahar: In arenosis deserti Registan, 20 km S Kandahar, 1000 m, Rech. 35300! In collibus saxosis 44 km NE Qala Bist, 900 m, Rech. 34753! In arenosis deserti Registan prope Bhagat, 600 m, Rech. 34664!

29. *Pachypterygium*

1. ***P. brevipes*** Bge.

Afghanistan: C: Bamian: Kuh-i Hisar: Inter Sauzak Sumaj et Serdak versus jugum Sad Bark, 2900 m, Rech. 36436!
Pakistan: Bal.: Hanna, Siddiqui!

2. ***P. Stocksii*** (Boiss.) Hedge

Afghanistan: SW: Farah: Inter Farah Rud et Dilaram, 1000 m, Rech. 33477! — SE: Kandahar: 30 km E Dilaram versus Girishk, 1050 m, Rech. 33554! Orozgan: Inter Tirin et Orozgan, Rech. 35151!; 2000 m, Rech. 35197! — C: Deh Kundi: In jugo Waras, 3150 m, Rech. 36583! In declivibus australibus jugi Waras, 2900 m, Rech. 36680!

37. *Aethionema*

13. ***Ae. grandiflorum*** Boiss. & Hohen. in Boiss.

Persia: E: Khor.: Kopet Dagh: 50 km E Bojnurd, 1220 m, Furse 7438!

42. *Stroganowia*

Since this account was prepared, *S. paniculata* Regel & Schmalh., Acta Horti Petrop. 5, 1: 242 (1877) has been found in North Afghanistan. Previously only known from Syr Darya, Tien Shan and Pamir-Alaj, it can be recognised by the widely branched panicles and the lilac-white flowers.

Afghanistan: NE: Kataghan: In valle Farkhar, 2450 m, Furse 8170!

46. *Octoceras*

1. ***O. Lehmannianum*** Bge.

Afghanistan: NW: Herat: In arenosis 52 km E Kisil Islam Qaleh, 750 m, Rech. 33282! Farah: 21 km NW Dilaram, 850 m, Rech. 33493! — SE: Kandahar: 30 km E Dilaram versus Girishk, 1050 m, Rech. 33531!

47. *Spirorrhynchus*

1. ***S. sabulosus*** Kar. & Kir.

Afghanistan: SE: Kandahar: In arenosis mobilibus deserti Registan, 25—30 km S Kandahar, 1000 m, Rech. 35323!, 35339! In arenosis deserti Registan prope Bhagat, 600 m, Rech. 34676!

51. *Euclidium*

1. ***E. syriacum*** (L.) R. Br. in Aiton

Afghanistan: N: Mazar-i Sharif: 21 km SE Tashkurghan, 600 m, Rech. 34056! In argillosis 18 km E Tashkurghan, Rech. 34247! — C: Bamian: In summo jugo Shahtu inter Panjao et Naiak, 3350 m, Rech. 36294! Kuh-i Hisar: Inter Sauzak Sumaj et Serdak versus jugum Sad Bark, 2600—2900 m, Rech. 36407!

61. *Fibigia*

F. compacta Rech. f., sp. nov.

Typus: Rech. 37400, W!

Sect. *Edmondia*. Suffruticoso-caespitosa, pulvinos compactos hemisphaericos 10—30 cm diametro formans; surculi plurimi steriles foliis diu persistentibus et residuis petiolorum columnares. Indumentum totius plantae albido-tomentosum, e pilis breviter multiradiatis valde appressis contiguis compositum. Caules floriferi breves, saepe e caespitibus vix emersi, ad summum 6 cm longi, 1—4-flori, subaphylli. Folia 6—9 (—11) × 2—4 (—5) mm, oblongo- vel obovato-lanceolata, apice obtusa vel rotundato-attenuata, basi in petiolum ± 1 mm latum sensim attenuata, costa mediana supra immersa, subtus obtuse carinata. Pedicelli fructiferi ± 5 mm longi, tomentosi, flaccidi, recurvi vel ± penduli. Sepala ± 3 mm longa, erecta, oblonga, obtusa, vix saccata, dense stellato-tomentosa, indistincte marginata. Petala ungue calycem aequante, lamina flava ± 3 × 1 mm, oblongo-cuneata. Silicula ± (8—) 10 (—12) mm diametro, orbicularis, applanata, valvis coriaceis nec membranaceis extremo margine incrassatis, nervo centrali basin versus et nonnullis subradiantibus

marginem versus ± incrassatis prominulis, pilis multiradiatis appressis dense tomentosis. Stylus 1 mm longus. Semina orbiculata, compressa, ± 5,5 mm diametro.

Afghanistan: E: Ghazni: In arenosis ad marginem boreali-orientalem altoplanitiei Dasht-i Nawar, 3100 m, 20. VII. 1967, Rech. 37400!

Distr. gen.: Endem.

Differt a *F. membranacea* Rech. f. et a *F. pendula* (Boiss.) Boiss. habitu compacto pulvinos densissimos hemisphaericos formante, foliis brevioribus latioribus obovato-lanceolatis, indumento magis albo densiore, caulibus floriferis brevibus subaphyllis paucifloris, calycibus petalisque minoribus, siliculis orbiculatis isodiametricis planis nec in vivo inflatis, valvis coriaceis nec membranaceis margine incrassatis.

62. *Alyssum*

15. ***A. turkestanicum*** Regel & Schmalh. ex Regel

Afghanistan: C: Deh Kundi: Inter juga Waras et Khonak, 65 km SW Panjao, 2600 m, Rech. 36596!

17. ***A. Stapfii*** Vierh.

Afghanistan: E: Gardez: In declivibus australibus jugi Altimur, 2300 m, Rech. 35409! — NE: Kataghan: In jugo Paigah Kotal inter Pul-i Khumri et Haibak, 1500 m, Rech. 33925!

25. ***A. turgidum*** Dudley

Persia: W: Ham: In jugo Aveh inter Qazvin et Hamadan, Zarguani 6781-E!

65. *Clypeola*

3. ***C. aspera*** (Grauer) Turrill

Afghanistan: SW: Farah: Inter Farah et Dilaram, 38 km SE Farah Rud, 1000 m, Rech. 33453!

67. *Draba*

1. ***D. hystrix*** Hook. f. & Thoms.

Afghanistan: SE: Orozgan: In saxosis calc. inter Orozgan et Malestan, 2900 m, Rech. 35219! — E: Ghazni: Sar-i Ab, 52 km W Ghazni, 2700 m, Rech. 37159! — C: Bamian: In declivibus borealibus jugi Shahtu, 2800—3000 m, Rech. 36360!

69. *Graellsia*

1. ***G. saxifragifolia*** (DC.) Boiss.

Afghanistan: E: Kabul: In faucibus Tang-i Gharu, 1500—1700 m, Rech. 34356! — C: Bamian: In fissuris rupium conglom. declivium borealium jugi Shahtu, 2800—3000 m, Rech. 36362! Panjao: In saxosis calc. 37 km SW Panjao versus jugum Waras, 2600 m, Rech. 36559!

70. *Cardamine*

2. ***C. quinquefolia*** (M. B.) Schmalh.

Persia: N: Gil.: Navrud, 1300 m, Tregubov 86!

4. ***C. tenera*** GMEL. jun. in C. A. MEY.

Persia: N: Maz.: Now Shahr, TREGUBOV 94!

72. *Barbarea*

3. ***B. plantaginea*** DC.

Afghanistan: C: Bamian: In declivibus borealibus jugi Shahtu secus rivulos, 2800—3000 m, RECH. 36369! Behzud: Siah Sang prope Farakulum, 2900 m, RECH. 36097!

74. *Arabis*

11. ***A. tenuisiliqua*** RECH. f. & KOEIE

Afghanistan: E: Ghazni: In jugo inter Sar-i Ab et Dasht-i Nawar, 3100 m, RECH. 37238! — C: Bamian: In declivibus borealibus jugi Shahtu inter Panjao et Naiak, 2800—3000 m, in fissuris rupium conglom., RECH. 36333-b! Panjao: 20 et 27 km SW Panjao versus jugum Waras, 2500 m, RECH. 36546!; 2600 m, RECH. 36569!

12. ***A. ariana*** HEDGE

Afghanistan: C: Bamian: In declivibus borealibus jugi Shahtu inter Panjao et Naiak, in fissuris rupium conglom., 2800—3000 m, RECH. 36333-b!

83. *Tetracme*

1. ***T. secunda*** BOISS.

Afghanistan: SW: Farah: Inter Farah Rud et Dilaram, 900 m, RECH. 33439!, 33466! Farah, 1100 m, KOEIE 3466! Inter Shindand et Farah Rud, 850—1150 m, RECH. 33431!, 33489! — SE: Kandahar: Ad marginem deserti Dasht-i Margo SW Qala Bist, 820 m, RECH. 34520! 44 km NE Kandahar versus Kalat-i Ghilzai, 1100 m, RECH. 33564! 43 km N Kandahar versus lacum artificiale „Arghandab Reservoir", 1100 m, RECH. 34895!

3. ***T. pamirica*** VASSILCZ.

Afghanistan: C: Panjao: 12 km E Panjao, 2700 m, RECH. 36199! Behzud: Siah Sang prope Farakulum, 2900 m, RECH. 36102! Deh Kundi: In summo jugo Waras, 3150 m, RECH. 36588!

85. *Pyramidium*

1. ***P. Griffithianum*** BOISS.

Afghanistan: SW: Herat: Shindand, 1150 m, RECH. 33358! — SE: Kandahar: In collibus saxosis 44 km NE Qala Bist, 900 m, RECH. 34788! 30 km E Dilaram versus Girishk, 1050 m, RECH. 33537!

86. *Matthiola*

4. ***M. graminea*** RECH. f.

Afghanistan: SE: Kandahar: In monte 15 km SW Kandahar, 1100 m, FREITAG in RECH. 34840! Tirin: In collibus inter lacum artificiale „Arghandab Reservoir" et Tirin, 1400—1700 m, RECH. 34984!

10. ***M. afghanica*** RECH. f. & KOEIE

Persia: E: Khor.: Inter Tayyebat et Kisil Islam Qaleh, 700 m, RECH. 33251!

12. ***M. chorassanica*** Bge. ex Boiss.

Afghanistan: SE: Orozgan, 2200 m, Rech. 35201! — C: Bamian: Kuh-i Hisar versus jugum Sad Bark, 2600 m, Rech. 36426! Deh Kundi: In saxosis graniticis NE Shahrestan, 2200 m, Rech. 36802! In declivibus australibus jugi Waras, 2900 m, Rech. 36696!

14. ***M. chenopodiifolia*** Fisch. & C. A. Mey.

Afghanistan: NW: Herat: In arenosis 52 km E Kisil Islam Qaleh, 750 m, Rech. 33284! — SW: Herat: 100 km S Herat, 1000 m, Rech. 33343! Inter Shindand et Dilaram, 1150 m, Rech. 33409! — SE: Kandahar: Ad marginem deserti Registan prope Mianpushta inter Darweshan et Safer, in arenosis, 700 m, Rech. 34561! In collibus saxosis 44 km NE Qala Bist, 900 m, Rech. 34776!

M. Stoddartii Bge., Arb. Naturf. Ver. Riga 1: 138 (1848).
Typus: Regio Aralo-Caspia, Lehmann, LE.

Herba annua crassicaulis pinguis a basi ramosa 7—15 (—20) cm alta, ramis saepe elongatis decumbentibus vel ascendentibus. Indumentum totius plantae stellatum canescens appressum. Folia 3—5 (—8) × 2—3 (—5) mm, ovata vel elliptica, subintegra vel remote sinuato- vel sublobato-dentata, in vivo subcarnosa, in sicco crasse membranacea, crasse petiolata. Pedicelli floriferi 3—7 (—10) mm longi erecto-patuli, fructiferi incrassati, subhorizontaliter patentes. Calyx (7—) 8—9 mm longus, pilis stellatis canescenti-tomentosus. Petala 20 × 7 mm, in vivo intense rosea odoratissima, ungue calycem aequante, lamina plana, suborbiculari-cuneata. Siliqua 40—50 (—65) × 2,5—3,5 mm, subrecta, ± arcuata vel ± tortuosa, leviter torulosa, non cornigera, valvis nervo mediano prominente percursa, pilis ramosis patulis tomentella, interdum glandulis stipitatis crassis immixtis, infra stigma constricta. Stigma bilobum lobis acutiusculis compressis. Semina 2,5 mm diametro ovato-orbicularia, compressa, anguste hyaline marginata.

Afghanistan: N: Mazar-i Sharif: Tashkurghan, in collibus argillosis, locis vere inundatis, copiosissime, 500 m, Rech. 34088!

Distr. gen.: Asia centralis inter mare Caspium et lacum Balkasch, Afghanistan.

Die afghanische Pflanze nimmt in mehreren Merkmalen — Länge der Fruchtstiele, Größe der Petalen, Maße der Schote, Gestalt der Narbenlappen — eine Zwischenstellung zwischen den beiden mir nur aus den Beschreibungen bekannten Arten *M. Stoddartii* Bge. und *M. bucharica* Czernjak. ein, sodaß ich an deren spezifischer Unterscheidbarkeit zweifeln muß. *M. Stoddartii* bildet durch die lebhaft rosa Petalen mit breiter flacher Lamina einen Fremdkörper in der Gattung *Matthiola* und erinnert hiedurch an *Malcolmia*.

87. *Chorispora*

2. ***Ch. Bungeana*** Fisch. & C. A. Mey. in Schrenk

Afghanistan: NE: Kataghan: Sar-i Hauz, in declivibus borealibus jugi Salang, substr. granit., 3700 m, Rech. 37523!

4. ***Ch. tenella*** (Pall.) DC.

Afghanistan: C: Panjao: In valle 12 km E Panjao, 2700 m, Rech. 36215!

88. *Diptychocarpus*

1. ***D. strictus*** (Fisch.) Trautv.

Afghanistan: N: Kataghan: In argillosis jugi Paigah Kotal, 1500 m, Rech. 33899!

89. *Parrya*

1. ***P. minjanensis*** RECH. f.

Afghanistan: C: Bamian: In jugo Shahtu, RECH. 36308!

90. *Koelea*

1. ***K. afghanica*** RECH. f.

Afghanistan: C: Bamian: In summo jugo Shahtu inter Panjao et Naiak, 3350 m, RECH. 36303!

V. BOTSCHANTZEV, Nov. Syst. Pl. Vasc. 1966: 123, 125 (1966) betrachtet *Koelea* als Synonym von *Prionotrichon* BOTSCH. & VVED., Not. Syst. Herb. Inst. Bot. et Zool. Acad. Sci. Uzbekistan 12:8 (1948).

92. *Leptaleum*

1. ***L. filifolium*** (WILLD.) DC.

Afghanistan: N: Mazar-i Sharif: In faucibus 20—25 km S Mazar-i Sharif, 500—700 m, RECH. 34142!

93. *Malcolmia*

1. ***M. turkestanica*** LITW.

Persia: E: Khor.: In artemisietis, 62 km E Loveh, 1200 m, RECH. 33175! 100 km W Sarakhs, REMAUDIÈRE 6819-E!
Afghanistan: N: Mazar-i Sharif: Tashkurghan, in collibus argillosis, 500 m, RECH. 34086! — NW: Bala Murghab: Inter Qala-i Chashmeh et Bala Murghab, 550 m, JAKEŠ s. n.! Herat: In arenosis 52 km E Kisil Islam Qaleh, 750 m, RECH. 33278!

2. ***M. spryginoides*** BOTSCH. & VVED.

Eine sehr nah verwandte Art ist *M. tadzhikistanica* VASSILCZ., Not. Syst. Leningrad 9: 260 (1966).

4. ***M. Behboudiana*** RECH. f. & ESFAND.

Persia: S: Fars.: Degonbadan W Kazerun, TREGUBOV 97!
Afghanistan: SE: Kandahar: Ad margines deserti Registan, 20 km S Kandahar, 1000 m, RECH. 35309!

8. ***M. taraxacifolia*** BALBIS

Afghanistan: N: Mazar-i Sharif: In deserto 23—35 km W Mazar-i Sharif, 400 m, RECH. 34182! — C: Bamian: In declivibus borealibus jugi Shahtu, 2800 m, RECH. 36335!

9. ***M. scorpioides*** (BGE.) BOISS.

Afghanistan: SE: Farah: Farah Rud inter Shindand et Dilaram, 1150 m, RECH. 33422! 30 km E Dilaram, RECH. 33541! Kandahar: Ad margines deserti Registan, 20 km S Kandahar, 1000 m, RECH. 35399! Inter lacum artificiale „Arghandab Reservoir" et Tirin, 1400—1700 m, RECH. 34990! — NE: Kataghan: Inter Pul-i Khumri et Ribat, 700—1200 m, RECH. 33860-b! In argillosis vallis fluvii Surkhab 33 km S Kunduz versus Baghlan, 500 m, RECH. 34296!

11. ***M. strigosa*** BOISS.

Afghanistan: C: Panjao: In glareosis schist. vallis 12 km E Panjao, 2650—2800 m, RECH. 36197! Behzud: Siah Sang prope Farakulum, 2900 m, RECH. 36042! Deh Kundi: Inter juga Waras et Khonak, 65 km SW Panjao, 2600 m, RECH. 36612!

12. ***M. longipetala*** Gilli

Afghanistan: E: Kabul: In declivibus orientalibus jugi Unai, 2800 m, Rech. 36024!

13. ***M. cabulica*** (Boiss.) Hook. f. & Thoms.

Afghanistan: E: Khost, 1400 m, Hager in Rech. 37792!, Wald 73!

97. *Clausia*

1. ***C. turkestanica*** Lipsky

Afghanistan: E: Gardez: 9—20 km SE Gardez versus jugum Sata Kandao, 2300 m, Rech. 35423! — C: Bamian: In declivibus borealibus jugi Shahtu, 2800—3000 m, Rech. 36355! Panjao: Inter Panjao et jugum Shahtu, 2800—3000 m, Rech. 36255! Deh Kundi: In saxosis 14 km a jugo Waras meridiem versus, 2100 m, Rech. 36711!

2. ***C. Podlechii*** Dvořák

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, in fissuris rupium granit., 3350 m, Rech. 37489!

100. *Sterigmostemum*

St. sulphureum (Banks & Soland.) Bornm.

In den Formenkreis dieser vielgestaltigen Art gehören auch *Sterigma brachypetalum* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 63 (1842); Syn. *Sterigma sulphureum* (Banks & Soland.) DC. var. *asperulum* Boiss., Fl. Or. 1: 24 (1867) und *Cheiranthus tomentosus* Willd., Spec. Plant. 3:523 (1800); Syn. *Sterigma sulphureum* (Banks & Soland.) DC. var. *angustifolium* Boiss., Fl. Or. 1: 241 (1867). Eine Klärung dieses Formenkreises ist mir gegenwärtig nicht möglich; die hier gebotene Darstellung ist provisorisch.

102. *Goldbachia*

1. ***G. verrucosa*** Komar.

Afghanistan: N: Mazar-i Sharif: Chashmeh-e Shafal, in faucibus fluvii Balkh SW Mazar-i Sharif, 500 m, Rech. 34102! — NE: Kataghan: In argillosis jugi Paigah Kotal inter Pul-i Khumri et Haibak, 1500 m, Rech. 33944!

2. ***G. laevigata*** (M. B.) DC.

Afghanistan: N: Mazar-i Sharif: In argillosis 18 km E Tashkurghan, 600 m, Rech. 34249!, 34281! Tashkurghan, 500 m, Rech. 34067!

103. *Erysimum*

2. ***E. oleifolium*** J. Gay

Persia: S: Fars.: Degonbadan W Kazerun, Tregubov 96!

3. ***E. caespitosum*** DC.
Adde syn.: *E. pulvinatum* J. Gay, Erys. 5 (1842).

Dieser Artname ist auf Auch. 4111 begründet. Auf dieselbe Nummer ist auch *E. Aucheri* Boiss. begründet.

14. ***E. macrospermum*** Cullen & Rech. f.

Afghanistan: C: Panjao: Inter Panjao et jugum Shahtu, 2800—3000 m, Rech. 36281! Bamian: In jugo Shahtu, 3350 m, Rech. 36306!

16. ***E. ischnostylum*** FREYN & SINT.

Afghanistan: E: Gardez: In declivibus australibus jugi Altimur, 2300 m, RECH. 35412! Kabul: Maidan, REINER 641!

18. ***E. subulatum*** J. GAY

Der Beschreibung dieser Art liegt AUCH. 4105 zugrunde. Derselbe Beleg ist auch die Grundlage von *E. persicum* BOISS. Beide Arten wurden 1842 veröffentlicht. GAY's Werk ist am 20. I. 1842 erschienen, sodaß man dessen Namen wohl Priorität zubilligen muß. Afghanistan: E: Gardez: 35 km NW Urgun versus Surmat, 2400 m, RECH. 35903!

19. ***E. ghasnicum*** CULLEN & RECH. f.

Afghanistan: E: Ghazni: Inter Ghazni et Sar-i Ab, 2500 m, RECH. 37122!

29. ***E. crassicaule*** (BOISS.) BOISS.

Afghanistan: SW: Farah: 38 km SE Farah Rud versus Dilaram, 1000 m, RECH. 33456! — SE: Kandahar: In saxosis aridis 80 km W Kandahar versus Girishk, 1100 m, RECH. 34805! 30 km E Dilaram versus Girishk, 1050 m, RECH. 33544!

30. ***E. Stocksianum*** (BOISS.) BOISS.

Afghanistan: SE: Kandahar: 34 km N Kandahar versus lacum artificiale „Arghandab Reservoir", 1200 m, RECH. 34874! Inter „Arghandab Reservoir" et Tirin, 1400—1700 m, RECH. 35023! — C: Deh Kundi: 24 km S jugi Waras, substr. granit., 2400 m, RECH. 36708!

33. ***E. ibericum*** (ADAMS) DC.
Adde syn.: *E. Aucherianum* J. GAY, Erys. 9 (1842). *E. Gayanum* BOISS., Fl. Or. 1: 196 (1867).

Beide Namen sind auf denselben Typus, AUCH. 4113, begründet.

37. ***E. Badghysi*** (KORSH.) LIPSKY ex N. BUSCH

Afghanistan: N: Mazar-i Sharif: In faucibus calc. 20—25 km SE Mazar-i Sharif, 500—700 m, RECH. 34139! — NW: Herat: In arenosis 52 km E Kisil Islam Qaleh versus Herat, 750 m, RECH. 33286! — SW: Herat: In saxosis serpentinicis 35—40 km S Herat, 1300—1500 m, RECH. 33329! — NE: Kataghan: In argillosis jugi Paigah Kotal, inter Pul-i Khumri et Haibak, 1500 m, RECH. 33904! In jugo Argana W Kunduz, RECH. 34295!

39. ***E. Griffithianum*** BOISS.

Pakistan: Quetta: Sariab S Quetta, 1700 m, RECH. 28810! — Bal. Mastung, 600 m, SIDDIQUI 1955!

41. ***E. acrotonum*** POLATSCHEK & RECH. f., sp. nov.
Typus: RECH. 35199, holotypus, W!

Radix biennis perpendicularis parum ramosa. Caudex basibus foliorum aliquantum comosus. Caulis plerumque singulus (raro bini) 15—50 cm altus, basi 2—3,5 mm crassus, erectus, a basi fere in ramos floriferos elongatos subaequales divisus, ± teres, in 1/5 usque ad 1/8 parte inferiore brevi- et multiarticulatus et multifoliatus, axillis foliorum fasciculiferis, internodio supremo caulis primarii et ramorum eximie elongato. Indumentum totius plantae canescens, pilis plurimis bifidis, trifidis sparsissime immixtis; pili bifidi heteromorphi, partim parte basali abbreviata ramis appressis, partim parte basali subelongata ramis subpatulis, ideoque planta scabrida. Folia rosularia 30—60 × 1,2—2 mm, lineari-lanceolata, integra, ± recurvata, pilis

plurimis bifidis, trifidis rarioribus, quadrifidis rarissime immixtis, rosulam confertam florendi tempore vigentem formantia. Folia caulina 15—35 × ± 1 mm, linearilanceolata, indumento ut in foliis rosularibus. Racemus simplex, floribus inferioribus remotis, superioribus ± congestis, fructifer valde elongatus laxus. Pedicelli floriferi 0—0,5 mm, fructiferi 3—4,5 mm longi. Sepala 4—6 mm longa, oblonga, scarioso-marginata. Petala 8—11 mm longa, saturate aurea, lamina elliptica usque ovata, in unguem sensim attenuata. Siliqua (immatura) pilis bi- et trifidis quadrifidis immixtis obsita. Stylus in siliquis juvenilibus jam bene evolutus, 2—3 mm longus. — Species nova habitu, ramis longis, internodio supremo eximie elongato et stylo longo insignis.

Afghanistan: SE: Orozgan: In declivibus saxosis, 2000—2200 m, 24. V. 1967, Rech. 35199! — E: Gardez: 9—20 km SE Gardez versus jugum Sata Kandao, Tonschiefer, 2300 m, Rech. 35440! In jugo Sata Kandao, in argillosis, 2750 m, Rech. 35450!

Distr. gen.: Endem.

Die neue Art ist durch ihren Wuchs, besonders durch die zahlreichen, langen Äste mit extrem gefördertem obersten Internodium schon habituell von den übrigen Arten der Gattung deutlich verschieden. Dazu kommt noch der relativ lange Griffel.

Species incomplete notae et pro regione nostra dubiosae.

1. ***E. altaicum*** C. A. Mey. in Ledeb., Fl. Alt. 3: 153 (1831).

Kommt im Gebiet der Flora Iranica nicht vor. Die Angabe in Dan. Biol. Skr. 10, 3: 46 (1958) für Afghanistan bezieht sich auf *E. macrospermum* Cullen & Rech. f.

2. ***E. brachycarpum*** Boiss., Fl. Or. 1: 196 (1867).

Die Herkunft des Typus: Russisch Armenien oder Persien, legit Szov. ist ungewiß. Der Typus konnte nicht untersucht werden. Möglicherweise handelt es sich um eine Deformierung der Schoten.

3. ***E. Buschianum*** Bornm., Feddes Repert. Beih. 89, 1: 33 (1940), nom. illeg.

Der Name ist ohne lateinische Beschreibung ungültig.

4. ***E. diffusum*** Ehrh., Beitr. Naturk. 7: 157 (1792). Syn.: *E. canescens* Roth, Cat. 1: 76 (1797).

Nach neueren Untersuchungen ist mit dem Vorkommen dieser Art im Gebiet der Flora Iranica nicht zu rechnen.

5. ***E. erosum*** O. E. Schulz, Notizbl. Bot. Gart. Berlin 9: 1081 (1927).

Pakistan: Chitral: Ihala Drosh, 4800 m, Harriss 15901. Drosh, 1500 m, Toppin 136.
Die Belege konnten leider nicht untersucht werden. Laut Beschreibung und Herkunft könnte die Art mit *E. nuristanicum* Polatschek & Rech. f. verwandt sein.

6. ***E. gelidum*** Boe., Pl. Abich. 4, 36 (1858); Boiss., Fl. Or. 1: 201 (1867).

Die Angabe für Nordpersien konnte nicht bestätigt werden.

7. ***E. laxiflorum*** J. Gay, Erys. 4 (1842). Typus Auch. 4110A.

Der Holotypus aus Esfahan im Herbar Boissier ist ein trauriges Fragment ohne Basis, Blüten und Früchte. Die Art läßt sich somit nicht deuten. — Der Typus von *E. fruticulosum* J. Gay, Erys. 5 (1842) ist dagegen Auch. 4110 und wird von Boissier zu *E. caespitosum* DC. gestellt. Ich habe den Beleg nicht gesehen.

8. ***E. leptophyllum*** (M. B.) ANDRZ. in DC., Prodr. 1: 198 (1824).

Syn.: *Cheiranthus leptophyllus* M. B., Fl. Taur.-Cauc. 2: 119 (1808). *Sisymbrium leptophyllum* (M. B.) TRAUTV., Acta Horti Petrop. 2: 500 (1873).
Typus: „In collibus siccis Iberiae", STEV.

Die Art wird von C. A. MEY. und HOHEN. für Talish angegeben. Ich habe keine Belege aus dem Gebiet der Flora Iranica gesehen.

9. ***E. leptostylum*** DC., Reg. Veg. Syst. Nat. 2: 494 (1821).

Diese kaukasische Art wird aus West-Persien angegeben. Der Beleg aus Haydere, PICHLER, ist *E. cuspidatum* (M. B.) DC.

10. ***E. Perofskianum*** FISCH. & C. A. MEY., Ind. Sem. Horti Petrop. 4: 36 (1837).

Der Typus aus Afghanistan konnte leider nicht untersucht werden; möglicherweise handelt es sich um einen Vertreter der *E. repandum*-Gruppe.

11. ***E. substrigosum*** (RUPR.) N. BUSCH, F. Cauc. Crit. 3, 4: 533 (1909).

Die Art wurde von GROSSH., Beih. Bot. Centrbl. 44: 216 (1928) für Azerbaijan, Mishab Dagh bei Yam, angegeben. Nach der Verbreitungskarte bei GROSSH., Fl. Kawk. 4, tab. 286 (1950) ist das Vorkommen im Gebiet der Flora Iranica höchst unwahrscheinlich.

110. *Sisymbrium*

3. ***S. gamosepalum*** HEDGE

Afghanistan: C: Bamian: In declivibus borealibus jugi Shahtu, inter Panjao et Naiak, 2800—3000 m, RECH. 36381! Behzud: Siah Sang prope Farakulum, in saxosis ad fluvium Helmand, 2900 m, RECH. 36083!

111. *Microsisymbrium*

1. ***M. minutiflorum*** (HOOK. f. & THOMS.) O. E. SCHULZ in ENGLER

Afghanistan: C: Panjao: In glareosis schist. 12 km E Panjao, 2700 m, RECH. 36196! Deh Kundi: In summo jugo Khonak, 3300 m, RECH. 36652! Inter juga Waras et Khonak, 2600 m, RECH. 36598!

115. *Streptoloma*

1. ***S. desertorum*** BGE.

Persia: E: Khor.: In arenosis inter Tayyebat et Kisil Islam Qaleh, 700 m, RECH. 33234! Afghanistan: NW: Herat: 52 km E Kisil Islam Qaleh versus Herat, 750 m, RECH. 33276!

116. *Torularia*

1. ***T. torulosa*** (DESF.) O. E. SCHULZ in ENGLER

Afghanistan: NW: Herat: 21 km W Herat, 950 m, RECH. 33297-b! — SW: Farah: Farah Rud inter Shindand et Dilaram, 1150 m, RECH. 33427! — SE: Kandahar: Ad margines deserti Registan, 20 km S Kandahar, 1000 m, RECH. 35270!, 35274! 4—5 km SE Safer, RECH. 34605! In arenosis deserti Registan prope Bhagat, 600 m, RECH. 34612!

6. ***T. dentata*** (FREYN & SINT.) KITAM.

Persia: E: Khor.: Inter Tayyebat et Kisil Islam Qaleh, 700 m, RECH. 33242!

Afghanistan: SW: Herat: Inter Shindand et Farah Rud, 1150 m, Rech. 33381! 100 km S Herat, 1300 m, Rech. 33342! — SE: Kandahar: In arenosis 40 km NE Kandahar versus Kalat-i Ghilzai, 1100 m, Rech. 33563! 30 km E Dilaram versus Girishk, 1050 m, Rech. 33535! 80 km W Kandahar versus Girishk, 1100 m, Rech. 34824! Orozgan: Inter Tirin et Orozgan, Rech. 35145!

8. ***T. afghanica*** (Gilli) Hedge

Afghanistan: SE: Tirin: 20—25 km S Tirin versus Kandahar, 1800 m, Rech. 35118! Orozgan: Inter Tirin et Orozgan, Rech. 35153! In montibus inter Tirin et Malestan, 2200 m, Rech. 35231!

119. *Arabidopsis*

3. ***A. Wallichii*** (Hook. f. & Thoms.) N. Busch

Afghanistan: E: Khost: In faucibus fluvii Kurram inter Chakmanni et Ahmad Khel, 1850 m, Rech. 35651! — C: Deh Kundi: Inter juga Waras et Khonak, 65 km SW Panjao, 2600 m, Rech. 36606!

122. *Camelina*

5. ***C. rumelica*** Velen.

Afghanistan: C: Deh Kundi: Inter juga Waras et Khonak, 65 km SW Panjao, 2600 m, Rech. 36638!

Corrigendum p. 105:

4. ***Aethionema virgatum*** (Boiss.) Hedge, comb. nov.
Syn.: *Moriera virgata* Boiss., Ann. Scienc. Nat. Ser. 2, 17: 183 (1842). *Aethionema elongatum* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 17 (1845).
Typus: Auch. 4165, G!

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Fig. 2

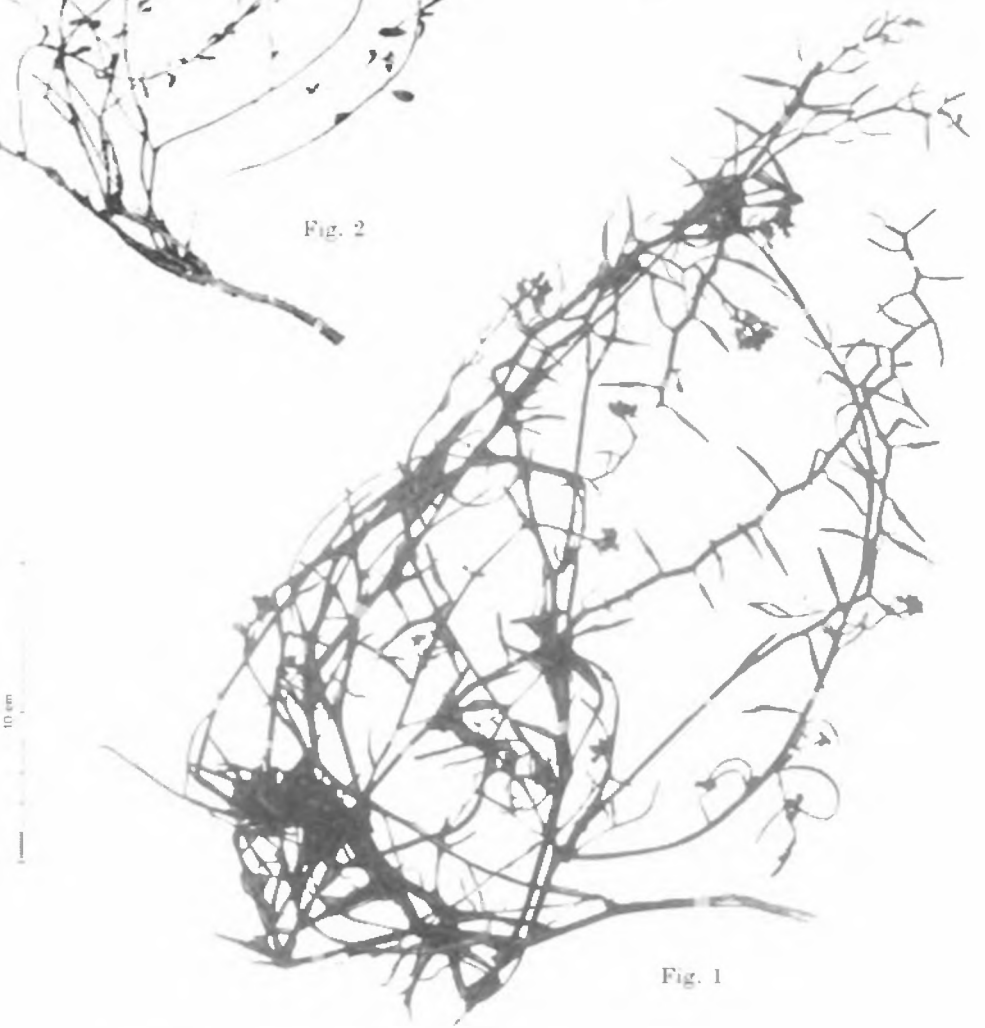


Fig. 1

Fig. 1: *Cakile arabica* Velen. & Bornm. — Rech. 8722
Fig. 2: *Aethionema umbellatum* (Boiss.) Bornm. — Archibald 2968

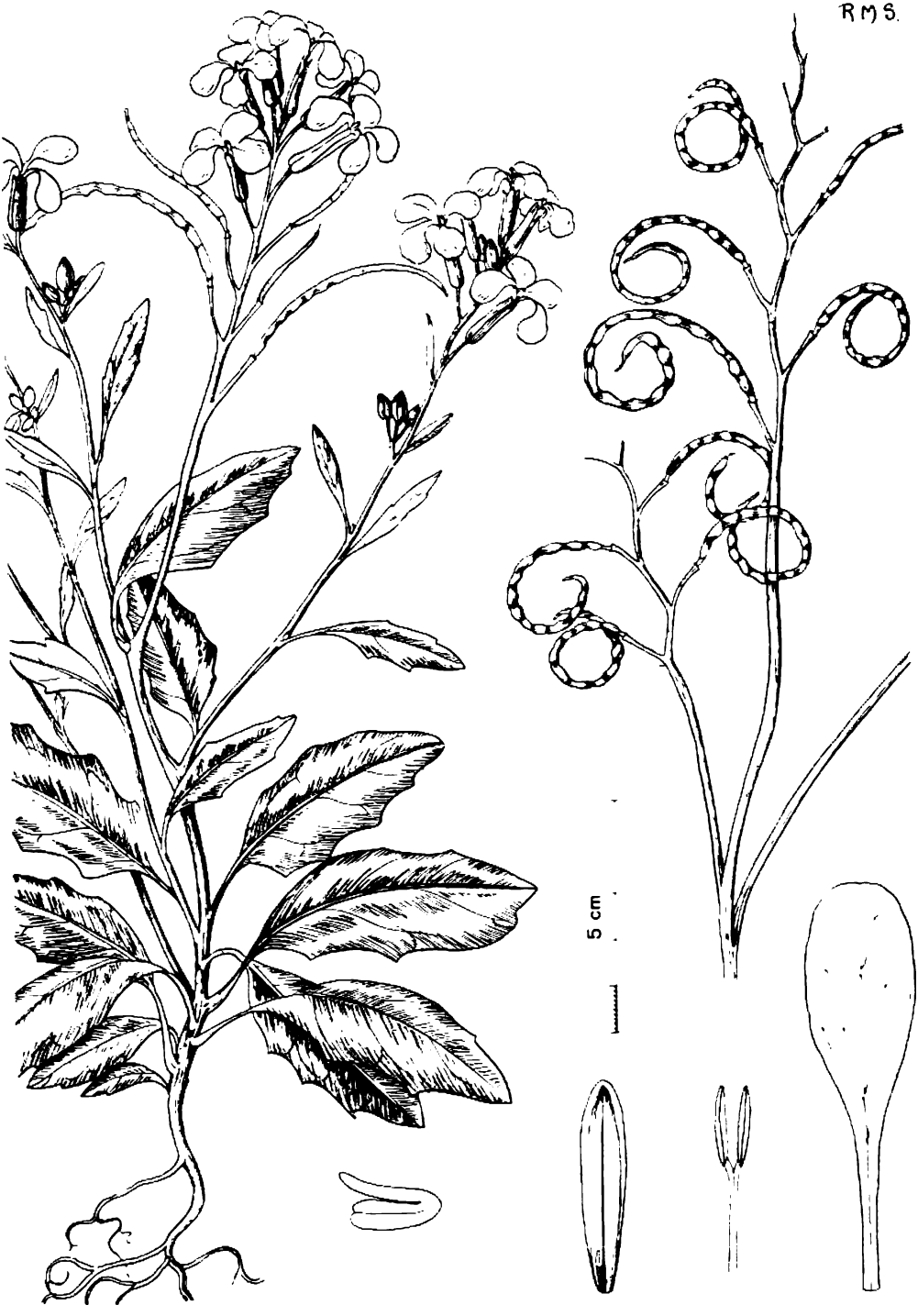
Fig. 2

Fig. 1

Fig. 1: *Physorrhynchus brahuicus* HOOK. — REICH. 27787
Fig. 2: *Ph. Chamaecrapidium* (BOISS.) BOISS. — ESFAND. 79-E

Fortunella Bungei Boiss. — Fig. 1: Rech. 27187, Fig. 2: Rech. 27177

Pseudofortuynia Esfandiarii HEDGE — Fig. 1: STUTZ 805, Fig. 2: BOROUMAND S. n.



Spryginia Winkleri (REGEL) M. POP.

Lepidium vesicarium L. — JACOBS 6638

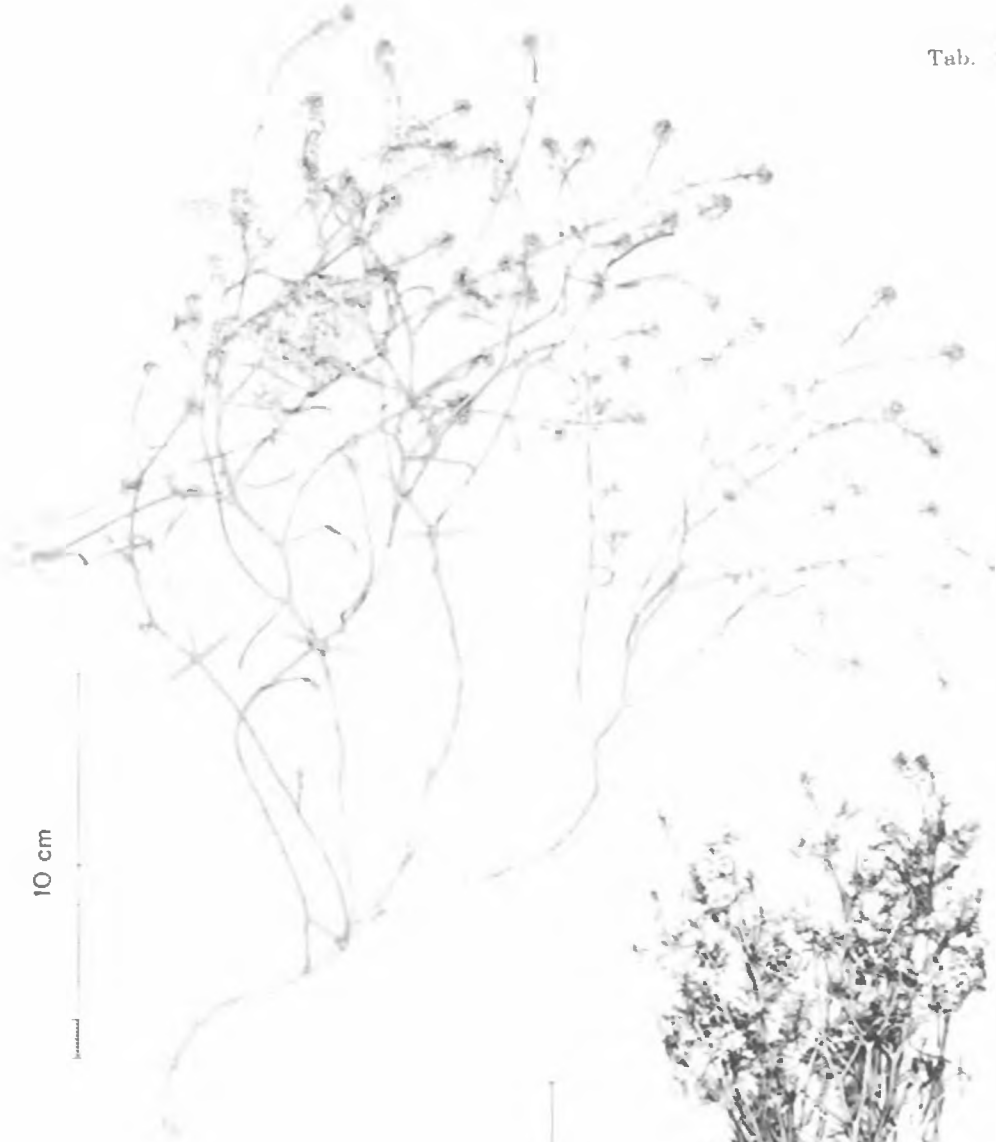


Fig. 1

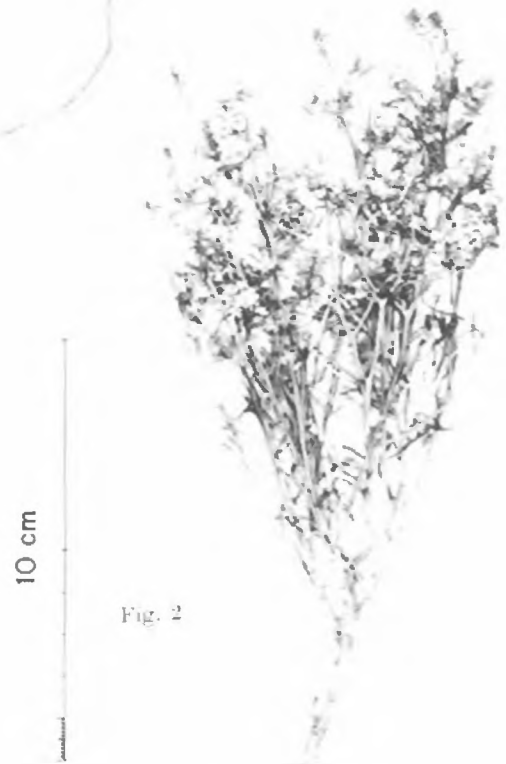


Fig. 2

Moriera spinosa Boiss. — Fig. 1: Hdw. & Wdb. 4684. Fig. 2: Hdg. & Wdb. 3362

Brassaridia papyracea Boiss. — Fig. 1: Koelz 17379. Fig. 2: Rech. 10350

Fig. 1

Fig. 2

Fig. 1: *Thlaspi tenue* (Boiss & Buhse) Hedge – Furse 2350
Fig. 2: *Glastaria glastifolia* (DC.) O. Kuntze – Barkley 7987

Fig. 1

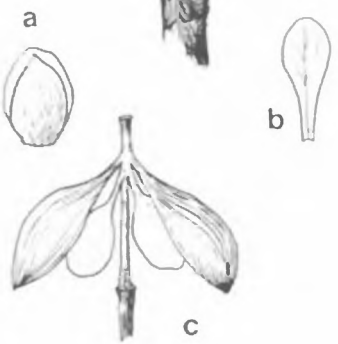


Fig. 2

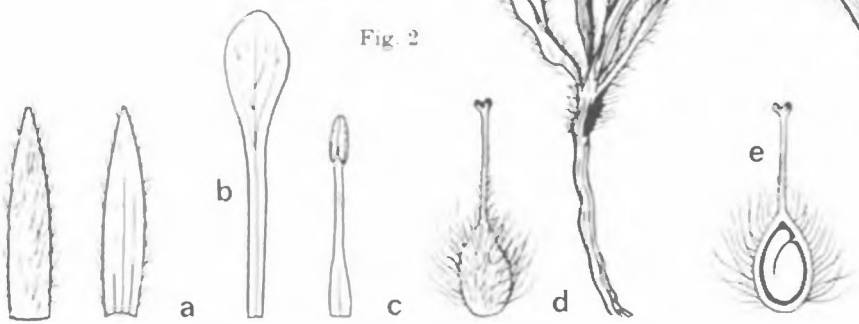


Fig. 1: *Cyphocarlamam arctioides* Hedge — Kasy 28
Fig. 2: *Lachnoloma Lehmannii* Bge. — Ruttner 385

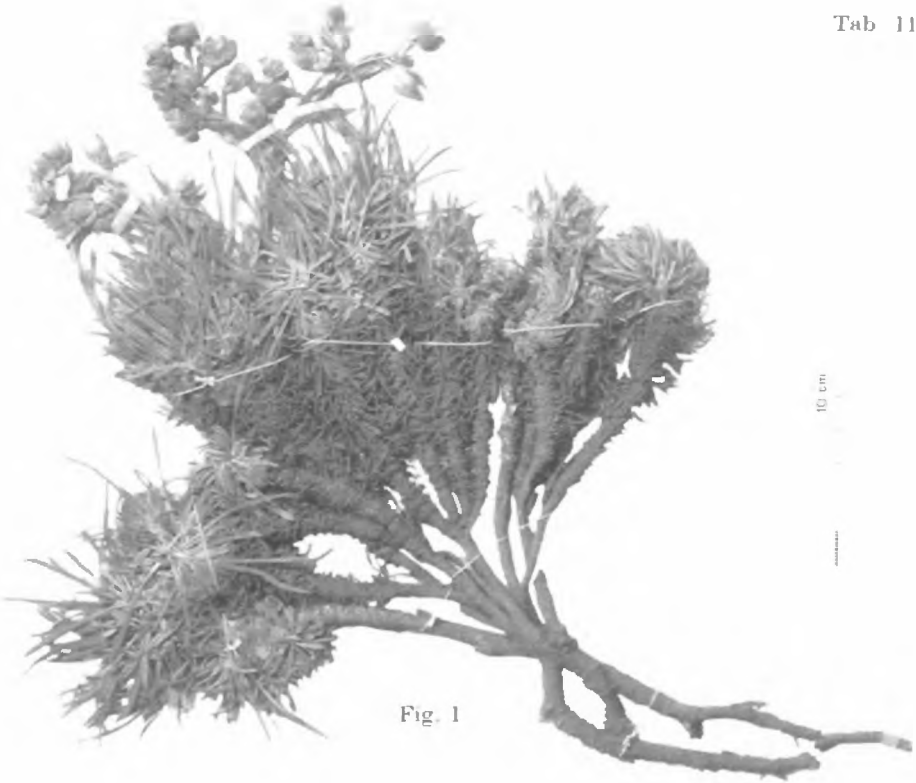


Fig. 1

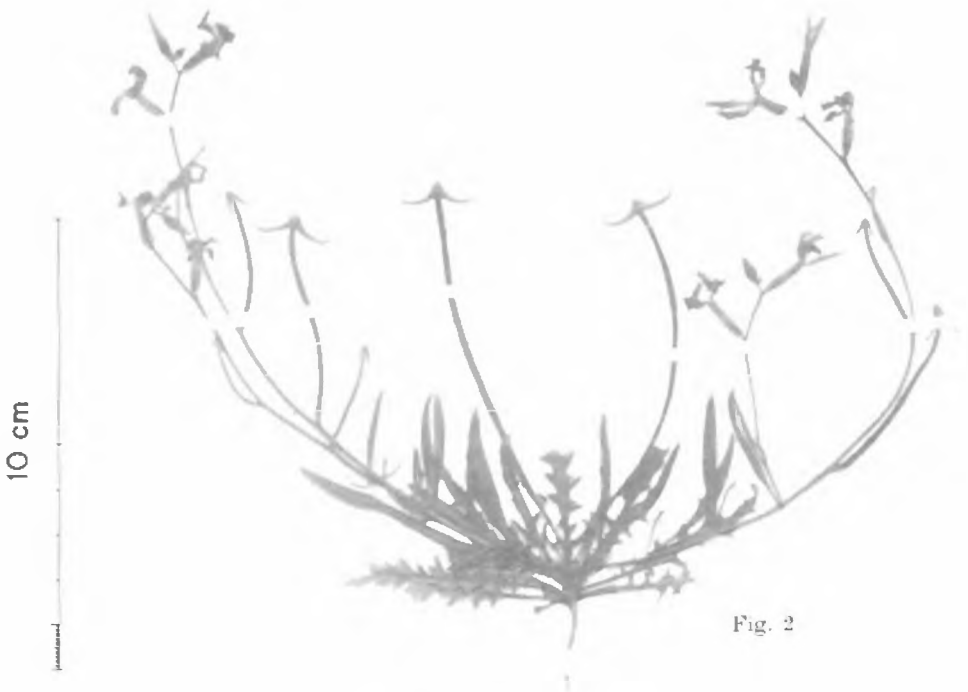


Fig. 2

Fig. 1: *Clastopus erubescens* Hausskn. — Rech. 10467
Fig. 2: *Matthiola aspera* Boiss. — Helbaek 460

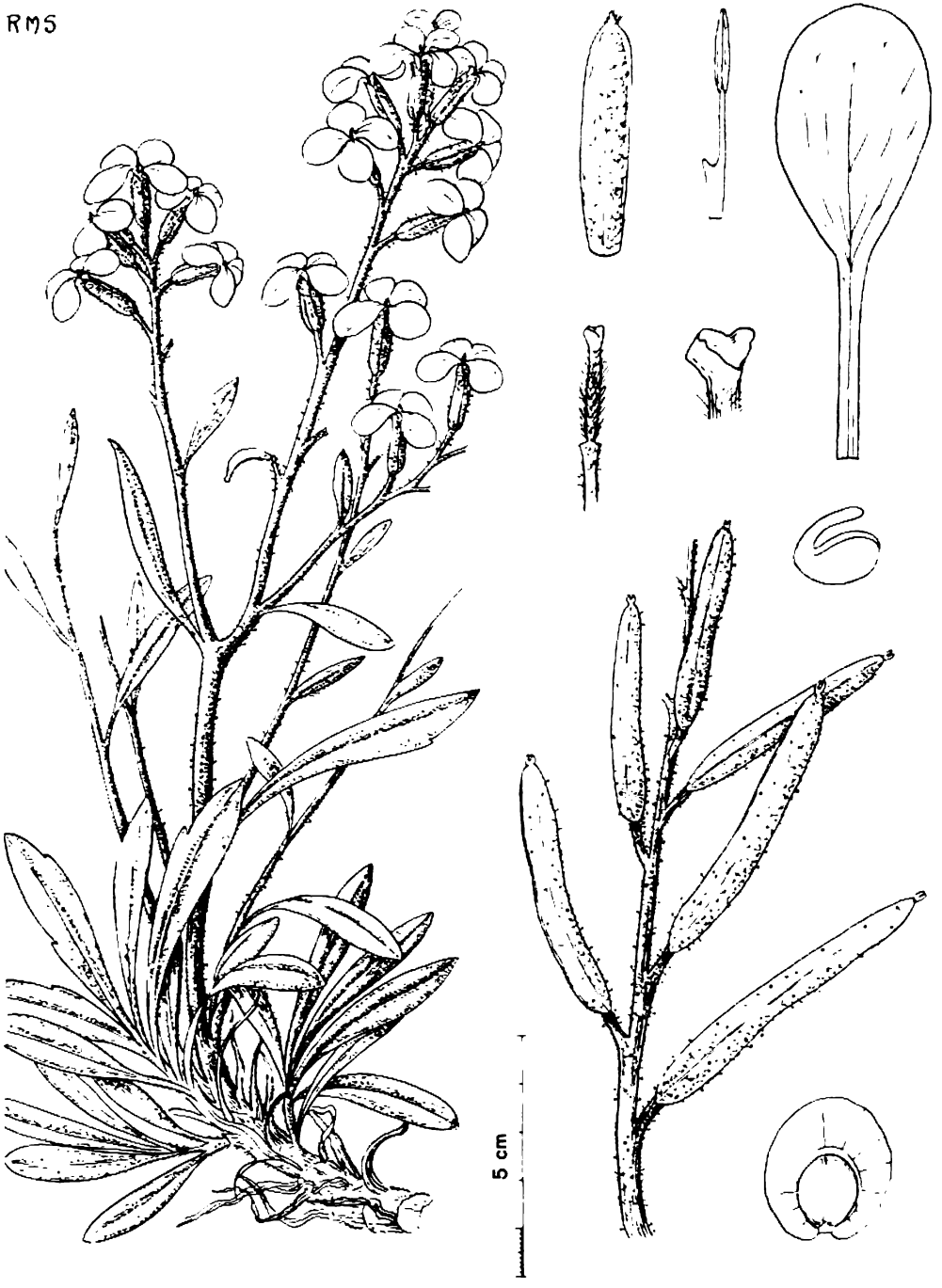
Fig. 1

Fig. 2

Physaptychia gnaphaloides (DC.) Boiss. — Fig. 1: Rech. 11459. Fig. 2: Rech. 11159

Fig. 1: *Rorippa indica* (L.) Hiern – Rech. 30232
Fig. 2: *R. kurdica* (Boiss. & Hausskn.) Hedge – Grant 16066

Pyramidium Griffithianum Boiss.



Matthiola Codringtonii Rech. f. – Hdg. & Wdb. 4779

Fig. 1

Fig. 2

Matthiola alyssifolia (DC.) Bornm. — Fig. 1: Rech. 18856, Fig. 2: Str. 32

Fig. 2

Fig. 1

Matthiola ovatifolia (Boiss.) Boiss. — Fig. 1: Rech. 2794, Fig. 2: Gauba 115

10 cm

Matthiola perpusilla Rech. f. — Hdg. & Wdb. 3205

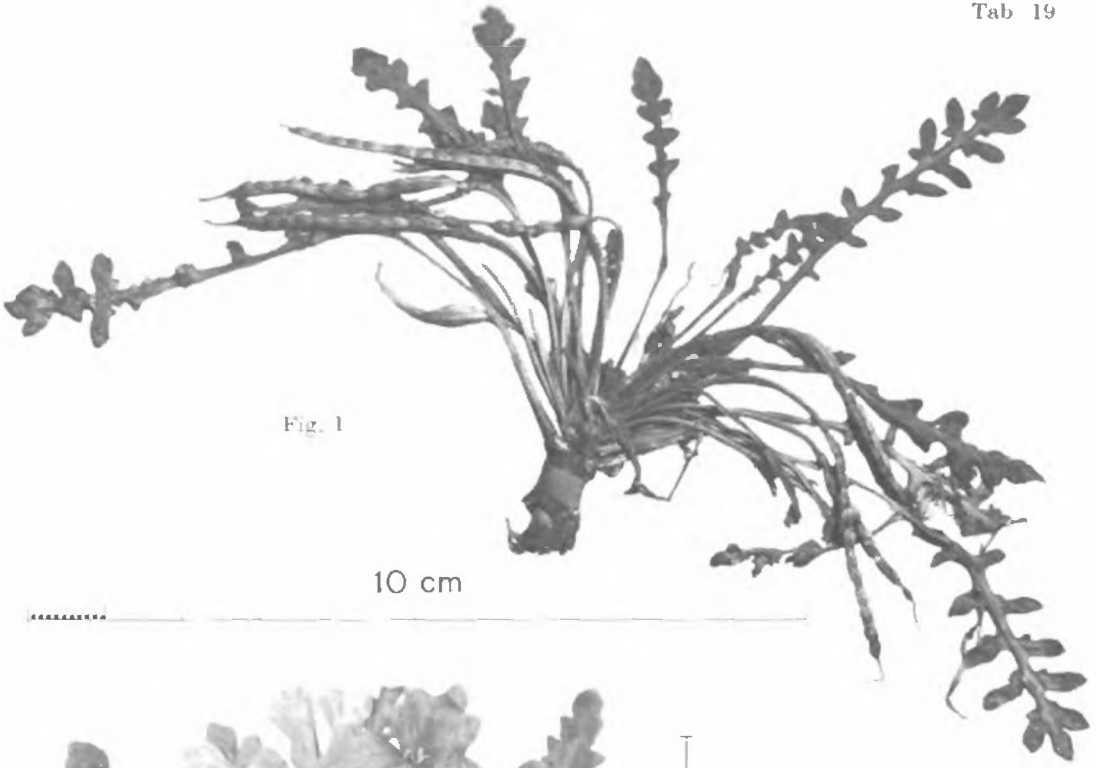


Fig. 1

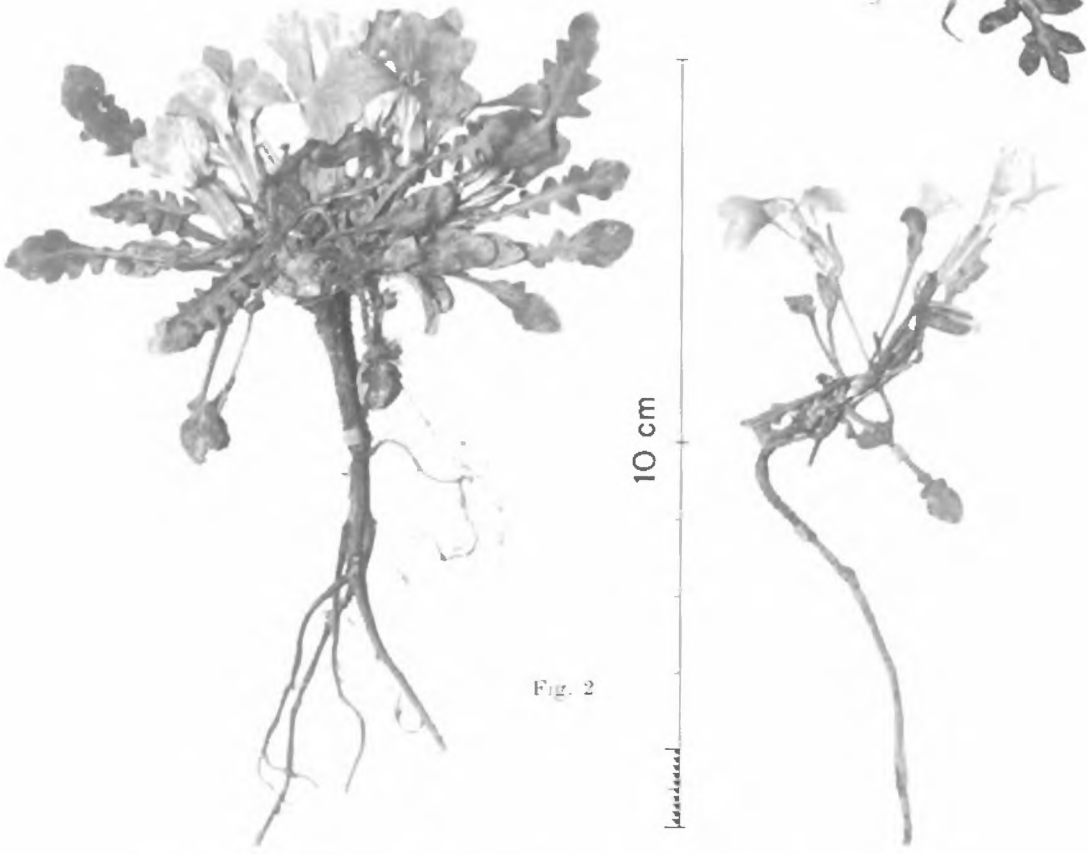


Fig. 2

Chorispora Bungeana Fisch. & C. A. Mey. — Fig. 1: Hdg. & Wdb. 5251. Fig. 2: Stainton 2663

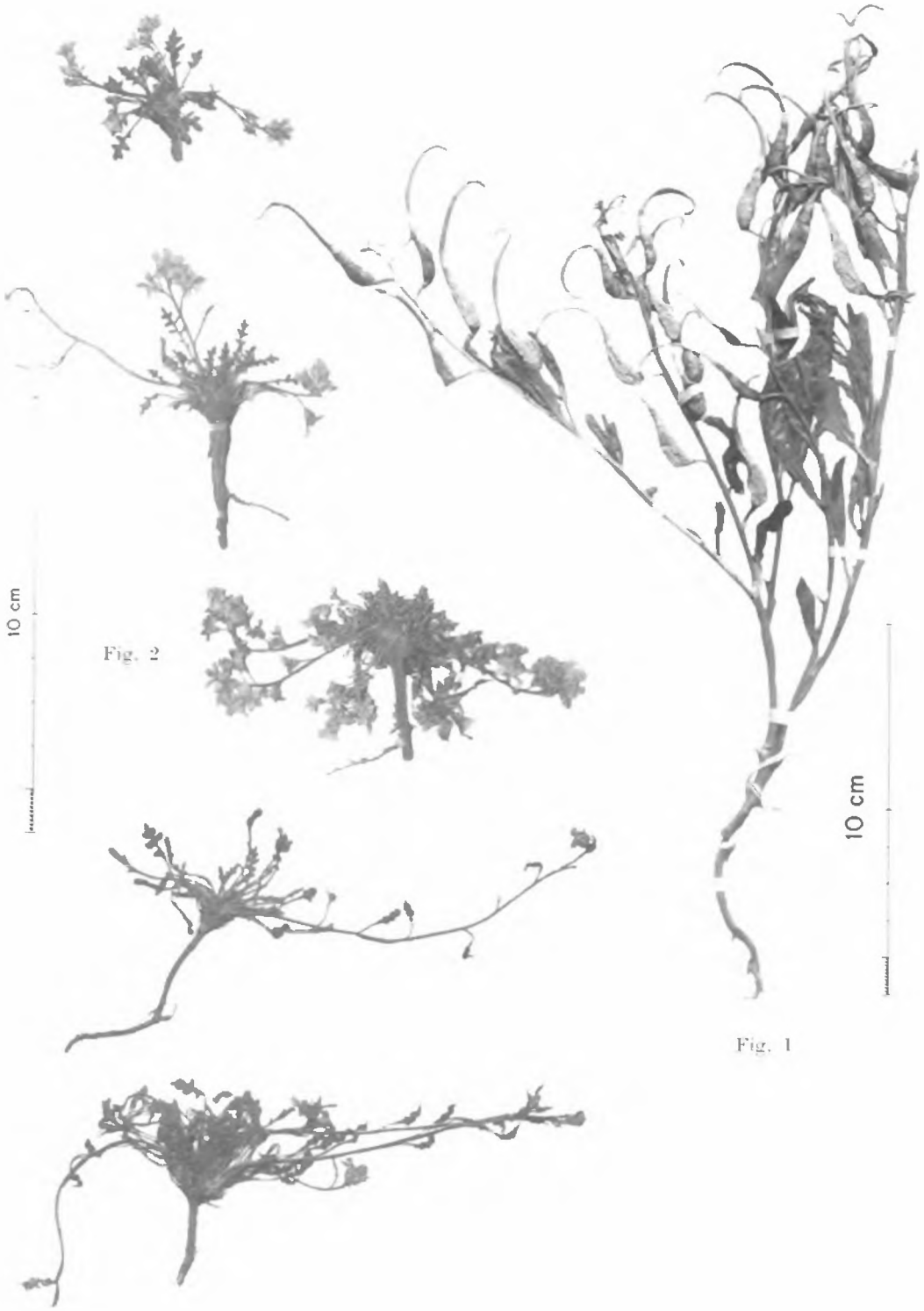


Fig. 2

Fig. 1

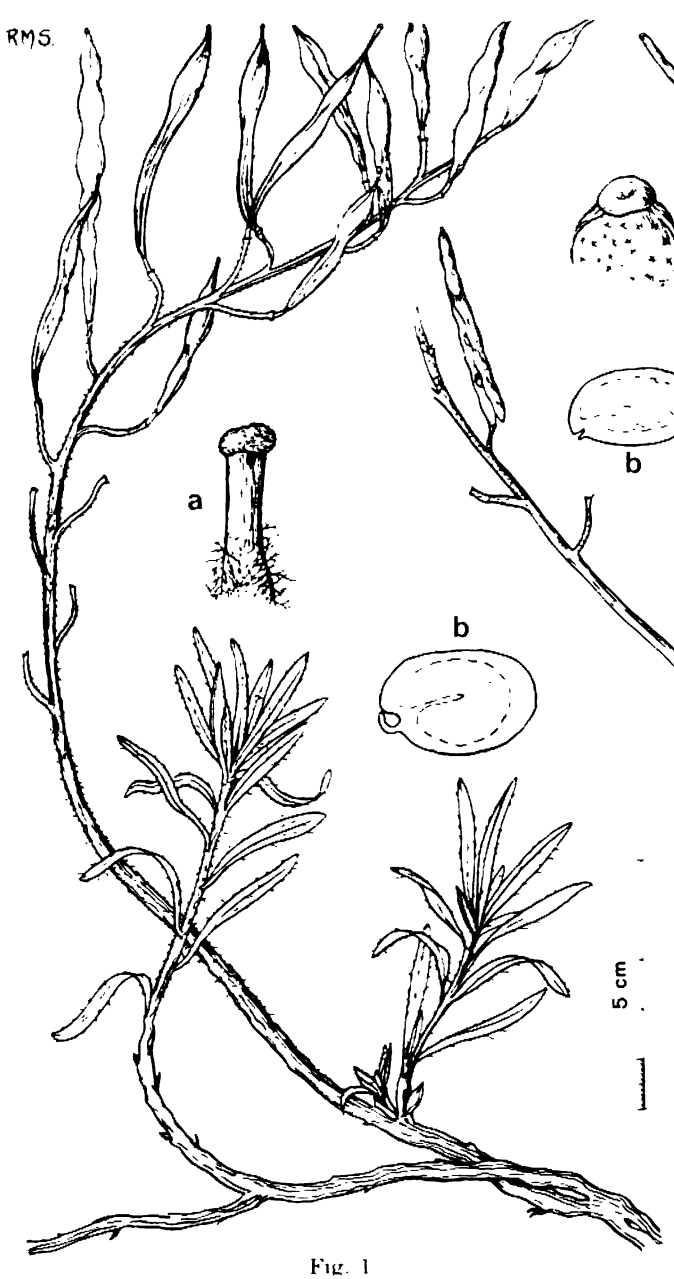


Fig. 1

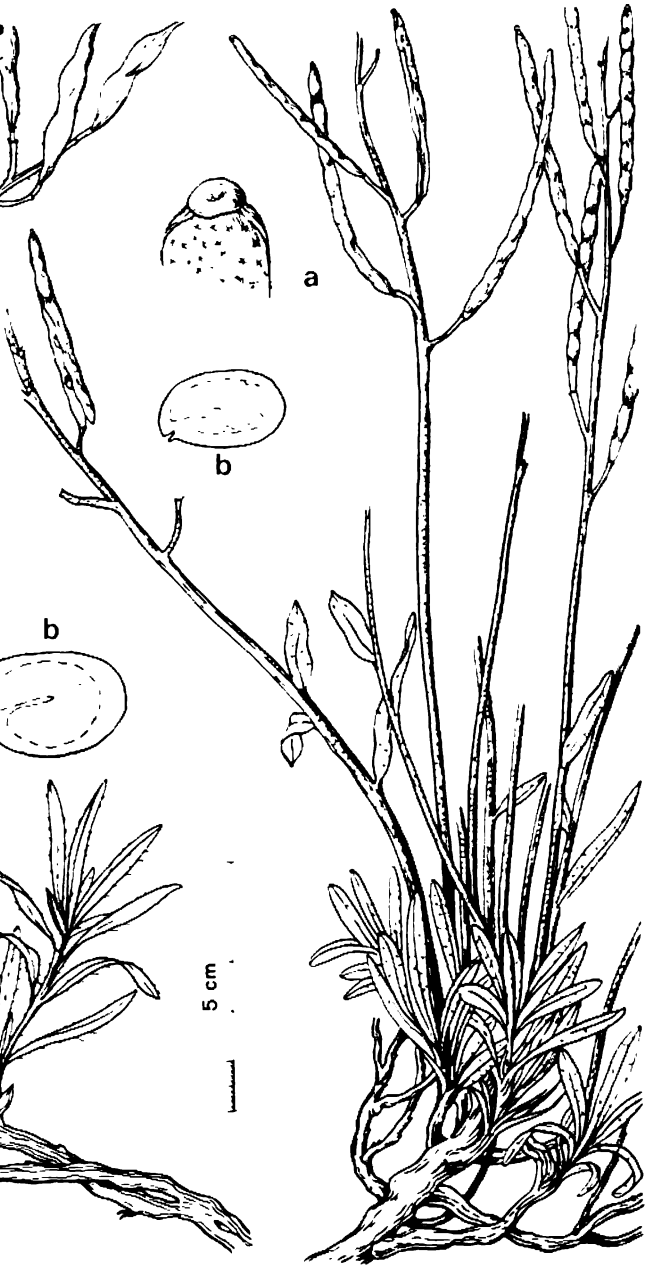


Fig. 2

Fig. 1: *Koeiea flexuosa* Rech. f. – Rech. 18027
Fig. 2: *K. altimurana* Rech. f. – Rech. 31845

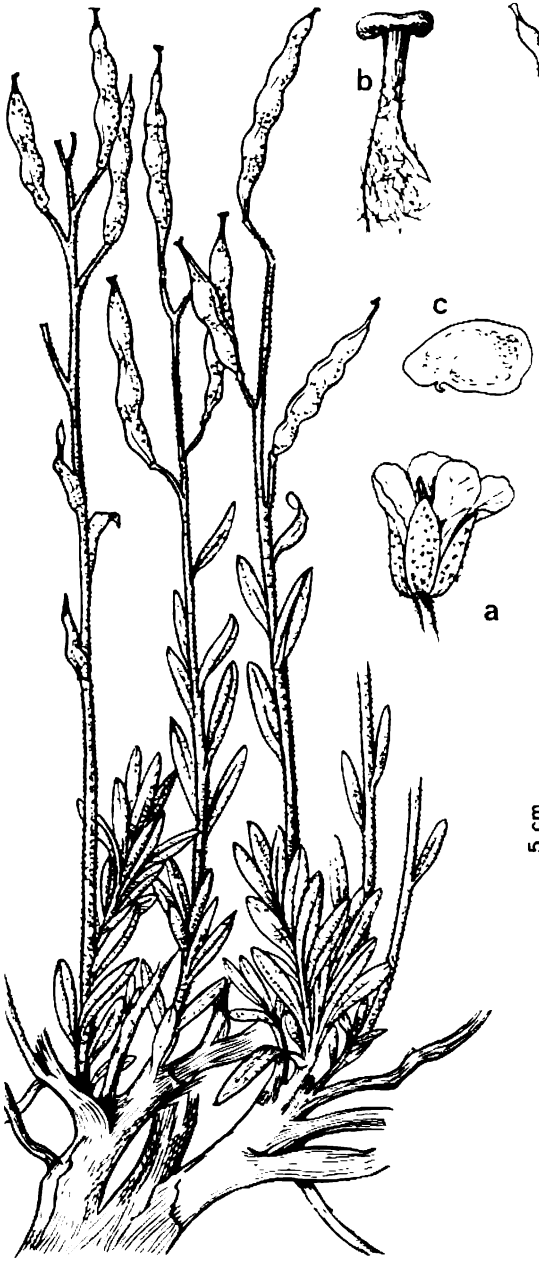


Fig. 1

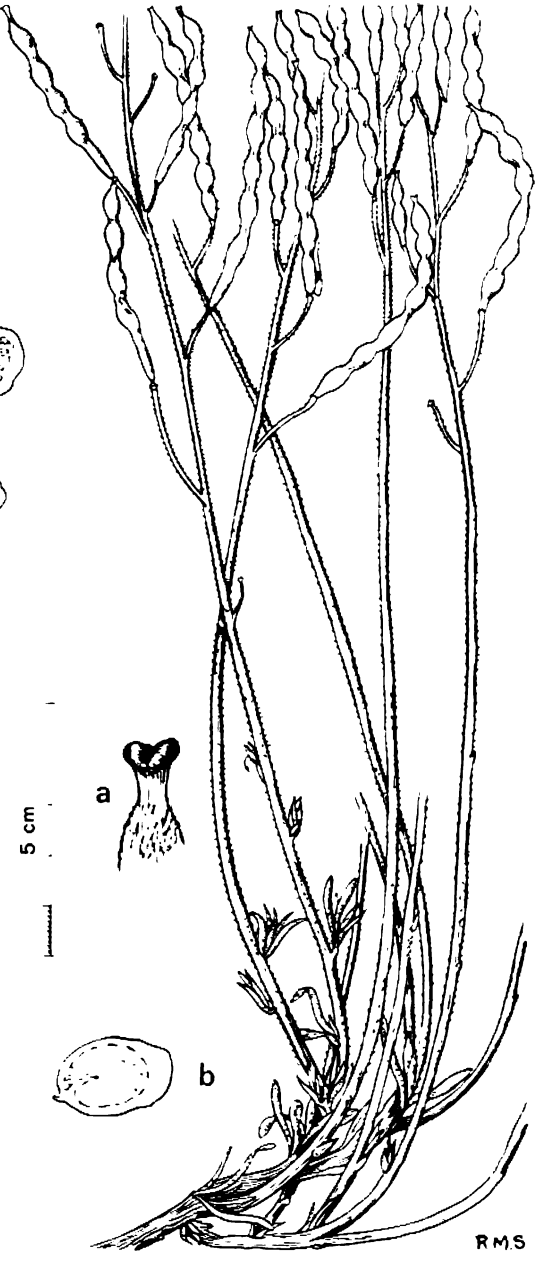


Fig. 2

Fig. 1: *Kocieа afghanica* Rech. f. Rech. 18413
Fig. 2: *K. ghorana* Rech. f. — Rech. 18866

10 cm

Fig. 1

Fig. 2

10 cm

Fig. 1: *Malcolmia spryg rioides* Bot-ch. & Vved. — Lindb. 1959 461
Fig. 2: *M. turkestanica* Litw. — Rech. 16092

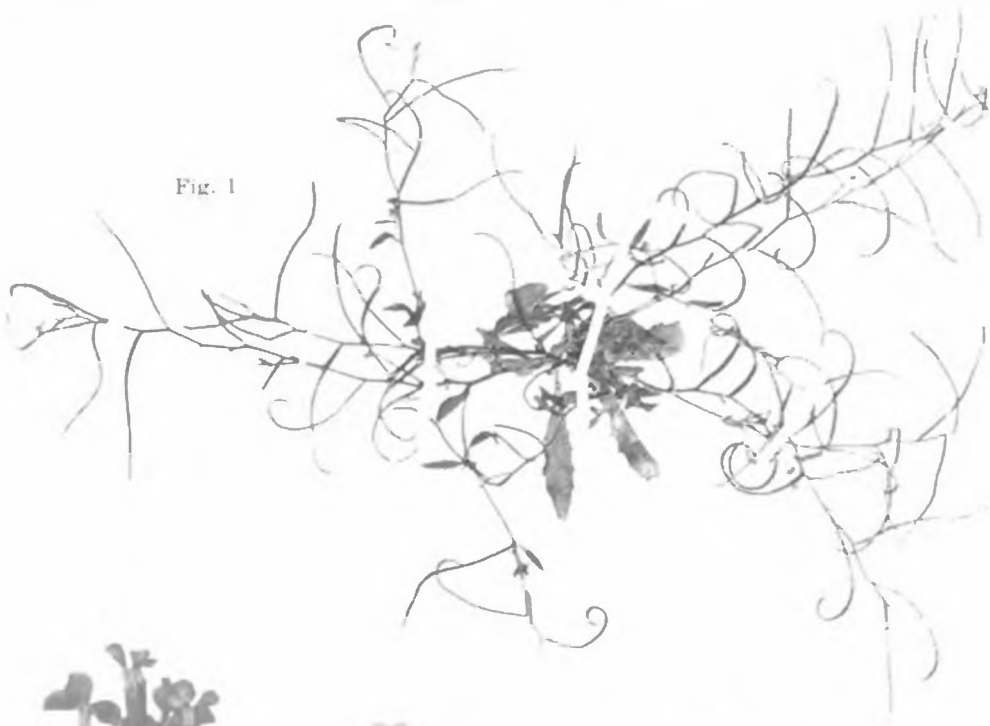


Fig. 1

Fig. 2

Fig. 1: *Malcolmia scorpioides* (Bge.) Boiss. — Rech. 27747
Fig. 2: *M. crenulata* (DC.) Boiss. — Barkley 4616

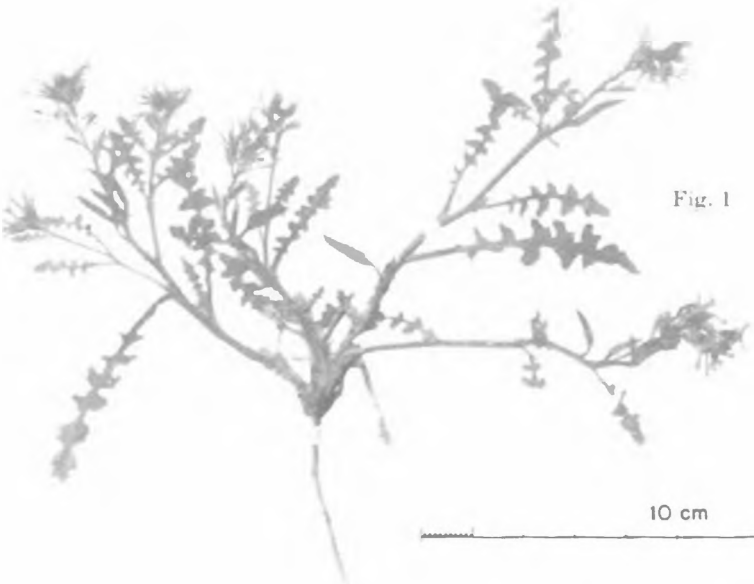


Fig. 1

10 cm

Fig. 2

Fig. 1: *M. Toppinii* O. E. Schulz – Toppin 106
Fig. 2: *Malcolmia Behboodiana* Rech. f. & Esfand. Behb. 109

Erysimum crassicaule (Boiss.) Boiss. — Fig. 1: Rech. 2967, Fig. 2. Rech 2687

Fig. 1

10 cm

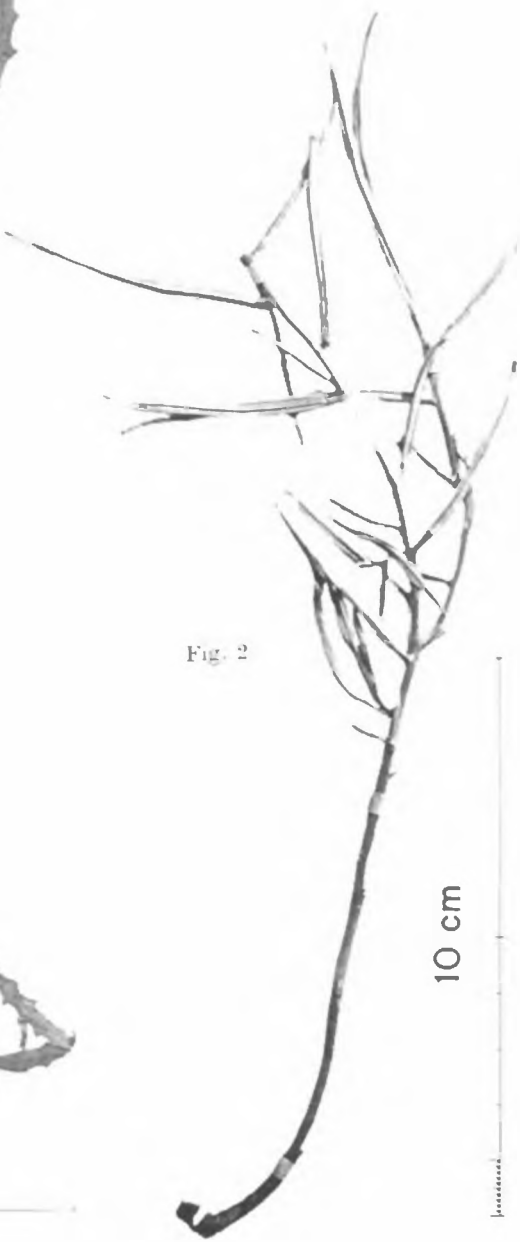


Fig. 2

10 cm

Erysimum gladiferum Boiss. & Haussk. — Fig. 1: Thesiger 433. Fig. 2 Haines in Rech. 15808

Fig. 1

Fig. 2

Fig. 1: *Erysimum salangense* Polatschek & Rech. f. — Rech. 31733
Fig. 2: *E. nuristanicum* Polatschek & Rech. f. — Rech. 32452

Fig. 1: *Erysimum ghazniense* CULLEN & RECH. f. — RECH. 17765
Fig. 2: *E. Badghys* (KORSH.) LIPSKY — ZUKERWANIK 66

Fig. 1

10 cm

Fig. 2

10 cm

Fig. 1: *Erysimum macrospermum* Cullen & Rech. f. — Rech. 18231
Fig. 2: *E. Koelzii* Polatschek & Rech. f. — Koelz 17450

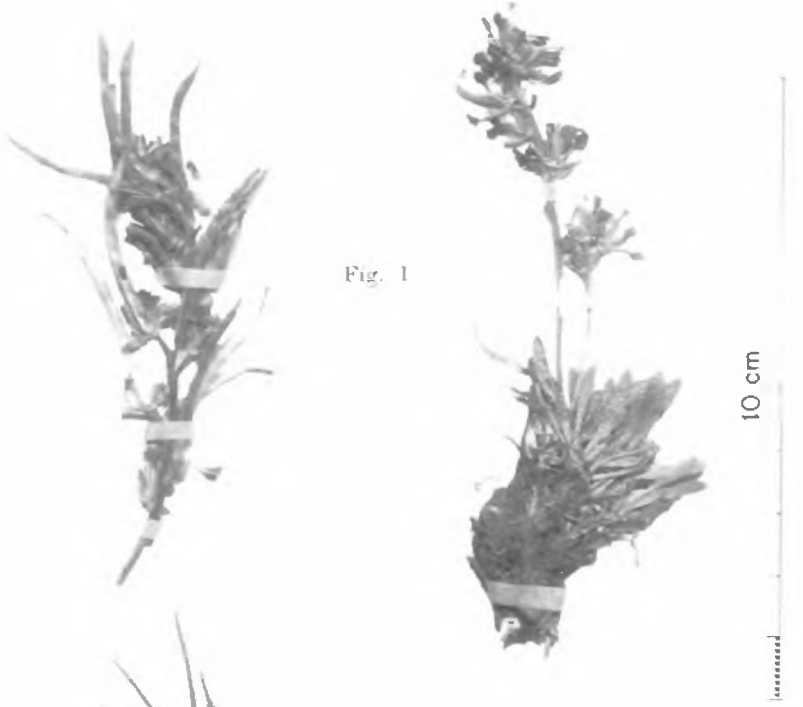


Fig. 1

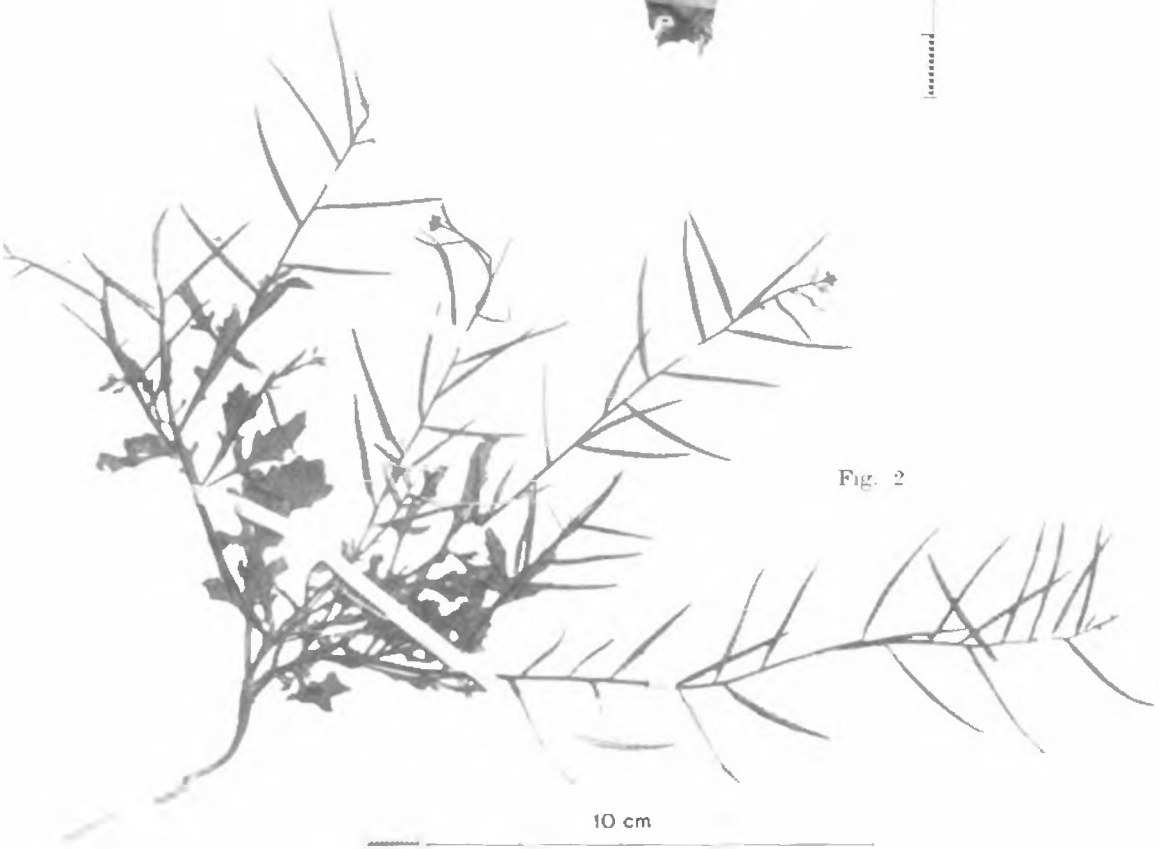


Fig. 2

Fig. 1: *Zerdana anchonioides* Boiss. — Remaudière 5847-E
Fig. 2: *Sisymbrium crassifolium* Desf. — Rech. 27736

Sisymbrium gamosepalum HEDGE — RECH. 16845

Sisymbrium gamosepalum HEDGE — RECH. 32002

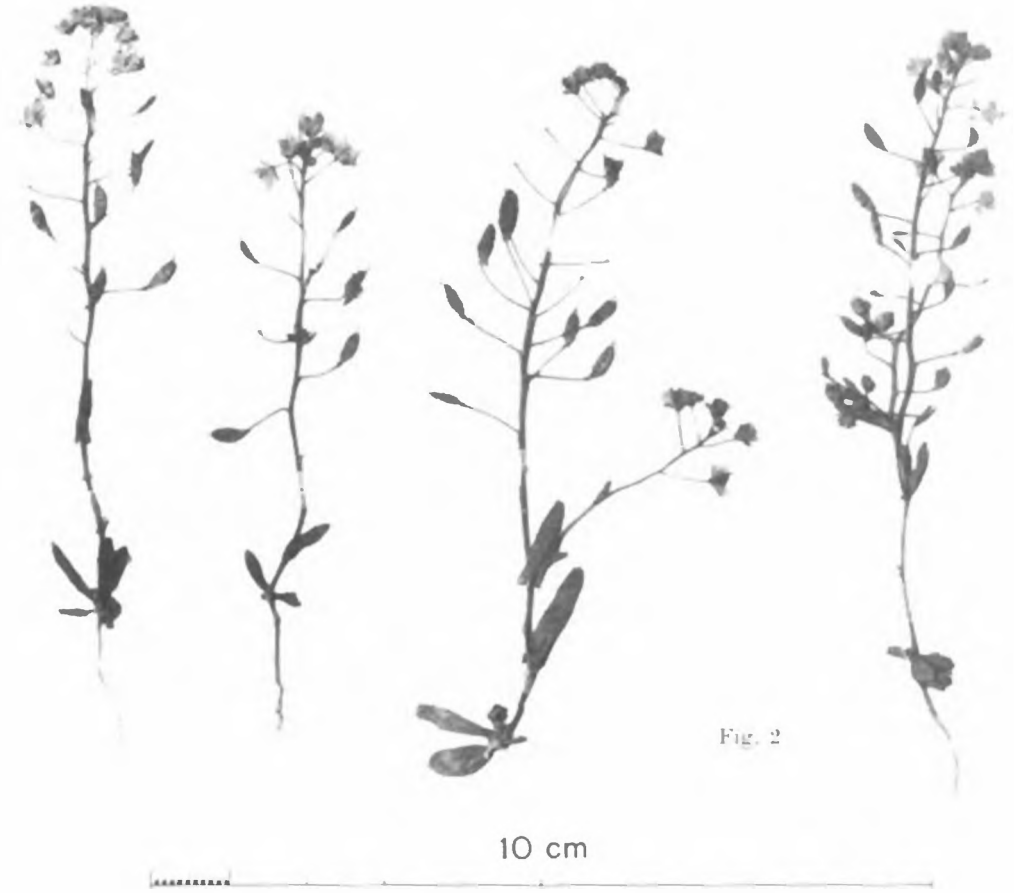


Fig. 1: *Dielsiochaeta Kotschyi* (Boiss.) O. E. Schulz — Rech. 5120
Fig. 2: *Nasturtiicarpa notorrhiza* Gilli — Neub. 3134

Fig. 1

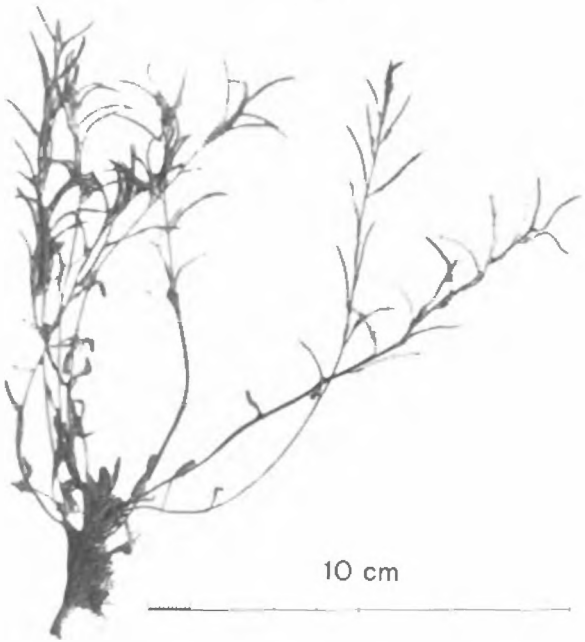


Fig. 2

Fig. 1: *Arabidopsis gamosepala* HEDGE — PODLECH 12379
Fig. 2: *A. exsepala* HEDGE — RECH. 18359

Fig. 1: *Torularia aculeolata* (Boiss.) O. E. Schulz — Volk 12
Fig. 2: *T. afghanica* (Gilli) Hedge — Neub. 4737

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Die in Kursiv gesetzten Familien sind bereits erschienen

	Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
PTERIDOPHYTA					
ilsetaceae	1	2	143	(2)	(2)
opodiaceae	2	1	142	(1)	(1)
silicaceae	5	5	144	(4)	(4)
ioglossaceae	3	3	140	(6)	(6)
ypodiaceae	4	4	141	(3)	(3)
iniaceae	6	6	145	(5)	(5)
GYMNOSPERMAE					
essaceae	9	8	136	(8)	(8)
draceae	10	10	138	(10)	(10)
ceae	8	9	135	(7)	(9)
eae	7	7	137	(9)	(7)
ANGIOSPERMAE					
iaceae	138	110	84	86	135
ceae	86	83	30a	42a	76
eae	48	27	50	57	106
alismataceae	16	127	115	124	146
nthaceae	45	23	93	92	112
Am yllidaceae	27	134	128	114	162
Ampelidaceae	91	91	32	41	66
Ana ardiaceae	81	81	46	43	75
Api eae	113	94	54	58	127
Apo ynaceae	125	117	82	75	82
Aqi oliaceae	82	86	70	38	58
Ara eae	22	143	120	122	158
Ara aceae	112	93	55	59	19
Aris olochiaceae	40	35	103	97	96
Asc piadaceae	126	118	74	76	84
ragaceae	26	133	129	116	155,7pp.
eae	146	126	61	65	131
oraceae	42	20	102	103	63
naceae	89	95	25	33b	140
			3	13	96
				108	25
				85a	86a
				79	142
				16	101
				77	80
	7..		3	36	72
tomaceae	17	128	116	124a	145
caceae	80	31	105	104a	23
esalpiniaceae	68b	59b	38b	45b	13
llitrichaceae	79	32	47	50b	117
nparulaceae	145	125	62	66	130
C nabiaceae	37	17a	106	105	30
C pparidaceae	59	45	8	17	36
Cabrifoliaceae	141	121	57	61	20
Caryophyllaceae	50	29	13	23	105
Celastraceae	83	87	35	39	60
Ceratophyllaceae	52	42	15	110	94
Chenopodiaceae	44	22	92	93	111
Cistaceae	99	49	10	19	33
Commelinaceae	24	138	132	117	154
Compositae	146	126	61	65	121
Convolvulaceae	127	102	78	80	133
Cornaceae	114	92	56	60	18
Corylaceae	33	11	112	108	27
Crassulaceae	63	56	51	48	123
Cruciferae	60	46	7	16	101
Cucurbitaceae	144	124	48	55	42
Cupuliferae	33-4	11-2	111-2	108	25-7
Cuscutaceae	128	103	79	80a	141
Cynocrambaceae	111	25	91	105c	113
Cyperaceae	20	139	134	126	169
Cytinaceae	41	36	101	96	98
Datiscaceae	101	54	49	56	43
Dioscoreaceae	28	137	131	115	164
Dipsacaceae	143	123	60	64	129
Ebenaceae	121	100	69	72	68
Ehretiaceae	129	104	80	79	87
Elaeagnaceae	103	61	97	100	64
Elatinaceae	96	52	18	26	103
Ericaceae	116	99	63	67	51
Euphorbiaceae	78	30	104	104	49
Fabaceae	68	59	38	45	13-5
Fagaceae	34	12	111	108a	26
Ficoidaceae	48	27	50	57	106
Frankeniaceae	97	51	17	22	38
Fumariaceae	58	44	6	15a	100
Gentianaceae	124	116	76	78	118
Geraniaceae	70	74	26	33	138
Globulariaceae	137	108	85	87	142
Graminae	19	140	135	127	170
Grossulariaceae	64	57	52	47	17
Guttiferae	95	55	19	27	54
Halorrhag(id)-aceae	109	67	46	50	115
Hamamelidaceae	65	33	53	49	21
Helleboraceae	53	39	1	11	90
Hippocastanaceae	87	84	30b	42b	77
Hippuridaceae	110	68	45	50a	116
Hydrangeaceae	64	57	52	47	16a
Hydrocharitaceae	18	129	114	111	146
Hypericaceae	95	55	19	27	54
Ilicineae	82	86	70	38	58
Illecebraceae	50	29	13	23	109
Iridaceae	29	135	126	113	163

	Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
Juglandaceae	32	13	109	109	2
Juncaceae	25	136	133	118	165
Juncaginaceae	[illegible]	130	117a	125b	148
Labiatae	131	112	87	89	144
Lamiaceae	131	112	87	[illegible]	144
Lauraceae	56	37	98	[illegible]	11
Leguminosae	68	59	38	45	13-5
Lemnaceae	23	144	119	123	159
Lentibulariaceae	136	107	85	84	137
Liliaceae	26	135	128	116	155
Linaceae	71	72	23	31	[illegible]
Loganiaceae	123	115	75	77	79
Loranthaceae	39	19	100	91	61
Lythraceae	104	62	43	53	114
Malvaceae	93	60	20	28	[illegible]
Meliaceae	76	79	31	37	73
Menispermaceae	55	78	2	12	9[illegible]
Menyanthaceae	[illegible]	[illegible]	76	78	119
Mimosaceae		59a	38a	45a	14
Moringaceae		27	50	57	105
Monotropaceae	[illegible]	98	64	67	52
Moraceae	38	[illegible]	107	105a	31
Moringaceae	62	28	37	44	37
Myrsinaceae	122	7	67	70	
Myrtaceae	107	84	40	52	55
Najadaceae	5	1	118	125	153
Nectariaceae	46		95	91	35
Nymphaeaceae	91	41	4	14	93
Oenotheraceae	108	66	44	54	115
Oleaceae	122	119	71	73	81
Onagraceae	108	66	44	54	115
Orchidaceae	30	141	125	112	167
Orobanchaceae	135	108	83	83	136
Oxalidaceae	69	73	24	33a	139
Paeoniaceae	53	39	1	11	99
Palmae	21	142	121	119	165
Pandanaceae	12	145	122	120	166
Papaveraceae	57	43	5	15	99
Papilionaceae	68c	59c	38c	45c	15
Parnassiaceae	64	57	52	47	126
Pedaliaceae	31	109	77	85	86
Periplocaceae	126	118	74	76	85
Philadelphaceae	64	57	52	47	16
Phytolaccaceae	47	24	90	94	110
Plantaginaceae	139	114	89	90	122
Platanaceae	66	34	110	106	22
Plumbaginaceae	119	95	88	68	121
Poaceae	19	140	135	127	170
Podophyllaceae	54	40	3	13	93
Polygalaceae	75	80	12	21	41

	Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
Polygonaceae	43	21	94	[illegible]	98
Portulacaceae	59	28	14	24	107
Potamogetonaceae	14	131	117		150
Primulaceae	118	96	66		[illegible]
Punicaceae	105	65	42	5	57
Pyrolaceae	115	98	[illegible]	65	80
Rafflesiaceae	41	36	101	95	98
Ranunculaceae	53	39	1	11	91
Resedaceae	61	47	9	[illegible]	102
Rhamnaceae	90	90	36		95
Rhizophoraceae	106	63	41		87
Rosaceae	67	58	39		12
Rubiaceae	140	120	58	62	85
Ruppiaceae	14	131	117	27a	151
Rutaceae	26	133	129	116	157
Rutaceae	73	76	28	34	70
Salicaceae	31	14	113	109	24
Salvadoraceae	84	88	72	74	79
Santalaceae	88	18		102	62
Sapindaceae	88	82	30	42	74
Sapotaceae	120	101	85	[illegible]	89
Saxifragaceae	64	57	52	7	[illegible]
Scheuchzeriaceae	—	130	117a	25b	148
Scrophulariaceae	133	106	82	82	134
Selaginaceae	137	108	85	87	—
Simar(o)ubaceae	74	77	29	35	71
Smila(ca)ceae	26	133	130	116	156
Solanaceae	132	105	81	81	132
Sparganiaceae	13	146	123	121a	160
Staphyleaceae	85	89	30c	42c	78
Sterculiaceae	94	71	21	23	45
Tamaricaceae	98	50	16	25	39
Theligonaceae	111	25	91	105c	113
Therebinthaceae	81	81	46	43	7
Thymelaeaceae	102	60	46	99	3
Tiliaceae	92	70	29	30	4
Typhaceae	11	147	124	121	18
Ulmaceae	35	18	108	105b	8
Umbelliferae	113	94	54	58	12
Urticaceae	37	17	106	105	3
Vaccinaceae	116	99	63	67	5
Vahliaceae	64	57	52	47	12
Valerianaceae	142	122	59	63	12
Verbenaceae	130	111	81	88	8
Violaceae	100	53	21	20	4
Vitaceae	91	91	52	41	6
Zannichelliaceae	14	131	117	125a	15
Zosteraceae	14	131	117	125a	14
Zygophyllaceae	72	75	27	32	4

FLORA IRANICA
K. H. RECHINGER

Lfg. No. 58 30. 4. 1969
Cont.

Lentibulariaceae

auctore S. J. CASPER, Jena

Lentibulariaceae

auctore S. Jost Casper, Jena

Lentibulariaceae L. C. Richard in Poiteau & Turpin, Fl. Paris 1: 26 (1808): „*Lentibularieae*".

Lit.: Augustin Pyramus de Candolle, Prodromus systematis naturalis 8: 1—32 (1844). E. Boissier, Flora Orientalis IV: 1—4 (1879). F. Kamienski, Lentibulariaceae in A. Engler & K. Prantl, Die natürlichen Pflanzenfamilien IV (3b): 108—123 (1891). J. H. Barnhart, Segregation of genera in Lentibulariaceae. Mem. N. Y. Bot. Gard. **6**: 39—64 (1916).

Aus dem Gebiete ist bisher nur die Gattung *Utricularia* nachgewiesen worden. Bornmüllers (1915: 300) These, daß das Geschlecht „vermutlich verbreitet, jedoch übersehen" sei, besteht noch immer zu Recht. Es ist nicht völlig ausgeschlossen, daß sich im äußersten Nordwesten auch noch *Pinguicula* finden wird.

1. *Utricularia*

Utricularia L., Spec. Plant. 18 (1753).

Lit.: J. Bornmüller, Plantae Brunsianae. Aufzählung der von F. Bruns im nördlichen Persien gesammelten Pflanzen. Beih. Bot. Centralbl. XXXIII, 2. Abtlg.: 270—324 (1915). P. Taylor, The genus Utricularia L. (Lentibulariaceae) in Africa (south of the Sahara) and Madagascar. Kew Bulletin 18 (1): 1—248 (1964).

Plantae perennes aquaticae sine radice. E caulium fluitantium nodis pedunculos floriferos supra aquas eriguntur teretes. Folia in tenuia et capillacea segmenta subdivisa, plurimum passim bullas quasdam lentes adnata. Flores racemosi personati. Calyx bilabiatus labiis integris persistens. Corolla bilabiata calcarata; labium superum integrum galeae figuram obtinet; labium inferum latum subtrilobum cum palato. Stamina 2. Stigma bilabiatum. Capsula unilocularis subglobosa multitudinem seminum minutissimorum continens.

1a. Laciniae foliorum margine setoso-ciliatae. Pedunculi basin versus cum rhizoideo. Calcar distincte longius quam crassum. Palatum concameratum faucem ± percludens. Hibernacula pilosa 2

b. Laciniae foliorum margine non setoso-ciliatae. Pedunculi basin versus sine rhizoideo. Calcar subaeque longum ac crassum obtuso-conicum. Palatum planum faucem non percludens. Hibernacula glabra ..... 1. *U. minor* L.

2a. Caules unius generis fluitantes solum non insidentes. Folia dichotome multipartiti laciniis capillaribus passim bullis lentiformibus 3

b. Caules duorum generum: alteris viridi-purpureis fluitantibus foliis dichotome partitis laciniis lineari-subulatis singulariter bullis lentiformibus; alteris pallidis solum insidentibus foliis incohatis 1—3 bullis lentiformibus ..... 2. *U. ochroleuca* R. Hartman

3a. Pedunculi supra aquas rigide eriguntur. Pedicelli 5—12 (—17) mm longi duplo vel triplo longiores quam bracteae post florem vix entensi. Labium superum corollae palatum subdepressum adiactum; labium inferum sellae

figuram obtinet. Superficies intestina calcari parte abaxiali glandulis substipitatis obsita. Pedicelli fructiferi reflexi ..... 3. *U. vulgaris* L.

b. Pedunculi supra aquas eriguntur huc et illuc flexi. Pedicelli 5—18 mm longi triplo vel quintuplex longiores quam bracteae post florem multum extensi (summum ad 42 mm) non reflexi. Labium superum corollae palatum hemisphaerium non adiactum; labium inferum subplanum. Superficies intestina calcari omni ex parte glandulis substipitatis obsita. Pedicelli non fructiferi.. ..... 4. *U. neglecta* LEHM.

1. ***U. minor*** L., Spec. Plant. 18 (1753).

Typus (Lectotypus): herb. Linnaei 34. 3. [2.] — LINN!

Planta perennis aquatica caulibus duorum generum: alteris viridibus fluitantibus foliis distichis 7—22 laciniis dichotome partitis bulligeris marginibus non setoso-ciliatis; alteris pallidis subterraneis foliis incohatis bulligeris. Hibernacula glabra. Pedunculi supra aquas eriguntur 2—5 floriferi. Flos 6—8,5 mm longus. Corolla pallide lutea bilabiata; labium superum integrum subovatum; labium inferum integrum late ovatum marginibus lateralibus revolutis. Palatum plane depressum. Calcar brevissimum subconicum non longius quam crassum. Capsula subglobosa 2—2,5 mm diametro. Pedicellus fructiferus reflexus.

Afghanistan: E: Ghazni: Ad lacum Jalgah-Shahr-Kawat, inter Okak et Behzud (Diwal Kol), 2300 m, RECH. 17885 p. p.!

Distr. gen.: Per totam regionem circumpolarem septentrionalem disjunctim dispersa.

2. ***U. ochroleuca*** R. HARTMAN, Bot. Not. 1857: 30 (1857).

Syn.: *U. bremicornis* ČELAK., Österr. Bot. Zeitschr. 36: 253—257 (1886).

Typus (Lectotypus): „Hucusque lecta in paludosis haud procul a lacu Tönshammarsjön par. Skog Helsingiae", R. HARTMAN, S.

Planta perennis aquatica caulibus duorum generum: alteris viridi-purpureis fluitantibus foliis distichis 7—19 (—29) laciniis lineari-subulatis dichotome partitis bullis plerumque destitutis vel rarissime hinc inde bulla unica solitaria instructis marginibus setoso-ciliatis; alteris pallidis foliis incohatis 1—3 bullis lentiformibus solum insidentibus. Hibernacula pilosa. Pedunculi supra aquas eriguntur 2—3 floriferi. Flos 10—13 mm longus. Corolla lutea bilabiata; labium superum ovatum leviter emarginatum obscure brunneo-striatum; labium inferum suborbiculatum planum palato suo hemisphaerio brunneo-striato bis longius. Calcar ex basi lata abrupte attenuatum conicum acutum 4—7 mm longum, dimidium longitudinis labii inferi corollae subaequans. Capsula ignota.

Afghanistan: E: Ghazni: Ad lacum Jalga-Shahr-Kawat, inter Okak et Behzud (Diwal Kol), 2800 m, RECH. 17870 p. p.!, 17885 p. p.!

Distr. gen.: Non satis cognita; per regiones septentrionales ab utraque parte Oceani Atlantici dispersa.

3. ***U. vulgaris*** L., Spec. Plant. 18 (1753).

Typus (Lectotypus): Herb. Linnaei 34. 2. (1), LINN!

Planta perennis aquatica caulibus unius generis: caules viridi-purpurei fluitantes foliis pinnato-multipartitis laciniis capillaribus passim bullis lentiformibus marginibus setoso-ciliatis. Hibernacula pilosa. Pedunculi supra aquas rigide eriguntur 4—15

(–23) floriferi. Pedicelli 5–12 (–17) mm longi duplo vel triplo longiores quam bracteae post florem vix extensi. Flos 13–20 mm longus. Calyx bilabiatus purpureus. Corolla bilabiata intense lutea; labium superum palatum subdepressum obscure irregulariter striatum pilosum adiactum subintegrum; labium inferum marginibus lateralibus revolutum et sellae figuram obtinet. Calcar ex basi lata acuto-conice attenuatum, 6–8 mm longum; superficies intestina calcari parte abaxiali glandulis substipitatis obsita. Capsula subglobosa 2–5 mm diametro. Pedicelli fructiferi reflexi crassi.

Afghanistan: E: Ghazni: Ad lacum Jalgah-Shahr-Kawat inter Okak et Behzud, 2800 m, RECH. 17870 p. p.!, 17885 p. p.! Ad lacum Sabzab, 2800 m, RECH. 17970! – C: Bamian: Band-i Amir, ad lacum Band-i Panir, 2800 m, RECH. 18398! Band-i Amir, VOLK 2299!, 2823!, NEUB. 449 1951!; 2900 m, GILLI 3000! Panjao, 2800 m, KOELZ 2743!

Pakistan: Chitral: In jugo Baroghil, 3600 m, STAINTON 3023!

Distr. gen.: Non satis cognita. Per majorem partem Europae, Asiae et Americae temperatae plusminusve disjunctim dispersa; in Africa boreali (?), non in Africa centrali et australi.

4. ***U. neglecta*** LEHM., Index schol. Hambg. Gymn. Acad. 38 (1828).

Syn.: *U. major* auct. nonnull. sec. SCHMIDEL.

(Lecto-)Typus: „Crescit in agro Hamburgensi, praesertim prope Eppendorf, locis paludosis uliginosis turfosis" LEHM.

Planta perennis aquatica caulibus unius generis: caules virides fluitantes foliis satis distantibus pinnato-multipartitis laciniis capillaribus plerumque passim bullis lentiformibus marginibus setoso-ciliatis. Hibernacula pilosa. Pedunculi supra aquas eriguntur huc et illuc flexi 3–12 floriferi. Pedicelli 5–18 mm longi triplo vel quintuplex longiores quam bracteae post florem multum extensi (ad summum 42 mm) non reflexi sed ab pedunculo oblique sursum distantes. Flos 12–18 mm longus. Calyx bilabiatus plerumque viridis. Corolla bilabiata lutea; labium superum palatum hemisphaerium obscure irregulariter striatum non pilosum adiactum subintegrum; labium inferum subplanum suborbiculatum. Calcar ex basi lata obtuse-conice attenuatum 5,5–7,5 mm longum; superficies intestina calcari omni ex parte glandulis substipitatis obsita. Pedicelli non fructiferi.

Persia: N: Maz.: Ad mare hyrcanum ad Babol (Barfurush), BRUNS! Bagh-e Shah prope Babol (Barfurush), BORNM. 442! In lacu prope Shahi, SCHMID 6393! – W: Lur.: Kebar, in stagno, KOELZ 18281!

Distr. gen.: Non satis cognita. Per magnam partem Europae disjunctim dispersa; Persia; in Asiae compluribus locis.

Die beiden zitierten Aufsammlungen von Babol (Barfurush) stammen trotz des unterschiedlichen Textes der Schedae von BRUNS (vgl. BORNMÜLLER (1915)). Daß BORNMÜLLER *U. neglecta* LEHM. mit *U. vulgaris* L. verwechselt hat, ist angesichts des Standes unserer Kenntnisse der Gattung nicht verwunderlich.

Pinguicula L. 1
Utricularia L. 1
brevicornis Čelak. 2
major auct. 3
minor L. 2
neglecta Lehm. 3
ochroleuca R. Hartman 2
vulgaris L. 2

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 59 30. 4. 1969

Sparganiaceae

auctore H. RIEDL, Wien

Sparganiaceae

Auctore H. RIEDL, Wien

Sparganiaceae RUDOLPHI, Syst. Orb. Veget. 27 (1830), nom. conserv.
Syn.: *Sparganieae* DUMORT., Anal. Fam. 66 (1829); *Sparganioideae* LINK, Handb. 1: 133 (1829). *Sparganiaceae* J. G. AGARDH, Theor. Syst. Plant. 13 (1858).

Lit.: E. BOISSIER, Flora Orientalis 5: 48 (1884). L. J. ČELAKOVSKÝ, Über die ramosen Sparganien Böhmens, Österreichische Botanische Zeitschrift 46: 377–381 & 421–433 (1896). P. GRAEBNER, Sparganiaceae in A. ENGLER, Das Pflanzenreich IV, 10: 1–26 (1900). S. W. JUZEPCZUK, Sparganiaceae in W. L. KOMAROV, Flora URSS. 1: 216–229 (1934). C. D. K. COOK, Sparganium in Britain, Watsonia 5: 1–10 (1961); C. D. K. COOK, Die bayerischen Sparganium-Arten, Berichte der Bayerischen Botanischen Gesellschaft 34: 7–10 (1961).

Genus unicum:

1. *Sparganium*

Sparganium L., Spec. Plant. 971 (1753). Gen. Plant. ed. 5: 418 (1754).

Flores monoici, in capitulis globosis lateralibus et terminalibus congesti. Capitula feminea plerumque prope basin ramorum infra mascula disposita. Flores masculi e tepalis et staminibus 3 (vel rare pluribus) compositi, inter flores bracteae ± irregulariter evolutae. Flores feminei in axillis bractearum e tepalis 6 (rare pluribus vel paucioribus) et ovario uniloculari consistentes. Ovulum anatropum unicum. Fructus paries e pericarpio carnoso vel spongioso et endocarpio lignoso durissimo composita. Semina alba, oblongo-ovoidea testa membranacea. — Herbae perennes rhizomate repente cataphyllis distichis vestito, caule erecto vel fluitante, foliis linearibus distichis, inferioribus subvaginantibus praeditae.

1a. Fructus utrinque attenuati loco latissimo paulo supra vel prope medium a tepalis superato. Stylus longiusculus. Tepala cochlearia apice subreniformi, brunnea vel brunnescentia, basin versus intensius colorata, maturitate fructuum 1 mm latitudine subaequantia. Capitula mascula in ramo primario quidem plerumque plus quam 10. Folia nervo mediano manifeste prominente, sed plana ..... 1. *Sp. neglectum* BEEBY

b. Fructus stylum longiusculum vel breviusculum versus ± abrupte contractus, loco latissimo in parte tertia superiore, a tepalis non superato. Tepala aut per totum albido-scariosa vel dilute brunnescentia aut brunnescentia apicem versus atro-brunnea, ad summum 0,5 mm lata. Capitula mascula quam 10 pauciora vel folia in lateribus concava ideoque nervo mediano angulato 2

2a. Fructuum locus latissimus paulo infra stylum brevem situs, fructus supra depresso-rotundati, obtuse angulati, subcontigui. Tepalorum apex truncatus, atro-brunneus. Folia in lateribus concava nervo mediano angulato prominente ..... 2. *Sp. erectum* L.

b. Fructus in parte tertia superiore latissimi, supra semiglobosi in apicem

abrupte attenuati, stylum longiusculum versus anguste conici. Tepala per totum albido-scariosa vel dilute brunnescentia, subfiliformia. Folia plana, nervo mediano manifeste prominente .... 3. *Sp. stoloniferum* BUCH.-HAM. ex JUZ.

Alle hier behandelten Arten gehören der Sektion *Melanosparganium* HOLMB., Bot. Not. 1922: 206 (1922) an. Sie werden von den meisten neueren Autoren, wie HYLANDER in Nordisk Karlväxtflora I: 82ff. (1953) und COOK, l. c. als Unterarten von *Sp. erectum* L. bewertet. Damit kann ich mich nicht ganz einverstanden erklären; wie aus dem Schlüssel ersichtlich, können zur Unterscheidung eine ganze Reihe korrelierter Merkmale herangezogen werden, die allein schon den Artrang rechtfertigen würden. Dazu kommen noch von mir nicht verwendete, anatomische Unterschiede im Bau der Fruchtwand; siehe HYLANDER, Nomenklatorische und Systematische Studien über nordische Gefäßpflanzen. Uppsala Universitätets Årsskrift 7: 66 (1945). Außerdem ist es üblich, als Unterarten solche Taxa anzusehen, die bei geringfügigeren morphologischen Unterschieden geographisch oder ökologisch voneinander getrennt vorkommen. Zumindest bei *Sp. erectum* L. und *Sp. neglectum* BEEBY ist das aber keineswegs eindeutig der Fall, wie sich vor allem in Europa zeigt. Das *Sp. erectum* nahestehende *Sp. stoloniferum* BUCH.-HAM. würde diese Forderung eher erfüllen. Durch die Bewertung als Subspecies wird aber meines Erachtens mehr über den genetischen Zusammenhang ausgesagt, als dies nach unseren heutigen Kenntnissen möglich ist. Im Gebiet der Flora Iranica könnte zwischen *Sp. erectum* und *Sp. neglectum* vielleicht geographische Vikarianz vorliegen, wobei ersteres nur ein kleines Areal in Nordpersien bewohnt, während letzteres mit Sicherheit nur im Osten fehlt. Doch selbst dann liegt dieses Teilareal zu sehr im Randbereich der Gesamtverbreitung, als daß man daraus Schlüsse ziehen dürfte.

1. ***Sp. neglectum*** BEEBY, Journ. Bot. 23: 26, 193 (1885).

Syn.: *Sp. erectum* L. β *neglectum* (BEEBY) RICHTER, Pl. Eur. 1: 10 (1890). *Sp. ramosum* HUDSON subsp. *neglectum* (BEEBY) NEUMAN, KROK., HARTM., Handb. 12: 112 (1889). *Sp. erectum* L. var. *neglectum* (BEEBY) FIORI & PAOL., Fl. Anal. Ital. 1: 146 (1896—98). *Sp. erectum* L. subsp. *neglectum* (BEEBY) SCHINZ & THELLUNG, Fl. Schweiz, ed. 3, 2: 14 (1914).

Typus (Syntypi): Anglia, Surrey, Albury. Ponds prope Guildford, BEEBY.

Planta ± 30—100 cm alta. Folia linearia apicem versus modice, demum ± abrupte attenuata. Capitula florum paniculatim disposita, feminea in ramo maximo 2—3, in ramis lateralibus 1—2, mascula in ramo maximo saepissime ultra 10 (in ditione nostra), in lateralibus 5—12. Floris feminei tepala ut in clave indicata. Ovaria plerumque unilocularia. Fructus 6—10 mm longi, 2,5—4 mm in loco latissimo lati, vix angulati, gradatim in stylum 2,5—3.5 mm longum attenuati.

Persia: N: Maz.: Inter Amol et Zardman, 500—1800 m, SCHMID 5882!, 5883! Mazanderan, ESFAND. 19! Īstgah-e Tir Tash, SHAR. 525! Gil.: Rasht, BORNM. 8266. Inter Rasht et Lahijan, RECH. 70! Lahijan, LINDS. 876! Astara, GAUBA & SAB. 1788! W: Kermansh.: 34° 25′ N, 46° 51′ E, 1300 m, JACOBS 6735! Ham.: Kuh-e Garri, STR. Borujerd, KOELZ 18212! Abbasabad, MIRD. 1789! Arak: Qeshlaq, STR.! M. Rasvand, STR. Lur.: Dow Rud, 1500 m, KOELZ 15835!

Distr. gen.: Europa pro maxima parte, septentriones versus rarius, Caucasus, Talish, Persia, Africa septentrionalis.

Meine Beschreibung weicht zumindest in einem Punkt von GRAEBNER's, l. c., Angaben ab. Während ich bei *Sp. neglectum* mehr als 10 männliche Köpfchen zumindest für den Hauptast der Synfloreszenz an fast allen untersuchten Exemplaren aus Persien fand, nimmt er diese Zahl als obere Grenze an. Es könnten dabei geographische Unterschiede eine Rolle spielen. Umgekehrt beschreibt er *Sp. stoloniferum* als reicher an männ-

lichen und weiblichen Infloreszenzen (obwohl nicht klar erkennbar ist, ob seine Zahlen, bzw. die Angabe „capitulis ... masculis numerosis" auf die ganze Synfloreszenz oder nur auf einen Ast bezogen wurden). Die Stellung der var. *oocarpum* ČELAK., Österr. Bot. Zeitschr. 46: 425 (1896) und ihr systematischer Wert scheinen mir zu unsicher, als daß sich Angaben über ein eventuelles Vorkommen in Persien machen ließen.

2. ***Sp. erectum*** L., Spec. Plant. 971 (1753).

Syn.: *Sp. ramosum* HUDSON, Fl. Angl. ed. 2: 401 (1778), emend. BEEBY, Journ. Bot. 23: 26. 193 (1885). *Sp. ramosum* HUDSON subsp. *polyedrum* ASCHERSON & GRAEBNER, Syn. Mitteleur. Fl. 1: 283 (1897). *Sp. erectum* L. subsp. *polyedrum* (ASCHERSON & GRAEBNER) SCHINZ & THELLUNG, Fl. Schweiz ed. 3, 2: 14 (1914). *Sp. ramosum* HUDSON var. *polyedrum* (ASCHERSON & GRAEBNER) HOLMB., Skand. Fl. 1: 79 (1922). *Sp. polyedrum* (ASCHERSON & GRAEBNER) JUZ., Fl. URSS. 1: 219 (1934).

Typus: *Sp. ramosum* BAUHIN, Théatre 231 (1620), ut delineatum est in L'OBEL, Historia Plant. 41 (1570) fide COOK, Watsonia 5: 7 (1961).

Planta usque ad 150 (200) cm alta. Folia linearia apicem versus attenuata vel late rotundata, angulato-carinata. Capitula florum paniculatim disposita, feminea in ramo maximo quidem 2—3, mascula saepe numerosa. Floris feminei tepala ut in clave indicata. Ovaria plerumque bilocularia, rare 1- vel 3-locularia. Fructus ± 5—8 mm longi, ± 4—6 mm lati, parte basali obpyramidali in sicco ± contracta, arcte angulata, abrupte in stylum brevem 2 mm plerumque vix attingentem attenuati.

Persia: W: Azerb.: Digele, in stagnis, KNAPP! — C: Qazv.: Kamalabad prope Karaj, GAUBA 1791! Karaj, GAUBA 1134.

Distr. gen.: Europa centralis, borealis, occidentalis et orientalis, Talish, Caucasus, Persia borealis.

COOK, l. c. gibt eine plausible Typifizierung von *Sparganium erectum* L. var. α auf Grund des von LINNÉ in Spec. Plant. 971 zitierten Synonyms *Sp. ramosum* BAUHIN. Die Exemplare in den Herbarien von LINNÉ und CLIFFORD gehören eindeutig zur var. β, die später als *Sp. simplex* HUDS. sensu CURTIS in die botanische Literatur Eingang gefunden hat. Der gültige Name für diese Art ist nach COOK *Sp. emersum* REHMAN.

Die Art dürfte in Nordpersien ihre südöstliche Verbreitungsgrenze erreichen. Die Angabe von S. KITAMURA, Fl. Afgh. 24 (1960) aus Afghanistan, Kunduz, scheint wenig glaubhaft.

3. ***Sp. stoloniferum*** BUCH.-HAM. ex JUZ., Fl. URSS. 1: 219 (1934).

Syn.: *Sp. carinatum* FALCONER, Proc. Linn. Soc. London 1: 18 (1839), nom. nud. *Sp. asiaticum* GRAEBNER, Allgem. Bot. Zeitschr. 4: 32 (1898), nom. nud. *Sp. ramosum* HUDSON subsp. *stoloniferum* GRAEBNER in ENGLER, Pflanzenr. IV, 10: 14 (1900).

Typus: WALLICH Nr. 4990, Calcutta fide JUZ.

Planta quam species praecedens humilior. Folia linearia apicem versus modice, demum ± abrupte attenuata, plana. Capitula florum paniculatim disposita, feminea in ramo maxima plerumque 2, in ceteris 1—2, mascula 5—10, plerumque remota. Floris feminei tepala tenuissima ut in clave indicata. Ovaria uni- vel bilocularia. Fructus 5—6 mm longi, ± 4 mm in loco latissimo lati, parte basali obpyramidali in sicco ± contracta, obtusiuscule vel arcte angulata, e parte subapicali rotundata ± abrupte in apicem anguste conicum stylum versus attenuata. Stylus longiusculus, 2.5—3 mm longus.

Afghanistan: E: Kabul: Charasiah, 1780 m, Gilli 90! Khotshe Mullah, Neub. 1950/785!, 786! Guzar Gah, 1770 m, Gilli 87!, 88!, 89! Nuristan: In valle fluvii Pech, Gusalak, Neub. 1951/862! — NE: Badakhshan: Barak, Yosii 346, 977. — In Regno Cabulico, Griff.

Distr. gen.: Afghanistan, montes Himalaya, Pamir-Alai, Sina, Japonia, Irtysh, Dahuria, Aralo-Caspia, Tien Shan.

Diese geographisch am klarsten von den beiden anderen geschiedene Art stellt morphologisch einen Übergang dar. Die erste gültige Beschreibung im Artrang stammt von Juzepczuk, l. c., der Name wurde von Buchanan-Hamilton in Wall., Cat. Nr. 4990 (1832) veröffentlicht. Als Subspecies wurde sie von Graebner in Pflanzenreich IV, 10: 14 (1900) zum ersten Mal in lateinischer Sprache beschrieben. Zu diesem Ergebnis gelangte bereits S. Kitamura, Fl. Afgh. 24 (1960), ohne es aber eingehender zu begründen.

Zweifelhafte Angabe

Sparganium natans L., Spec. Plant. 971 (1753), nom. ambig. — gültiger Name *Sp. minimum* Wallr., Erster Beitrag Fl. Hercyn. 2: 297 (1840) — wird von Boissier & Buhse, Nouv. Mem. Soc. Nat. Mosc. 12: 66 (1860) aus Nordpersien vom Bassin der Quelle Tscheshme Ali angegeben; diese Angabe wird aber von Boissier, Fl. Or. 5: 48 (1884) nicht übernommen. Ich vermute, daß die Bestimmung von ihm später in *Sp. ramosum* Hudson abgeändert worden ist und daß sich darauf die Angabe „Nordpersien" bezieht, für die kein Sammler erwähnt wird. Es kann sich dabei sowohl um *Sp. erectum* L., als auch um *Sp. neglectum* Beeby handeln. Übrigens war Boissier (1884) einer der ersten, der die von ihm als Synonyme angeführten Namen *Sp. erectum* L. und *Sp. emersum* Rehman richtig gedeutet hat.

Sparganium L. 1
Sect. **Melanosparganium** Holmb. 2
asiaticum Graebner 3
carinatum Falconer 3
emersum Rehman 3
erectum L. 3
subsp. *neglectum* (Beeby) Schinz & Thellung 2
subsp. *polyedrum* (Ascherson & Graebner) Schinz & Thellung ... 3
var. α 3
var. *neglectum* (Beeby) Fiori & Paol. 2
var. *neglectum* (Beeby) Richter ... 2
minimum Wallr. 4
natans L. 4
neglectum Beeby 2
var. **oocarpum** Čelak. 3
polyedrum (Ascherson & Graebner) Juz. 3
ramosum Hudson emend. Beeby 3
subsp. *neglectum* (Beeby) Neuman, Krok, Hartman 2
subsp. *polyedrum* Ascherson & Graebner 3
subsp. *stoloniferum* Graebner in Engler 3
var. *polyedrum* (Ascherson & Graebner) Holmb. 3
simplex Hudson sensu Curtis 3
stoloniferum Buch.-Ham. ex Juz. 3

FLORA IRANICA
K. H. RECHINGER

Lfg. No. 60/30. 4. 1969
Cont.

Paeoniaceae

auctore H. RIEDL, Wien

Paeoniaceae

auctore H. RIEDL, Wien

Paeoniaceae RUDOLPHI, Syst. Orb. Veg. 61 (1830), nom. conserv.
Syn.: *Paeoniaceae* DC., Prodr. 1: 64 (1824) p. p., pro tribu. *Ranunculaceae* subfam. *Helleboroideae* tribus *Paeonieae* (DC.) HUTCHINSON, Kew Bull. 1923: 81 (1923). *Ranunculaceae* subfam. *Paeonioideae* (DC.) JANCHEN, Handwörterbuch Naturwissensch. ed. 2, 2: 74 (1933).

Lit.: E. HUTH, Monographie der Gattung Paeonia, Englers Botanische Jahrbücher 14: 258—276 (1892). W. C. WORSDELL, The Affinities of Paeonia, The Journal of Botany 46: 114—116 (1908). N. SCHIPCZINSKY, Kratkii obsor roda Paeonia (TOURN.) L., Notulae systematicae ex Herbario Horti botanici Petropolitani 2: 41—47 (1921). M. KUMAZAWA, The Structure and Affinities of Paeonia, The botanical Magazine, Tokyo 49: 306—315 (1935). N. SCHIPCZINSKY, Paeonia, in KOMAROV, Flora URSS. 7: 24—35 (1937). F. C. STERN, A Study of the Genus Paeonia (London 1946). E. J. H. CORNER, Centrifugal Stamens, Journal of the Arnold Arboretum 27: 423—437 (1946). YAKOVLEV & YOFFE, Embryogeny of Paeonia, Phytomorphology 7: 74—81 (1957). A. CRONQUIST, Outline of a new System of Families and Orders of Dicotyledons, Bulletin du Jardin Botanique de l'Etat, Bruxelles 27: 13—40 (1957). J. HUTCHINSON, Paeoniaceae, The Families of Flowering Plants 1, ed. 2: 400—401 (1959). G. BUCHHEIM, Paeoniaceae in A. ENGLER, Syllabus der Pflanzenfamilien 2, ed. 12: 159 (1964). K. CARNIEL, Über die Embryobildung in der Gattung Paeonia, Österreichische botanische Zeitschrift 114: 4—19 (1967).

Genus unicum:

Paeonia

Paeonia L., Spec. Plant. 530 (1753). Gen. Plant. ed. 5: 235 (1754).

Flores hermaphroditi sepalis 5 liberis, petalis 5—10, staminibus numerosis. Carpella 5—2 in disco carnoso ab androecio formato pro maxima parte vel prope basin tantum inclusa, libera, carnosa. Stigma sessile, bilabiatum. Folliculi sutura adaxiali dehiscentes. Semina numerosa, anatropica, biseriata, integumento exteriore inferius valde superante. Endospermum copiose evolutum. — Herbae perennes vel rare suffrutices foliis alternantibus, biternatim divisis.

Sowohl auf Grund der Morphologie im Blütenbereich (androecialer Discus um die Karpelle) als auch wegen anatomischer und embryologischer Besonderheiten scheint die Notwendigkeit der Abtrennung von *Paeonia* als eigene Familie hinreichend erwiesen. Die anatomischen Grundlagen, vor allem die Tatsache, daß im sekundären Xylem nur Tracheiden und keine Libriformfasern entwickelt sind, wurden bereits von WORSDELL (1908) dargelegt. Über die Stellung zu anderen Familien herrschen nach wie vor geteilte Meinungen. Vor allem CORNER (1946) betonte die Verwandtschaft mit den *Dilleniaceae* wegen der zentrifugalen Anlage der Stamina, doch wurde von anderen Autoren, wie HUTCHINSON (1959), darauf hingewiesen, daß die sonstigen Ähnlichkeiten mit dieser Gruppe äußerst gering seien und eher nähere Beziehungen zu den *Magnoliales* vorliegen könnten. Die Sonderstellung von *Paeonia* in embryologischer Hinsicht wurde vor allem von YAKOVLEV & YOFFE (1957) unterstrichen. Von der in den letzten Jahren einsetzenden Flut embryologischer Untersuchungen sei nur als neueste Bearbeitung auf CARNIEL

(1967) hingewiesen. Dieser Autor gibt zwar zu, daß ein interessanter Sonderfall von Polyembryonie vorliegt, bei dem der nukleäre Zustand lange erhalten bleibt, daß aber die Erscheinung als solche weiter verbreitet ist und keinen Anlaß zu weitreichenden systematischen Folgerungen bietet. Bei ihm ist auch die weitere Literatur referiert.

Alle im behandelten Gebiet vorkommenden Arten gehören zur Sektion *Paeonia*.

1a. Folia utrinque omnino glabra 2
b. Folia subtus quidem, imprimis secus nervos pilosa ..... 2. *P. Wittmanniana* Hartw.
2a. Foliola lateralia ± angusta, lanceolata, longe acuminata . 3. *P. emodi* Wall..
b. Folia lateralia late elliptico-lanceolata vel obovato-lanceolata, acuta, saepe cuspidata, in foliis supremis interdum ± obtusato-suborbicularia .. .. 1. *P. kavachensis* Azn.

1. ***P. kavachensis*** Azn., Magyar Bot. Lapok 16: 7 (1917).

Syn.: *P. corallina* Ledeb., Fl. Ross. 1: 73 (1842) et auct. florae orientalis mult., non Retz. (1783). *P. corallina* Retz. β *triternata* Boiss., Fl. Or. 1: 97 (1867) p. p., non *P. triternata* Pall. ex DC., Prodr. 1: 65 (1824). *P. triternata* Rupr., Fl. Cauc. 44 (1869), non Pall. ex DC., Prodr. 1: 65 (1824). *P. corallina* L. var. *caucasica* Schipcz., Not. Syst. Herb. Hort. Bot. Petrop. 2: 45 (1921). *P. caucasica* Schipcz., Fl. URSS. 7: 28 (1937). *P. kurdistanica* Zohary, Palest. Journ. Bot. Ser. J. 2: 155 (1942), syn. nov. *P. corallina* Retz. var. *orientalis* Thiéb., Fl. Lib.-Syr. 1: 37 (1936). *P. arietina* G. Anders. var. *orientalis* (Thiéb.) Stern, Journ. Roy. Hort. Soc. 68: 127 (1943). *P. mascula* (L.) Miller subsp. *mascula* sec. Davis & Cullen, Fl. Turkey, non Miller, Gard. Dict. 1 (1768).

Typus: „Prope Vastan in districto Kavache", Tchitouny 187.

Perennis, usque ad 70 cm alta, caulibus foliatis, unifloris. Folia basalia florendi tempore saepe jam emarcida, omnia 1—2-jugo-bipinnata vel superiora biternata, suprema indivisa, foliolis obovato-lanceolatis vel late lanceolatis, 5—12 cm longis, 3—7 cm latis, acutis, interdum brevissime cuspidatis, basin versus longe gradatim attenuatis vel oblique ut apicem versus truncatis, nervis haud valde conspicuis, utrinque glaberrimis, subtus saepe glaucescentibus. Petala obovata, 5—6 cm longa, 4—4.5 cm lata, intense rubra. Filamenta antheris longiora. Folliculi 2—3, 2—3 cm longi, dense tomentosi.

Iraq: Kurd.: Mosul: In quercetis saxosis supra Sirsang, substr. calc., 1200 m, Rech. 11678! Sirsang, 920 m, Evenari s. n. (Typus *P. kurdistanicae* Zohary)!
Talish: Lenkoran, Hohen.

Distr. gen.: Caucasus, Anatolia, Syria, Libanon, Iraq (Kurdistan), Talish.

Um den Gebrauch des Namens *P. kavachensis* Azn. zu rechtfertigen, ist es nötig, etwas weiter auszuholen. In der älteren Literatur, etwa Boissier, Fl. Or. 1: 97 (1867) wird der Beleg von Hohenacker aus Lenkoran zu *P. corallina* Retz. gezogen, und zwar als var. *triternata* Boiss., l. c. Inzwischen wurde vor allem von Stern (1946) nachgewiesen, daß der Name *P. corallina* Retz. durch *P. mascula* (L.) Miller, zu ersetzen sei. Boissier zitiert als Synonym für seine Varietät unter anderen *P. daurica* Andrews, Bot. Reposit. 7, tab. 486 (1807), zu welcher *P. triternata* Pall. Nova Acta Acad. Petrop. 10: 312 (1795), nom. nud., gerechnet werden muß. Bei Stern etwa wird der Beleg unter *P. mascula* (L.) Miller erwähnt. Der Auffassung von Stern schließen sich vor allem Davis & Cullen in P. H. Davis, Flora of Turkey 1: 204—206 (1965) an, die bei türkischer *P. mascula* zwei Unterarten unterscheiden, nämlich subsp. *mascula* mit unterseits kahlen und subsp. *arietina* (G. Anders.) Cullen & Heywood mit unterseits behaarten

Blättern. Als Synonyme zu subsp. *mascula* werden *P. kavachensis* AZN., *P. caucasica* (SCHIPCZ.) SCHIPCZ. und *P. kurdistanica* ZOHARY gezogen. Subsp. *mascula* soll im Süden der Türkei, subsp. *arietina* vor allem im Norden vorkommen. Damit ist zuerst einmal der Unterschied gegen *P. mascula* (L.) MILLER zu klären. Diese Art macht leider in der Interpretation nicht unerhebliche Schwierigkeiten. LINNÉ (1753), der sie als Varietät führt, verweist auf ältere Autoren, wie vor allem HALLER und BAUHIN und auf die Herkunft aus der Schweiz, die völlig unwahrscheinlich ist, da dort die Pflanze zumindest wild sicher nicht vorkommt. Es dürfte aber außer Zweifel stehen, daß es sich um eine in Frankreich und dem südlichen Mitteleuropa vorkommende Art handelt, womit nach Ausschluß von *P. officinalis* L. nur eine bestimmte Sippe in Betracht zu ziehen ist. Diese ist von *P. officinalis* L. durch breitere Fiedern und vor allem in einem weiteren Winkel abzweigende Seitennerven auch vegetativ gut unterscheidbar, was LINNÉ noch in Zweifel zieht. In Europa unterscheiden CULLEN & HEYWOOD, Fl. Europaea 1: 244 (1964), neben den beiden auch für die Türkei angegebenen Unterarten noch subsp. *russii* (BIV.) CULLEN & HEYWOOD, die auf westmediterranen Inseln endemisch ist und sich durch breite, behaarte Blattfiedern auszeichnet. Meines Erachtens handelt es sich dabei ebenso wie bei der vor allem auf der Balkanhalbinsel verbreiteten subsp. *arietina* mit schmäler lanzettlichen, in der Nervatur an *P. officinalis* anklingenden, unterseits behaarten Fiedern um gute Arten. Als solche werden sie auch vom Monographen STERN angesehen, dem man sonst keineswegs einen zu engen Artbegriff vorwerfen kann. Leider geben CULLEN & HEYWOOD, l. c. für subsp. *mascula* als Verbreitung nur „widespread" an, doch ist mir bisher keine Pflanze aus dem östlichen Teil des für die Art bezeichneten Areals bekannt geworden. Von den Pflanzen aus dem Kaukasus, der Türkei und Kurdistan unterscheiden sich die mittel- und westeuropäischen Pflanzen vor allem dadurch, daß sie meist 5, seltener 3—4 Follikel ausbilden (gegenüber 2, selten 3), daß ihre Blattfiedern im Verhältnis zur Länge meist schmäler, oft spitz, seltener zugespitzt und zur Spitze gewöhnlich allmählicher verschmälert sind, und durch schwerer beschreibbare Verschiedenheiten in der Oberflächenbeschaffenheit (*P. kavachensis* ist z. B. unterseits meist stärker glauk), vielleicht auch in der Konsistenz. Auch die Blütenfarbe der östlichen Art wird als dunkler beschrieben, doch kann ich dies nicht beurteilen. Vor allem pflanzengeographische Gründe scheinen mir neben diesen Merkmalen für eine Trennung auf Artebene zu sprechen. Man könnte freilich auch den Rang einer Unterart annehmen, doch erhebt sich dann die Frage, wo bei *Paeonia* im mediterranen Raum überhaupt noch mit Recht Artgrenzen gezogen werden können. Noch eindeutiger sind die Unterschiede gegenüber der von der Krim beschriebenen *P. daurica* ANDREWS, die fast kreisrunde Blattfiedern mit sehr charakteristischer Nervatur besitzt: die beiden untersten Blattnervenpaare entspringen in sehr geringem Abstand voneinander in verschiedenem Winkel, während bei *P. kavachensis* die Abstände zwischen den Nervenpaaren in ganzer Länge annähernd gleich sind und die beiden untersten Nervenpaare beinahe parallel verlaufen. Überhaupt wurde die bei *Paeonia* für einzelne Arten äußerst charakteristische Blattnervatur bisher viel zu wenig berücksichtigt. Es ist dabei nur ein kleiner Umstand zu beachten: oft werden in die Endfiedern, seltener in die Seitenfiedern, an den oberen Blättern Fiedern einbezogen, die bei den unteren noch deutlich getrennt sind. In diesen Fällen bleibt die einbezogene Fieder gelegentlich nur noch an ihrem Mittelnerv zu erkennen, der dann nahezu rechtwinkelig vom Hauptnerv abzweigt. Er kann nicht als unterster Nerv der betreffenden verbleibenden Fieder gewertet werden. Meist aber ist der Vorgang der Einbeziehung auch noch am Umriß eindeutig zu erkennen.

P. caucasica (SCHIPCZ.) SCHIPCZ., ursprünglich als Varietät von *P. corallina* RETZ. aufgestellt, wurde in Unkenntnis der Existenz des Namens *P. kavachensis* AZN. beschrieben. Die Identität wurde endlich eindeutig bei GROSSHEIM, Fl. Kawk. 4: 12 (1950) festgestellt. Ich habe lebende, als *P. kavachensis* bestimmte Pflanzen im Alpengarten im oberen Belvedere in Wien gesehen, die aus Moskau unter diesem Namen bezogen worden waren, und konnte keinerlei Unterschiede gegenüber dem mir vorliegenden Herbarmaterial beobachten. Gleichfalls an Hand dieser lebenden Pflanzen war es mir möglich, endgültig die Identität von *P. kavachensis* AZN. und *P. kurdistanica* ZOHARY nachzu-

weisen. Nach dem spärlichen Herbarmaterial, das mir zugänglich war, hatte ich als einziges unterscheidendes Merkmal die Gestalt der Fiedern heranzuziehen versucht, die bei dem HOHENACKER-Beleg gegen Spitze und Basis gleichmäßig verschmälert sind, bei den Pflanzen aus Iraqi-Kurdistan aber gegen die Spitze ziemlich plötzlich, zur Basis allmählich schmäler werden. Bei den lebenden Pflanzen kamen beide Formen sogar gelegentlich an einem Individuum vor. Die Variationsbreite wird von ZOHARY, l. c., dem nur ein Beleg zur Verfügung stand, naturgemäß zu gering bewertet.

Wenn DAVIS & CULLEN, l. c., für Nord-Iran *P. daurica* ANDREWS angeben, so handelt es sich dabei wohl um einen Irrtum. Vermutlich lag dieser Angabe eine Stelle bei PARSA, Fl. de l'Iran 1: 443 (1946), zugrunde, wo die HOHENACKER-Kollektion aus Lenkoran unter dem von BOISSIER gebrauchten Namen *P. corallina* RETZ. β *triternata* mit Synonym *P. daurica* zitiert und die Vermutung geäußert wird, die Art könnte auch noch im nördlichen Iran entdeckt werden. Auf einen tatsächlichen Fund konnte ich in der Literatur keinen Hinweis entdecken.

2. ***P. Wittmanniana*** HARTW. ex LINDL., Bot. Reg. 32, tab. 9 (1846).

Syn.: *P. corallina* RETZ. var. *Wittmanniana* ALB., Prodr. Fl. Colch. 14 (1895). *P. abchasica* MISCHZ. ex GROSSH., Fl. Kawk. 2: 22 (1930).

Perennis usque ad 1 m alta, caulibus foliatis, unifloris, saepe rubescenti-suffusis. Folia basalia florendi tempore jam emarcida, caulina biternata, suprema tantum ternata, foliolis ovatis vel ovato-lanceolatis vel ovato-oblongis, 8—15 cm longis, 5—8 cm latis, acuminatis, basin versus truncatis, nervis supra valde impressis, subtus prominentibus, subtus imprimis secus nervos parce pilosis, foliolis lateralibus jugorum primariorum lateralium quam ceteris minoribus. Petala usque ad 5,5 cm longa, usque ad 4 cm lata, obovata vel obovato-lanceolata, lutea vel cremea. Filamenta rubra antheris subduplo longiora. Folliculi 2—3, dense tomentosi vel rarius glabri.

Distr. gen. speciei: Caucasus, Persia borealis.

1a. Folliculi tomentosi ..... *P. Wittmanniana* var. *Wittmanniana*
b. Folliculi glabri ..... *P. Wittmanniana* var. *nudicarpa* SCHIPCZ.

— — var. ***Wittmanniana***

Syn.: ? *P. Wittmanniana* HARTW. ex LINDL. var. *tomentosa* LOMAK., Trudy Tifliss. Bot. Sada 2: 283 (1897). ? *P. tomentosa* (LOMAK.) N. BUSCH, Opred. Ranales 7 (1919).
Typus: Culta in horto Societatis Horticulturae Britannicae, ex Abchasia („Abcharia" per errorem) missa a M. WORONTZOFF.

Talish: sec. Fl. URSS.
Persia: N: Gorg.: Sharbat inter Gorgan et Ziarat, GAUBA 4! Ramian, SHAR. 534! Dimalu, 2700 m, ad silvarum margines, KOELZ 16510! Maz.: Haraz E Emarat, 1100 m, WDB. 208! In declivibus borealibus jugi Kandavan, GAUBA 1332. Gil.: Manjil. BUHSE.

Distr. gen. varietatis: Caucasus, Persia borealis.

— — var. ***nudicarpa*** SCHIPCZ., Not. Syst. Herb. Hort. Bot. Petrop. 2: 44 (1921).

Syn.: *P. Wittmanniana* sensu STEV., Ann. Scienc. Nat. Ser. 3, 12: 374 (1849), non HARTW.
Typus varietatis: Non indicatus.

Persia: N: Gorg.: Prov. Gorgan, BGE. Gil.: Masuleh, BUHSE.

Distr. gen. varietatis: Imprimis in parte boreali areae speciei.

In der älteren Literatur folgte man allgemein der Interpretation von STEVEN, der *P. Wittmanniana* als eine Art mit kahlen Balgfrüchten betrachtete. Erst STERN

(1946) konnte diesen Irrtum aufklären. Bei BOISSIER, Fl. Or. 1: 97 (1867), wird sogar STEVEN als Autor des Taxons bezeichnet. Aus der Beschreibung von LINDLEY geht eindeutig hervor, daß die Bälge der in Frage stehenden Pflanzen filzig waren. STERN zog folgerichtig *P. tomentosa* (LOMAK.) N. BUSCH als Synonym zu typischer *P. Wittmanniana*, da LOMAKIN, l. c., die filzigen Früchte als das wesentliche Unterscheidungsmerkmal angegeben hatte. Bei GROSSHEIM, Fl. Kawk. 4: 13 (1950) erscheint der Name in der Synonymie von *P. Mlokosewitschii* LOMAK., die durch kahle Blätter mit an der Basis stets deutlich asymmetrischen Fiedern charakterisiert ist. Ich selbst kann zu dem Problem nicht Stellung nehmen, da ich den Typus von LOMAKIN nicht kenne.

Während die Blütenfarbe von LINDLEY als gelb angegeben wird und der Unterschied gegenüber den crèmefarbenen *Paeonia*-Arten besonders betont wird, kommen vor allem in botanischen Gärten auch heller gefärbte Pflanzen vor, die eindeutig zu *P. Wittmanniana* gehören.

3. ***P. emodi*** WALL. ex ROYLE, Ill. Bot. Himal. Mount. 57 (1839). Icon.: F. C. STERN, A Study of the Genus Paeonia (London 1946).
Typus: Shalmo-Mountain, Kemaon, WALLICH Cat. No. 4727.

Perennis, usque ad 70 cm fere alta, caulibus foliatis, 1—3-floris, imprimis in parte inferiore rubescenti-suffusis. Folia inferiora biternata, superiora ternata, suprema saepe indivisa foliolis lanceolato-oblongis vel lanceolatis, plerumque integris, usque ad 15 cm (vel ultra) longis, usque ad 7 cm latis, acutis, apice interdum protracto, decurrentibus, glabris, subtus interdum glaucis, nervis supra modice impressis. Petala obovata, 4—6 cm longa, 3,5—4 cm lata, alba. Filamenta flava, antheris manifeste breviora. Folliculus plerumque unicus tantum evolutus ovoideus, plerumque tomentosus, 2—2,5 cm longus.

Afghanistan: E: Nuristan: Wama, 1800 m, EDELB. 496! Chetras, 2400 m, EDELB. 862! Pakistan: Chitral: Ziarat, 2400 m, STAINTON 2559! Rumbur, 2600 m, BOWES LYON 676! — Swat: In declivibus occidentalibus montis E Kalam ad limitem silvarum, 3000 m, LAMOND 1828!

Distr. gen.: Afghanistan orientalis, Pakistan (Chitral etc.), Himalaya.

P. emodi WALL. ex ROYLE ist für Afghanistan neu. Die afghanischen Pflanzen scheinen durch besonders schmale Blattfiedern charakterisiert zu sein, doch könnte reicheres Material diesbezüglich vielleicht auch größere Schwankungen erkennen lassen. HOOKER & THOMSON in HOOK., Fl. Brit. Ind. 1: 30 (1872) erwähnen zwei Varietäten, von denen var. *emodi* behaarte Bälge mit langen, gelbbraunen Haaren, var. *glabrata* aber stets einzelne kahle Bälge haben soll. Alle von mir untersuchten Belege haben filzige Balgfrüchte. EDELBERG 852 zwei Karpelle. Über die Zahl der Karpelle äußern sich HOOKER & THOMSON dahingehend, daß Pflanzen aus dem äußeren Himalaya gewöhnlich ein Karpell, solche aus dem inneren Himalaya zwei Karpelle besitzen.

Paeonia L. 1
abchasica Mischz. ex Grossh. 4
arietina G. Anders.
var. *orientalis* (Thiéb.) Stern 2
caucasica Schipcz. 2
corallina auct. 2
corallina Retz.
var. *caucasica* Schipcz. 2
var. *orientalis* Thieb. 2
var. *triternata* Boiss. p. p. 2
var. *Wittmanniana* Alb. 4
daurica Andrews 2
emodi Wall. ex Royle 5
var. **emodi** 5
var. **glabrata** Hooker & Thomson in Hook. 5
kavachensis Azn. 2
kurdistanica Zohary 2
mascula (L.) Miller 2
subsp. **arietina** (G. Anders.) Cullen & Heywood 2
subsp. *mascula* sec. Davis & Cullen . 2
subsp. **russii** (Biv.) Cullen & Heywood 3

Mlokosewitschii Lomak. 5
officinalis L. 3
tomentosa (Lomak.) N. Busch 4
triternata Pall. ex DC. 2
triternata Rupr. 2
Wittmanniana sensu Stev. 4
Wittmanniana Hartw. ex Lindl. 4
var. **nudicarpa** Schipcz. 4
var. *tomentosa* Lomak. 4
var. **Wittmanniana** 4

Cruciferae
uctoribus I. HEDGE, Edinburgh et K. H. RECHINGER, Wien

Lfg. Cont. No. 57/28. 2. 1968

FLORA DES IRANISCHEN HOCHLANDES UND DER UMRAHMENDEN GEBIRGE

PERSIEN, AFGHANISTAN, TEILE VON WEST-PAKISTAN, NORD-IRAQ, AZERBAIDJAN, TURKMENISTAN

von

Univ.-Prof. Dr.
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GRAZ-AUSTRIA

Aceraceae

auctoribus E. MURRAY, Philadelphia et K. H. RECHINGER, Wien

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FLORA IRANICA

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auctoribus E. MURRAY, Philadelphia et K. H. RECHINGER, Wien

Aceraceae JUSS., Gen. Plant. 250 (1789) „*Acera*".

Lit.: E. BOISSIER, Flora Orientalis 1: 947–952 (1867). W. P. HIERN in HOOKER f., Flora of British India 1: 692–696 (1875). F. PAX in ENGLER, Das Pflanzenreich 4 (163) Heft 8: 1–80 (1902). A. I. POJARKOVA, Acta Instituti botanici Academiae Scientarum URSS. Ser. 1, 1: 225–374 (1933) & Aceraceae, Flora URSS. 14: 580–622 (1949).

Arbores vel frutices. Folia exstipulata, opposita palmatiloba, rarius pinnata. Inflorescentia racemosa vel corymbosa. Flores radiati, hermaphroditici vel diclines. Sepala et petala 4–5, rarius nulla. Stamina petalis isomera vel duplo numero, in vel extra discum annularem inserta. Ovarium bicarpellatum, transverse compressum, biloculare, loculis biovulatis. Fructus in mericarpia dua (samarae) alata indehiscentia secedens.

Acer

Acer L., Spec. Plant. 1054 (1753). Gen. Plant. ed. 5: 474 (1754).

Arbores vel frutices. Folia exstipulata, opposita, palmatiloba, rarius pinnata. vel integra, exstipulata, plerumque palmatinervosa. Flores aut terminales aut laterales, corymbosi, racemosi vel fasciculati. Calyx 4–5-merus. Corolla 4–5-mera rotata vel deficiens. Stamina nulla vel numero variabilia 4–5–8–10. Ovarium biloculare. Fructus samaroideus geminus.

1a. Lobi foliorum acuminati 2
b. Lobi foliorum acuti vel rotundati 5
2a. Lobi foliorum integri; folia subtus viridia nitida 3
b. Lobi foliorum dentato-serrati; folia subtus glaucescentia .....
..... 5. *A. caesium* WALL. ex BRANDIS
3a. Lobi integri; basis foliorum subcordata vel hastata .....
..... 2. *A. cappadocicum* GLED.
b. Lobi lobulati acuminati; basis foliorum concava aut hastata 4
4a. Basis foliorum concava. (Habitat in Afghanistan) .. 3. *A. turkestanicum* PAX
b. Basis foliorum hastata. (Habitat in montibus Elburz) .....
..... 1. *A. platanoides* L.
5a. Folia subtus viridia vel flavescenti-viridia 6
b. Folia subtus cinerea vel glaucescentia 7
6a. Lamina foliorum hirta, margine ciliata. Samarae horizontales .....
..... 4. *A. campestre* L.
b. Lamina foliorum glabrae subtus nitida, margine inciso-serrata. Samarae subconniventes ..... 7. *A. Semenovii* REGEL & HERDER
7a. Folia 5–7-loba, plerumque plus quam 6 cm lata et longa 8
b. Folia 3- (raro 5-) loba, plerumque minus quam 6 cm lata et longa 9

3a. Lamina foliorum plerumque 10—25 cm lata, subtus aut velutina aut glabra ..... 6. *A. velutinum* BOISS.
b. Lamina foliorum plerumque 6—10 cm lata, nervis saepe canescenti-tomentosis ..... 8. *A. hyrcanum* FISCH. & C. A. MEY.
9a. Foliorum lobi inaequaliter obtuse vel acute dentati rarius subintegri. Inflorescentia pedunculata, racemosa. Pedicelli quam flores sesquilongiores ..... 9. *A. pentapomicum* STEWART ex BRANDIS
b. Foliorum lobi integri, raro prope apicem 1(—2)-dentati. Inflorescentia subsessiles. Pedicelli quam flores 4-plo longiores .. 10. *A. monspessulanum* L.

Sect. *Platanoidea* PAX, Englers Bot. Jahrb. 6: 327 (1885) et 7: 233 (1886).

Folia 3—5—9-lobata. Inflorescentia terminalis, pedunculata, paniculata. Stamina 8 vel 5 perigyna. Samarae horizontaliter patentes vel sub angulo acuto rarius obtuso divergentes, loculis planis.

1. ***A. platanoides*** L., Spec. Plant. 1055 (1753).

Typus: „Habitat in Europa boreali".

Arbor usque ad 35 m alta. Rami juveniles glabri. Lamina foliorum 6—13 × 8—14(—20) cm, quinqueloba, basi cordata vel late aperte sinuata, lobulis pluribus tenuiter acuminatis provisis, subtus in axillis nervorum principalium pubescens, ceterum glabra lucida; petiolus 6—20 cm longus, glaber, lactifer. Corymbi floriferi erecti, breviter pedunculati. Samarae 30—35 × 12—15 mm, subhorizontaliter patentes; nuculae valde compressae, ovatae, glabrae; loculi glabri.

Talish: C. A. MEY.

Persia: N: Gorg.: Gale Maran, 1800 m, GAUBA 795! Ziarat, 2000 m, GAUBA 796! Maz.: Pol-e Zanguleh, 2300 m, GAUBA 794!

Distr. gen.: Europa (regionibus maxime borealibus et meridionalibus exceptis), Anatolia, Caucasia, Persia borealis.

2. ***A. cappadocicum*** GLED., Schrift. Ges. Naturf. Freunde Berlin 6: 116 tab. 2 (1785).

Syn.: *A. laetum* C. A. MEY., Verz. Pfl. Cauc. 206 (1831). *A. cultratum* WALL., Pl. Asiat. Rar. 2:4 (1831).

Icon.: Tab. 1.

Typus: „Cappadocia". Holotypus in herb. TOURNEFORT, P!

Arbor usque ad 20 m alta. Rami glabri, juveniles glaucopruinosi, anno secundo virescenti-brunnei. Lamina foliorum 4—10 × 6—16 cm, ad summum usque ad dimidium 5—7-lobata, basi cordata vel truncata, lobis ovato-triangularibus integris eleganter longe acuminatis, subtus in axillis nervorum principalium pubescentia, praeterea glabra; petiolus 3—12 cm longus, glaber, lactifer. Corymbi floriferi erecti. Samarae 10—25 × 4—12 mm, late divaricato-divergentes; nuculae compressae, ovatae, glabrae; loculi glabri.

Talish: Astara, HOHEN. Swant, HOHEN. Drych, HOHEN. Lenkoran, HOHEN., WORON. 1057! Talish, C. A. MEY., BUHSE.

Persia: N: Gorg.: Bandar-i Gaz, RECH. 5533! Prope Sharbat, GAUBA 797! Aliabad, SHAR. 348! Robat-e Qozloq, KOELZ 16233! Maz.: In valle fluvii Chalus, 2200 m, RECH. 858!, STUTZ 1127!, 1154! In valle Haraz, Karehsang, 100 m, WDB. 545! In valle fluvii Talar: Inter Abbasabad et Shahi, 400 m, RECH. 2048!, KRIESCHE in RECH. 2329! Ramsar, GAUBA. Prope Pol-e Zanguleh, 2300 m, GAUBA 799! Gilan: In valle fluvii Safid Rud,

BORNM. 6529!, BUHSE. Inter Rudbar et Rasht, GAUBA 798! Navrud, BUHSE. — **W**: Azerb.: M. Astara prope Asbine, MIRD. in GAUBA 800! In faucibus 20 km W Astara, GRANT 16401! Ad radices M. Talish, COWAN 1656. — **E**: Khor.: Kotal-e yek chenar, KOELZ 16723!

Pakistan: Swat: Utror prope Kalam, RECH. 30798!

Distr. gen.: Anatolia boreo-orientalis, Caucasus, Persia borealis, Pakistan.

3. ***A. turkestanicum*** PAX in ENGLER, Pflanzenr. (IV. 163) 8: 49 (1902).

Icon.: Tab. 2.

Typus: „Turkestan: Gebirgswälder bei Mumynawad", REGEL 1884, LE.

Arbor humilis vel elata. Rami juveniles glabri, fulvi. Lamina foliorum $10\times8-15\times20$ cm, usque ad medium circiter 5—7-lobata, lobis elongato-triangularibus integris sinuato-dentatis, eleganter longe acuminatis, subtus in axillis nervorum principalium pubescentia praeterea glabra, basi truncata vel leviter concava. Corymbi floriferi erecti. Samarae usque ad 40×15 mm, angulo obtuso patentes; nuculae compressae rotundato-oblongae, glabrae; loculi glabri.

Afghanistan: E: Nuristan: Supra pagum Darim, 1900—2400 m, NEUB. 999! Inter jugum Maswi et vallem Kulam, KERST. 1157! In valle Parun inter Pashki et Chetras, 2100—2300 m, KERST. 1345! Pashki, 2500 m, EDELB. 582!, 749!

Pakistan: Chitral: Rumbur, 3000 m, BOWES LYON 667!

Distr. gen.: Afghanistan, Pamir-Alaj, Tien Shan.

4. ***A. campestre*** L., Spec. Plant. 1055 (1753).

Typus: „Habitat in Scania & australiori Europa".

Frutex vel arbor humilis vel elata usque ad 25 m alta. Rami juveniles pubescentes vel glabri. Lamina foliorum $15—60\times25—80$ mm, usque ad 1/2—2/3 3—5-loba, basi cordata, lobis integris vel interdum (imprimis mediano) trilobulato, plerumque subtus pubescens imprimis secus nervos principales; petiolus 15—60 mm, pubescens vel glaber, lactifer. Corymbi floriferi erecti, pubescentes. Samarae $15—27\times5—11$ mm, horizontaliter patentes; nuculae compressae, pubescentes vel glabrae, ovato-orbiculares; loculi glabri.

Talish: Swant, HOHEN., C. A. MEY. Astara, BUHSE.

Persia: **N**: Gorg.: Prope Gorgan, BGE. Dimalu, 2600 m, SCHMID 5987! Sharbat, GAUBA 788! Gale Maran, GAUBA & SAB. Ketul, SHAR. 345! Maz.: In declivibus borealibus jugi Kandavan, 1800 m, STUTZ 1130! In valle fluvii Chalus, 2200 m, RECH. 875! Gaduk, BEHB. & AELL. 6541-E! Kalar Dasht, 2400 m, GAUBA 811! Kojur: Inter Kinch et Dasht Nazir, 800—1300 m, RECH. 6627-b! Inter Nemasieh et Zanus, 1800—2200 m, RECH. 6562! In valle Haraz: Darli, 2000 m, WDB. 1562! Gil.: Ispili, LINDS. 1355 — **W**: Azerb.: Kaleybar, MIRD. in GAUBA 791! Hasanbeyglu, KNAPP. M. Qara Dagh prope Hasanbeyglu, 1200 m, MIRD. in GAUBA 790!, 810!

Distr. gen.: Europa (regionibus maxime borealibus et orientalibus exceptis), Caucasia, Persia borealis, Africa boreo-occidentalis.

Die Art ist besonders was die Behaarung oder Kahlheit der Früchte anbelangt sehr variabel; da sich aber keine deutliche Korrelation mit anderen Merkmalen noch geographische Beziehungen ergeben, wird hier von der Unterscheidung niedriger systematischer Einheiten abgesehen.

Die komplizierte Synonymie der Art wird hier nicht berücksichtigt. Man vergleiche darüber OPIZ, Flora 7, Beil. 1: 82—83 (1824) und OPIZ, Seznam Rostlin Kveteny: 9 et 42 (1852).

Sect. *Acer*

Syn.: Sect. *Gemmata* Pojark., Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 312 (1933).

Gemmae magnae, squamis 10—14. Folia palmato-5-lobata, magna. Inflorescentia racemosa vel paniculato-corymbosa. Stamina 8 hypogyna. Samarae magnae, usque ad 5,5 cm longae, loculis convexis.

5. ***A. caesium*** Wall. ex Brandis, Forest Fl. 111 tab. 21 (1874).

Syn.: *A. molle* Pax, Englers Bot. Jahrb. 11: 74 (1889). *A. luteolum* Borbás, Term. Füz. 14: 77 (1891).

Icon.: Tab. 3.

Typus: „North-West Himalaya, from the Indus to Nepal, between 4000 and 10000 ft., scattered in mixed forests, mostly in shady valleys".

Arbor elata usque ad 25 m alta. Rami pallide brunnei, juveniles glabri. Squamae gemmarum florendi tempore magni, conspicui. Folia 15—25 × 12—18 cm, (3—)5-loba, lobis late triangularibus convexis acutis vel apice breviter protractis, in margine grosse irregulariter profunde cordata, subtus in axillis nervorum et secus nervos pubescentia, demum valde glabrescentia. Inflorescentia paniculato-corymbosa. Samarae 3—5 × 1,5—2 cm, angulo ± acutisculo valde obtuso patentes; nuculae globosae non compressae, glabrae. Loculi glabri.

Afghanistan: E: Nuristan: Chetras, 2900 m, Edelb. 841! Derin Elasoon, Edelb. 1742! Pakistan: Chitral: In jugo Lowarai, 2400 m, Toppin 428!

Distr. gen.: Montes Hindukush et Himalaya ab Afghanistan usque ad Sinam (Shensi).

Die Knospenschuppen sind groß und zur Blütezeit sehr auffällig.

6. ***A. velutinum*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 28 (1845).

Arbor elata usque ultra 20 m alta. Rami juveniles plerumque purpurei glabri. Folia usque ad 25 × 25 cm, variabilia, lobis plerumque ± breviter rarius elongato-triangularibus, convexis, margine plerumque irregulariter grosse crenatis usque crenato-serratis usque sublobato-serratis, ± acutis; lamina basi cordata, supra laete viridis subtus ± glaucescens, in axillis nervorum principalium tantum vel omnino velutino-pubescens. Petioli laminam aequantes vel ea longiores, saepe purpurascentes. Inflorescentiae densi- et multiflorae, paniculato-corymbosae. Samarae plerumque 4,5 × 1,5 cm, angulo plerumque acuto patentes, basin versus plerumque valde attenuatae; nuculae globulares, non compressae, puberulae.

— — var. ***velutinum***

Syn.: *A. insigne* Boiss. & Buhse var. *velutina* (Boiss.) Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 46 (1860). *A. insigne* Boiss. & Buhse var. *longiloba* Bornm., Bull. Herb. Boissier Ser. 2, 5: 643 (1905). *A. insigne* Boiss. & Buhse var. *typica* Bornm. f. *velutina* Bornm., l. c. (1905).

Typus: „Ghilan in sylv.", Auch. 4293-A, P!, W!

Folia subtus velutino-pubescentia.

Talish: Lenkoran, Karjagin!

Persia: N: Maz.: In valle fluvii Chalus 48 km versus jugi Kandavan, 1500 m, Stutz 1153! In valle fluvii Talar inter Abbasabad et Shahi, 400 m, Rech. 2052! Gil.: Inter Rudbar et Rasht, Gauba 793! Prope Rasht, Bornm. 6532!; Prope Rasht (Typus *A.*

insignis var. *longilobi*) BORNM. 6534! Inter Rasht et Lahijan, RECH. 33! Gilan, AUCH. 4293-a!

Distr. gen. varietatis: In montibus Talish et Elburz.

— — var. ***glabrescens*** (BOISS. & BUHSE) E. MURRAY, comb. nov.

Syn.: *A. insigne* BOISS. & BUHSE var. *glabrescens* BOISS. & BUHSE, Nouv. Mém. Soc. Nat. Mosc. 12: 46 (1860). *A. insigne* sensu BOISS. (non BOISS. & BUHSE) Fl. Or. 1: 947 (1867). *A. insigne* BOISS. & BUHSE var. *obtusiloba* FREYN & SINT. ex FREYN, Bull. Herb. Boissier 2: 843 (1902). *A. velutinum* BOISS. f. *glabrescens* (BOISS. & BUHSE) REHDER, Journ. Arnold Arb. 19: 83 (1938).

Icon.: Tab. 4.

Typus: „In Gilan und dem unteren Talyschgebirge, häufig bis ungefähr 2500 Fuß Höhe ü. d. M., April 1848 (florens), 13. August 1847 (fructiferum)." BUHSE 784, 943.

Folia subtus glabrescentia, glaucescentia.

Talish: KUNTZE, BUHSE 784, 943.

Persia: N: Gorg.: Bandar-i Gaz, SINT. 1355, 1523, 1524 (Lectotypus var. *otusilobae* FREYN & SINT.)! Robat-e Qozloq, KOELZ 16232! Minudasht, SHAR. 347! Inter Robat-e Qozloq et Gorgan, SCHMID 6012! Maz.: In valle fluvii Talar, KRIESCHE in RECH. 2332!, 2336! In valle Haraz, Karehsang, BRUNS, WDB. 540! In valle fluvii Chalus, 2200 m, RECH. 879! Shahsavar, 900 m, MOONEY 6599! 8 km S Chalus, 200 m, GRANT 16483! S Shahi, KRIESCHE in RECH. 2352! Gil.: Rasht, BORNM. 6531!, Inter Lajim et Atu, TREGUBOV 109! Kohdom, BORNM. 6530. Inter Rasht et Lahijan, RECH. 33! Gilan, BUHSE 784, 943 — W: Azerb.: 20 km W Astara, 500 m, GRANT 16402! Prope Asbine, MIRD. in GAUBA 792! In montibus prope Astara, STUTZ 569! — E: Khor.: 62 km E Loveh versus Dasht, RECH. 33171!

Distr. gen. varietatis: In montibus Talish et Elburz.

Sect. *Trilobata* POJARK., Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 324 (1833).

Gemmae parvae, squamis 8—10. Folia trilobata (in nostris). Inflorescentia corymboso-paniculata. Stamina 8, hypogyna. Samarae 2,5—3 cm longae, sub angulo acuto divergentes, loculis vix convexis.

7. ***A. Semenovii*** REGEL & HERDER, Bull. Soc. Nat. Mosc. 39 (1): 550 (1866).

Syn.: *A. tataricum* L. var. *Semenowii* (sic) NICHOLSON, Gard. Chron. 15: 74 (1881). *A. Ginnala* MAXIM. subsp. *Semenowii* (sic) PAX, Englers Bot. Jahrb. 7: 185 (1886). *A. tataricum* L. subsp. *Ginnala* (MAXIM.) WESMAEL var. *Semenovii* (REGEL & HERDER) WESMAEL, Bull. Soc. Bot. Belg. 29: 31 (1890). *A. Ginnala* MAXIM. var. *Semenowii* (sic) PAX in ENGLER, Pflanzenr. (IV. 163) 8: 12 (1902).

Icon.: Tab. 5.

Typus: „Zu Hause ist er in den Thälern des Alatau transiliensis, hauptsächlich im Thale des Almaty in einer Höhe von 3000—4000"; SEMENOV.

Frutex vel arbor humilis. Rami juveniles glabri. Folia 2,5—5(—6)×2—4 (—5,5) cm, latitudine semper longiora, forma valde variabilia, ambitu ovata, ovato-oblonga, subpalmato-ovata vel rotundato-triangularia, crenato-serrata, dupliciter serrata, serrato-lobata usque incisa, si triloba lobo mediano lateralibus semper evidenter longiore et latiore utrinque glabra, supra atroviridia subtus pallidiora flavescenti-viridia, basi cordata vel rotundata. Petiolus lamina plerumque brevior, supra canaliculatus, saepe rubro-suffusus. Inflorescentia pedunculata,

corymboso-paniculata. Samarae 2–3×0,8–1,2 cm subparallelae vel angulum acutum rarius rectum formantes, saepe rubro-suffusae; loculi glabri, ± appressi.

Afghanistan: **NW**: Herat: Obeh, 1700 m, Koeie 3753!; 1800 m, Koeie 3654! In valle Tang-e Chorsar inter Qala Shahrak et Khwajachisht, 1800 m, Rech. 19189! – **E**: Panjshir, 1900 m, Volk 180! Nuristan: Edelb. 2325! – **NE**: Kataghan: In declivibus borealibus jugi Salang, 2000–2100 m, Rech. 31710! In valle Ashraf, Neub. 4398/1964! – **C**: Bamian: Bamian, 1600 m, Koeie 2893! Darreh-i Shikar, Volk 2150!, 2707!; 1500 m, Hdg. & Wdb. 3387!; 2000 m, Rech. 36995! Inter Doab et Eshpushta, 1500 m, Gilli 1496!

Distr. gen.: Montes Tien Shan, Turkestan, Bokhara, Afghanistan.

Die Literaturangabe über das Vorkommen von *A. tataricum* L. aus Gorgan, Radkan hat sich nicht bestätigt.

Sect. *Goniocarpa* Pojark., Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 347 (1933)

Gemmae squamis 10–12. Folia 3–5-lobata, lobis integerrimis vel apice grosse paucidentatis. Inflorescentia terminalis corymbos breviter pedunculata vel subsessilis. Stamina 8, perigyna. Samarae subparallelae vel angulo acuto rarius fere recto divergentes, alis basi valde contractis, loculis nodosis trigonis.

8. ***A. hyrcanum*** Fisch. & C. A. Mey., Ind. Sem. Horti Petrop. 4: 31 (1837).

Syn.: *A. Opalus* sensu Hohen., Enum. Talysch 155 (1837), non Aiton (1789). *A. opulifolium* sensu Ledeb., Fl. Ross. 1: 445 (1842), non Vill. (1786). *A. italum* Lauth subsp. *variabile* Pax var. *crassifolium* Pax et var. *hyrcanum* Pax, Englers Bot. Jahrb. 7: 226 (1886). *A. italum* Lauth subsp. *hyrcanum* (Fisch. & C. A. Mey.) Pax var. *crassifolium* Pax in Engler, Pflanzenr. (IV. 163) 8: 60 (1902). *A. opulifolium* sensu Parsa, Fl. Iran 1 (2): 1540 (1952), non Vill. (1786).
Icon.: Tab. 6.
Typus: „Habitat in montibus Talüsch", C. A. Mey.

Arbor usque ad 20 m alta. Rami juveniles glabri vel pilosi. Lamina foliorum 3–9×3,5–11 cm, usque ad medium circiter 5-loba, lobis plerumque obtusis grosse obtuse interdum indistincte dentatis vel subsinuatis, lobis tribus intermediis lateribus subparallelis praeditis, supra laete viridia, subtus imprimis secus nervos principales ± pubescentia, ceterum ± glabra; petiolus 3–10 cm longus, ± glaber vel glabrescens, non lactifer. Corymbi floriferi erecti, breviter pedunculati vel sessiles. Samarae 25–40×8–12 mm, ± parallelae vel ± divaricatae, latitudine plerumque plusquam 2½-plo longiores; nuculae non compressae, rotundatae, glabrae; loculi glabri.

Talish: Inter Swant et Drych, 1200–1800 m, Hohen. Talish, C. A. Mey.
Persia: **N**: Gorg.: Radkan, Buhse. Ketul, Shar. s. n.! Gale Maran prope Ramian, Gauba 785! Prope Zarrin Gol, 2000 m, Gauba 786! Maz.: In declivibus borealibus jugi Kandavan, 2250 m, Gauba 787! Kojur inter Nemasieh et Zanus, 1800–2400 m, Rech. 6555! In valle fluvii Chalus, 2200 m, Rech. 879! Gil.: Kuh-e Dalak prope Rudbar, 2100 m, Gauba 789! M. Samam, Buhse. Inter Kelishom et Shahjan, 1800 m, Buhse. Radkan, Buhse.

Distr. gen.: Peninsula Balcanica, Anatolia boreo-orientalis, Caucasia, Persia borealis.

Die Art ist im Gebiet der Flora Iranica nur durch die subsp. *hyrcanum* vertreten; weiter westlich ist sie polymorph; siehe Yaltirik in Davis, Fl. Turkey 2: 514 (1967); sie ist übrigens mit dem südeuropäischem *A. Opalus* Miller nah verwandt.

9. ***A. pentapomicum*** J. L. STEWART ex BRANDIS, Forest Fl. 111 (1874).

Syn.: *A. pubescens* FRANCH., Ann. Scienc. Nat. Ser. 6, 15: 246 (1883). *A. monspessulanum* L. var. *turkestanicum* FRANCH., l. c. (1883). *A. monspessulanum* L. subsp. *pubescens* (FRANCH.) WESMAEL, Bull. Soc. Bot. Belg. 29: 50 (1890). *A. Regelii* PAX in ENGLER, Pflanzenr. (IV. 163) 8: 60 (1902). *A. pubescens* FRANCH. var. *genuinum* PAX, l. c. (1902). *A. pubescens* FRANCH. var. *glabrescens* PAX, l. c. (1902). *A. monspessulanum* L. f. *turkestanicum* (FRANCH.) PAX, l. c. 62 (1902). Typus: „Common locally, and at times almost gregarious, between 2300 and 7000 ft., in exposed hot dry places, not as a rule in thick forests, in the basins of almost all the great rivers in the Panjab, Himalaya from the Jhelam to the Sutlej, and east of the latter. Not found on the Bias", J. L. STEWART, K!

Arbor humilis vel frutex. Rami vetustiores pallide grisei, juveniles plerumque glabri. Folia 3—7 cm longa et lata, forma variabilia, plerumque triloba, basi truncata, rotundata vel leviter cordata, lobis triangularibus acutis integris vel leviter saepe indistincte crenato-subserratis rarius remote argutius serratis raro ± lobatis, supra canescenti-viridia, subtus cinerascentia, ± puberula vel rarius glabra; petiolus lamina plerumque paulo brevior. Inflorescentia subsessilis corymbosa pauciflora. Samarae 2—3×1(—1,5) cm, saepius ± convergentes; loculi compressi, glabri vel pubescentes.

Afghanistan: **E**: Kabul: In valle Salang N Jabal us-Siraj, 1760 m, GILLI 1498! In faucibus fluvii Panjshir prope Gulbahar, 1700 m, GILLI 1497! Gulbahar, NEUB. 468!, VOLK 238! Jaji: Dobandi ad fl. Kakobi, 3000 m, LALANDE R 1084-E 2! Nuristan: Kulam, Munui, 2150 m, KERST. 1041! In valle fluvii Pech prope Wama, 1380 m, KERST. 824! Chetras, 2100 m, EDELB. 544! Pashki, 2300 m, EDELB. 626!, 628! Kantivo, 2100 m, EDELB. 673! Waigel, 1500 m, EDELB. 869! Derin, EDELB. 1748! Urmur, 1600 m, NEUB. 4514! — **NE**: Badakhshan: Bam Kotal, LINDB. 728/59! 12 km S Ishkamish. 1600 m, PODLECH 10712! — Dreikkuli, 2250 m. COLLETT 63!

Pakistan: Chitral: Shoghot, 2400 m, STAINTON 2658! In jugo Lowarai, 2100 m, TOPPIN 189, 427! Brumboret Gol SW Chitral, 2400 m, BOWES LYON 607! — In valle Kurram, AITCH.

Distr. gen.: Bokhara, Turkestan, Montes Hindukush, Himalaya occidentalis.

Die Abgrenzung dieser Art ist wegen ihrer großen Variabilität schwierig.

10. ***A. monspessulanum*** L., Spec. Plant. 1056 (1753).

Arbores plerumque humiles vel frutices. Folia parva, 1,2—6×1—7 cm ramorum floriferum coriacea vel subcoriacea usque ad 1/2—2/3, triloba, subtus saepe cinerea lobis integerrimis rarius apice paucidentatis; basi rotundata vel subcordata consistentia subcoriacea; folia ramorum sterilium saepius dentata; petiolus laminam ± aequans vel paulo longior. Inflorescentia corymbosa, subsessilis, pauci-(5—15-)flora. Samarae usque ad 3×2 cm., conniventes, rectangulares rarius divergentes; loculi ± globulares durissimi non compressi, intus glabri vel villosi.

Distr. gen. speciei: Regio Mediterranea, Asia austro-occidentalis orientem versus usque ad Turcomaniam et Persiam australem.

Die weit verbreitete Art ist sehr variabel. Die von POJARKOVA (1933) vorgenommene systematische Gliederung wurde hier im Wesentlichen beibehalten. Da aber die Unterschiede geringfügig und durchaus nicht an allen Belegen gleichmäßig ausgeprägt sind, jedoch ein Vorherrschen der einzelnen Merkmale bzw. Merkmalskombinationen in gewissen Gebieten deutlich, in anderen wenigstens angedeutet ist, führe ich POJARKOVA's

Sippen hier nicht als Arten, sondern als geographische Rassen im Rang von Unterarten. Die durch Ausrufungszeichen gekennzeichneten Belege wurden von Pojarkova revidiert (Rechinger).

Zwischenformen treten vor allem zwischen subsp. *cinerascens* und subsp. *assyriacum* häufig auf. Die kleinblättrigen Ahorne aus der Verwandtschaft von *A. monspessulanum* gehören in den Gebirgen des iranischen Hochlandes zu den am meisten gegen Trockenheit resistenten Holzpflanzen; subsp. *turcomanicum* bildet am Ostende der hyrkanischen Waldzone den äußersten Vorposten, subsp. *persicum* am Südostende der kurdisch-lurischen; subsp. *cinerascens* und subsp. *assyricum* kommen bis an die untere, durch lang andauernde Sommerdürre bedingte Grenze der letztgenannten Trockenwaldzone vor. Die subsp. *ibericum* ist die im Gebiet der Flora Iranica in Bezug auf Feuchtigkeit offenbar anspruchsvollste Rasse und nimmt dementsprechend den Nordosten des Gesamtareals ein. Die subsp. *monspessulanum* ist im Mittelmeergebiet zuhause. Sie erreicht ihre Ostgrenze im westlichen Anatolien.

1a. Loculi intus glabri. Folia ± 2 cm longa et lata ..... subsp. *persicum* (Pojark.) Rech. f.
b. Loculi intus pilosi. Folia plerumque majora 2
2a. Loculi extus et intus (etsi sparse) pubescentes ..... subsp. *turcomanicum* (Pojark.) Rech. f.
b. Loculi extus glabri, intus pubescentes 3
3a. Folia plerumque 2(−3)×3,5−4 cm, etiam adulta subtus ± pubescentia. Samarae intus densissime pubescentes ..... subsp. *cinerascens* (Boiss.) Yaltirik
b. Folia majora, subtus demum praeter nervos principales glabrata 4
4a. Folia subtus primum ± dense pubescentia, demum praeter nervos principales glabrata ..... subsp. *ibericum* (M. B.) Yaltirik
b. Folia subtus ab initio praeter nervos principales sparse puberulos subglabra ..... subsp. *assyriacum* (Pojark.) Rech. f.

— — subsp. ***cinerascens*** (Boiss.) Yaltirik, Notes Roy. Bot. Gard. Edinb. 28: 10 (1967).

Syn.: *A. cinerascens* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 4: 29 (1845).
Typus subspeciei: Ky. 37, W!

Folia ramorum floriferorum 2(−3)×3,5(−4) cm, lobis plerumque brevibus latis integris, ea ramorum sterilium paulo tantum majora et obsolete crenato-dentata, omnia subtus plerumque ± persistenter pubescentia. Samarae 2,5−3× 1 cm, loculis extus glabris, intus dense pubescentibus.

Iraq: Kurd.: Arbil: In faucibus prope Rawandiz, Guest 450, 2025.
Persia: W: Kermansh.: M. Shahu, Str. Inter Kermanshah et Baghdad, Str. Rijab prope Qasr Shirin, 1500−1700 m, Nab. Bisotun, Str. Heyran, Hakimi 6538-E. M. Karaghan, Str. Jamnasu, Str. Ham.: Kuh-e Garri, Str. Arak: M. Rasvand prope Azna, Str. M. Latetar, Str. Koh Kohrud, Str. Arak, Str.! Esf.: 32−48 km W Esfahan, 1800 m. Stutz 826, 837, 840. Lur.: Khorramabad, Gauba 783! Dow Rud, Koelz 17145!, 17261! Najiu, coll. ign. Pol-e Kalchor prope Khorramabad, Gauba & Sab. Oshtoran Kuh, Str. Kuh Giluye. 1800−2700 m, Haussk. Qaleh Rostam, Str. In valle fluvii Safid Ab, Str. In montibus Zagros, 1500−2100 m, Haussk. Bakht.: Prope Kuh-e Kukular, Alexeenko! In valle Bazoft, Mart.-Escal. — S: Fars.: Inter Shiraz et Firuzabad, Gauba 781! Inter Shiraz et Esfahan, Pollak s. n. Inter Shiraz et Kazerun, Bornm., Cavara. 58 km W Shiraz, 1600 m, Grant 15534! Sabz Pushan, 2100 m, Wdb. 891! Sivand, Stapf 1151!, Behb. 6539-E! Inter Abadeh et Sivand, Cavara. Inter Abadeh et Dowlatabad, 1500−2000 m, Stutz 5298! Hajjiabad, Stapf 1149! Kuh Kable, 900−1800

m, STAPF 1150! Gere inter Bushehr et Shiraz, KY. 37! Inter Tal-e Khosravi et Sisakht, BEHB. 959-E! Inter Deh Now et Sisakht, BEHB. 960-E! Firuzabad, Tang-e Ab, KASHKOULI 6540-E Inter Persepolis et Pasargadae, 1800 m, BORNM. 3372. Tang-e Saadatabad prope Shiraz, GAUBA & SAB. Kuh Khormuj, 1700 m, NAB. 221. — Inter Malamir et Qaleh Madrasse, GADD 846! Inter Deh-bi et Qara Sarai Shamil, GADD 99!

Distr. gen. subspeciei: Anatolia austro-orientalis, Iraq, Persia occidentalis, Transcaucasia.

— — subsp. ***ibericum*** (M. B.) YALTIRIK, Notes Roy. Bot. Gard. Edinb. 28: 10 (1967).

Syn.: *A. ibericum* M. B., Fl. Taur.-Cauc. 2: 447 (1808).

Typus subspeciei: Iberia caucasica (Georgia).

Folia ramorum floriferorum 4,5(—5) × 6(—7) cm, subtus primum pubescentia, demum praeter nervos principales glabrata, lobis integris vel obsolete paucicrenatis, ea ramorum sterilium saepe ± irregulariter crenato-dentata. Samarae 2,5—3 × 0,8—1 cm, loculis extus glabris, intus pubescentibus.

Talish, C. A. MEY., HOHEN. Drych, HOHEN.

Persia: **N**: Maz.: Pol-e Zoghal, GAUBA & SAB. In valle fluvii Chalus, 350 m, RECH. 2345!; 1200—1800 m, STUTZ 1133, 1159. Kojur: Inter Kinch et Dasht Nazir, 800—1300 m, RECH. 6627-a! Dasht Nazir, 1100 m, GAUBA 802! In valle Haraz: Darli supra Panjab, 2000 m, WDB. 1581. In jugo E Emarat, 500 m, WDB. 220. Supra Zardman, 800 m, WDB. 411 Gil.: Harsevil prope Manjil, 1200 m, MIRD. in GAUBA 807! In valle fluvii Safid Rud prope Rudbar, 600 m, BORNM. 6535! Rudbar, Tunekabun, BUHSE. Gilan, AUCH. 4294-a! — **W**: Azerb.: Qareh Dagh, BUHSE 399!, KNAPP. Prope Hasanbeyglu, MIRD. in GAUBA 803!

Distr. gen. subspeciei: Caucasia, Persia boreo-occidentalis.

— — subsp. ***persicum*** (POJARK.) RECH. f., comb. nov.

Syn.: *A. persicum* POJARK., Act. Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 147 (1933).

Icon.: Tab. 7.

Typus subspeciei: BORNM. 3375, LE, W!

Folia ramorum floriferorum 1,5—2 cm longa et lata, glabra, lobis integris, ea ramorum sterilium vix majora, saepe obsolete tantum dentata. Samarae 1,5—2 × 0,5—0,8 cm, loculis extus et intus glabris.

Persia: **S**: Fars.: Jahrom, KOELZ 14625! Neyriz, KOELZ 14696! Deh Murd, 1700 m, BOBEK 137! Shahr-e Khafr, 1400 m, GAUBA 782! Sarvestan, 120 km E Shiraz, 1900 m, GAUBA 780!, GRANT 17022. Saadatabad, 1800 m, GRANT 15128, 15837. Kerm.: Kuh-e Jebal Barez; 2100 m, POPOV 51/204, BOBEK 163! Deh Bakri, 2100—2500 m, RECH. 3745! Rabor, Shah Kuh, 2700—3200 m, BORNM. 3375, 3376!

Distr. gen. subspeciei: Endem.

— — subsp. ***turcomanicum*** (POJARK.) RECH. f., comb. nov.

Syn.: *A. turcomanicum* POJARK., Act. Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 143 (1933).

Icon.: Tab. 8.

Typus subspeciei: M. Kopet Dagh, in angustiis Joldere, MICHELSON 81, LE.

Folia ramorum floriferorum 3,5—4 × 5—6 cm, lobis integris, ea ramorum sterilium obtuse 1—2-dentata, juvenilia pubescentia, demum glabrata. Samarae 2—3 × 0,8—1,2 cm, loculis extus et intus ± sparse pubescentibus.

Persia: **N**: Gorg.: Golidagh, 700 m, GAUBA & SAB.! Radkan, BUHSE! Gonbad-e Kavus, GAUBA 784!, STUTZ 624! Ketul, 1250 m, GAUBA 805! Naudeh, 700 m, GAUBA 801! Inter

Ghulaman et Gifan, 1300 m, Gauba 806! Ramian, 600 m, Gauba 808! M. Shahvar prope Hajjilang, 2400 m, Rech. 6189! Hazar Jerib, Shar. 346! Gorgan, Bge. — E: Khor.: Bojnurd, 1100 m, Gauba 809! Inter Shirvan et Bojnurd, Rech. 1779! 62 km E Loveh versus Dasht, 1200 m. Rech. 33167. Sepid inter Bojnurd et Tappeh-ye Moraveh, 1350 m, Rech. 32536. Kotal-e yek chenar, Koelz 16718. Prope Quchan, Czernjak.! Darreh Gaz, Iljin! In montibus Taljau, Czernjak. 843!, 851! — C: Shahr.-Bust.: Shahrud, Bge. In jugo Khash Aylan, 70 km E Shahrud, 2000—2200 m, Rech. 5484! Turcomania: M. Masinev, Sint. 1032-a. Ashkhabad: In montibus supra Nephton, Sint. 191! Suluklü, Sint. 642! Kara Kala, Sint. 1963! In montibus prope Ashkhabad, Litw. 91! Garmab. Sint. 1032-b, Antonov! In angustiis Joldere, Michelson 81, 2994!, Sąmokisz 3164!, Lipsky 2955!, Dubjanskij! Kopet Dagh, Fedtsch.! Aydere, Lipsky 3614!, Fedtsch. 741-a!, Massagetov & Bobrov! Inter Nokhur et Aydere, Michelson 380! M. Sjunt, Czernjak. 518!, 619!, 621!, 1194! In jugo Batymgjadytschi, Czernjak. 422! In angustiis Karanki, Jarmolenko & Gontscharov! Ad custodiam terminalem Czaek, Michelson 2195! In declivibus orientalibus M. Dushak. Michelson 2024! Inter Kurd-Ssu et Gaudan, Michelson 2412! Prope Kurd-Ssu, Dobrov! In faucibus fluvii Chuli, Michelson 1711! Keljata, Androssov 4152! Firyuza, Androssov! Inter Firyuza et M. Czapan-tjube, Iljin 750! In angustiis Gyaurskoje, Timoteev! In ascensu M. Sundso Dagh, Czernjak. 73! Inter Khodzhakala et Bami. Radde 243! In angustiis Tumanovsky, Czernjak. 75!

Distr. gen. subspeciei: Endem.

— — subsp. ***assyriacum*** (Pojark.) Rech. f., comb. nov.

Syn.: *A. assyriacum* Pojark., Act. Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 145 (1933).

Typus subspeciei: Bornm. 1006, LE.

Folia ramorum floriferorum usque ad 4,5×7 cm, lobis integris, ea ramorum sterilium interdum quinqueloba, acute irregulariter dentata, subtus imprimis secus nervos sparse pubescentia ± glabrata. Samarae ± 2(—3)×1(—1,5) cm, loculis extus ab initio glaberrimis, intus villosis.

Iraq: Kurd.: Arbil: M. Handren, 1300 m, Bornm. 1004. M. Sakri Sakran, 1500 m, Bornm. 1002. In jugo Sideka, 1800 m, Haley 200. Kuh Safin prope Shaqlawa, (Typus var. *Bornmülleri* Schwer.) Bornm. 1001, 1005, 1006. Inter Arbil et Rawandiz prope Harir, 600 m, Bornm. 1003. Sul.: Penjwin, 1200—1600 m, Rech. 10483! M. Avroman prope Tawilla, 1400—1600 m, Rech. 10258! M. Avroman, Haussk. 20 km SW Sulaymaniyah, Stutz 1397 Mosul: Jabal Khantur prope Sharanish, 1200—1400 m, Rech. 12041!

Persia: W: Kurd.: M. Shahu, 1500—2400 m, Haussk. 100 km W Sanandaj versus Dezh Shahpur, 1750 m, Bent & Wr. 520—601! 100 km N Kermanshah versus Sanandaj, 1750 m, Wdb. 1890 *).

Distr. gen. subspeciei: Turcomania, Persia boreo-orientalis, Anatolia.

Folgende drei Belege sind nach Pojarkova *A. assyriacum* × *cinerascens*:

Persia: W: Lur.: Inter Shah Bazan et Bisheh, 800 m, Koeie 1739! Bisheh, 1200—1400 m, Rech. 5654! 2 km E Malavi inter Khorramabad et Andimeshk, 750 m, Bent & Wr. 420—102! Kermansh.: Kuh-e Kal-i Qazi, prope Shahabad, Gauba 779!

weitere wohl auch:

Persia: W: Kurd.: Dezh Shahpur, 1300—1900 m, Jacobs 6469, 4690. Kermansh.: Karand. Shar. 6542-E. Lur.: Ilam, 1550 m, Jacobs 6327.

*) Unterscheidet sich vom Typus durch kleinere Blätter und Früchte (Pojarkova).

Acer L. 1
Sect. **Acer** 4
Sect. *Gemmata* Pojark. 4
Sect. **Goniocarpa** Pojark. 6
Sect. **Platanoidea** Pax 2
Sect. **Trilobata** Pojark. 5
assyriacum Pojark. 10
caesium Wall. ex Brandis 4
campestre L. 3
cappadocicum Gled. 2
cinerascens Boiss. 8
cultratum **Wall.** 2
Ginnala Maxim.
subsp. *Semenowii* Pax 5
var. *Semenowii* Pax in Engler 5
hyrcanum Fisch. & C. A. Mey. 6
subsp. **hyrcanum** 6
ibericum M. B. 9
insigne sensu Boiss. 5
insigne Boiss. & Buhse
var. *glabrescens* Boiss. & Buhse ... 5
var. *longiloba* Bornm. 4
var. *obtusiloba* Freyn & Sint. ex Freyn 5
var. *typica* Bornm.
f. *velutina* Bornm. 4
var. *velutina* (Boiss.) Boiss. & Buhse 4
italum Lauth
subsp. *hyrcanum* (Fisch. & C. A. Mey.) Pax
var. *crassifolium* Pax in Engler.. 6
subsp. *variabile* Pax
var. *crassifolium* Pax 6
var. *hyrcanum* Pax 6
laetum C. A. Mey. 2
luteolum Borbás 4
molle Pax 4
monspessulanum L. 7
subsp. **assyriacum** (Pojark.) Rech. f. 10
subsp. **cinerascens** (Boiss.) Yaltirik 8
subsp. **ibericum** (M. B.) Yaltirik ... 9
subsp. monspessulanum 8
subsp. **persicum** (Pojark.) Rech. f. . 9
subsp. *pubescens* (Franch.) Wesmael 7
subsp. **turcomanicum** (Pojark.) Rech. f. 9
var. *turkestanicum* Franch. 7
Opalus sensu Hohen. 6
Opalus Miller 6
opulifolium sensu Ledeb. 6
opulifolium sensu Parsa 6
pentapomicum J. L. Stewart ex Brandis 7
persicum Pojark. 9
platanoides L. 2
pubescens Franch. 7
var. *genuinum* Pax 7
var. *glabrescens* Pax 7
Regelii Pax in Engler 7
Semenovii Regel & Herder 5
tataricum L.
subsp. *Ginnala* (Maxim.) Wesmael
var. *Semenovii* (Regel & Herder) Wesmael 5
var. *Semenowii* Nicholson 5
turcomanicum Pojark. 9
turkestanicum Pax in Engler 3
velutinum Boiss. 4
var. **glabrescens** (Boiss. & Buhse) E. Murray 5
f. *glabrescens* (Boiss. & Buhse) Rehder 5
var. **velutinum** 4

Acer cappadocicum GLED. — RECH. 30798

Tab. 2

Acer turkestanicum Pax — Kerst. 1157

Acer caesium WALL. ex BRANDIS — EDELB. 1742

Tab. 4

Acer velutinum Boiss. var. *glabrescens* (Boiss. & Buhse) E. Murray — Mird. in Gauba 792

Acer Semenovii REGEL & HERDER — RECH. 36995

Tab. 6

Acer hyrcanum FISCH. & C. A. MEY. — SHAR. s. n.

Acer monspessulanum L. subsp. *persicum* (Pojark.) Rech. f. — Bornm. 3375

Tab. 8

Acer monspessulanum L. subsp. *turcomanicum* (Pojark.) Rech. f. — Sint. 191

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Familien mit vorangestellter Continuatio-Nummer sind bereits erschienen.

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
	PTERIDOPHYTA					
	Equisetaceae	1	2	143	(2)	(2)
	Lycopodiaceae	2	1	142	(1)	(1)
	Marsileaceae	5	5	144	(4)	(4)
	Ophioglossaceae	3	3	140	(6)	(6)
	Polypodiaceae	4	4	141	(3)	(3)
	Salviniaceae	6	6	145	(5)	(5)
	GYMNOSPERMAE					
50	Cupressaceae	9	8	136	(8)	(8)
3	Ephedraceae	10	10	138	(10)	(10)
14	Pinaceae	8	9	135	(7)	(9)
12	Taxaceae	7	7	137	(9)	(7)
	ANGIOSPERMAE					
24	Acanthaceae	138	110	84	86	135
61	Aceraceae	86	83	30a	42a	76
	Aizoaceae	48	27	50	57	106
	Alismataceae	16	127	115	124	146
	Amaranthaceae	45	23	93	92	112
	Amaryllidaceae	27	134	128	114	162
	Ampelidaceae	91	91	32	41	66
63	Anacardiaceae	81	81	46	43	75
	Apiaceae	113	94	54	58	127
	Apocynaceae	125	117	82	75	82
25	Aquifoliaceae	82	86	70	38	58
1	Araceae	22	143	120	122	158
	Araliaceae	112	93	55	59	19
26	Aristolochiaceae	40	35	103	97	96
	Asclepiadaceae	126	118	74	76	84
	Asparagaceae	26	133	129	116	155,7pp.
48	Asperifoliaceae	129	104	80	79	142
	Asteraceae	146	126	61	65	131
	Balanophoraceae	42	20	102	103	63
	Balsaminaceae	89	85	25	33b	140
	Berberidaceae	54	40	3	13	96
	Betulaceae	33	11	112	108	25
44	Bignoniaceae	137a	108a	76a	85a	86a
48	Boraginaceae	129	104	80	79	142
57	Brassicaceae	60	46	7	16	101
45	Buddleiaceae	123	115	75	77	80
	Burseraceae	75	78	33	36	72
	Butomaceae	17	128	116	124a	145
27	Buxaceae	80	31	105	104a	23
	Caesalpiniaceae	68b	59b	38b	45b	13
	Callitrichaceae	79	32	47	50b	117
13	Campanulaceae	145	125	62	66	130
	Cannabaceae	37	17a	106	105	30
	Capparidaceae	59	45	8	17	36
10	Caprifoliaceae	141	121	57	61	20
	Caryophyllaceae	50	29	13	23	105
64	Celastraceae	83	87	35	39	60
28	Ceratophyllaceae	52	42	15	110	94
	Chenopodiaceae	44	22	92	93	111
46	Cistaceae	99	49	10	19	33
	Compositae	146	126	61	65	121
2	Convolvulaceae	127	102	78	80	133
54	Cornaceae	114	92	56	60	18
	Corylaceae	33	11	112	108	27
	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
	Cupuliferae	33-4	11-2	111-2	108	25-7
8	Cuscutaceae	128	103	79	80a	141
39	Cynocrambaceae	111	25	91	105c	113
	Cyperaceae	20	139	134	126	169
	Cytinaceae	41	36	101	96	98
29	Datiscaceae	101	54	49	56	43
	Dioscoreaceae	28	137	131	115	164
	Dipsacaceae	143	123	60	64	129
30	Ebenaceae	121	100	69	72	68
48	Ehretiaceae	129	104	80	79	87
55	Elaeagnaceae	103	61	97	100	64
16	Elatinaceae	96	52	18	26	103
11	Ericaceae	116	99	63	67	51
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
	Fagaceae	34	12	111	108a	26
	Ficoidaceae	48	27	50	57	106
	Frankeniaceae	97	51	17	22	38
	Fumariaceae	58	44	6	15a	100
41	Gentianaceae	124	116	76	78	118
	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
	Gramineae	19	140	135	127	170
47	Grossulariaceae	64	57	52	47	17
49	Guttiferae	95	55	19	27	54
18	Halorag(id)aceae	109	67	46	50	115
53	Hamamelidaceae	65	33	53	49	21
	Helleboraceae	53	39	1	11	90
	Hippocastanaceae	87	84	30b	42b	77
31	Hippuridaceae	110	68	45	50a	116
19	Hydrangeaceae	64	57	52	47	16a
	Hydrocharitaceae	18	129	114	111	146

Cont. Nr.		Engler &Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
49	Hypericaceae	95	55	19	27	54
25	Ilicineae	82	86	70	38	58
	Illecebraceae	50	29	13	23	109
	Iridaceae	29	135	126	113	163
	Juglandaceae	32	13	109	107	28
	Juncaceae	25	136	133	118	168
	Juncaginaceae	14a	130	117a	125b	148
	Labiatae	131	112	87	89	144
	Lamiaceae	131	112	87	89	144
	Lauraceae	56	37	98	98	11
	Leguminosae	68	59	38	45	13-5
	Lemnaceae	23	144	119	123	159
58	Lentibulariaceae	136	107	65	84	137
	Liliaceae	26	133	128	116	155
	Linaceae	71	72	23	31	47
45	Loganiaceae	123	115	75	77	79
	Loranthaceae	39	19	100	101	61
51	Lythraceae	104	62	43	53	114
	Malvaceae	93	69	20	28	46
	Meliaceae	76	79	31	37	73
	Menispermaceae	55	38	2	12	95
41	Menyanthaceae	124	116	76	78	119
	Mimosaceae	68a	59a	38a	45a	14
	Molluginaceae	48	27	50	57	105
	Monotropaceae	115	98	64	67a	52
	Moraceae	36	15	107	105a	31
	Moringaceae	62	48	37	44	37
	Myrsinaceae	117	97	67	70	67
32	Myrtaceae	107	64	40	52	55
	Najadaceae	15	132	118	125	153
	Nyctaginaceae	46	26	95	91	35
33	Nymphaeaceae	51	41	4	14	93
7	Oenotheraceae	108	66	44	54	115
52	Oleaceae	122	119	71	73	81
7	Onagraceae	108	66	44	54	115
	Orchidaceae	30	141	125	112	167
5	Orobanchaceae	135	108	83	83	136
40	Oxalidaceae	69	73	24	33a	139
60	Paeoniaceae	53	39	1	11	89
	Palmae	21	142	121	119	165
34	Papaveraceae	57	43	5	15	99
	Papilionaceae	68c	59c	38c	45c	15
20	Parnassiaceae	64	57	52	47	126
	Pedaliaceae	134	109	77	85	86
	Periplocaceae	126	118	74	76	83
19	Philadelphaceae	64	57	52	47	16
35	Phytolaccaceae	47	24	90	94	110
15	Plantaginaceae	139	114	89	90	122
21	Platanaceae	66	34	110	106	22
	Plumbaginaceae	119	95	88	68	121
	Poaceae	19	140	135	127	170
	Podophyllaceae	54	40	3	13	93
	Polygalaceae	77	80	12	21	41
56	Polygonaceae	43	21	94	95	108
	Portulacaceae	49	28	14	24	107
	Potamogetonaceae	14	131	117	125a	150
9	Primulaceae	118	96	66	69	120
22	Punicaceae	105	65	42	53	57
	Pyrolaceae	115	98	64	67a	50
	Rafflesiaceae	41	36	101	96	98
	Ranunculaceae	53	39	1	11	91
	Resedaceae	61	47	9	18	102
	Rhamnaceae	90	90	36	40	65
	Rhizophoraceae	106	63	41	51	56
66	Rosaceae	67	58	39	46	12
	Rubiaceae	140	120	58	62	85
	Ruppiaceae	14	131	117	125a	151
	Ruscaceae	26	133	129	116	157
36	Rutaceae	73	76	28	34	70
65	Salicaceae	31	14	113	109	24
37	Salvadoraceae	84	88	72	74	59
	Santalaceae	38	18	99	102	62
38	Sapindaceae	88	82	30	42	74
	Sapotaceae	120	101	68	71	69
42	Saxifragaceae	64	57	52	47	124
	Scheuchzeriaceae	–	130	117a	125b	148
	Scrophulariaceae	133	106	82	82	134
	Selaginaceae	137	108	85	87	–
	Simar(o)ubaceae	74	77	29	35	71
	Smila(ca)ceae	26	133	130	116	156
	Solanaceae	132	105	81	81	132
59	Sparganiaceae	13	146	123	121a	160
	Staphyleaceae	85	89	30c	42c	78
	Sterculiaceae	94	71	21	29	45
4	Tamaricaceae	98	50	16	25	39
39	Theligonaceae	111	25	91	105c	113
	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
	Typhaceae	11	147	124	121	161
	Ulmaceae	35	16	108	105b	29
	Umbelliferae	113	94	54	58	127
	Urticaceae	37	17	106	105	32
11	Vacciniaceae	116	99	63	67	53
23	Vahliaceae	64	57	52	47	125
62	Valerianaceae	142	122	59	63	128
43	Verbenaceae	130	111	86	88	88
	Violaceae	100	53	11	20	40
	Vitaceae	91	91	32	41	66
	Zannichelliaceae	14	131	117	125a	152
	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48

Valerianaceae

ictore K. H. RECHINGER, Wien

Lfg. Cont. No. 62/30. 4. 1969

FLORA IRANICA

FLORA DES IRANISCHEN HOCHLANDES UND DER UMRAHMENDEN GEBIRGE

PERSIEN, AFGHANISTAN, TEILE VON WEST-PAKISTAN, NORD-IRAQ, AZERBAIDJAN, TURKMENISTAN

von

Univ.-Prof. Dr.
KARL HEINZ RECHINGER
Erster Direktor des Naturhistorischen Museums in Wien

AKADEMISCHE DRUCK- u. VERLAGSANSTALT
GRAZ-AUSTRIA

Valerianaceae

auctore K. H. Rechinger, Wien

Valerianaceae Batsch, Tab. Aff. Reg. Veg. 227 (1802).

Herbae annuae vel perennes. Folia opposita non stipulata. Calyx florendi tempore inconspicuus, deinde interdum auctus. Flores in cymas multifloras dispositi, plerumque leviter zygomorphi; corolla tubulosa, limbo ± explanato 3—5-lobo, basi interdum saccata vel calcarata. Stamina 1—3, tubo corollae inserta. Ovarium inferum triloculare, loculis uniovulatis uno tantum fertili, reliquis abortivis. Stylus unus, stigmate indiviso vel 2—3-fido. Nucula saepe calyce coronata. Embryo rectus, albumen nullum.

1a. Corolla basi longe calcarata. Stamen unicum ..... 3. *Kentranthus* Necker
b. Corolla non calcarata. Stamina tria 2
2a. Calyx fructificationis tempore pappum pilosum formans. Herbae perennes ..... 2. *Valeriana* L.
b. Calyx fructificationis tempore aut ± inconspicuus aut vario modo transformatus, numquam autem pappum pilosum formans. Herbae annuae ... . 1. *Valerianella* Miller

1. *Valerianella*

Valerianella Miller, Gard. Dict. Abr. ed. 4 (1754).
Syn.: *Fedia* Gaertn., Fruct. Sem. Pl. 2 (1791) p. p. *Dufresnia* DC., Prodr. 4: 624 (1830).

Lit.: T. O. B. N. Krok, Antekningar till en Monografi öfver växtfamiljen Valerianeae 1. Valerianella, Kongliga Svenska Vetenskapsakademiens Handlingar 5, 1, 1: 105 (1864). M. J. E. Coode, Materials towards a Flora of Turkey XV. Valerianaceae: Valerianella, Notes from the Royal Botanic Garden, Edinburgh 27: 219—256 (1967). J. Hadač, Valerianaceae of Iraq, Bull. Coll. Sci. Baghdad 6: 29—41 (1961).

Herbae annuae, dichotome ramosae. Inflorescentia cymosa saepe ± capitato-conferta. Flores minimi; corolla infundibuliformis ecalcarata, limbo quinquefido regulari. Fructus trilocularis loculis binis sterilibus. Calycis limbus persistens, dentiformis vel coroniformis, regularis vel irregularis, interdum obsoletus. Stamina tria.

Die vorliegende Bearbeitung basiert weitgehend auf derjenigen von Coode (1967); dieser wurde auch die Mehrzahl der auf den Tafeln wiedergegebenen Abbildungen entnommen. Coode's Arbeit enthält auch Verbreitungskarten für viele der hier behandelten Arten. Coode hat die mit Ausrufungszeichen versehenen Belege, soweit sie bis Ende 1965 vorlagen, bestimmt.

1a. Fructus omnes aequales, ei bifurcationum inferiorum eis cymarum similes vel deficientes, numquam ambi tricornes, numquam simulac textura spongiosa praediti 2
b. Fructus bifurcationum inferiorum tenuiores et saepe longiores quam ei cymarum, saepe abortivi et uniloculares; fructus cymarum assymetrice

tricornes, simulac textura spongiosa praediti ..... 12. *V. echinata* (L.) DC.

2a. Fructus manifeste tuberculatus, latitudine longius, incurvus. Calyx 6—12-lobus, irregularis, incrassatus, patulus vel reflexus, interdum uncinulatus ..... 1. *V. tuberculata* BOISS.

b. Fructus non tuberculatus combinatione characterum alia 3

3a. Calyx fructifer ± symmetricus et distincte coronatus vel radiatus vel inflatus 4

b. Calyx fructifer assymetricus vel inconspicuus 16

4a. Calyx fructifer vesiculoso-inflatus, dentibus parvis triangulari-subulatis introflexis ..... 21. *V. vesicaria* (L.) MOENCH

b. Calyx fructifer non vesiculoso-inflatus, dentibus si evolutis erectis vel patulis 5

5a. Calycis lobi (2—)3—6 6

b. Calycis lobi 6 vel plures 10

6a. Calycis lobi dilatati reticulati, margine serrati 7

b. Calycis lobi ovati vel ad undulationes irregulares marginis reducti 8

7a. Calycis lobi suborbiculares. Fructus breviter turbinatus dense albolanatus, sub corona gibbis binis provisus .. 16. *V. Dufresnia* BGE. ex BOISS.

b. Calycis lobi oblongi. Fructus cylindricus, papillosus, prope basin gibbis binis provisus ..... 4. *V. triplaris* BOISS. & BUHSE

8a. Loculi steriles fertiles circiter aequantes; carpelli steriles depressione rotundata vel ovoidea separati, ad summum puberuli ..... 14. *V. pumila* (L.) DC.

b. Loculi steriles fertiles superantes. Carpelli steriles depressione triangulari vel rectangulari separati, dense pilosi 9

9a. Fructus 3—3,5 mm longi; carpelli fertiles dorso plani ..... 19. *V. chlorostephana* BOISS. & BAL.

b. Fructus 1,5—3 mm longi; carpelli fertiles dorso rotundati ..... 22. *V. lasiocarpa* (STEV.) BETCKE

10a. Fructus (calyce excluso) latitudine duplo longiores, interdum parce glanduloso-pilosi; carpelli steriles basi dilatati; calycis lobi lanceolati, acuminati 11

b. Fructus (calyce excluso) latitudine non multo longiores, indumento saepe puberuli; carpelli steriles basi non dilatati; calycis lobi ± ovati vel triangulares 12

11a. Calycis lobi omnes basi reticulato-nervosi. Folia indivisa sed manifeste saepe remote dentata ..... 3. *V. dactylophylla* BOISS. & HOHEN.

b. Calycis lobi posteriores tantum basi reticulato-nervosi. Folia profunde pinnatisecta ..... 2. *V. uncinata* (M. B.) DUFR.

12a. Calyx intus glaber 13

b. Calyx intus pilosus ..... 20. *V. discoidea* (L.) LOISEL.

13a. Fructus 1,5—3 mm longus ..... 22. *V. lasiocarpa* (STEV.) BETCKE

b. Fructus quam 3 mm longior 14

14a. Calycis lobi 6(—12), distincti, apice uncinati 15

b. Calycis lobi saepe ± irregulares, non uncinati ..... 19. *V. chlorostephana* BOISS. & BAL.

15a. Uncinuli ad apices calycis loborum validi, manifeste stipitati. Flores dense globoso-glomerati ..... 17. *V. coronata* (L.) DC.

b. Uncinuli ad apices calycis loborum non validi, ± sessiles. Flores in glomerulos semiglobosos sublaxos compositi ..... 18. *V. Kotschyi* Boiss.
16a. Calyx lacinia laterali unica (vel pluribus) longitudinem fructus circiter aequante praeditus 23
b. Calyx breviter oblique tubulosus vel flabelliformis vel lobis ad dentem lateralem vel terminalem reductis vel inconspicuis 17
17a. Calyx breviter tubulosus vel dentiformis 20
b. Calyx omnino vel ad continuationem brevem carpelli fertilis reductus ... 18
18a. Folia profunde divisa fere pinnata. Fructus oblongo-ovatus leviter compressus; loculus fertilis in auriculam minutam abiens .....
..... 15. *V. amblyotis* Fisch. & C. A. Mey.
b. Folia ± integra vel denticulata ad summum dentata vel superiora interdum prope basin incisa 19
19a. Fructus latitudine longior, incurvus; loculus fertilis quam sterilis latior
..... 13. *V. carinata* Loisel.
b. Fructus latitudine circiter aequilongus; loculus fertilis quam sterilis circiter aequilatus vel multo angustior ..... 14. *V. pumila* (L.) DC.
20a. Loculus sterilis quisque sectione transversali quam fertilis crassior 22
b. Loculus fertilis quam sterilis quisque multo crassior 21
21a. Fructus latitudine duplo longior, incurvus .....
..... 8. *V. plagiostephana* Fisch. & C. A. Mey.
b. Fructus latitudine circiter aequilongus, non incurvus . 14. *V. pumila* (L.) DC.
22a. Calyx fructificationis tempore brevis, dimidium fructus latitudine non attingens ..... 23. *V. dentata* (L.) Poll.
b. Calyx fructifer longitudine dimidium fructus aequans vel superans, latitudine fructum totum aequans vel superans .....
..... 24. *V. muricata* (Stev.) Baxt.
23a. Fructus usque ad 7 × 5 mm, ovatus ..... 10. *V. platycarpa* Trautv.
b. Fructus ad summum 4,5(−5) mm longus 24
24a. Fructus ovato-oblongus, latitudine c. sesquilongior, 3,2−4 mm longus
.....9. *V. Szowitsiana* Fisch. & C. A. Mey.
b. Fructus linearis, latitudine c. duplo longior 25
25a. Fructus 3−3,5 mm longus, anguste lineari-tetragonus .....
..... 7. *V. cymbicarpa* C. A. Mey.
b. Fructus 4−5 mm longus 26
26a. Calyx basi non gibbosus; limbus inaequaliter tridentatus 27
b. Calyx basi gibbosus; limbus lacinia singula praeditus (vel laciniae binae: *V. diodon* Bge.) ..... 5. *V. oxyrrhyncha* Fisch. & C. A. Mey.
27a. Calycis limbi lacinia longissima usque ad 5 mm longa. .....
..... 11. *V. turkestanica* Regel & Schmalh.
b. Calycis limbi laciniae omnes breviores .....
..... 6. *V. sclerocarpa* Fisch. & C. A. Mey.

Sect. *Physocoele* (Krok) Boiss., Fl. Or. 3: 95 (1875).

Fructus elongati oblongo-cylindrici saepe incurvi, loculis sterilibus tenuiter filiformibus. Calycis limbus campanulatus vel hypocrateriformis, in lacinias ± elongatas fissus vel partitus.

1. ***V. tuberculata*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 3: 59 (1843).

Icon.: Tab. 1, fig. 1—3.
Typus: Auch. 4686, G.

Herba 10 cm alta. Folia ± integra, 22—35 × 6—7 mm. Inflorescentia laxissima, ramis rectis rigidis angulariter divergentibus, sub fructu aliquantum inflatis. Bracteae ± lineares, liberae, basi herbaceae, superne membranaceae. Flores lavandulacei. Fructus 6 mm longus, linearis antice sulcatus, omnino tuberculatus; loculi steriles filiformes; calycis limbus hypocrateriformis usque ad 5 mm diametro irregulariter 10—14-lobatus, lobis subulatis, apice uncinulatis; ovarium 1,3 mm diametro.

Iraq: Kurd.: Sul.: In glareosis serpentinicis jugi Malakawa, 1400 m, Rech. 12314!, Rawi. Qara Dagh, 800—850 m, Gillett.
Persia: W: Ham.: Borujerd, Str. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 444! Arāk: 40 km S Arak versus Golpayegan, 2000 m, Furse 1550! Esf.: Khunsar, Pravitz 847. Lur.: Bisheh, Koeie 599. 673. Borj, 2100 m, Koeie. — S: Fars.: In montibus Pireh-Zan, Auch. 4686. — C: Tehr.: Prope Tehran, Bge. Lashkarak ad fl. Jaji Rud, Bruns. Qazv.: In montibus prope Kalak, Gauba 700. Qazvin 1200—1300 m, Bornm. 7029.
Afghanistan: E: Gardez: In declivibus borealibus jugi Altimur, 2500—2700 m, Rech. 31525!

Distr. gen.: Anatolia, Syria, Iraq, Persia, Afghanistan, Asia centralis. — Tab. geogr.: 1, (Coode 1967).

Der Name var. *oligodonta* Boiss., Fl. Or. 3: 97 (1875), Typus: Tehran, Bge., G, wurde für Exemplare mit längeren Zähnen an den Fruchtkelchen geschaffen.

2. ***V. uncinata*** (M. B.) Dufr., Hist. Valer. 60 (1811).

Syn.: *Valeriana uncinata* M. B., Fl. Taur.-Cauc. 1: 26 (1808). *Valeriana pubescens* Germann, Bot. Zeit. 4: 360 (1805). *Valerianella pubescens* (Germann) Krok, Mon. Valer. 48 (1864), non Merat (1812).
Icon.: Tab. 1, fig. 4—5.
Typus (Syntypi): Tauria, Bosphorus, M. B., LE.

Herba (6—)13—35 cm alta. Folia inferiora integra, superiora pinnatifida usque pinnatisecta, pinnis interdum dentatis. Inflorescentia ± densa, hemisphaerica. Bracteae 3—6 × 0,3—0,7 mm, infimae ut folia superiora divisae, superiores lineares vel lineari-lanceolatae, integrae, glabrae. Flores albi. Fructus c. 6 mm; calycis limbus usque ad 6 mm diametro subhypocrateriformis, 6-partitus, laciniis ± aequalibus, reflexo-patulis, apice uncinatis; ovarium 1,5—2 mm diametro.

Talish: Swant, Hohen., C. A. Mey. Drych, Hohen., C. A. Mey.
Persia: N: Gorg.: Inter Robat-e Qozloq et Gorgan, 300—1600 m, Schmid 6025! Ziarat, Bge. Maz.: Kalar Dasht, Rudbarak, Esfand. 6731-E! Hazar Jerib, Shar. 400! Gil.: M. Samam, Buhse. In montibus prope Rudbar, Buhse. Rudbar, 300—500 m, Bornm. 7028. Kaluraz, Lipsky. In montibus prov. Gilan, Auch. 4683. — C: Qazv.: Fashand, 1600 m, Gauba 1567. Damgh.-Semn.: Orim, Kuh-i Nizwa, 1900 m, Wdb. 1141!
Turcomania: Kizyl-Arvat, Kara Kala, Sundsodagh, Sint.
Afghanistan: NE: Kataghan: Kunduz, Rech. 16019!
Distr. gen.: Anatolia, Caucasus, Tauria, Persia, Afghanistan, Asia centralis. — Tab. geogr.: 2, (Coode 1967).

Die Blätter ähneln denjenigen von *Kentranthus Calcitrapa* DC. Sie sind ganz von denjenigen der übrigen *Valerianella*-Arten verschieden mit Ausnahme von *V. amblyotis*.

V. uncinata und *V. dactylophylla* haben durchschnittlich höheren Wuchs als die übrigen Arten.

3. ***V. dactylophylla*** Boiss. & Hohen. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 10: 75 (1849).

Icon.: Tab. 1, fig. 6—7.
Typus (Syntypi): „In lapidosis M. Elburs", Ky. 91-A et 193; „Ad radices Antiibani", Boiss., G.

Herba 30—40 cm alta. Folia basalia fructificationis tempore ± emarcida. Folia 30—40 × 5—10 mm, elliptica vel lineari-elliptica, dentibus ad basin foliorum superiorum magnis, usque ad 22 × 2 mm. Inflorescentia ± densa, hemisphaerica; axillae nonnullae inferiores inflorescentiae fructiferae. Bracteae rigidae, lineari-anceolatae, in apicem acutum sensim attenuatae, anguste membranaceo-marginatae, nervo mediano crasso aliquantum ciliatae, liberae. Fructus 5—6 mm longus; calycis limbus usque ad 3—4 mm diametro, subaequaliter sex-laciniatus, laciniis patulis e basi lanceolato-triangulari sensim in aristas longas apice uncinulatas excurrentibus; ovarium c. 1 mm diametro.

Iraq: Kurd.: Sul.: Penjwin, in glareosis serpentinicis jugi Malakawa, 1400 m, Rech 12326!, Rawi. Penjwin, in apertis quercetorum, 1400 m, Rech. 12277! M. Avroman Tawilla, 1400 m, Rech. 10317! Kamarspa inter Halabja et Tawilla, 1840—2000 m, Rawi. Zewiya, 1500 m, Rawi. Qara Dagh, 1360 m, Haines. Pira Magrun, Hausskn. Arbil: In valle prope Nowanda, 200 m, Hadač. Kuh Safin, 1400 m, Gillett. M. Handren supra Rawandiz, 1900 m, Nab. 4292. Shaqlawa, 1000 m, Bornm. 1326. Mosul: Matina prope Mosul, Rawi. Sirsang, 1050 m, Haines.
Persia: W: Lur.: Kuh-e Safid, 1500 m, Koelz 17596! Dow Rud, 1650 m, Koelz 15613! Bisheh, Najiu, 1700 m, Koeie 1374. — C: Tehr.: Prope Darband, Ky. 91-A, 193.

Distr. gen.: Anatolia, Libanon, Palaestina, Iraq, Persia. — Tab. geogr.: 2 (Coode 1967).

4. ***V. triplaris*** Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 111 (1860).

Icon.: Tab. 1, fig. 8—9.
Typus: Persia: „Prope Rishm et Jezd", Bge., LE.

Herba 3—6 cm alta, saepe a basi ramosa, caulibus et ramis crassis fistulosis fragillimis. Folia integra, inferiora 20 × 5 mm, oblonga, superiora linearia, multo breviora. Cymae fructiferae densiusculae vel ± laxae. Bracteae oblongo-lineares, acutae, herbaceae, indistincte scarioso-marginatae, brevissime ciliatae. Fructus 2,5(—3) × ±1 mm, pubescens, basi bigibbosus, laciniis 2—3 oblongo-linearibus obtusis pluridenticulatis, reticulato-venosis, rarius laciniis ± reductis.

Persia: S: Kerm.: Kuh Tagh Ali, 2200 m, Bornm. 3606. Kuh Jebal Barez inter Bam et Jiroft, 2400 m, Rech. 15866! Inter Saidabad et jugum Chah-e Chaghak, 1900 m, Rech. 3512! — E: Ozbagu, Ruttner 236!, 389! Ferdow ad marginem deserti Kavir-e Namak, Ruttner 485! Prope Sar Chah, Bge. — C: Shahr.-Bust.: Prope Shahrud, Bge. Damgh.-Semn.: In montibus prope Rashm, Buhse. Yazd, Buhse 1217, 1418/1.
Afghanistan: SW: Herat: Inter Shindand et Jija, 900 m, Koeie 4426! Jija, 900 m, Koeie 4425! — SE: Kandahar: N Kandahar, 1000 m, Kerst. 2216! 30 km E Dilaram versus Girishk, 1050 m, Rech. 33513! — E: Kabul: Kuh-i Nanagak S Gulbagh, 1830 m, Hdg. & Wdb. 3194! — Choky, Griff.
Pakistan: Quetta: Ad radices occidentales M. Chiltan inter Dulai et Kanak, 1600 m, Rech. 29113 p. p.! Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29036!

In collibus W Quetta, Rech. 29078! 30 km NNE Quetta versus Pishin, 1500 m, Rech. 28878 p. p.!

Distr. gen.: Persia, Afghanistan, Pakistan, Kizyl Kum, Amu Darya.

Die Art ist hinsichtlich des Kelchlimbus variabel; vgl. Coode: 247 (1967).

5. ***V. oxyrrhyncha*** Fisch. & C. A. Mey., Ind. Sem. Horti Petrop. 3: 51 (1837).

Syn.: *V. diodon* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 3: 57 (1843). *V. diplusodon* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 10: 74 (1849). *V. Stocksii* Boiss., Fl. Or. 33: 99 (1875).

Icon.: Tab. 2, fig. 1—5.

Typus (Syntypi): Armenia et Talish, LE.

Herba 6—12(—18) cm alta. Folia inferiora 11—35×1—8 mm, quam in aliis speciebus minus distincte dentata, fructificationis tempore emarcida. Inflorescentia laxa, ramosissima, corymbosa; rami sub fructu persistentes. Bracteae inferiores 3—6×0,5—1 mm, herbaceae, superiores minores, magis membranaceae. Flores pallide lilacini. Fructus c. 4 mm, linearis, basi gibbosus; lacinia singula vel laciniae binae (*V. diodon* Boiss.) lineari-subulatae horizontales apice uncinatae; ovarium c. 1 mm diametro, rarissime laciniae laterales omnino deficientes (*V. anodon* Lincz.).

Iraq: 12 km E Samarra inter Tigris flumen et Jabal Hamrin, Rech. 9560!

Talish: Swant, Hohen. Talish, C. A. Mey., Hohen.

Persia: N: Gilan: Kaluraz, Bornm. Rudbar, Bornm. Manjil, Bornm. — W: Azerb.: Einal Zeinal prope Tabriz, Grossh. Var prope Khvoy, Knapp. M. Karnaru prope Shahpur, Knapp. Tabriz, Gill.-Sm. 1463, 1911 — Azerbaijan, Auch. 4684. Ham.: Bahar, Babai 6714-E! Aq Bolagh-e Aqdaq, Rioux & Golv. 443! Esf.: 32 km W Esfahan, 1800 m, Stutz 820! Bakhtiari, Bode. Arak: Girdu prope Nazmabad, Str. Arak, in planitie, Str. Lur.: Azna, Koeie 1373. Bisheh, Koeie. Dow Rud, 1500 m, Koelz 15706 p. p.!, 17286! — S: Fars.: Prope Shiraz, KY. 293. Pasargadae, 15 km N Saadatabad, 2000 m, Grant 15818! Kerm.: Inter Saidabad et jugum Chah-e Chaghak, 1900 m, Rech. 3513-b! Inter Mashiz et Gardaneh-ye Khaneh Sorkh, 2580 m, Rech. 3065 p. p.! Kerman, Bge., Bornm. 3608-b. — E: Khor.: Inter Chanaran et Quchan, 1300 m, Rech. 4720! Inter Quchan et jugum Alam Ali, 1600 m, Rech. 7205 p. p.! Kuh-e Hazar Masjed: Inter Gush et Talqur, 1800 m, Rech. 5199! Torbat-e Heydariyeh, 1300 m, Rech. 4336 p. p.! Kuh-e Neyshabur, Darreh-Abshar prope Akhlamad, 1800 m, Rech. 4534 p. p.! — C: Qazv.: Karaj, Rech. 157 p. p.! In montibus prope Kalak, Rech. 140 p. p.!, Gauba. Kuh Dashteh, Rech. 302-a! In collibus inter Khur et Fashand, Rech. 642 p. p.! Fashand, 1600 m, Gauba 1564. Qazvin, Bornm. 7041. Pachenar, 200—600 m, Bornm. 7036, 7037, 38, 40. Yazd, Buhse. Shahrud, Bge. Damgh.-Semn.: In montibus prope Rashm, Buhse.

Turcomania: Ashkhabad, Korsh. Bami, Brotherus 948.

Afghanistan: NW: Herat: Tirphul, Aitch. 1066. — SW: Herat, Amsel s. n.! Farah: Jija, 900 m, Koeie 4421! Inter Farah Rud et Dilaram, 38 km SE Farah Rud, 1000 m, Rech. 33474! 21 km NW Dilaram, 850 m, Rech. 33492! — SE: Kandahar: N Girishk, 1200 m, Kerst. 402! Inter Kandahar et Girishk, 900—1000 m, Kerst. 324! Kandahar, Volk K-119! Tirin: 42 km S Tirin versus Kandahar, 1800 m, Rech. 35057! — E: Kabul: Babur, Volk 2034! Sebroderakan, 2500 m, Gilli 3865 p. p.! Qaleh Eslam, 25 km S Kabul, 1830 m, Hdg. & Wdb. 3210! Khord Kabul, 2200 m, Gilli 3864! Kuh-e Chelsotun, 2200 m, Gilli 3863! Aliabad, Neub. 51/86!, 51/145! Kabul, Volk 396 p. p.! Charikar, Neub. 50/745! Gulbahar, 1700 m, Gilli 3856! Istalif, 1800 m, Gilli 3858!, 3860! Inter Kabul et Tang-i Gharu, 1700 m, Gilli 3857! In jugo Lataband, 2000 m, Neub. 4745 p. p.! Inter Sarobi et jugum Lataband, Volk 1854! In valle Logar, Volk 115!; 50 km N Gardez, 2000 m, Rech. 35375-a! Pul-i Alam, 2100 m, Koelz 11850! Gardez: In declivibus australibus jugi Altimur versus Gardez, 2300 m, Rech. 35404! Urgun: In jugo

Mirzakai Kotal, 2200—2500 m, Rech. 35810! Nuristan: Gusalak, 1600 m, Edelb. 2189! Wama, 1400—1600 m, Edelb. 494! 532!, — **NE**: Kataghan: 25 km S Pul-i Khumri, 700 m, Rech. 33781-a! — **C**: Deh Kundi: 3—30 km NE Shahrestan, 2200 m, Rech. 36806!

Pakistan: Kurram: Parachinar, 1800 m, Afendi 101-b! — Quetta: Yaro prope Bostan, 1450 m, Rech. 28939 p. p.! Inter Bostan et Khanozai, 1600 m, Rech. 29136 p. p.! Spin Karez, 1800 m, Rech. 29223 p. p.! Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29037 p. p.! 30 km NNE Quetta versus Pishin, 1500 m, Rech. 28878 p. p.! In jugo Tak, 30 km S Quetta, 2100 m, Rech. 28384! — Kalat: Inter Kolpur et Mach, 900 m, Rech. 28435! In montibus prope Harboi, H.-B. 19536. — Baluchistan, Lace.

Distr. gen.: Anatolia, Palaestina, Iraq, Persia, Turcomania, Afghanistan, Pakistan, Asia centralis. — Tab. geogr.: 2 (Coode 1967).

„Specimens with some much larger fruits in the lower forkings of the inflorescence, bulbous and with less surface detail than those of normal *V. oxyrrhyncha* have been named *V. Stocksii* Boiss. (Type: Beloutschistan, 1851, E. Stocks (W); N. Iran, Elburs, Rechinger 1937: 157 and Afendi 101-b from Kurram). These plants seem to me to be diseased or galled, since the large fruits are extremely variable and peculiar; it would be interesting to try to grow them"; Coode: 232 (1957).

Bei Rech. 28435 fehlen die sonst für die Art charakteristischen „lateral straps" des Fruchtkelches; diese Nummer entspricht laut Beschreibung der *V. anodon* Lincz., Not. Syst. Leningrad 17: 383 (1955).

Sect. *Sclerocarpae* Boiss., Fl. Or. 3: 95 (1875)

Fructus elongati cylindrici rarius ovato-oblongi vel ovati saepe incurvi, loculis sterilibus fertili subaequilatis vel latioribus. Calycis limbus brevis dentibus vel laciniis 1—3 valde inaequalibus, rarius indivisus.

6. ***V. sclerocarpa*** Fisch. & C. A. Mey., Ind. Sem. II Horti Petrop. 53 (1835).

Icon.: Tab. 2, fig. 6—7. Fl. URSS. 23: tab. 33, fig. 13 (1958).

Typus: Talish, LE.

Herba 5—20(—40) cm alta, pluries dichotoma, scabridula. Folia grosse dentata vel subincisa, inferiora oblonga. Bracteae lineares glabriusculae. Cymae laxae, ramis fructiferis subincrassatis; dichotomiae inferiores fructiferae. Fructus 4—4,5 mm longus, linearis, subtetragonus, pubescens, dorso planus, antice sulcatus, basi gibbosus; calycis limbus campanulatus inaequaliter tridentatus, dente intermedio ovato, lateralium altero obsoleto, altero longissimo lineari.

Talish, C. A. Mey., Hohen. Swant, Hohen.

Persia: **N**: Gil.: Manjil, 400 m, Bornm. 7034. — **W**: Azerb.: Khvoy, Szov. Einal Zeinal prope Tabriz, Grossh. — **C**: Tehr.: Prope Darband, Ky. 91 (sub *V. remota*). Qazv.: In montibus prope Kalak, Gauba 702.

Turcomania: Kopet Dagh, in faucibus Karanki prope Ashkhabad, Litw. 630.

Afghanistan: **SW**: Herat: Shindand, 1300 m, Koelz 3573! — **E**: Kabul: Babur, 1700 m, Kerst. 111!

Distr. gen.: Caucasus, Talish, Persia, Turcomania, Afghanistan.

Koelz 3573 hat unreife Früchte, Bestimmung daher zweifelhaft.

7. ***V. cymbicarpa*** C. A. Mey., Verz. Pfl. Cauc. 49 (1831).

Syn.: *V. monodon* C. Koch, Linnaea 17: 34 (1843). *V. Huetii* Boiss., Fl. Or. 3: 101 (1875).

Icon.: Tab. 3, fig. 1—3.

Typus (Isotypus): „In arena rivulorum pluvialium exsiccatorum ditionis Swant Georg. caucas., altitud. 4000—4500'", Hohen. s. n., W!

Herba 7—14 cm alta. Folia basalia 20(—60) × 1,5(—5) mm, fructificationis tempore emarcida. Inflorescentia laxa, ramis patulis persistentibus, cymis ultimae ordinis distinctis, dichotomiis inferioribus nonnullis fructiferis. Bracteae 2—3 × c. 0,4 mm, oblongae, inferiores ± liberae herbaceae, superiores minores magis membranaceae breviter puberulae. Fructus 3—3,5 mm, anguste sublineari-tetragonus, antice profunde sulcatus, loculis sterilibus fertili paulo crassioribus; calycis limbus e lacinia erecto-patula c. 2 mm longa consistens; ovarium 0,5—1 mm diametro.

Talish: Swant, 1200—1350 m, Hohen., C. A. Mey.
Persia: W: Prov. Azerbaijan, Auch. 4685. Arak: Mowdar, Str. — S: Fars.: Dalaki, Str. — E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1800 m, Rech. 4534 p. p.! Inter Quchan et jugum Alam Ali, 1600 m, Rech. 7205 p. p.! — C: Qazv.: Pachenar, 500—600 m, Bornm. 7033.
Turcomania: Ashkhabad, Litw. 636. Firyuza, Korsh.
Afghanistan: N: Mazar-i Sharif: In faucibus fluvii Balkh SW Mazar-i Sharif, 500 m, Rech. 34101! — E: Kabul: Sebroderakan, 2500 m, Gilli 3865 p. p.! Paghman, 2400—2700 m, Chaw.-Must.! Logar: In valle Logar, 2200 m, Gilli 3862! Tang-i Gharu, Neub. 4168! Istalif, 1800 m, Gilli 3859! Unai, 2200 m, Volk 1650-b! Nuristan: Chandao, 2400 m, Koelz 11759! Khost: In declivibus australibus jugi Terakai inter Maidan Khola et Yakubi, Rech. 35695! — NE: Kataghan: 25 km S Pul-i Khumri, 700 m, Rech. 33762-b!, 33781-b! — C: Bamian: Darreh-i Shikar, 15 km S Doab, 1500 m, Hdg. & Wdb. 3382!; 1600—2000 m, Rech. 16703! Deh Kundi: Inter juga Waras et Khonak, 65 km SW Panjao, 2600 m, Rech. 36610!
Pakistan: Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29037 p. p.!

Distr. gen.: Anatolia orientalis, Caucasus, Persia, Afghanistan, Pakistan, Asia centralis.

8. ***V. plagiostephana*** Fisch. & C. A. Mey., Ind. Sem. Horti Petrop. 2: 52 (1835).

Syn.: *V. carinata* Loisel. var. *navicularis* Krok, Mon. Valer. 63, tab. 2, fig. 20 (1864).
Icon.: Tab. 3, fig. 4—6.
Typus: „In campis altiorum montium Talish", LE.

Herba 14—18 cm alta. Folia 25—27 × 5—6 mm, saepe integra. Inflorescentia laxa, obpyramidalis, ramis inflorescentiae fructibus delapsis persistentibus. Bracteae 3—5 × 0,5 mm, inferiores herbaceae, superiores minores, membranaceae. Flores lilacini. Fructus 3,5 × 1 mm, sublineari-tetragonus, antice profunde sulcatus, loculis sterilibus fertili ± aequicrassis; calycis limbus edentulus vel breviter lateraliter laciniatus.

Talish: Swant prope Tatuni, 1350 m, Hohen.! Talish, C. A. Mey., Hohen.
Persia: N: Gilan: Rudbar, Stapf. — W: Azerb.: War prope Khvoy, Knapp. Tabriz, Grossh. Azerbaijan, Szov. — C: Qazv.: Karaj, Gauba 704. Kalak prope Karaj, 1400 m, Rech. 140 p. p.! Yazd: Prope Yazd, Buhse.
Turcomania: sec. Nikitin, Fl. Ashkhabad 330 (1965).
Afghanistan: E: Kabul: Sher Darwasa, 1900 m, Neub. 746/1950!
Pakistan: Chitral: Chitral village, 1500 m, Stainton 2210! — Quetta: In jugo Tak, 30 km S Quetta, 2100 m, Rech. 28386!

Distr. gen.: Anatolia orientalis, Caucasus, Afghanistan, Pakistan, Asia centralis.

9. ***V. Szowitsiana*** Fisch. & C. A. Mey., Ind. Sem. Horti Petrop. 3: 48 (1837).
Syn.: *V. Aucheri* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 3: 58 (1843). *V. persica* Boiss., l. c.
Icon.: Tab. 2, fig. 10—12.
Typus: Khvoy, Azerbaijan, LE.

Herba, 4—18 cm alta. Folia 17—45 × 1—6 mm, plerumque integra. Inflorescentia primum densa, deinde laxa, obpyramidalis, ramis et bracteis rigidis. Bracteae 2,5—3 × 0,5—0,8 mm, inferiores ± liberae, herbaceae. Flores pallide lilacini. Fructus 3,2—4 mm, ovato-oblongus, antice sulcatus, loculis sterilibus fertili multo crassioribus; calycis limbus plerumque e lacinia unica 2—2,1 mm longa anguste lineari horizontaliter patente consistens; ovarium 1,2—2 mm diametro.

Iraq: Kurd.: Kirkuk: 10 km N Tuz Khormatu, Barkley 7008! — Diyala: Jabal Hamrin, Hadač.
Persia: **N**: Maz.: In valle Haraz: Panjab, 950—1300 m, Wdb. 297!, 655! — **W**: Azerb.: Marand, ad radices M. Karnaru prope Shahpur, Knapp. Inter Marand et Jam, 1400—1600 m, Grossh. Tabriz. Gill. Sm. 1909, 2072-a. S Tabriz, Gill. Sm. 2533. Azerbaijan, Szov., Auch. 4684. Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 445! In montibus prope Hamadan, Stapf. Kurd.: N Sanandaj, 1500 m, Jacobs 6474! Lur.: Bisheh, Koeie 674. Khorramabad, Bent & Wright 410—116! Dow Rud, 1500 m, Koelz 15706 p. p.! Arak: Yekab, Str. Esf.: Kuh-e Sofeh, 2000 m, Wdb. 923!, Esfahan, Auch. 4687 — **S**: Fars.: Shiraz, Ky. 965. 10 km SW Shiraz, 1600 m, Grant 15521 p. p.! Kerm.: Inter Mashiz et Gardaneh-ye Khaneh Sorkh, 2000—2500 m, Rech. 3065 p. p.! Inter Saidabad et Chah-e Chaghak, 1900 m, Rech. 3513-b p. p.! Kerman, Bge., Buhse. Kuh Tagh Ali, 2000 m, Bornm. 3608, 3609. — **E**: Sistan: Kuh-e Khajeh, Shar. 7036-E! Khor.: Inter Chanaran et Quchan, 1300 m, Rech. 4720 p. p.! Ozbagu, Ruttner 109!, 238!, 258! Torbat-e Heydariyeh, 1300 m, Rech. 4336 p. p.! — **C**: Tehr.: Evin, Mirzayan 6415-E! Prope Tehran, Ky. 20, 916. Qazv.: Pachenar, Bornm. 7032. Karaj, Gauba 705; 1400 m, Rech. 157 p. p.! Kuh Dashteh prope Karaj, Rech. 302-b p. p.! Inter Khur et Fashand, Rech. 642 p. p.! Fashand, Gauba 1566. Yazd, Bge., Buhse.
Turcomania: Kizyl Arvat, Becker
Afghanistan: **NW**: Herat: Kishlak-i Khwaja, 700 m, Koeie 4422! — **SE**: Tirin: In collibus inter lacum articifiale „Arghandab Reservoir" et Tirin, 1400—1700 m, Rech. 35047! — **E**: Kabul: In jugo Lataband, 2000 m, Rech. 4745 p. p.! In monte SE Sarobi, 1400 m, Gilli 3855! Kabul, Volk 396 p. p.! In valle Logar, 50 km N Gardez, 2000 m, Rech. 35375-b! Ghazni: Kuh Mostufi, Lindb. 252/1958! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, Rech. 32038! — **NE**: Kataghan: 20—25 km S Pul-i Khumri, 700 m, Rech. 33749!, 33782-a! — **C**: Panjao: 12 km E Panjao, 2650 m, Rech. 36230! Kotal-e Akhsarat W Panjao, Hdg. & Wdb. 4972! — Afghanistan, Griff.
Pakistan: Dir, 1350 m, Harriss. — N. Wazir.: Boya, Blatt. & Fz. Miram Shah, Blatt. & Fz. — S. Wazir.: Shindar, 2100—2700 m, Blatt. & Fz. Barwand, Duthie 15775. Kaniguram, Stewart. — Quetta: Spin Karez, 1900 m, Rech. 29223 p. p.! Inter Bostan et Khanozai, 1600 m, Rech. 29136 p. p.! Yaro prope Bostan, 1450 m, Rech. 28939 p. p.! 26 km N Fort Sandeman versus Wana, 1500 m, Rech. 29848! Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29037 p. p.! 30 km NNE Quetta versus Pishin, 1500 m, Rech. 28878 p. p.! Ad radices occidentales M. Chiltan inter Dulai et Kanak, 1600 m, Rech. 29113 p. p.! — Kalat: Inter Surab et Kalat, 1800 m, Rech. 28328!

Distr. gen.: Anatolia, Syria, Palaestina, Iraq, Persia, Afghanistan, Caucasus, Pakistan, Asia centralis. — Tab. geogr. 1 (Coode 1967).

10. ***V. platycarpa*** Trautv., Acta Horti Petrop. 9: 453 (1886).
Icon.: Tab. 3, fig. 7—8.

Typus: Kizyl Arvat, LE.

Herba 8—26 cm alta. Folia inferiora fructificationis tempore emarcida, caulina media usque ad 40×12 mm, basi laciniata, apice obtusiuscula. Inflorescentia laxe paniculata, ramulis divaricatis fructibus delapsis persistentibus, dichotomiis inferioribus fructus majores persistentes proferentibus. Fructus usque ad 7×5 mm, ovatus, glaber, laevis, leviter sulcatus; calycis limbus bilobus, lobo uno lato obtuso, altero subulato apice uncinulato horizontaliter patente.

Persia: N: Gilan: Rudbar, Bornm. 7045. Inter Rudbar et Kaluraz, Bornm. 7048. — C: Tehran: Darband, Esfand. 101-E! Qazv.: Pachenar, Bornm. 7046! In collibus inter Khur et Fashand, 1400—1700 m, Rech. 682! Fashand, Gauba 1563.
Turcomania: Ashkhabad supra Nephton, Sint. 410. Kizyl Arvat, Becker. In faucibus Karanki prope Ashkhabad, Litw. 642, 643.

Distr. gen.: Caucasus, Persia, Turcomania.

Coode: 247 (1967) bemerkt: „Plants can be seen both with and without straps on the fruit; it is possible that it is the strapless forms that have been named V. *Lipskyi* Lincz. (and have been recorded from Iran)".

11. ***V. turkestanica*** Regel & Schmalh. ex Regel, Descr. Pl. Nov. Fedtsch. in Isv. obsh. ljub. Estv. Abtr. Etnogr. 34, 2: 43 (1882).

Icon.: Tab. 2, fig. 8—9. Fl. URSS. 23: tab. 33, fig. 1 (1958).
Typus (Syntypi): Taschkent et M. Serawschan, LE.

Herba 10—35 cm alta. Folia basalia florendi tempore emarcida; folia caulina media maxima, usque ad 60×13 mm, prope basin interdum laciniato-dentata, apice obtusa. Bracteae lineari-subulatae, herbaceae. Inflorescentia congesta. Fructus 4—5 mm longus, linearis, sulcatus et tenuiter costatus, glaber vel papillosopuberulus; calycis limbus valde inaequaliter tridentatus; lacinia longissima usque ad 5 mm longa, rigide subulata, apice hamata, rectangulariter patens ± recurva, ceterae plusquam triplo breviores altera dilatata reticulato-nervosa, altera triangulari-subulata.

Persia: E: Khor.: M. Kopet Dagh: Inter Quchan et jugum Alam Ali, 1600 m, Rech. 7205 p. p.!
Afghanistan: NE: Kataghan: 20—25 km S Pul-i Khumri, 700 m, Rech. 33748!, 33780! In jugo Paigah Kotal inter Pul-i Khumri et Haibak, 1500 m, Rech. 33918!

Distr. gen.: Turcomania, Syr Darya, Pamir-Alaj, Tien Shan, Persia, Afghanistan.

Sect. *Cornigerae* Soyer-Willemet in Gren. & Godron, Fl. Franc. 2: 51 (1850) emend. Krok, Kung. Svenska Vet.-Akad. Handl. 5, 1: 33 (1864).

Fructus biformes, ei dichotomiarum tenuiter cylindrico-prismatici abortu uniloculares, ei cymarum ovati vel oblongi, sulcati, pericarpio spongioso loculorum sterilium altero vel utroque latis. Calycis limbus breviter tricornis. Ramuli fructiferi incrassati, clavati.

12. ***V. echinata*** (L.) DC., Fl. Franc. 4: 242 (1805).

Syn.: *Valeriana echinata* L., Syst. Nat. ed. 10, 2: 861 (1759).
Icon.: Tab. 6, fig. 1—3.
Typus: „Europa australis".

Herba 5—20(—30) cm alta. Folia basalia fructificationis tempore plerumque

emarcida; folia caulina 15—35×5—8 mm, sinuato-dentata vel basi incisa. Cymae parvae pauciflorae applanato-capitatae. Rami superiores interdum cum pedunculis fructificationis tempore ± inflati. Bracteae herbaceae, 2—3×0,5 mm, lineares, superiores inconspicuae. Fructus 4—6 mm longus, persistens, oblongus, fungosus, inaequaliter trisulcato-costatus, ad loculum fertilem saepe cristato-gibbosus; limbus inaequaliter tridentatus, dentibus induratis ± uncinatis.

Persia: N: Gilan: Kaluraz, Lipsky.

Distr. gen.: Regio Mediterranea, Anatolia, Libanon, Palaestina, Cyprus, Tauria, Persia. — Tab. geogr. 2 (Coode 1967).

Sect. *Platycoele* DC., Prodr. 4: 627 (1830), emend. Boiss., Fl. Or. 3: 96 (1875)

Fructus parvi globosi vel ovato-oblongi, loculis sterilibus fertili latioribus rarius angustioribus, numquam tenuiter filiformibus. Calycis limbus parvus, capsula saepissime angustior.

13. ***V. carinata*** Loisel., Not. Pl. Fr. 149 (1810).

Icon.: Tab. 4, fig. 6—8.
Typus: Paris, Loiseleur.

Herba 5—30 cm alta. Folia inferiora fructificationis tempore saepe vigentia; folia caulina 10—15×1—10 mm, integra vel sinuato-dentata, oblonga usque spathulata. Inflorescentia florendi tempore ± hemisphaerica, fructifera laxiuscule globularis. Bracteae herbaceae, conspicuae, 5—15×1—4 mm, lineares, oblanceolatae vel oblongae. Fructus 2—2,7×0,7—1 mm, deciduus, oblongo-tetragonus, subincurvus, antice profunde sulcatus, lateraliter sulcato-carinatus, loculo fertili apice in denticulum brevissimum abeunte.

Iraq: Kurd.: Arbil: Kuh Safin, 900 m, Bornm. 1316.
Persia: S: Fars.: Shapur, 900 m, Haussk.!

Distr. gen.: Europa media et australis, Regio Mediterranea, Anatolia, Tauria, Transcaucasia, Syria, Libanon, Iraq, Persia.

14. ***V. pumila*** (L.) DC., Fl. Franc. 4: 242 (1805).

Syn.: *Valeriana Locusta* L. var. *pumila* L., Syst. Nat. ed. 2, 2: 73 (1767). *Fedia tridentata* Stev., Mém. Soc. Nat. Mosc. 2: 178 (1809) et 5: 346 (1817). *Valerianella tridentata* (Stev.) Krok, Mon. Valer. 73 (1864).
Icon.: Tab. 6, fig. 7—10.
Typus: „Europa australis".

Herba 4—17 cm alta. Folia 12—36×1—7 mm, pro genere angusta. Inflorescentia ± globosa, densa. Bracteae 3—5×0,5 mm, fructibus delapsis persistentes. Flores albi, rosei vel lilacini. Fructus 2—2,1×1,5—1,8 mm, mox deciduus, subglobosus; calycis limbus minute saepe indistincte tridentatus.

Iraq: Kurd.: Kirkuk: Tuz Khormatu, Rawi & Gillett. 10 km N Tuz Khormatu, Barkley 7007! Kirkuk, Guest 1377-B. Qara Anjir inter Kirkuk et Chamchamal, 700 m, Rawi. Altin Köprü, Hadač. Arbil: Kalak, Rawi & Gillett. Arbil, Guest 1452. — Diyala: Jabal Hamrin, Guest, Haines. Kut-al Imara: E Zurbatiyah, Gillett.
Turcomania: sec. Nikitin, Fl. Ashkhabad 330 (1965).
Persia: W: Lur.: In faucibus fluvii Kashkan inter Khorramabad et Andimeshk, Bent & Wr. 416—102!, 420—113 p.p.! Khuz.: Inter Shush et Dehloran, Nab. 4298. — S: Fars.: Dalaki, Ky. 201.

Distr. gen.: Europa centralis, australis et orientalis, Anatolia, Palaestina, Iraq, Persia.

Die Art ist anderwärts in der Ausbildung des Kelchlimbus variabel, vgl. darüber Krok: 74—76 (1864) und Coode: 238 (1967).

15. ***V. amblyotis*** Fisch. & C. A. Mey. in Hohen., Bull. Soc. Nat. Mosc. 11: 263 (1838).

Icon.: Tab. 6, fig. 4—6.

Typus: Talish, Tatuni, Hohen., LE.

Herba 15—30 cm alta. Folia basalia fructificationis tempore emarcida. Folia 20—40×8—12 mm, superiora angusta laciniata. Inflorescentia laxiuscula vel ± conferta, ramis fructiferis non incrassatis. Bracteae subulatae, glabrae, vix ciliatae. Fructus c. 3×2,5—3 mm, glaber, oblongo-ovatus, antice applanato-concavus, loculis sterilibus compressis, divergentibus, introrsum tantum contiguis, calycis limbo oblique minute auriculatus.

Talish: Swant, Tatuni, Hohen.

Persia: **W**: Azerbaijan, Szov.

Turcomania: Firyuza, Litw. 640!

Distr. gen.: Anatolia, Talish, Persia boreo-occidentalis, Turcomania.

Sect. *Coronatae* Boiss., Fl. Or. 3: 96 (1875)

Fructus majusculi breviter obconico-turbinati, antice sulcati; loculi steriles approximati, fertili subaequilati vel latiores. Calycis limbus coroniformis, capsulae aequilatus vel ea latior.

16. ***V. Dufresnia*** Bge. ex Boiss., Fl. Or. 3: 109 (1875).

Syn.: *Dufresnia orientalis* DC., Prodr. 4: 625 (1830). ? *D. conjungens* Bge. ex Boiss., Fl. Or. 3: 109 (1875).

Icon.: Tab. 4, fig. 1—3.

Typus: Inter Mosul et Baghdad, Bruguière & Olivier, P.

Herba 3—10(—20) cm alta. Folia basalia usque ad ineuntem fructificationem persistentia. Folia caulina 15—55×9—15 mm, mediana plerumque maxima, integra usque sinuato-dentata, interdum sparse dentata, ± elliptica. Inflorescentia ± globosa. Bracteae 3—5× c. 1 mm, ovatae vel ellipticae, ± glabrae, herbaceae, liberae. Flores albi interdum rosei. Fructus 6—10 mm; calycis limbus trilobus; lobi usque ad 10 mm patentes, prominenter reticulato-venosi, nervis in denticulos excurrentibus. Ovarium c. 3 mm diametro.

Iraq: Kurd.: Kirkuk: Kifri, Rawi & Gillett. 19 km E Kirkuk, 500 m, Rawi & Gillett. Tauq prope Kirkuk, Polunin, Bornm. 1325. Altin Köprü, Hadač. 8 km N et 26 km S Kirkuk, Barkley 4493!, 4541! — Diyala: Khanaqin, Rech. 9058! Jabal Hamrin, Guest 684, 1908. Haines 869!, Hadač. Inter Shahraban et Jalula, Rech. 8987! Naft Khana prope Khanaqin, Guest 1843. Prope Mandali, 140 m, Rawi. — Kut-al Imara: 16—22 km SSE Badrah, Rech. 13929!, 13948! Zurbatiyah, Gillett. Shatt at-Tib, 70 km N Amarah, 200 m, Rech. 8938! Guest & Rawi.

Persia: **N**: Gilan: Rudbar, Stapf. — **W**: Azerb.: Prope Khvoy, Auch. 4682, Knapp. Tabriz, Knapp. Marand, Knapp. Kermansh.: Inter Khanaqin et Karand, Str. Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 442! Khuz.: Inter Dehloran et Amarah, Nab. 80. — **S**: Kerm.: Inter Khabis et Kerman, Bge. Inter Saidabad et Chag-e Chaghak, 1700 m, Rech. 3171! Inter Mashiz et Khaneh Sorkh, 2000—2500 m,

Rech. 3013!, 3536! Kuh Seidin, 2000 m, Bornm. 3607. Fars.: Ali Changi prope Bushehr, Nab. 4293. 10 km SW Shiraz, 1600 m, Grant 15521 p. p.! Inter Shiraz et Shahr-e Khafr, Gauba 1272! Takht-e Jamshid, Koelz 14477!, Schmid 5426! — C: Tehr.: Ab Ali, 2000 m, Schmid 5611! Tehran, Bruns. Qazv.: Karaj, 1400 m, Rech. 428!, Stutz 1085! Prope Kalak, Gauba 703. Soltanabad prope Qazvin, Linds. 147. Shahr.-Bust.: Inter Mayamey et Shahrud, Rech. 5312!

Turcomania: Kizyl Arvat, Becker, Trautv. Bami, Brotherus 961. Ad fl. Atrak, Radde. Karry-Bent, Korsh.

Afghanistan: NW: Herat: Kushk, 900 m, Koeie 4423! Tirphul, Aitch. 1067. — SW: Herat, Amsel s. n.! Jija, 900 m, Koeie 4424! Farah: Inter Farah Rud et Dilaram, 38 km SE Farah Rud, 1000 m, Rech. 33473-a! Kandahar: Inter Kandahar et Kalat-i Ghilzai, Kerst. 212! — Afghanistan, Griff.

Pakistan: Quetta: Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 29038! Yaro prope Bostan, 1450 m, Rech. 28932! — Kalat: Inter Kolpur et Mach, 900 m, Rech. 28439! — Baluchistan, 1500—1800 m, Stocks.

Distr. gen.: Anatolia, Syria, Transcaucasia, Iraq, Persia, Afghanistan, Pakistan, Asia centralis. — Tab. geogr.: 5, (Coode 1967).

Nach Coode, l. c. handelt es sich bei *V. conjungens* Bge. höchstwahrscheinlich nur um eine Form von *V. Dufresnia*, welche in Größe und Grad der Behaarung der Früchte stark variiert.

17. ***V. coronata*** (L.) DC., Fl. Franc. 4: 241 (1805).

Syn.: *Valeriana Locusta* L. var. *coronata* L., Spec. Plant. 34 (1753).

Icon.: Tab. 4, fig. 4—5.

Typus: Lusitania.

Herba 5—25 cm alta. Folia basalia fructificationis tempore emarcida. Folia 20—40 × 1—3 mm, linearia. Inflorescentia dense globularis. Bracteae ovatae, membranaceae, nervo mediano lato viridi, acuminatae, margine et ad nervos setosae, leviter connexae. Flores pallidi, coerulescentes, lilacini vel rosei, raro albi. Fructus 3—5 × 2—4 mm, villosus, antice sulcatus; calycis limbus herbaceus, reticulato-nervosus, campanulatus, glaber, sex-lobatus, lobis aequalibus triangularibus, in aristam longiusculam apice uncinulatam abrupte attenuatis.

Iraq: Kurd.: Mosul: Shaikh Adi prope Mosul, 800 m, Rawi. Ad pontem prope Mindan, 400 m, Anders 1266! Bashiqa, Hadač. Kirkuk: Altin Köprü, Bornm. 1320. Arbil: Kuh Safin, 900 m, Bornm. 1319. Rawandiz, 900 m, Guest 2042. — Diyala: Jabal Hamrin, Haines. Jabal Darawishka prope Khanaqin, Guest 1753. Pilkhana, 10 km E Khanaqin, 220 m, Rawi. — Kut-al Imara: E Zurbatiyah, Rawi.

Persia: W: Azerb.: SW lacus Rezaiyeh, 1300 m, Jacobs 6628! M. Karnaru prope Shahpur, Knapp. Lur.: Dow Rud, 1500 m, Koelz 15838! Bisheh, Koeie. Shah Bazan, Koeie 452. Bakht.: Keshvar, 700 m, Koeie. — S: Fars.: Shiraz, 1425 m, Pravitz 568, 627. Dalaki, Ky. — C: Qazv.: In collibus prope Khur et Fashand, Rech. 640!, Gauba 1568.

Turcomania: sec. Nikitin, Fl. Ashkhabad 329 (1965).

Distr. gen.: Europa centralis et australis, Asia austro-occidentalis et centralis usque ad montes Tien Shan.

18. ***V. Kotschyi*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 3: 60 (1843).

Icon.: Tab. 4, fig. 11—12.

Typus (Syntypi): Aleppo, Ky. 108-a, G; Mesopotamia, Auch. 2077.

Herba 7—25 cm alta. Folia inferiora fructificationis tempore interdum viridia, 24—45 × 4—7 mm. Inflorescentia ± laxe globulosa. Bracteae inferiores

liberae, 3—6×0,5—1 mm, herbaceae, superiores magis membranaceae connexae. Flores rosei, lilacini vel pallide coerulescentes. Fructus 3,5—5 mm longus antice sulcatus villosus. Calycis limbus 4,5—3,5(—5) mm diametro, sinuato-sex-lobatus prominenter reticulato-nervosus, lobis subinaequalibus late ovatis, in mucronem uncinatum excurrentibus. Ovarium 1,5—2,3 mm diametro.

Iraq: Arbil: 10 km N Arbil, 900 m, Barkley 5585! Arbil, Guest. Rawandiz, 700 m, Gillett. Shaqlawa, 850 m, Haines; 1000 m, Bornm. 1321. In valle prope Khanzad, 400 m, Guest. Ad radices M. Baradost prope Shanidar, Erdtman & Goedemans in Rech. 15694! Mosul: Mar Jirjis, Lazar. Mosul, Lazar. Dihok, 450 m, Guest. Nineveh, Hadač. Kirkuk: Tuz Khormatu, 230 m, Hadač. Kirkuk, Rawi & Gillett. Chamchamal, Rogers. 5 km SW Chamchamal, Rawi & Gillett. Altin Köprü, 320 m, Hadač, Bornm. 1322. 9 km a Kirkuk versus Altin Köprü, Erdtman & Goedemans in Rech. 15493! Inter Doraman et Altin Köprü, 320 m, Hadač. Qara Anjir, 27 km E Kirkuk, 600 m, Rech. 12518! Sul.: Khurmal, 900 m, Rawi.
Persia: N: Gilan: Rudbar, Gauba s. n.! — W: Lur.: Dow Rud, 1650 m, Koelz 15610! Shirvan Zangevan, Behb. 267! — S: Fars.: Shiraz, 1600 m, Koelz 14743!

Distr. gen.: Anatolia, Iraq, Persia. — Tab. geogr.: 6 (Coode 1967).

19. ***V. chlorostephana*** Boiss. & Bal. in Boiss., Diagn. Pl. Or. Nov. Ser. 2, 6: 92 (1859).

Syn.: *V. Boissieri* Krok, Mon. Valer. 81 (1864).
Icon.: Tab. 4, fig. 9—10.
Typus: Phrygia: Uschak, Balansa 1263, G, K.

Herba 12—15 cm alta. Folia inferiora fructificationis tempore emarcida. Folia 0,8—3,7×0,1—0,5 mm, lineari-oblonga vel oblanceolata. Inflorescentia ± globularis, laxa, pauci-(6—12-)flora. Bracteae 2,5×2 mm ovatae usque late ovatae, membranaceae, leviter connexae, nervo mediano lato apice prominente. Fructus 3—3,5×2,5 mm, villosus; calycis limbus parce reticulato-venosus, angustus, subobliquus, utrinque glaber, sinuato-sex-lobatus, lobis subaequalibus triangularibus muticis vel brevissime mucronulatis.

Iraq: Kurd.: Sul.: In valle fluvii Tanjaro prope Sulaymaniyah, Gowan 2410. — Diyala: Jalula, Polunin. Pilkhana 10 km E Khanaqin, 220 m, Rawi. Jabal Darawishka prope Khanaqin, Guest.
Persia: W: Kermansh.: 32 km W Kermanshah versus Karand, 1350 m, Furse 1931!

Distr. gen.: Anatolia, Iraq, Persia.

Die wenigen aus dem Gebiet der Flora Iranica vorliegenden Belege sind nicht reif; daher bleibt die Bestimmung zweifelhaft.

20. ***V. discoidea*** (L.) Loisel., Not. Pl. Fr. 148 (1810).

Syn.: *Valeriana Locusta* L. var. *discoidea* L., Syst. Nat. ed. 10,2: 860 (1759).
Icon.: Tab. 5, fig. 5—6.
Typus: Non indicatus.

Herba 5—20(—30) cm alta. Folia basalia fructificationis tempore saepe viridia. Folia 2—3,5×0,5—10 cm, oblanceolata vel spathulata. Inflorescentia ± densa globosa. Bracteae lanceolatae vel anguste ovatae, membranaceae, nervo mediano distincto, pilosae et ciliatae. Flores pallide lilacini. Fructus 4—5 mm, villosus; calycis limbus usque ad 4 mm diametro, (6—)7—12-laciniatus, laciniis saepe ± inaequalibus, in mucronem longum apice saepe uncinulatum excurrentibus; ovarium c. 1,5 mm diametro.

Persia: W: Kurd.: Dezh Shahpur, 1300—1600 m, Jacobs 6470!
Distr. gen.: Graecia, Macedonia, Palaestina, Libanon, Cyprus, Anatolia, Persia.

21. ***V. vesicaria*** (L.) Moench, Meth. 493 (1794).

Syn.: *Valeriana Locusta* L. var. *vesicaria* L., Spec. Plant. 33 (1753).
Icon.: Tab. 5, fig. 7—8.
Typus: Creta.

Herba (5—)9—20(—30) cm alta. Folia inferiora fructificationis tempore viridia, 5—40×2—11 mm. Inflorescentia ± globosa. Bracteae 4×4 mm, late ovatae vel orbiculares, membranaceae, nervosae, margine ciliatae. Flores lilacini vel rosei. Fructus 4—6×4—6 mm, hirsutus; calycis limbus globoso-inflatus, reticulato-nervosus, sex-dentatus, dentibus triangulari-subulatis horizontaliter inflexis.

Iraq: Kirkuk: Inter Kirkuk et Altin Köprü, Erdtman & Goedemans in Rech. 15508! Inter Dariman et Altin Köprü, Hadač. Altin Köprü, Hadač. Kifri, 250 m, Rawi & Gillett. Kirkuk, Rawi & Gillett, Bornm. 1824, Guest 1377-a. Darbandikhan, Barkley 7709! Arbil: Shaqlawa, 840 m, Haines. Salah ad-Din, 900 m, Gillett. Rawandiz, Gillett. Arbil, Bornm. 1324-b. Ad radices M. Baradost prope Shanidar, 900 m, Erdtman & Goedemans in Rech. 15683! Handiyan, Thesiger 861! Ad fluv. Zab Majorem prope Ashkey Kalik, Barkley 5552! Safin Dagh, 1000—1500 m, Gillett, Bornm. 1323. Mosul: Jabal Khair, 25 km W Aqrah, Thesiger 603! Dihok, Guest. Mar Jirjis prope Mosul, Lazar. Aqrah, Mardan. Bashiqa, Hadač. Sul.: Khurmal, 900 m, Rawi. Tawilla, 130 m, Rawi. Dukan Dam, Hadač. Sulaymaniyah, Thesiger 349! — Diyala: Khanaqin, Rech. 9057-a! Jalula, Schatz. Naft Khana, Seilacker. Prope Mandali, Rawi. Jabal Hamrin, Guest 1832, Hadač. Jabal Darawishka, Guest.
Persia: N: Gilan: Rudbar, Bornm. 7043. — W: Azerb.: 32 km NW Mahabad, 24 km a lacu Rezaiyeh, 1400 m, Furse 2218! Kermansh.: Qasr Shirin, Farahbakhsh 7040-E!, Nab. 4296. Kinisht. Str. Taq-e Bostan, Str. Kangavar, Str. Rijab, 900 m, Nab. 4295. Lur.: Shah Bazan, Koeie 280. Inter Keshvar et Bisheh, Koeie. Khorramabad, Bent & Wr. 412—315! Ilam, 700 m, Jacobs 6292! In faucibus fl. Kashkan inter Khorramabad et Andimeshk, Bent & Wr. 416—109! 64 km a Khorramabad versus Dezful, 600 m. Furse 1169! Gilan-e Gharb, Vizhnan, Behb. 265! Bakht.: Saridasht, Koelz 15027! — S: Fars.: Shiraz, 1600 m, Grant 15285!, 15492! Dalaki, Ky. 168, 201-a! Firuzabad, Tang-e Ab, Kashkouli 7038-E! — C: Tehr.: Prope Tehran, Bge. Qazv.: Pachenar, Bornm. 7044. Inter Khur et Fashand prope Karaj, Rech. 641! Fashand, Gauba 1563.
Turcomania: Bami, Brotherus. Ashkhabad, Litw. 633. M. Chuli, Litw. 634!
Distr. gen.: Insulae Aegaeae, Anatolia, Syria, Palaestina, Libanon, Cyprus, Iraq, Persia, Turcomania.

22. ***V. lasiocarpa*** (Stev.) Betcke, Animadv. Bot. Valer. 26 (1826).

Syn.: *Fedia lasiocarpa* Stev., Mém. Soc. Nat. Mosc. 5: 350 (1817). *Valerianella microstephana* Boiss. & Bal. in Boiss., Diagn. Pl. Or. Nov. Ser. 2,6: 96 (1859).
Icon.: Tab. 5, fig. 9—14.
Typus (Syntypi): Tauria, Caucasus, H.

Herba (4—)11—19 cm. Folia inferiora fructificationis tempore ± emarcida, linearia usque oblanceolata. Inflorescentia ± hemisphaerica. Bracteae ovatae, membranaceae, nervo mediano viridi, margine ciliatae, ± liberae. Flores albidi. Fructus 1,5—3 mm longus, pubescens; calycis limbus usque ad 1,5 mm diametro, ± aequaliter ± profunde sex-lobus, lobis ovato-lanceolatis vel minutis triangu-

laribus, ± uncinulato-mucronatis vel breviter bilabiatus, muticis vel in mucronulum rectum excurrens; ovarium 0,8—1 mm diametro.

Iraq: Kurd.: Kirkuk: Tauq, Guest, Eig & Zohary. Kirkuk, Guest 1377, Bornm. 1318. Mosul: Makhlat, 180 m, Guest. — Diyala: Jabal Hamrin, Bornm. 1317.
Persia: W: Kermansh.: Qasr Shirin, Shar. 7039-E p. p.! Lur.: Khas Ali, Behb. 268 p. p.! Khuz.: Shushtar, Nab. 4297. — S: Kerm.: Prope Kerman, Bge.

Distr. gen.: Rossia europaea, Caucasus, Transcaucasia, Anatolia, Iraq, Persia. — Tab. geogr.: 1 (Coode 1967).

Die Art wird hier, Coode (1967) folgend, sehr weit gefaßt, da der Kelchsaum an ein und derselben Pflanze variabel ist. Der Grad und die Richtung der Variabilität sind allerdings nicht in allen Teilen des Gesamtareals gleich. Weitere Untersuchungen sind erwünscht.

Sect. *Siphonocoele* Soyer-Willemet in Gren. & Godron, Fl. Franc. 2: 62 (1830), emend. Krok, Kung. Svenska Vet.-Akad. Handl. 5, 1: 36 (1864)

Fructus minimi ovati, loculis sterilibus tenuiter filiformibus basi convergentibus. Calycis limbus breviter tubulosus, oblique truncatus, integer vel denticulatus.

23. ***V. dentata*** (L.) Poll., Hist. Pl. Palat. 1: 30 (1776) p. p.

Syn.: *Valeriana Locusta* L. var. *dentata* L., Spec. Plant. 34 (1753). *Valerianella Morisonii* DC., Prodr. 4: 627 (1830). ? *V. microcarpa* Loisel., Not. Pl. Fr. 151 (1810).
Icon.: Tab. 5, fig. 1—4.
Typus: Europa australis.

Herba (6—)10—25 cm alta. Folia 12—40×2—5(—7) mm. Inflorescentia ± obpyramidalis. Bracteae 1—3×0,5 mm, lanceolatae, membranaceae, apicem versus attenuatae, plerumque non ciliatae. Flores pallide coerulei vel lilacini. Fructus 1,5—2×0,7—1 mm, ovato-conicus antice planus; calycis limbo saepe indistincto rarius herbaceo parce reticulato-venoso oblique truncato irregulariter denticulato.

Iraq: Diyala: Khanaqin, Rech. 9057-b!
Talish, C. A. Mey.
Persia: N: Gorg.: Ziarat, Bge. Gorgan, Shar. 267!, 398! Maz.: Hazar Jerib, Shar. 436! — W: Kermansh.: Qasr Shirin, Shar. 7039-E p. p.!
Turcomania: Ashkhabad, in montibus, Litw. 638 *).

Pakistan: Chitral: Bundai, 1200 m, Harriss. In valle Baraul, 2100 m, Gatacre.

Distr. gen.: Europa, Caucasus, Anatolia, Iraq, Persia centralis, Turcomania, Chitral.

24. ***V. muricata*** (Stev.) Baxt. in Loudon, Hort. Brit. Suppl. 3: 654 (1839).

Syn.: *Fedia muricata* Stev. in Roemer & Schultes, Syst. Veg. 1: 366 (1817). *Valerianella truncata* Betcke, Animadv. Bot. Valer. 22 (1826). *V. truncata* Betcke var. *muricata* (Stev.) Boiss., Fl. Or. 3: 106 (1875).
Icon.: Tab. 3, fig. 9—10.
Typus: Tauria, Stev., H.

Herba 6—30 cm alta. Folia 12—35×3—8 mm, fructificationis tempore viridia vel marcescentia. Inflorescentia obpyramidata vel ± capitata, ramis

*) In *V. muricatam* transiens.

fructificationis tempore interdum incrassatis et inflatis, bracteas occultantibus. Bracteae 5—6×0,5—2 mm, ± herbaceae, centrum cymarum versus minores usque ± inconspicuae et connexae, inferiores fructum interdum includentes. Flores pallide coerulescentes vel lilacini. Fructus 2—2,2×0,8—1,1 mm, ovatus, papilloso-pubescens; calycis limbus oblique truncatus, apiculatus, integer, herbaceus.

Iraq: Kurd.: Kirkuk: Kifri, Rawi & Gillett. Altin Köprü, Guest. Jarmo, Helbaek 869! Kirkuk, 300 m, Guest 1993. Mosul: Shaikh Adi, Thesiger 703! Bashiqa, Hadač. Sul.: Halabja, Rawi. Qarachitan, Gillett. Dukan Dam, Hadač. — Diyala: Jabal Hamrin versus Khanaqin, Haines.

Persia: N: Maz.: Hazar Jerib, Shar. 399 *) Gilan: Rudbar, Bornm. 7042. — W: Kermansh.: Bisotun, 1600—1800 m, Jacobs 6605! Lur.: Shah Bazan, Koeie 364. Khas Ali, Behb. 268 p. p.! Malavi inter Kohrramabad et Andimeshk, 750 m, Bent & Wr. 420—113 p. p.! Khuz.: Behbehan, Esfand. 52-E *)! — S: Fars.: Gere inter Bushehr et Shiraz, Ky. 52.

Turcomania: Ashkhabad, Litw. 637, 638, 639! Nephton, Sint. 412-a.

Pakistan: Swat: Inter Khawazakhiela et Shangla, 1300—1900 m, Rech. 30568!

Distr. gen.: Rossia europaea, Caucasus, Anatolia, Palaestina, Iraq, Persia, Pakistan.

Species incomplete nota

V. corniculata C. A. Mey., Verz. Pfl. Cauc. 49 (1839).

Typus: Baku, C. A. Mey.

Persia: N: Gorgan: Shah Pasand, Mirzayan 6522-E!

2. *Valeriana*

Valeriana L., Spec. Plant. 31 (1753). Gen. Plant. ed. 5: 19 (1754).

Herbae perennes. Calycis laciniae in flore involutae, indistinctae, in fructu expansae, pappiformes, plumosae. Corolla infundibuliformis, tubo basi gibbo laterali proviso, limbo 3—5-fido. Stamina 3. Stigma 3-radiatum. Fructus monospermus, pappo coronatus, loculis sterilibus abortivis.

1a. Folia basalia omnia vel nonnulla quidem indivisa 2
b. Folia basalia omnia pinnatipartita, 2—3-juga ... 3. *V. sisymbriifolia* Vahl
2a. Planta caespitosa humilis. Folia basalia ± orbicularia ± 10 mm longa et lata ..... 5. *V. Fedtschenkoi* Coincy
b. Plantae elatiores, si exceptione humiles numquam caespitosae 3
3a. Radix tuberosa simplex vel furcata ..... 1. *V. leucophaea* DC.
b. Rhizoma vel radix numquam tuberosa 4
4a. Folia basalia omnia indivisa 5
b. Folia basalia partim indivisa, partim lyrato-pinnatifida 6
5a. Folia basalia ampla, ad minimum 15 cm longa et lata. Caulis metralis vel elatior. Planta glabra ..... 2. *V. alliariifolia* Adams in Web. & Mohr
b. Folia basalia 4—8×3—6 cm. Caulis 25—35 cm altus. Planta pubescens ..... 6. *V. Jatamansi* Jones
6a. Caulis tenuissimus, jam infra basin longe tenuiter ramosus, inferne cum foliis papilloso-puberulus. Rhizoma crassum, tenuiter fibrosum, non comosum ..... 7. *V. Clarkei* Briq.
b. Caulis ± validus glaber. Radix fibras tenuiter cylindricas emittens, collo squamoso ..... 4. *V. ficariifolia* Boiss.

*) In *V. dentatam* transiens.

1. ***V. leucophaea*** DC., Prodr. 4: 641 (1830).

Syn.: *V. bracteata* Boiss., Fl. Or. 3: 91 (1875).

Typus: Armenia, P.

Radix tuberosa, simplex vel furcata. Caulis 20—30(—60) cm altus, erectus, simplex, fistulosus, remote foliatus. Folia basalia et caulina infima usque ad 7,5×2 cm, lanceolata, obtusiuscula, integra, breviter petiolata, caulina sessilia, in segmenta anguste linearia pinnatipartita, summa segmentis filiformibus. Corymbus capitatus. Bracteae lineari-filiformes membranaceo-marginatae, flores aequantes vel superantes. Calyx 4—5 mm longus. Corolla in vivo c. 3 mm diametro, cinerascenti-coerulea. Fructus oblongus, compressus, utrinque inter strias lineatim hirsutus, limbi aristis 6—8.

Persia: W: Azerb.: Ad radices Kuhha-ye Sabalan, 32 km W Ardabil, 2100 m. Furse 2441! M. Gelosa prope Shahpur, Knapp. Kuh-e Sahand, 2800 m, Buhse.

Distr. gen.: Anatolia orientalis, Transcaucasia, Persia occidentalis.

2. ***V. alliariifolia*** Adams in Web. & Mohr, Beitrag Naturk. 1: 44 (1805), emend. Trotzky, Vest. Tifl. Bot. Sada 13—14: 92 (1919).

Syn.: *V. macrophylla* M. B., Pl. Taur.-Cauc. 1: 25 (1808).

Typus: Cappadocia, hb. Tourn., P.

Rhizoma crassum, ramosum, durum. Caulis valde elatus, in sicco sulcatus, in regione inflorescentiae erecto-ramosus. Folia omnia indivisa, basalia et caulina inferiora longe petiolata, petiolo lamina pluries longiore; lamina ad minimum 15×15 cm; late cordato-triangularis, sinu basilari late aperto, apice obtusiuscula vel acutiuscula, lobis basalibus late rotundatis, margine grosse dentata vel repanda vel subintegra; folia superiora sensim brevius petiolata, acutiora, decrescentia. Corymbi in ramis terminales pluries dichotomi. Bracteae basi connatae, triangulari-subulatae, apice longe membranaceae. Flores 5 mm longi, conferti, rosei. Fructus glaber.

Iraq: Kurd.: Arbil: Algurd Dagh, 2100 m, Guest 2924; 3000—3300 m, Rawi. In valle prope Nowanda, 2200—2800 m, Agnew & Hadač.

Talish: Drych, Hohen.

Persia: N: Gil.: Prov. Gilan, Auch. 4690.

Distr. gen.: Graecia, Anatolia, Transcaucaucasia, Iraq, Persia borealis.

3. ***V. sisymbriifolia*** Vahl, Enum. Pl. 2: 7 (1805).

Icon.: Tab. 7, fig. 1—2.

Typus: „Hab. in Oriente", ex herb. Jussieu, P.

Rhizoma crassum, fibras cylindricas numerosas emittens, collo crebre squamoso-fibrosum, caules saepe plures emittens. Caulis 10—60 cm altus, erectus, fistulosus, remote foliatus. Folia omnia pinnatisecta, forma et magnitudine variabilia, 4—15×2—5 cm, segmentis 2—3-jugis, lateralia ovata subpetiolulata, terminale majus orbiculatum, saepius integris; folia superiora valde decrescentia, segmentis confertis ovato-lanceolatis vel lanceolatis. Inflorescentia terminalis corymbosa simplex conferta, rarius breviter paniculato-ramosa. Bracteae lineares, ciliatae, fructu subbreviores. Corolla rosea, tubus limbo sesquilongior. Fructus hirsutus.

Iraq: Kurd.: Arbil: Algurd Dagh, 3000—4000 m, Rech. 11426!, Ludlow Hewitt, Haley 145!, Gillett, Rawi & Serhang In parte superiore vallis prope Nowanda,

2500—3000 m, Agnew & Hadač. In montibus Qandil, 3100—3500 m, Rech. 11173!, Rawi & Serhang 24443! Ser Kurawa, 3000 m, Gillett. Chiya-i Mandau, 2400—2700 m, Guest 2707, 2797. Sakri Sakran, 2200 m, Bornm. 1328. E Qala Diza, 2000—3300 m, Thesiger 1143! Sul.: M. Avroman, Haussk.
Talish: Swant, 1800 m, Hohen. Talish, C. A. Mey.
Persia: N: Gorg.: In declivibus borealibus M. Shahvar prope Hajjilang, 2400—2600 m, Rech. 6155!, 6223! Ketul, Shar. 396! Ramian, Shar. 397! Maz.: Kojur: M. Uloj, 3200 m, Rech. 6469-d! N jugi Kandavan, 1900—3100 m, Gilli s. n.!, Stutz 1269! Inter Zardman et Aliabad, 1500 m, Wdb. 618! In valle fluvii Chalus, 2400 m, Rech. 964! Prope Waraho-zul, Buhse 114, 1019/1. Pol-e Zanguleh, 2200 m, Rech. 878! — W: Azerb.: Kuhha-ye Sabalan, Mird. s. n.! 32 km N Khvoy, Kuh-e Mishu Dagh, Furse 2293!; 2300 m, Grossh. Kuh Rang, 2400 m, Wdb. 952! In montibus Tabriz, Buhse, Ky. 275. M. Karnaru prope Shahpur, Knapp. M. Gelosa, Knapp. Kurd.: M. Shahu, Haussk. Kermansh.: Kuh-e Kinisht, Str. Ham.: Borujerd, Str. Kuh-e Alvand, Str. Kuh-e Garri, Str. Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 441! Esf.: Khunsar, 1800 m, Pravitz 830. Kuh-e Damaneh, Str. Lur.: Kuh-i Nur, Haussk. Sabzekuh, Haussk. Arak: Kuh-e Safid Khaneh, Str. M. Rasvand, Str. Mowdar, Str. Khomeyn, Str. Anjidan, Str. Kuh Gasavand, Str. Bakht.: In ditione Bakhtiaris, Bode. Kuh-e Kukalar, Haussk. Gahar, 3000 m, Koelz 17934! — S: Fars.: Kuh-e Dinar, Behb. 910-E! Pireh Zan, Auch. 4689. — E: Khor.: M. Hazar Masjed, 2500—2800 m, Rech. 5131! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4629! — C: Tehr.: 48 km NNE Tehran, 3500 m, Furse 3201! Emamzadeh Dawud, 2600 m, Bornm. 7050. Prope Shahrestanak, 2200—2400 m. Bornm. 7053. In faucibus prope Junesar, 2700 m, Bornm. 7049. Lashkarak, Bruns. Supra Reneh, 2600 m, Gilli s. n.! Qazv.: Kuh Dashteh, 2000 m, Gauba 706. Shahr.-Bust.: Kuh-i Kakashan, 3300 m, Koelz 16411! In jugo Khash Aylan, 70 km E Shahrud, 2000—2200 m, Rech. 5418!
Turcomania: Prope Ashkhabad, Litw. 1079!
Afghanistan: E: Jaji: Ali Khel, Griff. 759.

Distr. gen.: Anatolia orientalis, Transcaucasia, Persia, Turcomania, ? Afghanistan.

Die Art ist in der Höhe des Wuchses und in der Blattform sehr variabel; bei Furse 3201, Wdb. 618, Rech. 11173 sind die Stengel nur 10 cm hoch und die kleinsten Blättchen nur 5 mm lang; bei Rech. 878 und 5418 dagegen erreichen die Stengel 50—60 cm Höhe; bei Furse 2293 sind die Endblättchen bis 4,5 cm lang und 2,5 cm breit. Die Infloreszenzen bzw. bei verzweigten Exemplaren die Teilinfloreszenzen sind jedoch immer dichtblütig. Das Vorkommen der Art in Afghanistan ist äußerst zweifelhaft.

4. ***V. ficariifolia*** Boiss., Fl. Or. 3: 89 (1875).

Icon.: Tab. 8.
Typus: „Persia boreo-orientalis: Siaret", Bge. L., G.

Radix a collo squamoso fibras tenuiter cylindricas elongatas apice attenuatas emittens. Caulis (10—)20—50 cm altus, erectus, simplex, fistulosus, remote foliatus, paniculam thyrsoideam e cymis laxiusculis compositam ferens. Folia basalia longe petiolata, saepe nonnulla indivisa, late cordato-rheniformia, longitudine latiora usque ad 3 cm longa, 5 cm lata, obtuse late saepe indistincte sinuato-dentata rarius subintegra, alia lyrato-pinnatifida 1—2-juga, quam segmentum terminale semper pluries minora et angustiora; folia caulina superiora valde diminuta, plerumque lyrato-pinnatifida, segmentis diminutis saepe angustioribus approximatis. Bracteae lanceolatae, fructu subduplo breviores. Corolla in vivo alba, interdum roseo- vel violaceo-suffusa, tubus limbo vix longior. Fructus hirsutus, limbi calycini setae basi membrana latiuscula coaliti.

Persia: N: Gorg.: Ziarat, Bge. — W: Arak: In fauce Girdu, Str. Ham.: Kabutar

Khan, Polak. — S: Kerm.: Kuh-e Jupar, 300 m, Bornm. 3605! — E: Khor.: Darreh Abshar supra Akhlamad, Kuh-e Neyshabur, 1600—1800 m, Rech. 4630!
Turcomania: In montibus prope Ashkhabad, Litw. 1076!, 1077! Gaudan, Litw. 1080!
Afghanistan: NW: Herat: Obeh, 1600—1700 m, Koeie 3660!, 4427! — E: Kabul: Sher Darwasa, 1840 m, Neub. 1950/744!, Gilli 3852!, Kerst. 93! Tang-i Gharu, Volk 1541! Aliabad, 2100 m, Volk 2557! Sarobi, 1500 m, Volk 2482!, Neub. 4047! Kabul, Lindb. 396! Kuh-i Asmai, 2100 m, Hdg. & Wdb. 2713! Sebroderakan, 2500 m, Gilli 3853! Istalif, 1900 m, Rech. 33604! Nuristan: Wama, Edelb. 467! Panjshir: Tang-i Saidan, Gilli 3851 — C: Doab, Meinertzhagen s. n.!
Pakistan: Chitral: Ad fl. Turikho, Istar, 3000 m, Stainton 2489! Brumboret Gol, 2700 m, Bowes Lyon 604!

Distr. gen.: Persia borealis, Turcomania, Pamir-Alaj, Tien Shan.

Die Art variiert homolog zu *V. sisymbriifolia* stark in der Höhe des Wuchses und Form der Größe der Blätter. Der Blütenstand ist bei *V. ficariifolia* jedoch auch bei Exemplaren von niedrigem Wuchs verzweigt und locker; im übrigen fehlt der für *V. sisymbriifolia* charakteristische, rhizomartig verlängerte Wurzelstock; weniger konstant ist das breit herz-nierenförmige Endblättchen der Grundblätter.

5. ***V. Fedtschenkoi*** Coincy, Ecloga altera pl. Hispan. 15 (1895) in obs.

Syn.: *V. caespitosa* Rupr., Sert. Tianschan. 51 (1869), non Requien & Guerin (1813). *V. longiflora* Regel & Schmalh., Acta Horti Petrop. 7: 384 (1880), non Willk. (1851). *V. globulariifolia* auct., non Ramond ex DC. (1805). *V. minuta* Wendelbo, Nytt Mag. Bot. 1: 59, fig. 20 (1952), syn. nov.
Typus: Tien Shan, LE.

Humilis, caespitosa, glabra, surculis numerosissimis residuis foliorum flexibilibus dense obsitis. Caules floriferi (3—)5—10(—20) cm alti, erecti, foliorum paribus 1—2 obsiti. Folia basalia et surculorum sterilium orbiculato- vel ovato-spathulata, (5—)10(—25) × 6—10(—18) mm, indivisa, integra, simplicia, rarissime lobulorum pari minuto accesorio aucta, longe petiolata, petiolo lamina pluries longiore; folia caulina inferiora basalibus similia, superiora sessilia lyrata, lobo terminali ovato vel lanceolato, segmentis lateralibus lanceolatis obtusiusculis vel acutiusculis terminali approximatis. Inflorescentia capitata. Corolla viva pallide vel intense rosea, interdum coerulescens vel violascens; tubus 5 mm longus, lobi 2 mm longi. Stamina et stylus exserta. Ovarium hispido-lineolatum.

Afghanistan: E: In jugo Unai, Kuh-i Qhalandaran, 3700 m, Hdg. & Wdb. 4504! Panjshir: W jugi Anjuman, 3900 m, Hdg. & Wdb. 5413! Ghazni: In monte Saperlebuli ad marginem austro-orientalem altoplanitiei Dasht-i Nawar, 4200 m, Rech. 37346! Nuristan: Wama, 1450 m, Edelb. 435! — NE: Wakhan: Prope Qala-i Panja, 4000 m, Roemer 301! — C: Bamian: Kuh-i Baba, 3700—4050 m, Koeie 2628!, Gilli 3854!
Pakistan: Chitral: Och Anzog, Barum Gol, 3600 m, Wdb. s. n.! Barum Gol supra Marmano Shal, 4000 m (Typus *V. minutae* Wendelbo) Wdb. s. n.! Supra Och Anzog, 3900 m, Jörstad s. n.! Ovir, 4000 m, Bowes Lyon 879! Golen, 4200 m, Bowes Lyon 132! N Mastuj, 3700 m, Stainton 2878! Drosh, Bowes Lyon 190!

Distr. gen.: Afghanistan, Chitral, Altai, Dsungaro-Alatau, Tien Shan.

6. ***V. Jatamansi*** Jones, Asiat. Res. 2: 416 (1790) et 4: 451 (1795).

Syn.: *V. Wallichii* DC., Mem. Valer. 15, tab. 4 (1832).
Icon.: Tab. 9.
Typus: Butan.

Rhizoma crassiusculum ± horizontale, radicis fibras tenues emittens, collo vix comoso. Tota planta pubescens. Caulis (15—)25—35(—45) cm altus, tenuis, erectus vel ascendens, remote foliatus. Folia basalia 4—8×3—6 cm, indivisa, cordato-triangularia, sinu basali angusto profundo, apice acuta vel acuminata, margine remote interdum indistincte sinuato-dentata, consistentia in sicco tenuiter membranacea, nervatura tenui sed distincta; folia caulina inferiora oblonga vel lanceolata, acuta, basi segmentis vel laciniis 1—2 angustis acutis aucta, superiora valde diminuta anguste lanceolata vel linearia, basi lacinulis aucta vel ± integra. Inflorescentia glabrescens, iteratim tenuiter paniculato-ramosa. Flores albi; calyces virides interdum purpureo-suffusi. Antherae exsertae concolores. Fructus 2,5×1 mm, seriatim hirsutus.

Afghanistan: **E**: Nuristan: Nishai, 1600 m, Edelb. 759! — Afghanistan, Griff. 3427!

Pakistan: Chitral: Ziarat in jugo Lowarai, 2700 m, Stainton 2326!, 2571!; 3200 m, Harriss. In valle Gujar, 1800 m, Gatacre. Jambatai, 1800 m, Harriss. Bundai, 2400 m, Harriss. Mirga, 2400 m, Harriss. — Swat: Shangla, 2050 m, Rech. 30658! E Kalam, 3000 m, Lamond in Rech. 30839! — Kurram: Shend Toi, 3000 m, Aitch. 380. Kaiwas, Aitch. — S. Wazir.: Razmak, Fz. Pre Ghal, Williams 7834, 7835.

Distr. gen.: Afghanistan, Pakistan, Kashmir.

7. ***V. Clarkei*** Briq., Ann. Cons. Jard. Bot. Genève 17: 331 (1914).

Syn.: *V. elegans* C. B. Clarke in Hook., Fl. Brit. Ind. 3: 212 (1881), non Clos in C. A. Mey. (1847).

Icon.: Tab. 10.

Typus: Baltistan: Skardo, C. B. Clarke, K.

Rhizoma crassum, radicis fibras tenues emittens, collo non comoso. Caules 20—40 cm longi, tenuissimi, jam infra medium longe ramosi, remote paucifoliati. Planta imprimis in parte inferiore papilloso-puberula. Folia basalia usque ad 3×2 cm, petiolata, interdum nonnulla indivisa, ovata vel lanceolata, saepius autem lyrato-pinnatifida, segmento terminali quam lateralia majore ovato, acuto vel acuminato, lateralibus 1(—2)-jugis ovatis vel ovato-lanceolatis, acutiusculis vel obtusiusculis; folia caulina inferiora basalibus similia vix minora, sessilia, segmentis foliolo terminali approximati, summis lanceolatis indivisis. Inflorescentia ab initio laxa, cymis paucifloris longe tenuiter pedunculatis. Flores minuti, ± pallide rosei vel albi.

Persia: **N**: Persia borealis, Szov. **W**: Lur.: Kuh-i Nur, 3600 m, Haussкn.! — **S**: Fars.: Kuh-e Dinar, Ky. 593! — **C**: Tehr.: Darband, Ky. 275! Shahrestanak, 2200 m, Bornm. 7051!

Afghanistan: **E**: Nuristan: Inter Waigelak et Bardadesh, 2500—2700 m, Kerst. 1195! In jugo Ashpi, Neub. 1951/1031!, Edelb. 1687! Inter jugum Ashpi, 3500 m, et Kushtos, 2500 m, Neub. 1951/692! Gusalak, Neub. 1951/834! Nuristan orientalis, Edelb. 1758!

Pakistan: Chitral: Drosh Gol, S Drosh, 2000 m, Stainton 3184! Drosh Gol, 2700 m, Bowes Lyon 155! Beorai Gol, 2700 m, S Drosh, Stainton 3276! — Swat: Utror, 2500 m, Rech. 19488!, 19582!

Distr. gen.: Persia, Afghanistan, Pakistan.

Zweifelhafte Angaben

V. dioica L., Spec. Plant. 31 (1753)

Pakistan: Chitral: In jugo Lowarai, 3180 m, Harriss. In collibus Mirga, 2700 m, Gatacre. — Swat: Inter Diwan Gol et Pichar, Honda 228. — Kurram: Seratigah, Aitch. 829. — S. Waziristan, Duthie 15643. — Baluchistan, Lace.

V. officinalis L., Spec. Plant. 31 (1753).

Persia: W: Azerb.: Kuh-e Mishu Dagh, Gill.-Sm. 2391.

V. petrophila Bge. in Ledeb., Fl. Alt. 1: 54 (1829).

Afghanistan: In colle alpino Kushuk, 2200 m, Griff. 474.
Pakistan: Kurram: M. Sikaram, 4200 m, Aitch.

V. Stracheyi C. B. Clarke in Hook., Fl. Brit. Ind. 3: 212 (1881).

Afghanistan: E: Nuristan: Inter Pashki et Kushitaki, Kitam.

3. *Kentranthus*

Kentranthus Neck. ex Lam. & DC., Fl. Fr. ed. 3, 4: 283 (1805) „*Centranthus*".

Herbae perennes (nostrae). Florae in cymas dispositi. Calycis laciniae in flore evoluti, in fructu patuli plumosi pappiformes. Corolla leviter zygomorpha tubuloso-infundibuliformis, tubo basi longe calcarato, limbo quinquefido. Stamen unicum. Stigma 2—3-partitum. Fructus pappo coronatus monospermus, loculis sterilibus ad nervos reductis.

1. ***K. longiflorus*** Stev., Nouv. Mém. Soc. Nat. Mosc. 1, 7: 272 (1829).

Syn.: *Centranthus elatus* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 10: 73 (1849). *C. longiflorus* Stev. var. *latifolius* Boiss., Fl. Or. 3: 92 (1875).
Typus: Transcaucasia, Stev., H.

Herba perennis multicaulis glabra, in vivo glaucescenti-pruinosa. Caulis usque ad 60 cm altus, teres fistulosus, a basi fere ramosus. Folia caulina inferiora florendi tempore emarcida, media usque ad 7×3 cm, late elliptico-lanceolata, utrinque subaequaliter attenuata, integerrima, saepe obtusiuscula, superiora et ramealia minora et praecipue angustiora acutiora. Cymae in paniculam interruptam ± thyrsoideam dispositae. Corolla ± 20 mm longa, intense rosea, ad calcaris insertionem sessilis, calcare tubo parum breviore, ovario subtriplo longiore.

Iraq: Kurd.: Arbil: M. Qandil: Pushtashan, 2000 m, Rech. 11189! N Pushtashan, 1100 m, Rawi & Serhang. Algurd Dagh, 2300 m, Rawi.

Distr. gen.: Anatolia, Transcaucasia, Iraq.

Centranthus DC.
elatus Boiss. 22
longiflorus Stev.
var. *latifolius* Boiss..... 22
Dufresnia DC. 1
conjungens Bge. ex Boiss. 12
orientalis DC. 12
Fedia Gaertn. p. p. 1
lasiocarpa Stev. 15
muricata Stev. in Roemer & Schultes 16
tridentata Stev..... 11
Kentranthus Neck. ex Lam..... 22
Calcitrapa DC. 4
longiflorus Stev..... 22
Valeriana L. 17
alliariifolia Adams in Web. & Mohr.. 18
bracteata Boiss..... 18
caespitosa Rupr..... 20
Clarkei Briq..... 21
dioica L. 21
echinata L. 10
elegans C. B. Clarke in Hook. 21

Fedtschenkoi Coincy 20
ficariifolia Boiss. 19
globulariifolia auct. 20
Jatamansi Jones 20
leucophaea DC. 18
Locusta L.
var. *coronata* L. 13
var. *dentata* L. 16
var. *discoidea* L. 14
var. *pumila* L. 11
var. *vesicaria* L. 15
longiflora Regel & Schmalh. 20
macrophylla M. B. 18
minuta Wendelbo 20
officinalis L. 22
petrophila Bge. in Ledeb. 22
pubescens Germann 4
sisymbriifolia Vahl 18
Stracheyi C. B. Clarke in Hook. 22
uncinata M. B. 4
Wallichii DC. 20
Valerianella Miller 1
Sect. **Cornigerae** Soyer-Willemet in Gren. & Godron 10
Sect. **Coronatae** Boiss. 12
Sect. **Physocoele** (Krok) Boiss. 3
Sect. **Platycoele** DC. 11
Sect. **Sclerocarpae** Boiss. 7
Sect. **Siphonocoele** Soyer-Willemet in Gren. & Godron 16
amblyotis Fisch. & C. A. Mey. in Hohen. 12
anodon Lincz. 6
Aucheri Boiss. 9
Boissieri Krok 14
carinata Loisel. 11
var. *navicularis* Krok 8
chlorostephana Boiss. & Bal. in Boiss. 14
corniculata C. A. Mey. 17
coronata (L.) DC. 13
cymbicarpa C. A. Mey. 7
dactylophylla Boiss. & Hohen. in Boiss. 5
dentata (L.) Poll. 16
diodon Boiss. 6
diplusodon Boiss. 6
discoidea (L.) Loisel. 14
Dufresnia Bge. ex Boiss. 12
echinata (L.) DC. 10
Huetii Boiss. 7
Kotschyi Boiss. 13
lasiocarpa (Stev.) Betcke 15
Lipskyi Lincz. 10
microcarpa Loisel. 16
microstephana Boiss. & Bal. in Boiss. 15
monodon C. Koch 7
Morisonii DC. 16
muricata (Stev.) Baxt. in Loudon 16
oxyrrhyncha Fisch. & C. A. Mey. 6
persica Boiss. 9
plagiostephana Fisch. & C. A. Mey. 8
platycarpa Trautv. 9
pubescens (Germann) Krok 4
pumila (L.) DC. 11
sclerocarpa Fisch. & C. A. Mey. 7
Stocksii Boiss. 6
Szowitsiana Fisch. & C. A. Mey. 9
tridentata (Stev.) Krok 11
triplaris Boiss. & Buhse 5
truncata Betcke 16
var. *muricata* (Stev.) Boiss. 16
tuberculata Boiss. 4
var. **oligodonta** Boiss. 4
turkestanica Regel & Schmalh. ex Regel 10
uncinata (M. B.) Dufr. 4
vesicaria (L.) Moench 15

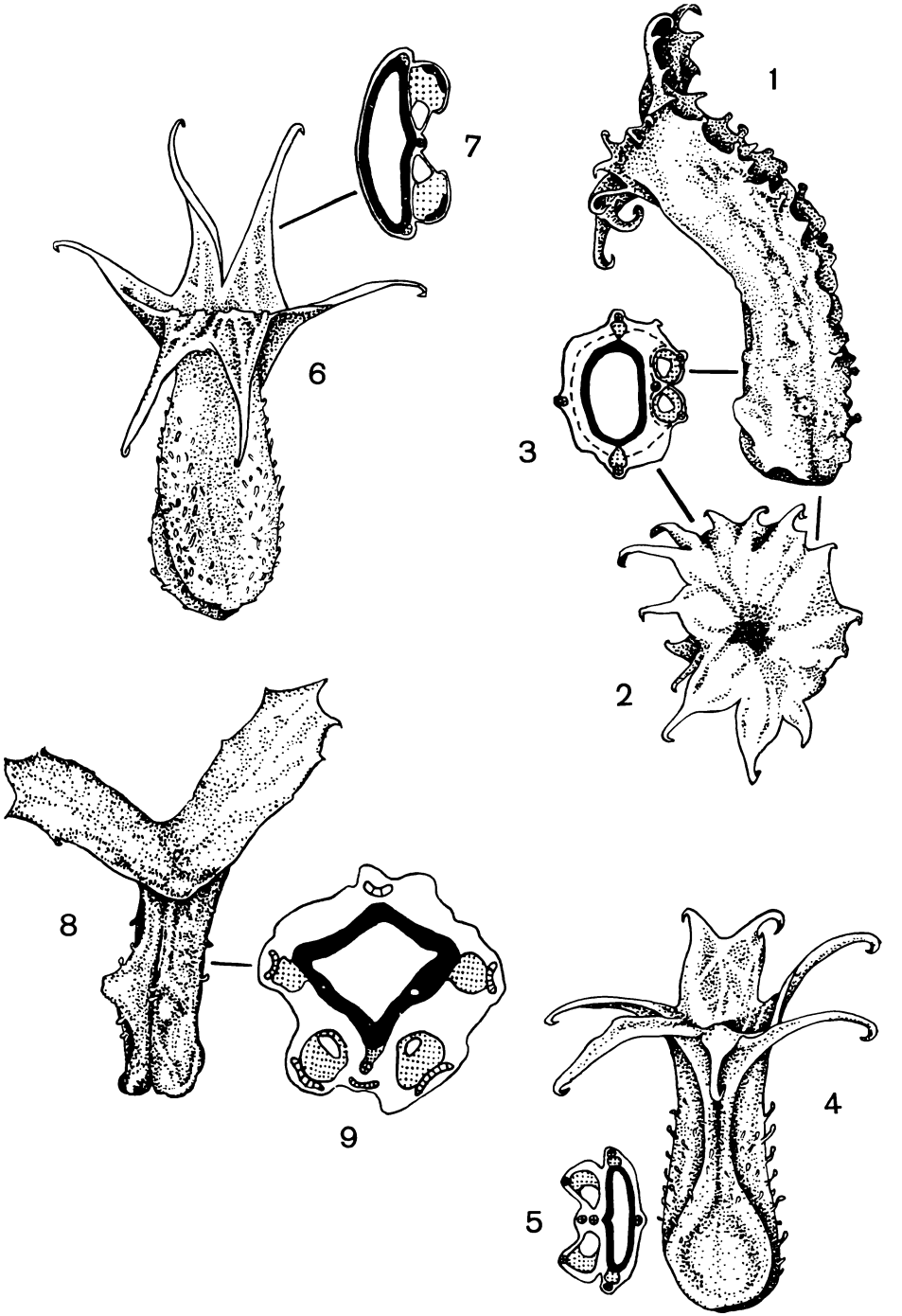


Fig. 1— 3: *Valerianella tuberculata* Boiss.
4— 5: *V. uncinata* (M. B.) Dufr.
6— 7: *V. dactylophylla* Boiss. & Hohen.
8— 9: *V. triplaris* Boiss. & Buhse

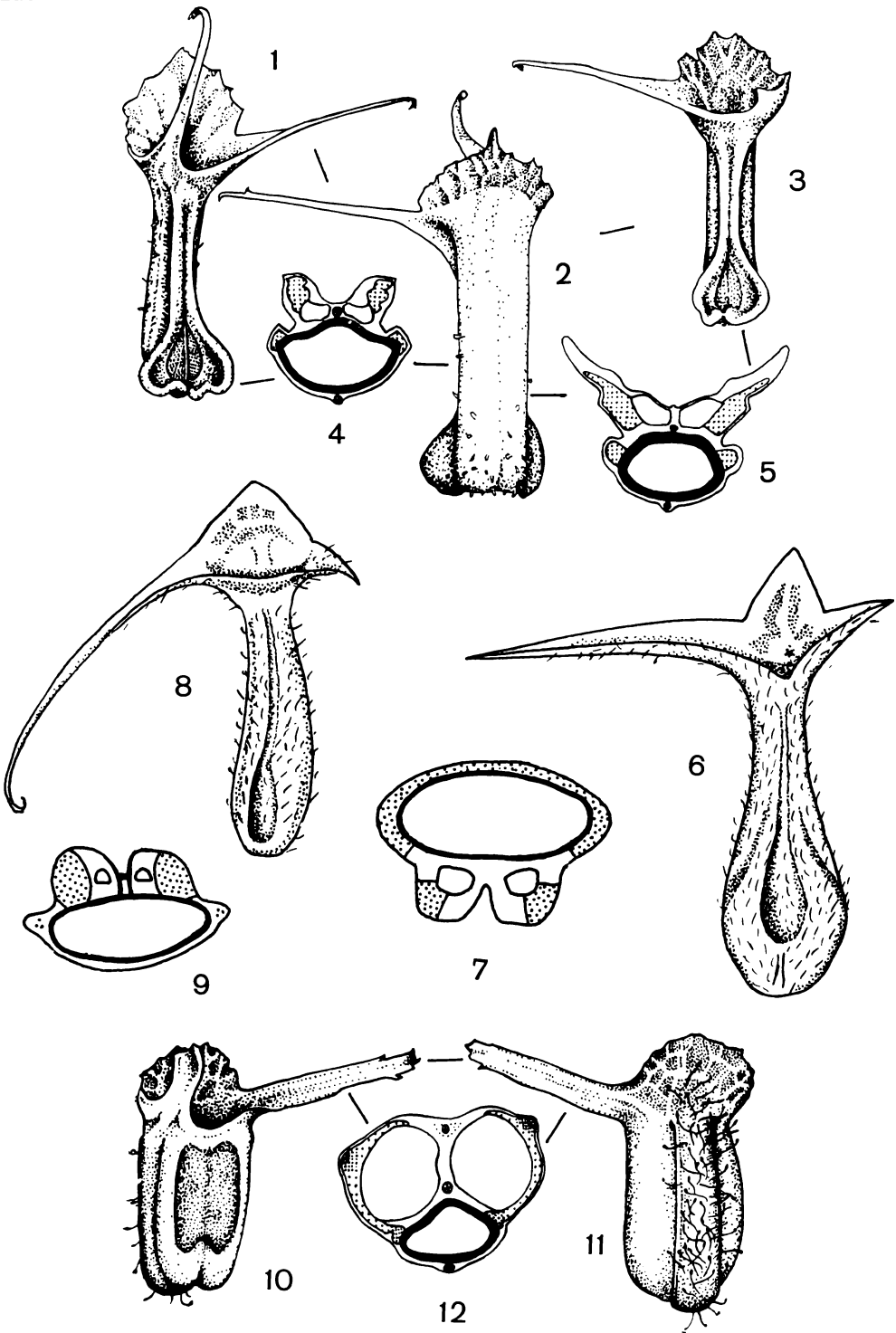
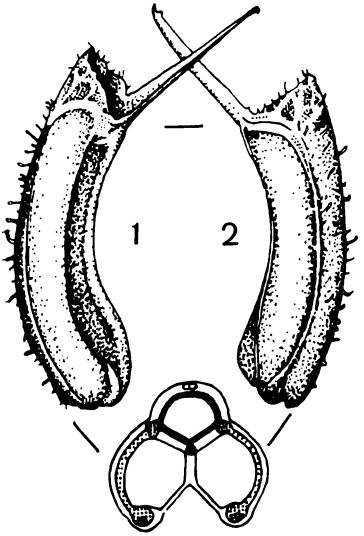
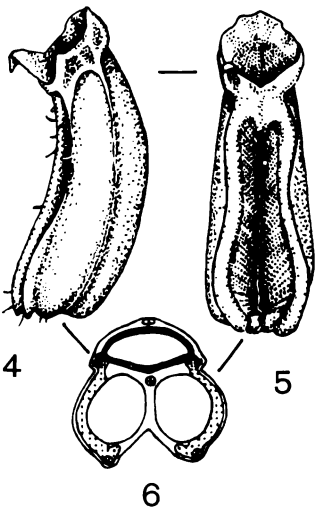
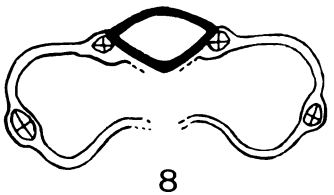
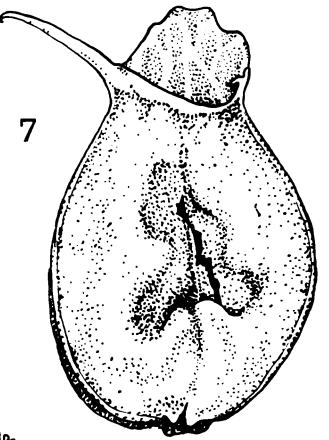


Fig. 1— 5: *Valerianella oxyrrhyncha* Fisch. & C. A. Mey.
6— 7: *V. sclerocarpa* Fisch. & C. A. Mey.
8— 9: *V. turkestanica* Regel & Schmalh.
10—12: *V. Szowitsiana* Fisch. & C. A. Mey.









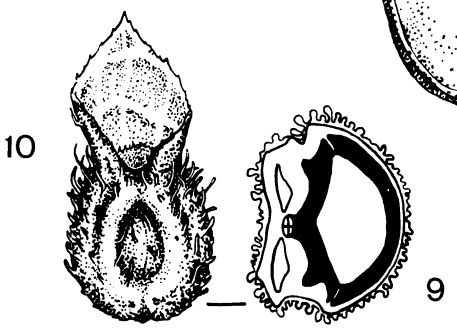


Fig. 1— 3: *Valerianella cymbicarpa* C. A. Mey.
4— 6: *V. plagiostephana* Fisch. & C. A. Mey.
7— 8: *V. platycarpa* Trautv.
9—10: *V. muricata* (Stev.) Baxt.

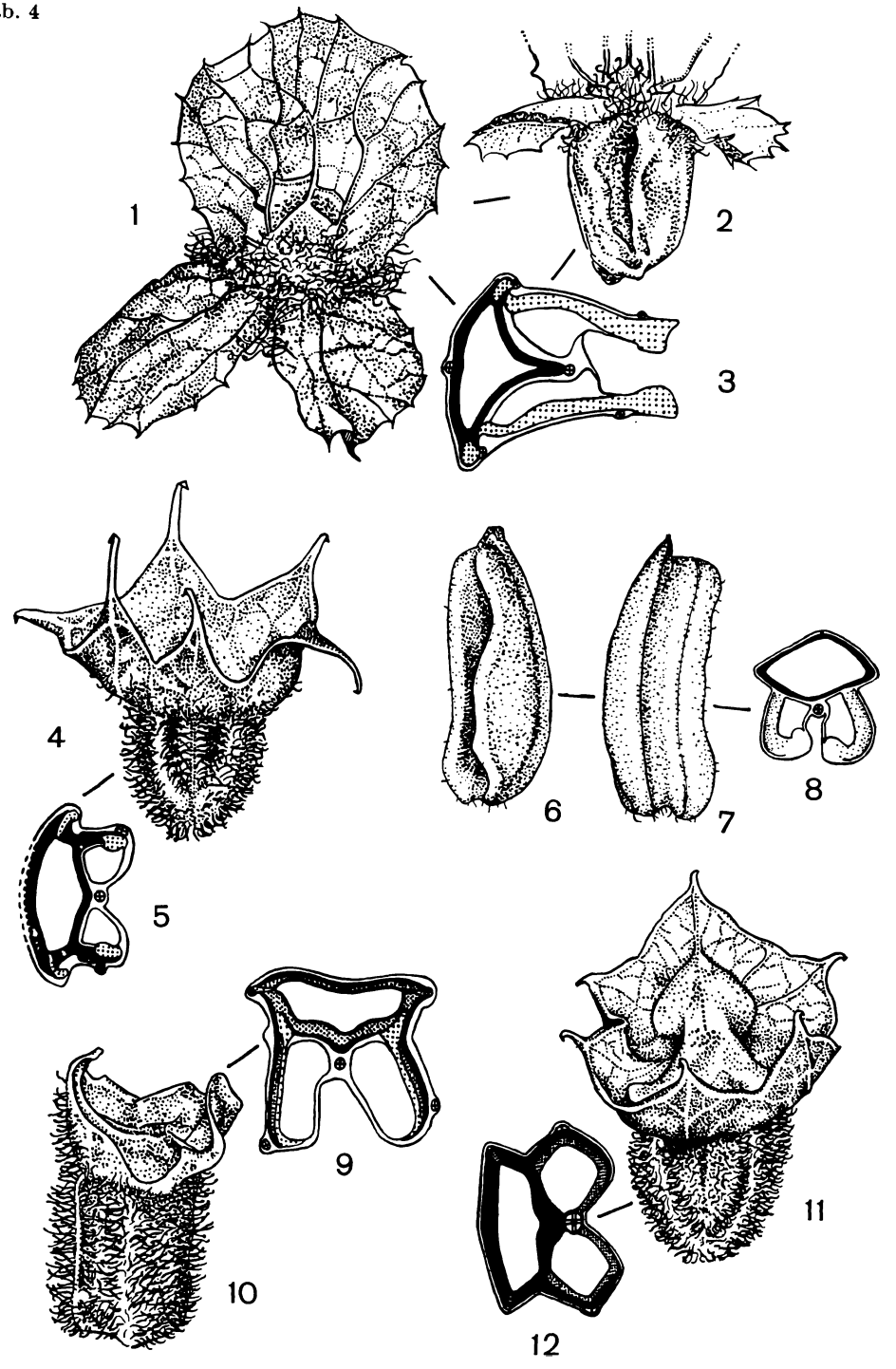


Fig. 1— 3: *Valerianella Dufresnia* Bge. ex Boiss.
4— 5: *V. coronata* (L.) DC.
6— 8: *V. carinata* Loisel.
9—10: *V. chlorostephana* Boiss. & Bal.
11—12: *V. Kotschyi* Boiss.

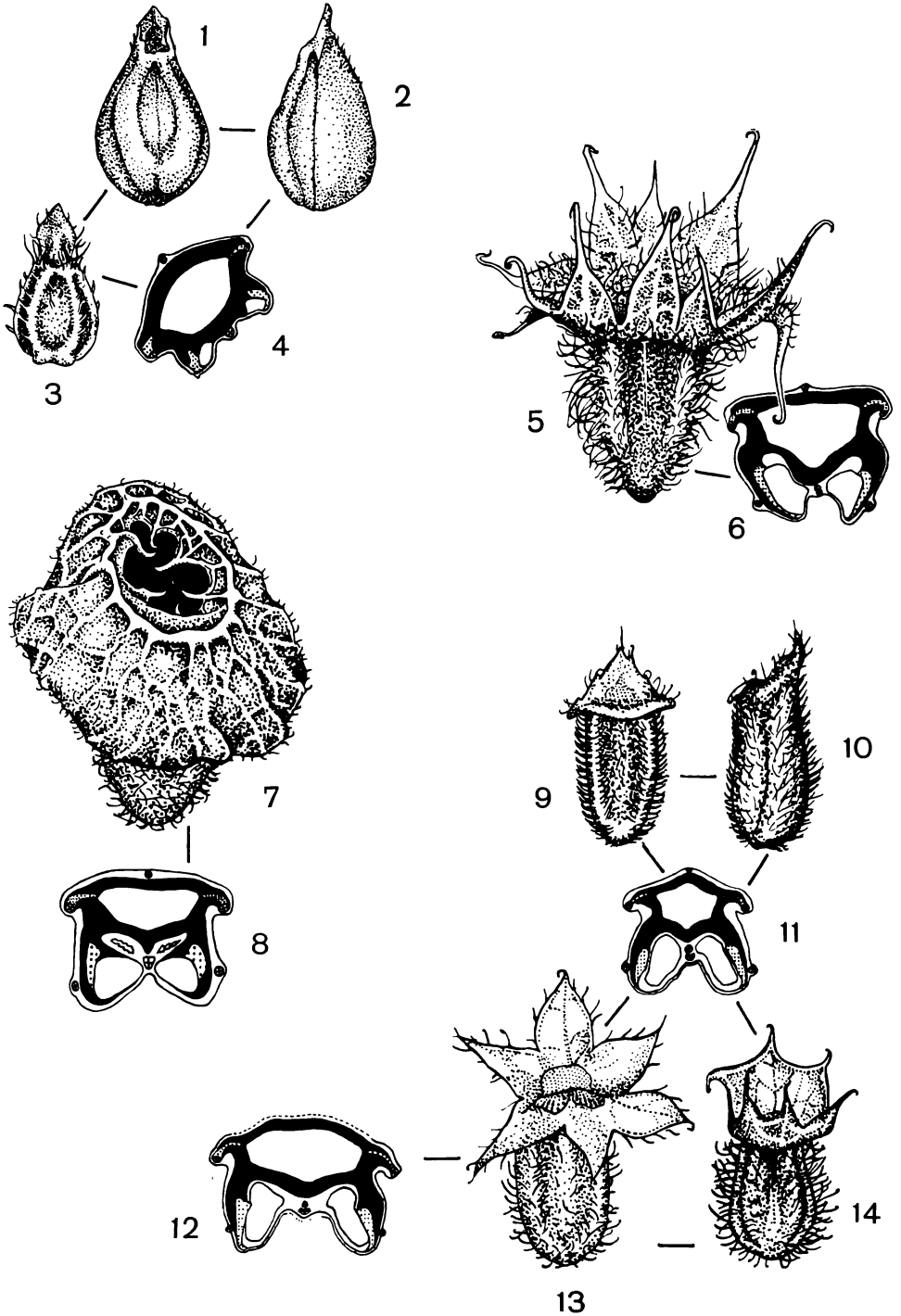


Fig. 1— 4: *Valerianella dentata* (L.) Poll.
5— 6: *V. discoidea* (L.) Loisel.
7— 8: *V. vesicaria* (L.) Moench.
9—14: *V. lasiocarpa* (Stev.) Betcke

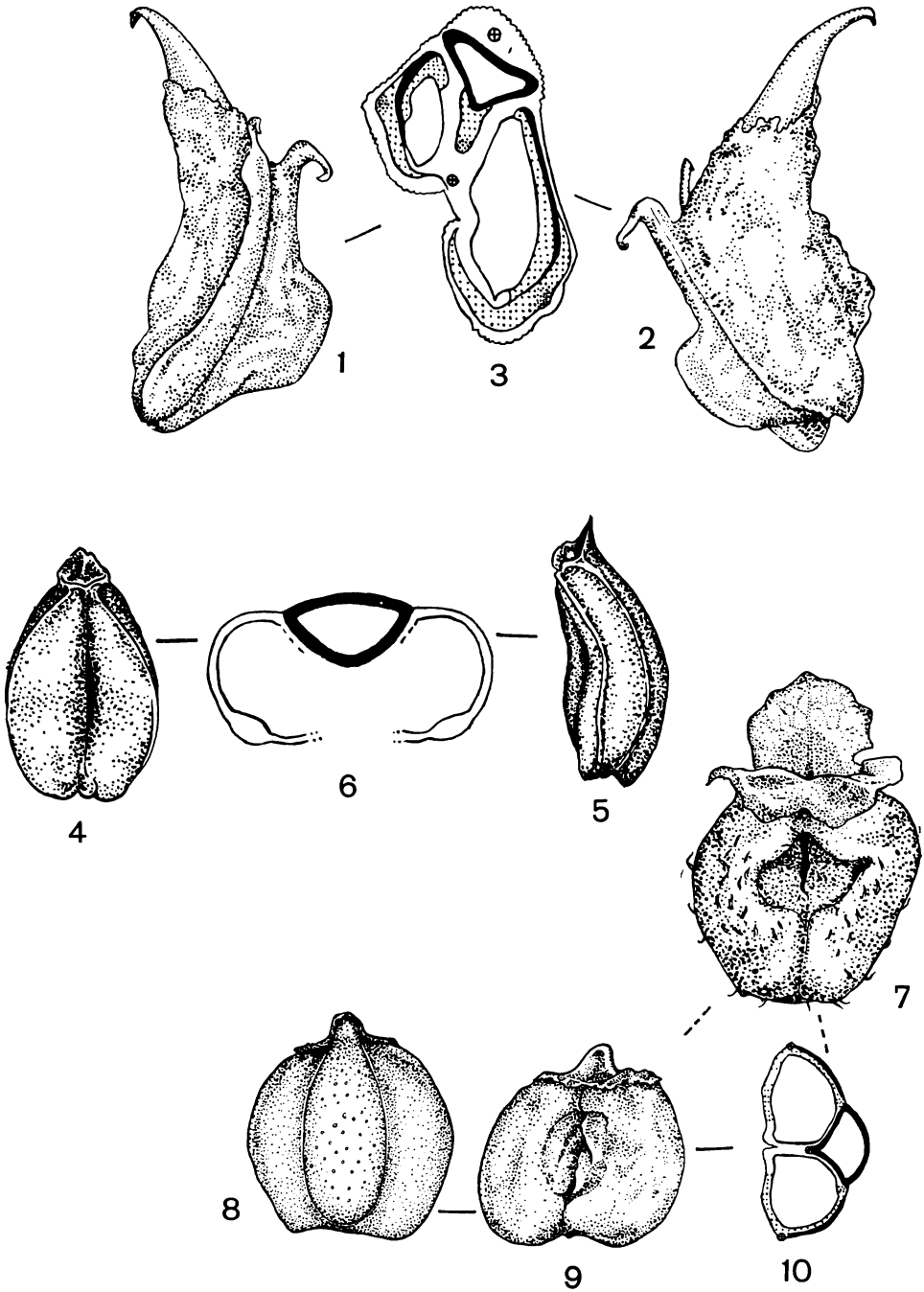


Fig. 1— 3: *Valerianella echinata* (L.) DC.
4— 6: *V. amblyotis* Fisch. & C. A. Mey.
7—10: *V. pumila* (L.) DC.

Valeriana sisymbriifolia VAHL — Fig. 1: RECH. 878, Fig. 2: RECH. 6223

Valeriana ficariifolia Boiss. — Rech. 33604

Valeriana Jatamansi JONES — RECH. 30658

Tab. 10

Valeriana Clarkei Briq. — Rech. 19582

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Familien mit vorangestellter Continuatio-Nummer sind bereits erschienen.

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
	PTERIDOPHYTA					
	Equisetaceae	1	2	143	(2)	(2)
	Lycopodiaceae	2	1	142	(1)	(1)
	Marsileaceae	5	5	144	(4)	(4)
	Ophioglossaceae	3	3	140	(6)	(6)
	Polypodiaceae	4	4	141	(3)	(3)
	Salviniaceae	6	6	145	(5)	(5)
	GYMNOSPERMAE					
50	Cupressaceae	9	8	136	(8)	(8)
3	Ephedraceae	10	10	138	(10)	(10)
14	Pinaceae	8	9	135	(7)	(9)
12	Taxaceae	7	7	137	(9)	(7)
	ANGIOSPERMAE					
24	Acanthaceae	138	110	84	86	135
61	Aceraceae	86	83	30a	42a	76
	Aizoaceae	48	27	50	57	106
	Alismataceae	16	127	115	124	146
	Amaranthaceae	45	23	93	92	112
	Amaryllidaceae	27	134	128	114	162
	Ampelidaceae	91	91	32	41	66
63	Anacardiaceae	81	81	46	43	75
	Apiaceae	113	94	54	58	127
	Apocynaceae	125	117	82	75	82
25	Aquifoliaceae	82	86	70	38	58
1	Araceae	22	143	120	122	158
	Araliaceae	112	93	55	59	19
26	Aristolochiaceae	40	35	103	97	96
	Asclepiadaceae	126	118	74	76	84
	Asparagaceae	26	133	129	116	155,7pp.
48	Asperifoliaceae	129	104	80	79	142
	Asteraceae	146	126	61	65	131
	Balanophoraceae	42	20	102	103	63
	Balsaminaceae	89	85	25	33b	140
	Berberidaceae	54	40	3	13	96
	Betulaceae	33	11	112	108	25
44	Bignoniaceae	137a	108a	76a	85a	86a
48	Boraginaceae	129	104	80	79	142
57	Brassicaceae	60	46	7	16	101
45	Buddleiaceae	123	115	75	77	80
	Burseraceae	75	78	33	36	72
	Butomaceae	17	128	116	124a	145
27	Buxaceae	80	31	105	104a	23
	Caesalpiniaceae	68b	59b	38b	45b	13
	Callitrichaceae	79	32	47	50b	117
13	Campanulaceae	145	125	62	66	130
	Cannabaceae	37	17a	106	105	30
	Capparidaceae	59	45	8	17	36
10	Caprifoliaceae	141	121	57	61	20
	Caryophyllaceae	50	29	13	23	105
64	Celastraceae	83	87	35	39	60
28	Ceratophyllaceae	52	42	15	110	94
	Chenopodiaceae	44	22	92	93	111
46	Cistaceae	99	49	10	19	33
	Compositae	146	126	61	65	121
2	Convolvulaceae	127	102	78	80	133
54	Cornaceae	114	92	56	60	18
	Corylaceae	33	11	112	108	27
	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
	Cupuliferae	33-4	11-2	111-2	108	25-7
8	Cuscutaceae	128	103	79	80a	141
39	Cynocrambaceae	111	25	91	105c	113
	Cyperaceae	20	139	134	126	169
	Cytinaceae	41	36	101	96	98
29	Datiscaceae	101	54	49	56	43
	Dioscoreaceae	28	137	131	115	164
	Dipsacaceae	143	123	60	64	129
30	Ebenaceae	121	100	69	72	68
48	Ehretiaceae	129	104	80	79	87
55	Elaeagnaceae	103	61	97	100	64
16	Elatinaceae	96	52	18	26	103
11	Ericaceae	116	99	63	67	51
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
	Fagaceae	34	12	111	108a	26
	Ficoidaceae	48	27	50	57	106
	Frankeniaceae	97	51	17	22	38
	Fumariaceae	58	44	6	15a	100
41	Gentianaceae	124	116	76	78	118
	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
	Gramineae	19	140	135	127	170
47	Grossulariaceae	64	57	52	47	17
49	Guttiferae	95	55	19	27	54
18	Halorag(id)aceae	109	67	46	50	115
53	Hamamelidaceae	65	33	53	49	21
	Helleboraceae	53	39	1	11	90
	Hippocastanaceae	87	84	30b	42b	77
31	Hippuridaceae	110	68	45	50a	116
19	Hydrangeaceae	64	57	52	47	16a
	Hydrocharitaceae	18	129	114	111	146

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
49	Hypericaceae	95	55	19	27	54
25	Ilicineae	82	86	70	38	58
	Illecebraceae	50	29	13	23	109
	Iridaceae	29	135	126	113	163
	Juglandaceae	32	13	109	107	28
	Juncaceae	25	136	133	118	168
	Juncaginaceae	14a	130	117a	125b	148
	Labiatae	131	112	87	89	144
	Lamiaceae	131	112	87	89	144
	Lauraceae	56	37	98	98	11
	Leguminosae	68	59	38	45	13-5
	Lemnaceae	23	144	119	123	159
58	Lentibulariaceae	136	107	65	84	137
	Liliaceae	26	133	128	116	155
	Linaceae	71	72	23	31	47
45	Loganiaceae	123	115	75	77	79
	Loranthaceae	39	19	100	101	61
51	Lythraceae	104	62	43	53	114
	Malvaceae	93	69	20	28	46
	Meliaceae	76	79	31	37	73
	Menispermaceae	55	38	2	12	95
41	Menyanthaceae	124	116	76	78	119
	Mimosaceae	68a	59a	38a	45a	14
	Molluginaceae	48	27	50	57	105
	Monotropaceae	115	98	64	67a	52
	Moraceae	36	15	107	105a	31
	Moringaceae	62	48	37	44	37
	Myrsinaceae	117	97	67	70	67
32	Myrtaceae	107	64	40	52	55
	Najadaceae	15	132	118	125	153
	Nyctaginaceae	46	26	95	91	35
33	Nymphaeaceae	51	41	4	14	93
7	Oenotheraceae	108	66	44	54	115
52	Oleaceae	122	119	71	73	81
7	Onagraceae	108	66	44	54	115
	Orchidaceae	30	141	125	112	167
5	Orobanchaceae	135	108	83	83	136
40	Oxalidaceae	69	73	24	33a	139
60	Paeoniaceae	53	39	1	11	89
	Palmae	21	142	121	119	165
34	Papaveraceae	57	43	5	15	99
	Papilionaceae	68c	59c	38c	45c	15
20	Parnassiaceae	64	57	52	47	126
	Pedaliaceae	134	109	77	85	86
	Periplocaceae	126	118	74	76	83
19	Philadelphaceae	64	57	52	47	16
35	Phytolaccaceae	47	24	90	94	110
15	Plantaginaceae	139	114	89	90	122
21	Platanaceae	66	34	110	106	22
	Plumbaginaceae	119	95	88	68	121
	Poaceae	19	140	135	127	170
	Podophyllaceae	54	40	3	13	93
	Polygalaceae	77	80	12	21	41
56	Polygonaceae	43	21	94	95	108
	Portulacaceae	49	28	14	24	107
	Potamogetonaceae	14	131	117	125a	150
9	Primulaceae	118	96	66	69	120
22	Punicaceae	105	65	42	53	57
	Pyrolaceae	115	98	64	67a	50
	Rafflesiaceae	41	36	101	96	98
	Ranunculaceae	53	39	1	11	91
	Resedaceae	61	47	9	18	102
	Rhamnaceae	90	90	36	40	65
	Rhizophoraceae	106	63	41	51	56
66	Rosaceae	67	58	39	46	12
	Rubiaceae	140	120	58	62	85
	Ruppiaceae	14	131	117	125a	151
	Ruscaceae	26	133	129	116	157
36	Rutaceae	73	76	28	34	70
65	Salicaceae	31	14	113	109	24
37	Salvadoraceae	84	88	72	74	59
	Santalaceae	38	18	99	102	62
38	Sapindaceae	88	82	30	42	74
	Sapotaceae	120	101	68	71	69
42	Saxifragaceae	64	57	52	47	124
	Scheuchzeriaceae	–	130	117a	125b	148
	Scrophulariaceae	133	106	82	82	134
	Selaginaceae	137	108	85	87	–
	Simar(o)ubaceae	74	77	29	35	71
	Smila(ca)ceae	26	133	130	116	156
	Solanaceae	132	105	81	81	132
59	Sparganiaceae	13	146	123	121a	160
	Staphyleaceae	85	89	30c	42c	78
	Sterculiaceae	94	71	21	29	45
4	Tamaricaceae	98	50	16	25	39
39	Theligonaceae	111	25	91	105c	113
	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
	Typhaceae	11	147	124	121	161
	Ulmaceae	35	16	108	105b	29
	Umbelliferae	113	94	54	58	127
	Urticaceae	37	17	106	105	32
11	Vacciniaceae	116	99	63	67	53
23	Vahliaceae	64	57	52	47	125
62	Valerianaceae	142	122	59	63	128
43	Verbenaceae	130	111	86	88	88
	Violaceae	100	53	11	20	40
	Vitaceae	91	91	32	41	66
	Zannichelliaceae	14	131	117	125a	152
	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48

Anacardiaceae

auctore K. H. RECHINGER, Wien

Lfg. Cont. No. 63/30. 4. 19(

FLORA DES IRANISCHEN HOCHLANDES UND DER UMRAHMENDEN GEBIRGE

PERSIEN, AFGHANISTAN, TEILE VON WEST-PAKISTAN, NORD-IRAQ, AZERBAIDJAN, TURKMENISTAN

von

Univ.-Prof. Dr.
KARL HEINZ RECHINGER
Erster Direktor des Naturhistorischen Museums in Wien

AKADEMISCHE DRUCK- u. VERLAGSANSTALT
GRAZ-AUSTRIA

Anacardiaceae

auctore K. H. Rechinger, Wien

Anacardiaceae Lindl., Intr. Nat. Syst. 127 (1830).

Arbores vel frutices, cortice saepe resinifera. Folia alterna, simplicia, trifoliolata vel pinnata, exstipulata vel stipulis ± obsoletis provisa. Flores actinomorphi, plerumque functione unisexuales, raro hermaphroditi. Sepala 3—5 vel raro deficientia, plerumque basi coalita. Petala 3—5, libera vel deficientia. Stamina 5 vel 10, disco inserta. Ovarium superum, plerumque uniloculare (abortu ex ovario trilobo derivatum). Ovula 1(—3), plerumque basalia. Styli 1—3. Fructus drupa monosperma, saepe obliqua et ± exsucca.

1a. Folia simplicia. Pedicelli partim non fructiferi, demum elongati, plumosi ..... 1. *Cotinus* Miller
b. Folia plerumque composita (rarissime simplicia). Pedicelli omnes flores fertiles ferentes 2
2a. Folia matura et rami juveniles pilosi; foliola serrata. Gemmae nudae. Petala 5. Styli terminales ..... 2. *Rhus* L.
b. Folia matura et rami juveniles glabri (petiolis interdum exceptis). Gemmae squamis imbricatis tectae. Petala nulla ..... 3. *Pistacia* L.

1. *Cotinus*

Cotinus Miller, Gard. Dict. abr. ed. 4 (1772).

Frutex. Folia alterna, simplicia, decidua. Inflorescentia racemus paniculis compositus. Flores hermaphroditi, pentameri. Styli 3. Pedicelli numerosi floribus abortivis elongati et demum plumoso-villosi, pilis multicellularibus. Fructus drupa monosperma, obliqua, exsucca.

1. ***C. Coggygria*** Scop., Fl. Carn. ed. 2, 1: 220 (1772).

Syn.: *Rhus Cotinus* L., Spec. Plant. 383 (1753).

Frutex rotundatus usque ad 5 m altus. Folia orbiculata vel obovata, glauca, valde glabrescentia, 3—8 cm diametro. Petiolus non alatus. Inflorescentia ampla, longe ramosa, bracteata. Drupa 3—4 mm diametro, reniformis.

Persia: W: Azerb.: Hasan Beyglu, Knapp, Mird. in Gauba 769!
Pakistan: Kurram: Prope Shalozan, 2100—2400 m, Aitch. 233. — N. Wazir.: In regionibus superioribus, Stewart. — Quetta: 12 km N Murgha Kibzai, 1600 m, Rech. 29809!, 29822! — Kalat: Hushtar Rahi Kaur, 1100 m, Hotson 301-a, 310.

Distr. gen.: Europa australis, Rossia australis, Caucasus, Anatolia, Syria, Persia, Pakistan occidentalis, Kumaon, Sina austro-occidentalis.

Die Art weist eine merkwürdige Disjunktion in ihrer Verbreitung auf: einerseits Südeuropa und Südwestasien ostwärts bis Nordwestpersien, dann West-Pakistan, angeblich auch Indien (Kumaon) und Südwest-China. Ich sehe keine greifbaren Unterschiede zwischen südeuropäischen und pakistanischen Belegen.

2. *Rhus*

Rhus L., Spec. Plant. 265 (1753). Gen. Plant. ed. 5: 129 (1754).

Frutex. Folia alterna, pinnata. Flores minuti, dense paniculati. Petala et stamina 5. Placentatio basalis. Pedicelli fructiferi breves, non plumosi. Styli 3, terminales. Fructus drupa globosa monosperma, rubescens.

1a. Frutex inermis. Folia imparipinnata, foliolis multijugis crenato-serratis. Panicula terminalis, densa, foliis plerumque brevior .... 1. *Rh. Coriaria* L..

b. Frutex saepe spinescens. Folia trifoliolata, foliolis sinuato-lobatis. Panicula terminalis vel axillaris, laxa, folia valde superans .... 2. *Rh. mysurensis* Heyne ex Wight & Arn.

1. ***Rh. Coriaria*** L., Spec. Plant. 265 (1753).

Typus: Europa australis.

Frutex usque ad 3 m altus, ramis juvenilibus et petiolis dense hispidis. Folia imparipinnata 4-juga, foliolis grosse serratis vel crenato-serratis; rachis partim alata, hispida. Inflorescentia densa, usque ad 10 cm longa. Sepala ovata, virescentia. Petala oblonga, alba, quam sepala longiora. Drupa brunneo-purpurea, villosa.

Iraq: Kurd.: Mosul: 5 km S Zakho, Rech. 10720! Inter Dihok et Zawita, Regel 13! Supra Sirsang, Barkley 9090! Arbil: Kuh Safin, 1000 m. Bornm. 1017. Sul.: M. Avroman, Tawilla, 1300 m, Rech. 10213! Penjwin, 1400 m, Rech. 10546!
Talish, Hohen.
Persia: N: Maz.: In valle Haraz, Panjab, 1000 m, Wdb. 1553! Gil.: Rudbar, Buhse 971. Persia borealis, Bge. — W: Azerb.: Tabriz, Gill.-Sm. 2183. Ham.: Ganjnameh, Stapf. Hamadan, Sab. in Gauba 775! — S: Fars.: Kuhha-ye Dashtak prope Emamazdeh Esmail, Stapf 514! Kalat, 35 km NW Shiraz, 2300 m, Grant 17683! — E: Khor.: Torbat-e Jam, Aitch. 632. Sangan, Aitch. Khorasan, Bge. — C: Tehr.: Tajrish, Bruns. Qazv.: Karaj, Gauba. Qazvin, Koelz 17003! Qom: Rahjerd, 1700 m, Koeie 790! — Darband, Ky. 428.
Afghanistan: NW: Herat: Obeh, 1700 m, Koeie 3751! — E: Kabul: Istalif, 1900 m, Volk s. n.!, Gilli 1773-a!, Rech. 31176! Kabul, Honigberger s. n.

Distr. gen.: Insulae Canarienses, Regio Mediterranea, Tauria, Caucasus, Anatolia, Kurdistan, Persia, Afghanistan.

2. ***Rh. mysurensis*** Heyne ex Wight & Arn., Prodr. Fl. Penins. Ind. Orient. 1: 172 (1834).

Typus: Mysore, Heyne.

Frutex ramis saepe spinescentibus. Rami juniores cum petiolis et paniculis dense pubescentes. Folia palmato-trifoliolata subtus tomentella; foliola obovata retusa, sinuato-lobata, terminale lateralibus majus usque ad 3,5×2,5 cm, basi sensim attenuatum. Paniculae terminales vel axillares folia valde superantes. Discus concavus glaber; stamina infra marginem disci inserta. Styli distincti; stigma capitatum. Fructus globosus, 4—5 mm diametro.

Pakistan: Bela, H.-B. 18727. — Kalat: Jhalowan, H.-B. 19858.

Distr. gen.: Pakistan, India.

3. *Pistacia*

Pistacia L., Spec. Plant. 1025 (1753). Gen. Plant. ed. 5: 450 (1754).

Lit.: A. ENGLER in DC., Monographiae Phanerogamarum 4: 284—293 (1883). M. ZOHARY, A Monographic Study of the Genus Pistacia, Palestine Journal of Botany Jerusalem, ser. 5: 187—228 (1952). F. YALTIRIK, Pistacia in DAVIS, Flora of Turkey 2: 544—548 (1967).

Arbores vel frutices gummi sudantes. Folia alterna plerumque pinnata. Racemi axillares. Flores parvi dioici apetali. Flores masculi: Calyx 5-fidus; stamina 5 filamentis brevissimis basi cum disco connatis; antherae magnae. Flores feminei: Calyx 3—4-fidus; ovarium sessile uniloculare; stylus brevis trifidus. Drupa monosperma epicarpio chartaceo, putamine osseo, glabra, saepe compressa. Semen compressum, cotyledones crassae, radicula cotyledonum dorso incumbens notorrhiza.

1a. Rachis foliorum (interdum indistincte) alata vel ad minimum marginata ..... 1 *P. atlantica* DESF.
b. Rachis foliorum non alata 2
2a. Foliolum terminale semper evolutum, foliola omnia subaequalia..... 3
b. Foliolum terminale in foliis nonnullis non evolutum vel valde reductum ..... 4. *P. chinensis* BGE.
3a. Nervatura foliorum utrinque valde elevata. Foliola reticulato-venosa 1—2(—3)-paria, 2,5—7(—10) cm lata. Fructus ad minimum 10 mm longus ..... 3. *P. vera* L.
b. Nervatura foliorum supra non, subtus paulum elevata. Foliola non reticulato-venosa, 1—3(—4)-paria. Fructus multo minor .. 2. *P. Khinjuk* STOCKS

1. *P. atlantica* DESF., Fl. Atlant. 2: 364 (1800).

Typus: Algeria

Arbor usque ad 7 m alta, coma densa subglobosa, rarius frutex. Folia decidua, imparipinnata; foliola 2—4(—5(-juga, forma et magnitudine valde variabilia, rotundato-ovata, oblonga vel lanceolata. (2—)2,5—8×0,7—2(—2,5) cm, obtusa vel mutica, numquam mucronata, margine ciliolata ceterum glabra, nervatura non vel vix prominente; rachis marginata vel anguste alata. Inflorescentia paniculata. Drupa forma et magnitudine variabilis, (4,5—)5—8×5—6(—8) mm.

Distr. gen. speciei: Insulae Canarienses, Regio Mediterranea, Tauria, Anatolia, Syria, Caucasus, Persia, Afghanistan, Pakistan.

Die beiden Versuche einer systematischen Gliederung von ZOHARY (1952) und YALTIRIK in DAVIS (1967) sind für das Gebiet der Flora Iranica nicht befriedigend. Auf Grund des mir vorliegenden verhältnismäßig reichlichen Herbarmaterials und von Naturstudien bin ich zur Unterscheidung von vier geographischen Rassen als Subspecies gelangt. Die Korrelation der Differentialmerkmale ist ziemlich weitgehend und das Vorherrschen der einzelnen Merkmalskombinationen deutlich an bestimmte Teilareale gebunden. Doch ist die schon durch die Größe und Breite der Blättchen und Früchte besonders auffällige subsp. *kurdica* mit subsp. *mutica* durch Übergangsformen so eng verknüpft, daß ich sie im Gegensatz zu YALTIRIK (1967) nicht als Art zu unterscheiden vermag. Die subsp. *cabulica* kommt in der hohen Zahl und im länglichen Umriß der Blättchen der subsp. *atlantica* am nächsten, scheint mir aber durch die im Schlüssel angegebenen Merkmale der Färbung, Konsistenz und Nervatur der Blättchen recht deutlich unterscheidbar, was bisher nicht beachtet worden ist. Schwieriger ist in manchen

Fällen die Unterscheidung der subsp. *mutica* von subsp. *cabulica*, doch sind die angegebenen Unterscheidungsmerkmale für die weitaus überwiegende Zahl der Belege zutreffend.

1a. Foliola 4—5-juga, ± manifeste discoloria, latitudine 4—5-plo longiora, nervatura subtus tenuiter sed distincte prominente, costa mediana in sicco subtus saepe rufescenti-brunnescente. Drupa 6—7×5(—6) mm, latitudine plerumque longior, in sicco imprimis longitudinaliter rugosa. (Regio Mediterranea; in regionae Florae Iranicae non ocurrit) ..... subsp. *atlantica*

b. Foliola (1—)2—3(—4)-juga, indistincte discoloria vel subconcoloria, latitudine 1,5—4-plo longiora, in sicco utrinque pallide subopace viridia, nervatura subtus non vel vix prominente, costa mediana pallide viridi. Drupa (compresso-)subglobosa vel latior quam longa, in sicco longitudinaliter et transversaliter nervosa 2

2a. Foliola (2—)3—4-juga, lanceolata, a basi apicem versus sensim attenuata, latitudine plerumque 3—4-plo longiora. Drupa latitudine plerumque ± aequilata ..... subsp. *cabulica* (Stocks) Rech. f.

b. Foliola plerumque 2—3-juga, ovato-lanceolata vel ovato-elliptica, latitudine (1,5—)2—3-plo longiora. Drupa longitudine saepius ± latior 3

3a. Foliola usque ad 8×3,5 cm, saepius prope basin latissima, apicem versus sensim attenuata, marginibus ± rectis, consistentia crasse coriacea. Drupa longitudine plerumque evidenter latior, 5—8×8—10 mm ..... subsp. *kurdica* (Zohary) Rech. f.

b. Foliola minora et proportione breviora, saepius prope medium vel paulo infra latissima, plerumque usque ad ± 4×1,5—2 cm, marginibus ± convexis, consistentia coriaceo-membranacea. Drupa minor, longitudine vix vel paulo tantum latior. . subsp. *mutica* (Fisch. & C. A. Mey.) Rech. f.

— — subsp. ***mutica*** (Fisch. & C. A. Mey.) Rech. f., comb. nov.

Syn.: *P. mutica* Fisch. & C. A. Mey. in Hohen., Enum. Talysch 102 (1838).
Icon.: Tab. 1.
Typus subspeciei: Transcaucasia.

Iraq: Kurd.: Sul.: Penjwin, Haussk.! Pira Magrun, Haussk. Arbil: Kuh Safin, 1000 m, Bornm. 1022. In faucibus prope Rawandiz, 600 m, Guest 1595.
Persia: N: Maz.: M. Alamut prope Esfaran, 1800 m, Gauba 777! Gilan: Rudbar, 300 m, Bornm. obs. Inter Kelishom et Pul-i ambu, Alexeenko 379. — W: Azerb.: Khvoy, Szov. Ali Bolaghi, Knapp. Afshar, Knapp. Qareh Dagh prope Hasan Beyglu, 1200 m, Mird. in Gauba 776! Ham.: Safid Ab, Str. Kermansh.: Karand, Str. Kuh-e Nevoh, Str. Kuh-i Gahvareh, Str. Arak: M. Rasvand, Str. Lur.: Qaleh Rostam, Str. Bakht.: Taleh, 3000 m, Koelz 15194! — S: Fars.: Kotal Drun, Stapf 536! Abdui, Stapf 537! Inter Jahrom et Mansurabad, 1600 m, Gauba 770! Furg, 1050 m, Popov 51—58! Dundarlu ad lacum Neyriz, Gauba 774! Inter Pa na'l Jangal et Sarvestan, 1500—1600 m, Bornm. 3431. Sarvestan, Gauba 773! Beshneh, 1800—2200 m, Bornm. 3433. Khaneh-ye Zenyan, Stapf 540! Kuh Bil, Stapf 541! Hajjiabad, Stapf 531! Kuh-e Dasht, W Kazerun, Stapf 533! Inter Eqlid et Deh Girdu, Stapf 534! Kerm.: Inter Saidabad et Chah-e Chaghak, 1900 m, Rech. 3520! Bal.: Inter Zahedan et Khash, 1300—1600 m, Rech. 4217! Makran: Tang-e Sorkh, Shar. 501-E! — E: Khor.: In montibus prope Torbat-e Heydariyeh, Gauba! In silva Bardu, Koelz 16791! Inter Khvaf et Bezg, Gauba 772! — C: Qazv.: Kalak prope Karaj, 1500 m, Rech. 216!, Gauba 771! Fashand, 1900 m, Bornm. obs. Inter Bibersin et Langarud, Buhse 997, 1224/1. Yazd: Shir Kuh, 2000 m, Bornm. 3432. In montibus prope Yazd, Buhse.

Distr. gen. subspeciei: Tauria, Anatolia, Caucasus, ?Iraq, Persia.

Rech. 216 und Haussk. s. n. (Penjwin) nähern sich stark der subsp. *cabulica*. Die Zugehörigkeit vieler Literaturangaben zu subsp. *mutica* bleibt zweifelhaft; insbesondere manche Angaben aus den westlichen und südlichen Arealteilen dürften sich auf subsp. *kurdica* beziehen.

— — subsp. ***kurdica*** (Zohary) Rech. f., comb. nov.

Syn.: *P. atlantica* Desf. var. *kurdica* Zohary, Palest. Journ. Bot. Ser. 5: 206 (1952). *P. eurycarpa* Yaltirik, Notes Roy. Bot. Gard. Edinb. 28: 11 (1967).
Icon.: Tab. 2.
Typus subspeciei: Non indicatus.

Iraq: Kurd.: Arbil: M. Qandil supra Shahidan, 800 m, Rech. 11733! Ad radices M. Baradost prope Shanidar, 800 m, Erdtman & Goedemans in Rech. 15623!, 15627! Mosul: Shaikh Adi N Mosul, 900 m, Guest 1643. Zawita, 900 m, Guest 3738. E Dihok, 1300—1600 m, Guest 3760. Jabal Khantur prope Sharanish, 1480 m, Rech. 10834! Kirkuk: Kani Sard, Helbaek 1272! Sul.: 20 km SW Sulaymaniyah, 1150 m, Stutz 1409! M. Avroman, Tawilla, 1200—1600 m, Rech. 10268!
Persia: **W**: Kurd.: 100 km N Kermanshah versus Sanandaj, 1800 m, Wdb. 1940! Kermansh.: Prope Karand, Loftus. 40 km SW Shahabad versus Ilam, 1900 m, Bent & Wr. 602—501! Khuz.: 16 km W Gach Saran, 700 m, Stutz 985! Lur.: Bisheh, Koeie 1601. Dow Rud, Koelz 17323! W Oshtoran Kuh, Bobek 73! Gilan-e Gharb, Doraheh, Behb. 184! In valle Rud-e Khersan, Haussk. s. n.! Bakht.: Gahar, 2100 m, Koelz 17859! Chashmehghirin, Koelz 15332! — **S**: Kerman: Rabor, 2700 m, Bornm. 3435! Inter Tal-e Khosravi et Sisakht, Behb. 1014-E! Yazd-e Khvast, Stapf 538! 3 km W Saadatabad, 1800 m, Grant 15835! Tang-i Jiz, Stapf 539! Fars.: Kuh Chah Siah prope Sivand, 2300 m, Stapf 532! Emamzadeh E Shiraz, Stapf 542! 25 km N Firuzabad, 1400 m, Grant 15032! Bal.: M. Karevandar inter Khash et Iranshahr, 1600 m, Rech. 4033!

Distr. gen. subspeciei: Syria, Anatolia, Iraq, Armenia rossica, Persia.

Zu subsp. *kurdica* gehören vielleicht noch einige der unter subsp. *mutica* angeführten Angaben aus der Literatur, besonders solche aus Süd- und West-Persien.

— — subsp. ***cabulica*** (Stocks) Rech. f., comb. nov.

Syn.: *P. cabulica* Stocks, Kew Journ. Bot. 4: 143 (1852). *P. mutica* Fisch. & C. A. Mey. subsp. *cabulica* (Stocks) Engler in DC., Monogr. Phan. 4: 287 (1883).
Icon.: Tab. 3.
Typus subspeciei: „In collibus Belutschiae et Afghaniae", Stocks, K.

Persia: **W**: Lur.: Kuh Giluye, Haussk. — **S**: Kerm.: Shah Kuh, 2900—3000 m, Bornm. 3434. 13 km SW Nosratabad Sipi, Rech. 27206! Kuh Jebal Barez, 2100—2700 m, Popov 51/58!, 51/203!, Rech. 7543!, Bobek 98!, 159!, 160! Bal.: Kuh-e Taftan, 2200 m, Gauba. Baluchistan, Stocks.
Afghanistan: **NW**: Herat: Inter Qala Shahrak et Khwajachisht, 1800 m, Rech. 19192! Inter Herat et Tabas, Bge. M. Paropamisus: Chashmeh Obeh, 1800 m, Rech. 19220! — **SW**: Farah: In declivibus borealibus jugi inter Farah Rud et Dilaram, 1250 m, Rech. 33485! — **SE**: Kandahar: Kandahar, 1500 m, Koelz 13224! Tirin: In collibus inter lacum artificiale „Arghandab Reservoir" et Tirin, 1400—1700 m, Rech. 34972!, 35034! — **E**: Kabul: Gulbahar, Neub. 50/467! Rig Revan, Lindb. 212/1957! Sarobi, Volk 2590!, 1615 p. p.! Kabul, Honigberger! Panjshir: Inter Ruka et Panjshir, 1700 m, Koeie 2941! Khost: In faucibus fluvii Kurram inter Chakmanni et Ahmad Khel, 1850 m, Rech. 35637! Jaji: Shutargardan, 2500 m, Lalande R 1095-E 2! Ad fl. Asra, 2000 m, Lalande R 1038 E 2! Nuristan: Inter Waigel et Nishai, Neub. 51/745! Inter Asmar et Barikot, 840 m, Gilli 1777!, Edelb. 1639! Gusalak, 1600 m, Edelb. 2216! Wama,

Edelb. 550! Inter Parigel et Waigalak, 1700 m, Kerst. 1192! Inter Nishai et Xingalam, Neub. 51/787! — C: Doab: Darreh-i Shikar. 6—26 km S Doab, in saxosis silic., 1500—2000 m. Rech. 37001!. Hdg. & Wdb. 3389! Supra Doab, Volk 465!, 1784! Ghorat: In saxosis calc. 3 km E Parjuman, 2400 m, Lindb. in Rech. 19119! — Afghanistan, Griff. 1093!, Stocks.

Pakistan: Chitral: In valle Shishi, 2000 m, Bowes Lyon 620! Arandu SW Drosh, 1200 m, Stainton 2303! Chitral-Mastuj Track, 1800 m, Stainton 2532! — Kurram: Inter Thal et Shalozan, Aitch. 361. — N. Wazir.: Razani, Stewart. Chhota Darweshta, 900—1200 m, Blatt. & Fz. — Quetta: Wam Tangi NW Harnai, 1200 m, Rech. 29567! In parte superiore faucium Torkhan inter Sanjawi, 1400 m, et Harnai, 900 m, Rech. 29449!, Maynard. Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Rech. 28983! In valle 12 km N Murgha Kibzai, 1600 m, Rech. 29799! Shinghar, 50 km N Fort Sandeman, 2050—2300 m, Rech. 29891! In jugo Bolan, Maynard. Ad fl. Bolan, Gaz. 118, 120. Duki, Banerji 8066! Loralai, Gaz. 12, 27. 366, 369. Shahrig, Gaz. 329, 331. Kohlu, Gaz. 329, 331. Sibi, Gaz. 329, 331. Gwal, Maynard. Zhob distr., Gaz. 327. Quetta, Lace. Lakaband, Harsukh 18810. Murgha, Harsukh 18809. Qila Saifullah, H.-B. 19148. Chaman, H.-B. 20726, 20727. M. Khwaja Amran, Gaz. 354, Maynard. M. Chiltan, Gaz. 354, Maynard. M. Mashel Akh, Gaz. 354. M. Zargun, Gaz. 354. — Bal.: Kalat: Jangal, 1500 m, Popov 233! Harboi ESE Kalat, Hotson 46. SSW Kalat, Hotson 202. Inter Kolpur, 1800 m et Mach, 900 m, Rech. 28458! Chagai: Ras Koh, Blatt. & Hallb. Chagai, Lace. Makran, Palmer. — Gustoi, Harsukh 20526!

Distr. gen. subspeciei: Persia australis, Afghanistan, Pakistan.

Rech. 19119, 33485, Koeie 2941 und Gilli 1777 p. p. nähern sich der subsp. *mutica*. Hdg. & Wdb. 3389 nähert sich der subsp. *kurdica*.

2. ***P. Khinjuk*** Stocks, Kew Journ. Bot. 4: 143 (1852).

Syn.: *P. acuminata* Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 53 (1860).

Icon.: Tab. 4, 5 et 6.

Typus: Baluchistan, Stocks, K.

Arbor 3—7 m alta, cortice laevi cinerea. Folia decidua imparipinnata, interdum (var. *populifolia* Boiss., Fl. Or. 2: 7 (1872)) ad folium singulum terminale reducta. primum pubescenti-velutina, demum glabrescentia; petiolus teres; foliola 1—2(—3)-juga, 3—10 × 1,5—7(—8) cm, late ovata, obliqua, abrupte ± longe acuminata, supra lucida. Panicula fructifera stricta. Drupa 4—6 × 4—5 mm, globosa, subcompressa, subobliqua, apiculata.

Iraq: Kurd.: Mosul: 8 km S Zakho, Rech. 12150! In jugo inter Dagh al Raziem et Sharanish, 900 m, Rech. 10806! Arbil: Kuh Safin, 1400 m, Bornm. 1025; 1200 m, Bornm. 1024. Rawandiz, 800—1200 m, Bornm. 1023. Sul.: M. Avroman, Haussкn.!

Persia: W: Kurd.: Tang-i Dinawer, Str. M. Shahu, Haussкn. s. n.! Kermansh.: Qasr Shirin supra Rijab, 1500 m, Nab. 255, 256. Bisotun, 1350—1650 m, Jacobs s. n.! Lur.: Pol-e Kalchor prope Khorramabad, Gauba. Oshtoran Kuh, Str. Kuh-e Saverz, Haussкn. Shah Bazan, 700 m, Koeie 434! Malavi inter Khorramabad et Andimeshk, 750 m, Bent & Wr. 420—101!, 420—138! Luristan, Olguin! S Lurestan, 500—800 m, Jacobs 6417! In montibus Luristaniea, 1500 m, Haussкn.! Arak: M. Rasvand, Str. s. n.!, M. Latetar, Str. Khuz.: Poshtkuh supra Dehloran, Nab. 257. 40 km E Dow Gonbadan, Grant 15887! — S: Fars.: Shiraz, Knight. Inter Runiz et Jangal, 1560 m, Bornm. 3444! Prope Kazerun, 800—900 m, Bornm. 3445. Kuh-e Khormuj prope Hawize, 700—1000 m, Nab. 71. Kuh Kable prope Kazerun, Stapf 526!, 529! Tang-i Jiz, Stapf 527!, 528! Tang-i Abdui, Stapf 525! Hajjiabad, Stapf 530! Mah Farrokhan S lacus Neyriz (Inselberg), Bobek 35! Deh Murd, 1700 m, Bobek 22! Kerm.: Kuh-e Jupar, 2700 m, Bornm. 3440, 3441, 3442! Inter Baghin et Mashiz, 2000 m, Bornm. 3443. Inter Khabis et Kerman, Bge. In faucibus versus Sabzvaran, 900—1200 m, Rech. 3711! Bal.: Inter

Sarbaz et Iranshahr, Salavatian 500-E! M. Karevandar inter Khash et Iranshahr, 1500—1600 m, Rech. 4025! Inter Zahedan et Khash, 1300—1600 m, Rech. 4231! Esfand, Gabr. 90! Baluchistan, Elliott s. n.!; 1200—1400 m, Stocks. Makran: Kalgar in montibus Kuh-e Bam Posht supra 900 m, Blatt. & Hallb. Gasht, Blatt. & Hallb. Miandar, Blatt. & Hallb. — **E**: Sistan: Hormak, cult., Grant 15336! Ad radices Kuh-e Malek Siah, 1000 m, Rech. 4098! Khor.: Khowr, 2400 m, Koelz 16832!, 16833! Inter Birjand et Qayen, Czern. — **C**: Tehr.: Siah Kuh, 150 km SE Tehran, Schricker s. n.! Damgh.-Semn.: In vallibus prope Rashm, Buhse. Dasht-e Kavir: Arasavan, 1060 m, Gabr. 39!, 54. Yazd: In valle prope Yazd, Buhse 1224. Kermanshahan, 1700 m, Bornm. 3439!

Afghanistan: **NW**: Herat: Inter Herat et Tabas, Bge. — **E**: Kabul: Giri, 2400 m, Koelz 11515! Tang-i Gharu, 1600—1700 m, Kerst. 539! Maipar, 1600—1720 m, Gilli 1775!, 1776! Sarobi, 1050 m, Gilli 1774!, Volk 1615 p. p.!, 2589! Khost: Yakubi, Volk 1097! Lakka Tigga, Volk 1079! Nuristan: Nishai, 1300 m, Edelb. 814! Inter Waigel et Nishai, Neub. 51/733! In valle fluvii Pech infra Wama, 1380 m, Kerst. 825! Prope Ashkun, in faucibus inter Kulatam et Gultsalam, 1600 m, Kerst. 1268! In valle Korgal, 1800 m, Thesiger 1670! — Afghanistan, Griff. 1092!

Pakistan: Chitral: Brumboret Gol, 2050 m, Bowes Lyon 651! — Quetta: Jirani, H.-B. 18894. In parte superiore faucium Torkhan inter Sanjawi, 1400 m, et Harnai, 900 m, Rech. 29448! Harnai, Lace. Kohlu, H.-B. 19450. Loralai, H.-B. 19619. — Kalat: In jugo Burida SSW Kalat, 1270 m, Hotson 210, 210-A. Wad, H.-B. 1729. — Bela: Kanoji N Bela, 970 m, Hotson 210-B. — Makran: In jugo Hodal S Panjgur, 850 m, Hotson M 221. In declivibus australibus jugi Hodal, 750—850 m, Hotson 222. Bal.: In montibus Chagai, Khaisar, Barab Chah, Bulo hills, Chagai Gaz. 125.

Distr. gen.: Syria borealis, Kurdistan, Persia, Afghanistan, Baluchistan, Chitral, Panjab, Kashmir.

Die Art ist in ihrer Blattform variabel; die mehrfach erwähnten f. *populifolia* Boiss. und f. *heterophylla* Engl. sind nach meinen Beobachtungen ohne systematische Bedeutung. Ungeteilte bzw. auf das Endblättchen reduzierte Blätter treten besonders an sterilen Langtrieben nicht selten auf, finden sich jedoch auch neben normalen Blättern gelegentlich an fertilen Zweigen. Wichtiger erscheint mir dagegen die Tatsache, daß eine ost-westliche geographische Gliederung angedeutet ist. West- und südpersische Belege sind zumeist durch große, breite, kurz zugespitzte Blättchen von derber Textur ausgezeichnet, Belege aus Ost-Afghanistan dagegen durch kleinere, relativ schmälere, länger zugespitzte Blättchen von weniger derber Beschaffenheit. Zu einer Unterscheidung von geographischen Rassen sind die mir gegenwärtig vorliegenden Belege nicht ausreichend. Immerhin wäre in Ost-Afghanistan und West-Pakistan auch die Möglichkeit einer hybridogenen Beeinflussung durch *P. chinensis* Bge. subsp. *integerrima* J. L. Stewart in Betracht zu ziehen.

3. ***P. vera*** L., Spec. Plant. 1454 (1753).

Syn.: *P. reticulata* Willd., Spec. Plant. 4: 751 (1797).

Icon.: Tab. 7.

Typus: Planta quaedam culta.

Arbor 3—8(—10) m alta, cortice brunnescente demum cinereo. Folia decidua coriacea imparipinnata; foliola 1—2(—3)-paria, raro foliolum singulum evolutum, glabra vel secus costam medianam sparse puberula, supra lucida, subtus pallidiora, opaca, ovata vel orbicularia, saepe abrupte acuminata, acuta, rarius obtusa, 5—10(—12)×3—6(—8) cm; rachis teres, puberula. Panicula fructifera stricta. Drupa 10—20×6—12 mm, oblongo-linearis vel ovata, apiculata.

Persia: **E**: Khor.: Bezg, Aitch. 665. Khowr, Koelz 16846! In valle fluvii Hari Rud prope Zohrabad, Czernjak. Pul-i Khvatun, Czernjak.

Turcomania: Kopet Dagh, 700—1200 m, sec. Nikitin.
Afghanistan: **N**: Mazar-i Sharif: Chashmeh-i Shafal, in faucibus fluvii Balkh, 500—900 m, Rech. 16321!, Hdg. & Wdb. 3884! — **NW**: Herat: Badghiz: Kamchao, Kaman-i Binisht, Sang-Haji, Aitch. 390. — **E**: Kabul: Kalamao, 2700 m, Koelz 12155! Sher Darwasa prope Kotshe Safar, 1800 m, verosimiliter culta, Gilli 1773! — **NE**: Kataghan: Pul-i Khumri, Volk 2666! In jugo Paigah Kotal inter Haibak et Pul-i Khumri, 1500 m, Rech. 16464!, 33910!, Hdg. & Wdb. 3540! Badakhsh.: Teshkan, 1800 m, Koelz 13086!
Distr. gen.: Persia boreo-orientalis, Afghanistan borealis, Turcomania, Uzbekistan, Tadjikistan, Bokhara, Tien Shan, praeterea praecipue in Regione Mediterranea culta.

Die Art hat offenbar ursprünglich in den Vorbergen Nord-Afghanistans ausgedehnte Bestände gebildet. Diese sind heute in der Nähe größerer Ortschaften und frequentierter Verkehrswege stark dezimiert. *P. vera* wird wegen ihrer genießbaren Früchte stellenweise kultiviert.

4. ***P. chinensis*** Bge., Mem. Div. Acad. St. Petersb. 2: 89 (1835).
In ditione Florae Iranicae tantum occurrit:

— — subsp. ***integerrima*** (J. L. Stewart) Rech. f., comb. nov.
Syn.: *P. integerrima* J. L. Stewart in Brandis, Forest Fl. 122 (1874) et Ill. Fl. NW and Centr. India, tab. 22 (1874). *P. chinensis* Bge. var. *integerrima* (Stewart) Zohary, Palest. Journ. Bot. 5: 216 (1952). *Rhus integerrima* Wall., Catal. 8474 (1828). *Pistacia Khinjuk* Stocks var. *Stocksii* Engler in DC., Monogr. Phan. 4: 291 (1883).
Typus subspeciei: Syntypi numerosi e Pakistan occid.

Arbor 3—15(—25) m alta vel frutex. Folia 18—35×7—10 cm, decidua, saepe paripinnata; foliola 2—4-paria, late lanceolata usque oblonga, basi leviter tantum in petiolum distinctum sinuato- vel cuneato-attenuata, apice longe acuminata. Rami paniculae ascendentes vel patuli. Drupa 5—6 mm diametro, globularis vel obovato-globosa, leviter obliqua.

Afghanistan: **E**: In valle Landesin 1600 m, Neub. 4587!
Pakistan: Kurram: Prope Shalozan et inter Thal et Kurram, Aitch. 38. In valle Kurram, Aitch. 34. — N. Wazir.: Razani, Fz. Boya, Fz. — S. Wazir.: Wana, Blatt. & Fz. In declivibus orientalibus montium Sulaiman, sec. Zohary, l. c. — Bal.: Makran, Palmer.
Distr. gen. subspeciei: Pakistan, Panjab, montes Himalaya occidentales.

Verdient als geographische Rasse subspezifische Bewertung. Die subsp. *chinensis* findet sich nach Zohary, l. c. in China, Formosa und auf den Philippinen, die subsp. *falcata* (Beccari) Rech. f., comb. nov.; Syn. *P. falcata* Beccari ex Ghartelli, Florula Bogosensis 25 (1886), in Ostafrika.

Cotinus Miller 1
Coggygria Scop. 1
Pistacia L. 3
acuminata Boiss. & Buhse 6
atlantica Desf. 3
subsp. **atlantica** 3
subsp. **cabulica** (Stocks) Rech. ... 5
subsp. **kurdica** (Zohary) Rech. f... 5
subsp. **mutica** (Fisch. & C. A.Mey.) Rech. f. 4
var. *kurdica* Zohary 5
cabulica Stocks 5
chinensis Bge. 8
subsp. **chinensis** 8
subsp. **falcata** (Beccari) Rech. f. .. 8
subsp. **integerrima** (J. L. Stewart) Rech. f. 8
var. *integerrima* (Stewart) Zohary. 8
eurycarpa Yaltirik 5
falcata Beccari ex Ghartelli 8
integerrima J. L. Stewart 8
Khinjuk Stocks 6

var. **heterophylla** Engler 7
var. **populifolia** Boiss. 6
var. *Stocksii* Engler 8
mutica Fisch. & C. A. Mey. 4
subsp. *cabulica* (Stocks) Engler ... 5
reticulata Willd. 7
vera L. 7
Rhus L. 2
Coriaria L. 1
Cotinus L. 2
integerrima Wall. 8
mysurensis Heyne ex Wight & Arn. 2

Pistacia atlantica DESF. subsp. *mutica* (FISCH. & C. A. MEY.) RECH. f. — STAPF 536

Tab. 2

Pistacia atlantica Desf. subsp. *kurdica* (Zohary) Rech. f. — Rech. 10834

Pistacia atlantica DESF. subsp. *cabulica* (STOCKS) RECH. f. — RECH. 37001

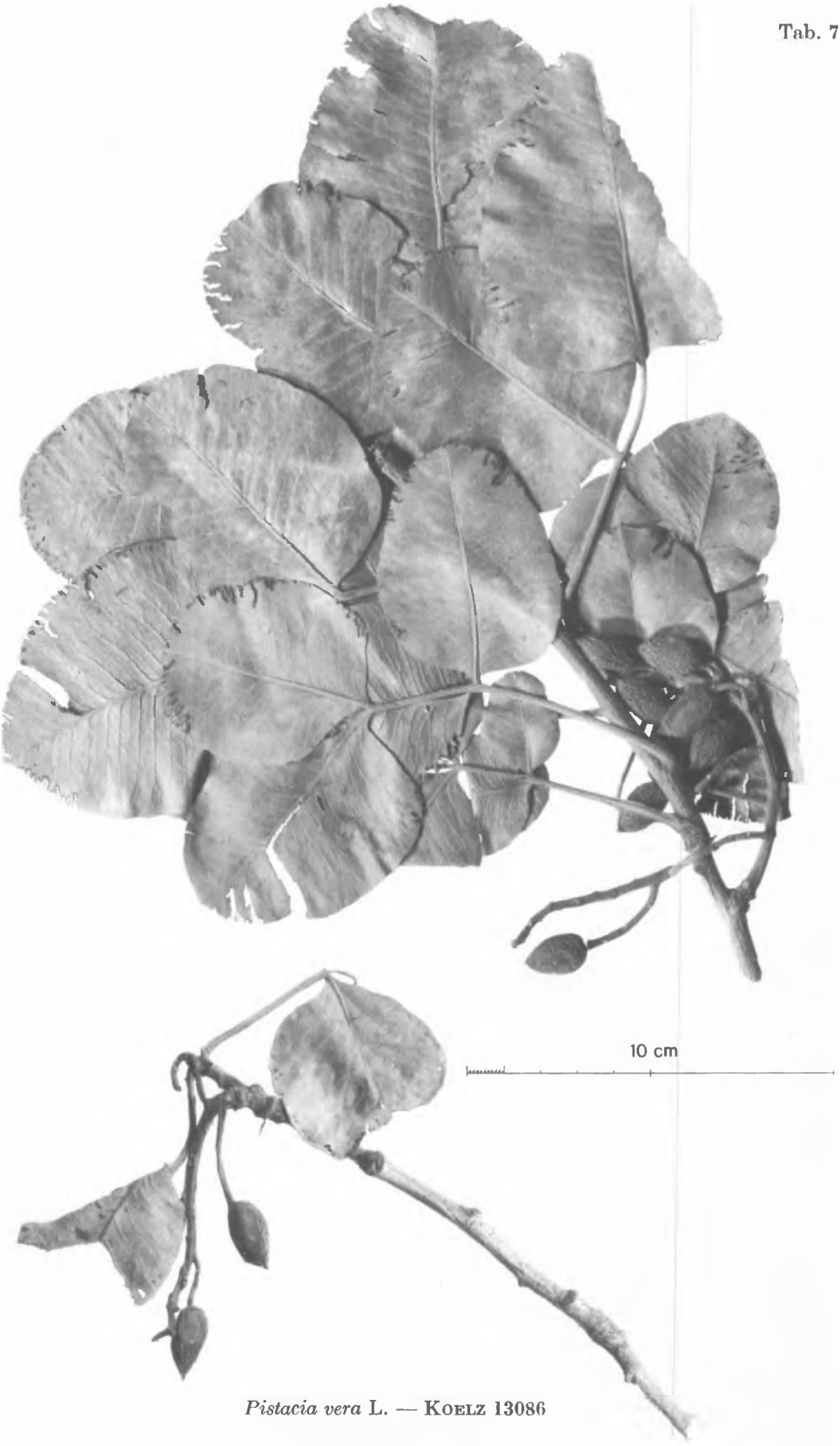
Tab. 4

Pistacia Khinjuk Stocks — Rech. 29448

Pistacia Khinjuk STOCKS — RECH. 3711

Tab. 6

Pistacia Khinjuk Stocks — Rech. 4025



Pistacia vera L. — KOELZ 13086

Pistacia chinensis Bge. subsp. *integerrima* (J. L. Stewart) Rech. f. — Neub. 4587

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Familien mit vorangestellter Continuatio-Nummer sind bereits erschienen.

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
	PTERIDOPHYTA					
	Equisetaceae	1	2	143	(2)	(2)
	Lycopodiaccae	2	1	142	(1)	(1)
	Marsileaceae	5	5	144	(4)	(4)
	Ophioglossaceae	3	3	140	(6)	(6)
	Polypodiaceae	4	4	141	(3)	(3)
	Salviniaceae	6	6	145	(5)	(5)
	GYMNOSPERMAE					
50	Cupressaceae	9	8	136	(8)	(8)
3	Ephedraceae	10	10	138	(10)	(10)
14	Pinaceae	8	9	135	(7)	(9)
12	Taxaceae	7	7	137	(9)	(7)
	ANGIOSPERMAE					
24	Acanthaceae	138	110	84	86	135
61	Aceraceae	86	83	30a	42a	76
	Aizoaceae	48	27	50	57	106
	Alismataceae	16	127	115	124	146
	Amaranthaceae	45	23	93	92	112
	Amaryllidaceae	27	134	128	114	162
	Ampelidaceae	91	91	32	41	66
63	Anacardiaceae	81	81	46	43	75
	Apiaceae	113	94	54	58	127
	Apocynaceae	125	117	82	75	82
25	Aquifoliaceae	82	86	70	38	58
1	Araceae	22	143	120	122	158
	Araliaceae	112	93	55	59	19
26	Aristolochiaceae	40	35	103	97	96
	Asclepiadaceae	126	118	74	76	84
	Asparagaceae	26	133	129	116	155,7pp.
48	Asperifoliaceae	129	104	80	79	142
	Asteraceae	146	126	61	65	131
	Balanophoraceae	42	20	102	103	63
	Balsaminaceae	89	85	25	33b	140
	Berberidaceae	54	40	3	13	96
	Betulaceae	33	11	112	108	25
44	Bignoniaceae	137a	108a	76a	85a	86a
48	Boraginaceae	129	104	80	79	142
57	Brassicaceae	60	46	7	16	101
45	Buddleiaceae	123	115	75	77	80
	Burseraceae	75	78	33	36	72
	Butomaceae	17	128	116	124a	145
27	Buxaceae	80	31	105	104a	23
	Caesalpiniaceae	68b	59b	38b	45b	13
	Callitrichaceae	79	32	47	50b	117
13	Campanulaceae	145	125	62	66	130
	Cannabaceae	37	17a	106	105	30
	Capparidaceae	59	45	8	17	36
10	Caprifoliaccae	141	121	57	61	20
	Caryophyllaceae	50	29	13	23	105
64	Celastraceae	83	87	35	39	60
28	Ceratophyllaceae	52	42	15	110	94
	Chenopodiaceae	44	22	92	93	111
46	Cistaceae	99	49	10	19	33
	Compositae	146	126	61	65	121
2	Convolvulaceae	127	102	78	80	133
54	Cornaceae	114	92	56	60	18
	Corylaceae	33	11	112	108	27
	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
	Cupuliferae	33-4	11-2	111-2	108	25-7
8	Cuscutaceae	128	103	79	80a	141
39	Cynocrambaceae	111	25	91	105c	113
	Cyperaceae	20	139	134	126	169
	Cytinaceae	41	36	101	96	98
29	Datiscaceae	101	54	49	56	43
	Dioscoreaceae	28	137	131	115	164
	Dipsacaceae	143	123	60	64	129
30	Ebenaceae	121	100	69	72	68
48	Ehretiaceae	129	104	80	79	87
55	Elaeagnaceae	103	61	97	100	64
16	Elatinaceae	96	52	18	26	103
11	Ericaceae	116	99	63	67	51
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
	Fagaceae	34	12	111	108a	26
	Ficoidaceae	48	27	50	57	106
	Frankeniaceae	97	51	17	22	38
	Fumariaceae	58	44	6	15a	100
41	Gentianaceae	124	116	76	78	118
	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
	Gramineae	19	140	135	127	170
47	Grossulariaceae	64	57	52	47	17
49	Guttiferae	95	55	19	27	54
18	Halorag(id)aceae	109	67	46	50	115
53	Hamamelidaceae	65	33	53	49	21
	Helleboraceae	53	39	1	11	90
	Hippocastanaceae	87	84	30b	42b	77
31	Hippuridaceae	110	68	45	50a	116
19	Hydrangeaceae	64	57	52	47	16a
	Hydrocharitaceae	18	129	114	111	146

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
49	Hypericaceae	95	55	19	27	54
25	Ilicineae	82	86	70	38	58
	Illecebraceae	50	29	13	23	109
	Iridaceae	29	135	126	113	163
	Juglandaceae	32	13	109	107	28
	Juncaceae	25	136	133	118	168
	Juncaginaceae	14a	130	117a	125b	148
	Labiatae	131	112	87	89	144
	Lamiaceae	131	112	87	89	144
	Lauraceae	56	37	98	98	11
	Leguminosae	68	59	38	45	13-5
	Lemnaceae	23	144	119	123	159
58	Lentibulariaceae	136	107	65	84	137
	Liliaceae	26	133	128	116	155
	Linaceae	71	72	23	31	47
45	Loganiaceae	123	115	75	77	79
	Loranthaceae	39	19	100	101	61
51	Lythraceae	104	62	43	53	114
	Malvaceae	93	69	20	28	46
	Meliaceae	76	79	31	37	73
	Menispermaceae	55	38	2	12	95
41	Menyanthaceae	124	116	76	78	119
	Mimosaceae	68a	59a	38a	45a	14
	Molluginaceae	48	27	50	57	105
	Monotropaceae	115	98	64	67a	52
	Moraceae	36	15	107	105a	31
	Moringaceae	62	48	37	44	37
	Myrsinaceae	117	97	67	70	67
32	Myrtaceae	107	64	40	52	55
	Najadaceae	15	132	118	125	153
	Nyctaginaceae	46	26	95	91	35
33	Nymphaeaceae	51	41	4	14	93
7	Oenotheraceae	108	66	44	54	115
52	Oleaceae	122	119	71	73	81
7	Onagraceae	108	66	44	54	115
	Orchidaceae	30	141	125	112	167
5	Orobanchaceae	135	108	83	83	136
40	Oxalidaceae	69	73	24	33a	139
60	Paeoniaceae	53	39	1	11	89
	Palmae	21	142	121	119	165
34	Papaveraceae	57	43	5	15	99
	Papilionaceae	68c	59c	38c	45c	15
20	Parnassiaceae	64	57	52	47	126
	Pedaliaceae	134	109	77	85	86
	Periplocaceae	126	118	74	76	83
19	Philadelphaceae	64	57	52	47	16
35	Phytolaccaceae	47	24	90	94	110
15	Plantaginaceae	139	114	89	90	122
21	Platanaceae	66	34	110	106	22
	Plumbaginaceae	119	95	88	68	121
	Poaceae	19	140	135	127	170
	Podophyllaceae	54	40	3	13	93
	Polygalaceae	77	80	12	21	41
56	Polygonaceae	43	21	94	95	108
	Portulacaceae	49	28	14	24	107
	Potamogetonaceae	14	131	117	125a	150
9	Primulaceae	118	96	66	69	120
22	Punicaceae	105	65	42	53	57
	Pyrolaceae	115	98	64	67a	50
	Rafflesiaceae	41	36	101	96	98
	Ranunculaceae	53	39	1	11	91
	Resedaceae	61	47	9	18	102
	Rhamnaceae	90	90	36	40	65
	Rhizophoraceae	106	63	41	51	56
66	Rosaceae	67	58	39	46	12
	Rubiaceae	140	120	58	62	85
	Ruppiaceae	14	131	117	125a	151
	Ruscaceae	26	133	129	116	157
36	Rutaceae	73	76	28	34	70
65	Salicaceae	31	14	113	109	24
37	Salvadoraceae	84	88	72	74	59
	Santalaceae	38	18	99	102	62
38	Sapindaceae	88	82	30	42	74
	Sapotaceae	120	101	68	71	69
42	Saxifragaceae	64	57	52	47	124
	Scheuchzeriaceae	–	130	117a	125b	148
	Scrophulariaceae	133	106	82	82	134
	Selaginaceae	137	108	85	87	–
	Simar(o)ubaceae	74	77	29	35	71
	Smila(ca)ceae	26	133	130	116	156
	Solanaceae	132	105	81	81	132
59	Sparganiaceae	13	146	123	121a	160
	Staphyleaceae	85	89	30c	42c	78
	Sterculiaceae	94	71	21	29	45
4	Tamaricaceae	98	50	16	25	39
39	Theligonaceae	111	25	91	105c	113
	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
	Typhaceae	11	147	124	121	161
	Ulmaceae	35	16	108	105b	29
	Umbelliferae	113	94	54	58	127
	Urticaceae	37	17	106	105	32
11	Vacciniaceae	116	99	63	67	53
23	Vahliaceae	64	57	52	47	125
62	Valerianaceae	142	122	59	63	128
43	Verbenaceae	130	111	86	88	88
	Violaceae	100	53	11	20	40
	Vitaceae	91	91	32	41	66
	Zannichelliaceae	14	131	117	125a	15
	Zosteraceae	14	131	117	125a	14
	Zygophyllaceae	72	75	27	32	4

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 64/30. 4. 1969

Celastraceae

auctore K. H. RECHINGER, Wien

Celastraceae

auctore K. H. Rechinger, Wien

Celastraceae „Celastrinae" R. Brown in Flinders, Voy. Terra Austral. 2: 554 (1814).

Lit.: M. A. Lawson, Celastrinae in J. D. Hooker, Flora of British India 1: 606–629 (1875). Th. Loesener, Celastraceae in A. Engler, Die Natürlichen Pflanzenfamilien 3, 5: 189–222 (1896). Th. Loesener, Celastraceae in A. Engler, Die Natürlichen Pflanzenfamilien, ed. 2, 20b: 87–197 (1942). Y. I. Prochanow, Celastraceae in Flora URSS. 14: 546–577 (1949).

Frutices vel arbores humiles, inermes vel spinosi. Folia simplicia. Stipulae parvae vel deficientes. Inflorescentia cymosa. Flores actinomorphi, plerumque hermaphroditi. Calyx 4–5-lobus. Petala 4–5, calycis lobis opposita. Discus plerumque evolutus. Ovarium superum, 1–5-loculare; loculi 1–2(-multi)-ovulati.

1a. Folia opposita. Frutices inermes. ..... 1. *Evonymus* L.
b. Folia alterna vel fasciculata. Frutices spinosi .....
..... 2. *Gymnosporia* (Wight & Arn.) J. D. Hooker

1. *Evonymus*

Evonymus L., Spec. Plant. 197 (1753). Gen. Plant. ed. 5: 91 (1754). (*Evonimus*, *Euonymus*).

Lit.: R. A. Blakelock, A Synopsis of the Genus Euonymus L., Kew Bull. 1951: 210–290 (1952).

Frutices inermes. Folia opposita (in nostris). Flores 4–5-meri. Stamina supra discum inserti. Capsula 4–5-locularis, dehiscens; semina arillo carnoso omnino vel partim obtecta.

1a. Rami dense atro-verrucosi ..... 4. *E. verrucosa* Scop.
b. Rami non verrucosi 2
2a. Rami foliaque pubescentes .....
..... 1. *E. velutina* (C. A. Mey.). Fisch. & C. A. Mey.
b. Rami foliaque glabri 3
3a. Flores pentameri ..... 5. *E. latifolia* (L.) Miller
b. Flores terameri 4
4a. Folia longe argutissime interdum duplicato-serrata, nervis lateralibus utrinque 4–5 ..... 6. *E. fimbriata* Wall.
b. Folia breviter interdum crenato-serrata, nervis lateralibus numerosioribus 5
5a. Antherae flavae..... 2. *E. europaea* L.
b. Antherae purpureae ..... 3. *E. Hamiltoniana* Wall.

Subgen. *Evonymus*

Gemmae hiemales plerumque ovoideae, acutae, parvae. Staminum filamenta evoluta vel antherae subsessiles, thecis duabus apice haud vel imperfecte con-

fluentibus rimis duabus distinctis dehiscentibus. Capsula varia, si ovato-globosa tum haud alata.

1. ***E. velutina*** (C. A. Mey.) Fisch. & C. A. Mey., Bull. Soc. Nat. Mosc. 11: 337 (1838).

Syn.: *E. europaeus* L. var. *velutinus* C. A. Mey., Verz. Pfl. Cauc.: 134 (1831).
Typus: Inter Lenkoran et Swant, Hohen, LE!

Frutex mediocris, ramis subtetragonis tomentellis laevibus. Gemmae vix 2 mm longae, acutae. Petiolus brevis, 2—3(—4) mm tantum longus. Folia usque ad 6(—7,5)×3 cm, elliptico-oblonga vel ± late lanceolata, acuta, minute serrulata, utrinque praesertim secus nervos pubescentia. Cymae pedunculo brevi ad summum 1 cm longo suffultae, umbelliformes, pauciflorae. Flores tetrameri, petala c. 2,5 mm longa. Capsula ± 10 mm diametro, obtuse angulata, pubescens.

Talish: Inter Lenkoran et Swant, Hohen.! In montibus Talish prope Achewlar, Buhse. Talish, C. A. Mey.
Persia: N: Gorg.: Ramian, 600 m, Gauba 816! Ketul, 960 m, Gauba 877! Radkan, Buhse. Gale Maran, 700 m, Gauba 819! Maz.: Nur, 700 m, Gauba 815! Kojur: Inter Nemasieh et Zanus, 800 m, Rech. 6563! Kalar Dasht, 1500 m, Gauba 822! Warahozul, Buhse. — E: Khor.: Gardaneh-ye Chenaran, 700 m, Gauba 818! Inter Bojnurd et Tappeh-ye Moraveh, 1300 m, Rech. 1888!
Turcomania: Kizyl Arvat, Kara Kala, Joldere, Sint. 1836!

Distr. gen.: Talish, Persia borealis, Turcomania.

2. ***E. europaea*** L., Spec. Plant. 197 (1753).

Syn.: *E. vulgaris* Miller, Gard. Dict. ed. 8, No. 1 (1768).
Typus: „Pannonia".

Frutex valde ramosus 2—6 m altus, rarius arbuscula. Rami virides quadranguli. Petiolus 5—10 mm longus canaliculatus. Folia usque ad 10×5,5 cm, ovato-lanceolata usque elliptica, acuta vel acuminata, crenato-serrulata. Cymae pedunculo 1—3 cm longo suffultae, 3—8-florae. Flores plerumque tetrameri; petala 3—5 mm longa, albido-virentia, triangulari- vel elongato-ovata. Antherae flavae. Arillus semen totum involvens. Capsula 10—15 mm diametro, obtuse angulata.

Talish: Astara, Hohen.

Distr. gen.: Europa fere omnis (boreali excepta), Sibiria occidentalis, Anatolia, Caucasus, Talish, Turcestania.

3. ***E. Hamiltoniana*** Wall. in Roxb., Fl. Ind. ed. Carey 2: 403 (1824).

Syn.: *E. europaeus* L. var. *Hamiltonianus* (Wall.) Maxim., Bull. Acad. Sci. Petersb. 27: 449 (1881).
Typus: Nepal, Wall.

Frutex ramis griseis laevibus vetustioribus interdum suberoso-alatis. Folia usque ad 10×5 cm, consistentia in sicco subcoriacea, colore sordide viridi, basi late cuneata vel subrotundata, apice sensim acuminata, margine breviter serrata vel crenato-serrata. Petiolus 8—11 mm longus. Cymae breviter (2—2,5 cm) pedunculatae, pauciflorae, floribus 3—12. Flores tetrameri, virescentes; antherae purpureae. Stylus nullus. Capsula usque ad 10 mm diametro.

Afghanistan: E: Nuristan: Derin, Edelb. 1670! Inter Wama et Pashki, Edelb. 549!

Darim, 1900—2400 m, Neub. 51/998! Parun: Inter Pashki et Chetras, 2100—2300 m, Kerst. 1344!
Pakistan: S.-Wazir.: Sindar Peak, 2100—2700 m, Blatt. & Fz. 1601.
Distr. gen.: Afghanistan, Pakistan, Montes Himalaya, Sina, Japonia.

4. ***E. verrucosa*** Scop., Fl. Carn. ed. 2, 1: 166 (1772).
Typus: Carniolia, Scop.

Frutex ramosissimus, 30—200 cm altus. Rami tenues, teretes, atro-verrucosi, primum virescentes. Petiolus 2—3 mm longus, canaliculatus. Folia usque ad 6×3,5 cm, elliptico-oblonga usque ovata, acuta vel acuminata, crenato-serrulata, ad nervos subtus interdum papillosa. Cymae pedunculo 3—4 cm longo suffultae, 1—3-florae. Flores tetrameri; petala 2,5—3 mm longa, virescentia, rubro-punctata, suborbicularia. Capsula 10—12 mm diametro, obtuse angulata. Arillus semen dimidium involvens.

Talish, C. A. Mey.
Persia: W: Azerb.: Hasanbeyglu, Knapp.
Distr. gen.: Europa, Caucasus, Transcaucasia, Persia boreo-occidentalis.

Subgen. *Kalonymus* G. Beck, Fl. Nieder-Österr. 2, 1: 588 (1892)

Gemmae hiemales plerumque conicae acutissimae, magnae. Stamina subsessilia; antherae late reniformes, thecis unicis apice confluentibus rima continua dehiscentibus post dehiscentiam patelliformibus. Capsula oblato-globosa, parum lobata, saepissime alata.

5. ***E. latifolia*** (L.) Mill., Gard. Dict. ed. 8 No. 2 (1768).
Syn.: *E. europaeus* L. var. *latifolius* L., Spec. Plant. 197 (1753).
Typus: Pannonia.

Frutex elatus longe ramosus rarius arbuscula 2—3(—5) m alta. Rami leviter compressi, olivacei. Petiolus 5—15 mm longus. Folia usque ad 14×6 cm, oblongo-elliptica usque obovata, acuminata, serrulata. Cymae longe tenuiter pedunculatae, 4—12-florae. Flores plerumque pentameri; petala ± 2,5 mm longa, pallide brunnescenti-virescentia, suborbicularia. Capsula 20—25 mm diametro, angulis anguste alatis. Arillus semen totum involvens.

Talish: M. Drych, 1800 m, Hohen. Prope Astara, Cowan. Achewlar, Buhse. Talish, C. A. Mey.
Persia: N: Gorg.: Gorgan, Buhse, Bge. Ketul, 1200 m, Gauba & Sab. Maz.: Prope Shirgah in valle Talar, 300 m, Gauba 821! In jugo Kandavan, 2300 m, Gauba & Sab. Pol-e Zanguleh, Gauba & Sab. Kojur: Inter Kinch et Dasht Nazir, 800—1300 m, Rech. 6643! In valle fluvii Chalus, 2200 m, Rech. 853! Gil.: Prope Masuleh, 650—900 m, Buhse 405, 942. Keyrudkenar, Tregubov 111! — W: Azerb.: Hasan Beyglu, Knapp. Kaleybar, Mird. 820!
Distr. gen.: Algeria, montes Europae australis, Tauria, Caucasus, Anatolia, Persia borealis.

6. ***E. fimbriata*** Wall. in Roxb., Fl. Ind. ed. Carey 2: 408 (1824).
Typus (Syntypi): Sewalik Mts., Cowan. Shreenugur, Kamroop.

Rami teretes. Petiolus usque ad 1 cm longus. Folia usque ad 9×5 cm, in sicco tenuiter membranacea, late obovata, basi cuneata, apice acuminata, margine

argutissime anguste subbiserrata. Cymae pedunculo tenui 2—3 cm longo suffultae, multiflorae. Flores tetrameri; petala 2—2,5 mm longa, pallide flavescenti-viridia, oblongo-obovata. Capsula usque ad 17 mm diametro, quadrialata.

Afghanistan: E: Nuristan: In valle Parun prope Pashki, 2300 m, Kerst. 1336! Pashki, 2300 m, Edelb. 94!, 627!
Pakistan: Chitral: Ziarat, in jugo Lowarai, Stainton 2349! — Kurram: Prope Kaiwas et Shend Toi, 2400—3000 m, Aitch. 375. In collibus N Hariab distr., Aitch.

Distr. gen.: Montes Himalaya, Afghanistan orientalis.

2. *Gymnosporia*

Gymnosporia (Wight & Arn.) J. D. Hooker in G. Bentham & J. D. Hooker, Gen. Plant. 1: 365 (1862), nom. conserv.

Frutices divaricate ramosi spinosi. Folia alterna vel fasciculata, ± coriacea. Inflorescentia cymosa, axillaris vel in ramis spinigeris sessilis. Calyx 4—5-fidus. Petala 4—5 patula. Stamina 4—5, infra discum inserta. Discus dilatatus, sinuatus vel lobatus. Ovarium in disco sessile vel ei immersum, 2—3-ovulare. Stylus brevis; stigma 2—3-lobum. Capsula obovoidea vel globosa; arillus semina partim vel complete obtegens.

1 a. Spinae saepe lateraliter floriferae. Cymae laxiusculae folia saepe superantes. Capsula obovata, bivalvis ..... 1. *G. senegalensis* (Lam.) Loes.
b. Spinae non floriferae. Cymae confertae, foliis breviores. Capsulae globoso-depressa, trivalvis ..... 2. *G. Royleana* (Wall.) Laws.

1. ***G. senegalensis*** (Lam.) Loes., Englers Bot. Jahrb. 28: 151 (1901).

Syn.: *Celastrus senegalensis* Lam., Encycl. Meth. Bot. 1: 661 (1783). *Gymnosporia montana* auct. p. p.
Typus: Senegal.

Frutex squarroso-ramosus, ramulis crassiusculis rectangulariter patentibus, floriferis plerumque valide spinosis. Folia usque ad 3,5×1 cm, oblongo-lanceolata, in tertia parte superiore latissima, coriacea, glauca, indistincte nervosa, apice obtusa vel retusa, basi in petiolum brevissimum attenuata, margine integra vel subintegra vel ± indistincte serrulata. Cymae ± congestae. Capsula ± 5 mm longa, obovata, bivalvis, atropurpurea, subpruinosa. Semen ± 3×2,5 mm, globoso-ellipsoideum, brunneum, nitidum.

Persia: E: Sistan, Annandale & Carter.
Afghanistan: „calidior", Griff. 209.
Pakistan: S. Wazir.: Jandola, Fz. — Quetta: Kohlu, H.-B. 19427. In faucibus calc. Torkhan prope Harnai, 900 m, Rech. 29522! — Kalat: Rar Kaur SW Kalat, 1200 m, Hotson 120-B. Saruna, Jhalowan, H.-B. 1704-a. — Bal.: Gasht, 1380 m, Blatt. & Hallb. Ormara, H.-B. 18565. — Karachi: Soorjana Hills, 480 m, Ticehurst 30883. Inter Mango Pir et Band Murad Khan, Jafri 1355. Malir Cant. Jafri 2593. N Nazimabad, Jafri 833.

Distr. gen.: Africa et Asia tropica et subtropica.

Die Zugehörigkeit der aus der Literatur entnommenen Verbreitungsangaben bleibt wegen der schwankenden Interpretation der Artnamen *montana* und *spinosa* zweifelhaft.

2. ***G. Royleana*** (Wall. ex) Laws. in Hook., Fl. Brit. Ind. 1: 620 (1872).

Syn.: *Celastrus Royleanus* Wall., Catalogus 4317 (1828), nomen. *G. spinosa* auct. p. p.

Typus: Wallich, Cat. No. 4317.

Frutex patule ramosus horride spinosus; spinae 2—3 cm longae, tenues, rigidae, subhorizontaliter vel suberecto-patentes, non floriferae. Folia forma et magnitudine valde variabilia, 1—3 × 0,5—2,5 cm, late lanceolata, elliptica, ovata interdum suborbiculata, infra medium vel in medio latissima, crasse coriacea, pallide viridia, nervatura densissime reticulata parum prominente, basi late cuneata vel rotundata, brevissime petiolata, apice obtusiuscula vel ± acuta, margine integra vel indistincte serrulata. Cymae in axillis spinarum subsessiles. Capsula 4—6 mm longa, longitudine latior, depresso-globosa, trivalvis, viridis. Semen c. 5 × 2,5 mm, fuscum, opacum.

Afghanistan: **E**: Laghman: Najil, 1500 m, Koelz 11631! Khost: In valle fluvii Matun, 10—15 km NW Khost, 1400 m, Rech. 35747! Yakubi, Baq, Volk 1102-a! Nuristan: Inter Asmar et Barikot, 900 m, Edelb. 1635! Inter Nikshai et Ningalam, Neub. 792/1951! Inter Ningalam et Darim, 1300—1900 m, Neub. 951/1951!
Pakistan: Kohat: 20—30 km W Kohat versus Thal, in collibus conglom., 500—700 m, Rech. 30205! — Kurram: Hangu, Y. M. Khan 22!, 41! — Bannu: Tutaki, 50 km N Bannu, 700 m, Rech. 30081! — N. Wazir.: Spinwam Fort, Blatt. & Fz. Miram Shah, Blatt. & Fz. Shewa Post, Blatt. & Fz. Boya, Blatt. & Fz. — Bal.: S Panjgur, 930 m, Hotson M 76-a. Chambor E Kolalai, 570—690 m, Hotson M 76-b. Baluchistan, Lace.

Distr. gen.: Sina, India, Pakistan, Afghanistan.

Celastrus L.
- *Royleanus* Wall. 4
- *senegalensis* Lam. 4

Evonymus L. 1
- Subgen. **Evonymus** 1
- Subgen. **Kalonymus** G. Beck 3
- **europaea** L. 2
  - var. *Hamiltonianus* (Wall.) Maxim. 2
  - var. *latifolius* L. 3
  - var. *velutinus* C. A. Mey 2
- **fimbriata** Wall. 3
- **Hamiltoniana** Wall. 2
- **latifolia** (L.) Mill. 3
- **velutina** (C. A. Mey.) Fisch. & C. A. Mey. 2
- **verrucosa** Scop. 3
- *vulgaris* Mill. 2

Gymnosporia (Wight & Arn.) J. D. Hooker 4
- *montana* auct. p. p. 4
- **Royleana** (Wall. ex) Laws. 4
- **senegalensis** (Lam.) Loes. 4
- *spinosa* auct. p. p. 4

Salicaceae

auctoribus A. NEUMANN, Wien et A. K. SKVORTSOV, Moskva

Lfg. Cont. No. 65/30. 4. 19(

FLORA DES IRANISCHEN HOCHLANDES UND DER UMRAHMENDEN GEBIRGE

PERSIEN, AFGHANISTAN, TEILE VON WEST-PAKISTAN, NORD-IRAQ, AZERBAIDJAN, TURKMENISTAN

von

Univ.-Prof. Dr.
KARL HEINZ RECHINGER
Erster Direktor des Naturhistorischen Museums in Wien

AKADEMISCHE DRUCK- u. VERLAGSANSTALT
GRAZ-AUSTRIA

Salicaceae

auctoribus A. NEUMANN, Wien et A. K. SKVORTSOV, Moskva

Salicaceae „Salicineae" MIRBEL, Elém. Phys. Vég. Bot. 2: 905 (1815).

Arbores vel frutices humiles vel elati. Folia spiraliter disposita petiolata, indivisa plerumque penninervia. Stipulae fere semper evolutae, caducae vel persistentes. Flores in amenta racemosa vel spiciformia dispositi. Perianthium cupuliforme vel e nectariis pluribus consistens, plerumque persistens. Stamina numerosa vel pauca (2). Fructus capsula quadri- usque bivalvis, unilocularis. Semina plerumque numerosa, basi comosa.

1 a. Medulla surculorum sectione transversali 5-angula. Petiolus foliorum plerumque longus a latere compressus; lamina longitudini plerumque aequilata vel latior. Amenta floribus ± longe pedicellatis racemosa, elongata, mascula flaccida. Bracteae profunde fimbriatae vel rarius grosse dentatae, valde caducae, jam sub anthesi omnino deciduae vel exsiccatae, partim in amentis persistentes. Perianthium cupuli- vel cyathiforme, non vel incomplete tantum divisum. Stamina numerosa, filamentis brevibus . 1. *Populus* L.

b. Medulla surculorum sectione transversali teres. Petiolus foliorum plerumque brevis, a dorso subcompressus vel teres, numquam a latere compressus, lamina latitudine plerumque longior. Amenta floribus ± sessilibus spicata magis compacta, etiam mascula rigida. Bracteae integrae, post anthesin deciduae vel omnino persistentes. Perianthium e glandulis nectariferis paucis non prominentibus consistens. Stamina pauca, plerumque 5—2 (interdum connata), filamentis longis ..... 2. *Salix* L.

1. *Populus*

auctore A. NEUMANN, Wien

Populus L., Spec. Plant. 1034 (1753). Gen. Plant. ed. 5: 456 (1754).

Lit.: L. A. DODE, Extraits d'une monographie inédite du genre Populus, Mém. Soc. d'Histoire naturelle d'Autun 18: 161—231 (1905). E. GOMBOCZ, A Populus-nem monographiaja (Monographia generis Populi), Math. és Term. Közl., 30. kötet, 1 sz. (Budapest 1908). V. L. KOMAROV, Popularum USSR. incolarum revisio, Journal botanique de L'URSS. 19: 495—511 (1934). V. L. KOMAROV, Flora URSS. 5: 21—242 (1936). G. HOUTZAGERS, Het Geslacht Populus in verband met zijn Beteekenis voor de Houtteelt (Wageningen 1937). W. BUGALA, Systematika euroazjatyckich topoli z grupy Populus nigra L., Arboretum Kornickie 12 (1967).

Arbores deciduae (raro foliis incomplete perhiemantibus) ligno molli, corona plerumque monopodiali, gemmis plerumque plurisquamosis balsameis. Folia semper positione 2/5, in brachyblastis quidem longe petiolata, in arboribus juvenilibus ad basin laminae plerumque glandulosa. Stipulae initio semper evolutae, sed plerumque sub evolutione foliorum vel paulo post deciduae. Amenta plerumque praecocia, basi plerumque sine foliis vel squamis persistentibus. Germen 4- usque

2-carpellatum, in perianthio semper sessile, stigmatibus sessilibus, plerumque lobato-dilatatis. Ovula plerumque numerosa.

Die Arten der Gattung *Populus* sind schwierig zu erfassen. Je nach Triebsorte — Wurzelsproß, Kurz- oder Langtrieb — wie auch nach Alter des Individuums ist die Blattgestalt äußerst verschieden. Daher sollte man beim Sammeln die verschiedenen Triebsorten jeweils vom gleichen Individuum berücksichtigen und deutlich als zusammengehörig kennzeichnen, noch unbelaubte Kätzchenzweige womöglich mit abgefallenen vorjährigen Blättern ergänzen und Notizen über die Wuchsform und weitere, am Herbarbeleg nicht erkennbare Eigenschaften hinzufügen.

Bekanntlich sind die Pappeln zweihäusig und durch Stecklinge leicht zu vermehren. Dadurch erklärt sich die Tatsache, daß über weite Landstriche hinweg ausschließlich das eine oder das andere Geschlecht einer bestimmten Pappelsorte vorkommt. Bei der mangelhaften Kenntnis der asiatischen Pappeln einerseits, bei ihrer überragenden Bedeutung als raschwüchsige Holzlieferanten in holzarmen Gebieten andererseits wären nähere Angaben auch über die kultivierten Pappeln aus entlegenen Gebieten willkommen. Auch würde es sich empfehlen, Stecklinge zur näheren Untersuchung und Bestimmung aus dem iranischen Gebiet in europäische Pflanzgärten einzuführen.

1a. Rami tenues, omnes gemmis binis obtusis lateralibus provisi. Gemmae squamae exteriore singula coriacea provisae, squamae interiores abrupte membranaceae. Folia ramorum et surculorum, arborum juvenilium et vetustorum valde heteromorpha (lanceolata usque reniformia), non lobata, integra vel dentium paribus paucis validis acutis provisa, non ciliata, utrinque glauca. Amenta coaetanea, id est eodem tempore ac folia evoluta, floribus non numerosis (ad summum 30) longe pedicellatis. Perianthium acutilobum usque incisum, ante maturitatem deciduum. Germina et capsulae anguste ovato-conoideae, laeves, multiovulatae. (Sect. *Turanga*) 2

b. Rami crassi (vel crassiusculi), gemma terminali a lateralibus bene distincta provisi. Gemma terminalis acuta, squamis paucis usque pluribus crasse pergamenis provisa. Folia subaequalia, indivisa vel folia summa macroblastorum lobata, numquam integra nec grosse dentata sed plerumque minute crenata usque serrata. Amenta praecocia, id est ante folia evoluta. Perianthium integrum usque obtuse lobatum, persistens 3

2a. Gemmae farinoso-puberulae, numquam balsameae. Folia arborum juvenilium et macroblastorum ± ovata, ea arborum vetustorum et brachyblastorum ± transversaliter elliptica usque reniformia, omnia integra vel indistincte tantum denticulata, juvenilia quidem cum ramis farinoso-puberula. Perianthium florum femineorum usque ad basin fere in lacinias ± 8 lanceolatas uninervias divisum ..... 1. *P. pruinosa* Schrenk

b. Gemmae glabrae, foliis enascentibus paulum balsameae. Folia valde heteromorpha, in surculis radicalibus linearia integra, in arboribus juvenilibus et in macroblastis ± lanceolata, in arboribus vetustis et in brachyblastis ± rhombica semicircularia transversaliter elliptica vel reniformia, grosse acute dentata, mox glabrescentia vel ab initio glabra. Perianthium florum femineorum incomplete divisum, dentibus vel laciniis enerviis ..... 2. *P. euphratica* Olivier

3a. Gemmae semper balsameae, laterales squamis paucis ad summum tribus non vel incomplete occultis provisae. Folia omnia non lobata, valde acuta, minute crenata vel serrata. Amenta modice multiflora (floribus non ultra 90). Bracteae caducae, sub anthesi jam delapsae, flavescentes

vel in margine profunde fimbriato brunnescentes, non vel breviter tantum ciliatae. Perianthium florum femineorum symmetricum, applanato-cupuliforme. Germen 2—4-carpellatum, ovatum usque globosum. Stigmata magna, late lobata. Ovula modice numerosa. (Sect. *Aigeiros*) 4

b. Gemmae parce vel non balsameae et tunc tomentosae, laterales squamis 4 vel pluribus visibilibus provisae. Folia acuta vel obtusiuscula, obtuse dentata, summa macroblastorum in speciebus nostris semper lobata et subtus tomentosa. Amenta multiflora, floribus semper ultra 90. Bracteae sub anthesi partim quidem exsiccatae in amentis persistentes, incisae usque grosse dentatae, non fimbriatae, sed longe ciliatae, brunneae. Perianthium florum femineorum assymetricum, oblique cupuliforme. Germen bicarpellatum, ovoideo-conicum, non rugosum. Stigmata parva, anguste lobata. Ovula pauca. (Sect. *Leuce*) 11

4a. Foliorum laminae utrinque concolores nitidae, petiolo lateraliter compresso non rimoso saepe oblique vel verticaliter dispositae, non distincte ciliato-puberulae. Germen ± laeve 5

b. Foliorum laminae supra atriora et magis lucida quam subtus, petiolo teretiusculo saepe rimoso semper horizontaliter dispositae, juveniles plerumque distincte ciliato-puberulae. (Sect. *Tacamahaca*) 7

5a. Foliorum laminae marginibus leviter arcuatis ± ovatae, omnes ambitu et apice subaequales. Germen sat breviter pedicellatum ..... 3. *P. afghanica* (AITCH. & HEMSL.) C. K. SCHNEIDER

b. Foliorum laminae marginibus valde vel subangulato-arcuatis subrhombico-ovatae, imprimis in folio sexto vel septimo ramulorum longe acuminatae 6

6a. Foliorum laminae ± anguste rhombico-ovatae, plerumque latitudine longiores. Flores et capsulae breviter pedicellati usque subsessiles ..... 4. *P. Sosnowskii* GROSSH.

b. Foliorum laminae ± late rhombico-ovatae, plerumque latitudini aequilongae. Flores et capsulae longiuscule pedicellati ..... 5. *P. nigra* L.

7a. Rami annotini pallide grisei, in arboribus vetustis quoque ± acutanguli. Laminae foliorum omnium latitudine longiores, parce ciliato-puberulae. Germen glabrum 8

b. Rami annotini brunnescentes (anno secundo quoque grisei), in arboribus vetustis subteretes. Laminae foliorum partim latitudini aequilongae, margine dense ciliato-puberulae 9

8a. Surculi angulati, breviter pubescentes. Rami arborum vetustorum obtusanguli. Petioli longi lateraliter compressi; laminae e basi late cuneata ovatae, subtus pallide virides. Flores et capsulae breviter pedicellatae ..... 6. *P.* × *berolinensis* C. KOCH

b. Surculi alato-angulati, glabri. Rami arborum vetustorum manifeste angulati. Petioli breves teretiusculi; laminae e basi cuneata vel rotundata (in foliis maximis quoque subcordata) lanceolatae, subtus albido-virides. Flores et capsulae subsessiles ..... 7. *P. laurifolia* LEDEB.

9a. Folia minuscula usque ad ± 10 cm longa, lamina plerumque latitudine longiore, basi cuneata usque rotundata, ovata, leviter acuminata ..... 8. *P. talassica* KOMAR.

b. Folia majuscula usque magna, ± 10—±20 cm longa, lamina basi plerumque truncata usque subcordata, latitudini aequilonga, subito acumi-

nata 10

10a. Surculi et rami pubescentes. Folia mediocria, petiolo incluso ± 10 cm longa, laminae e basi subcordata vel rotundata late ovatae. Germen et capsula apicem versus puberulae ..... 9. *P. pamirica* Komar.

b. Surculi et rami glabri. Folia majuscula ± 20 cm longa, laminae arborum vetustorum e basi cordata cordato-ovatae, acuminatae, dense ciliato-pubescentes. Germen glabrum ..... 10. *P. ciliata* Wall.

11a. Indumentum ramorum et foliorum ± floccosum aegre persistens. Folia infima surculorum subtus mox glabrescentia, opaca, viridia, a foliis superioribus subtus albo-tomentosis valde diversa. Gemmae et amenta magnae ..... 11. *P. caspica* Bornm.

b. Indumentum ramorum et foliorum dense intertextum, magis persistens. Folia infima surculorum subtus incomplete glabrescentia, splendore argenteo-cinerascente persistente, a foliis superioribus subtus albo-tomentosis minus diversa. Gemmae et amenta minores ..... 12. *P. alba* L.

1. ***P. pruinosa*** Schrenk, Bull. Acad. Sci. Petersb. 3: 210 (1845).

Icon.: Gombocz, l. c. 74 (1908).

Typus: Ad ripas fluvii Ili, LE.

Arbor parva (?) vel mediocris, coma diffusa intricate ramosa, radicibus proliferis saepe silvulas formans. Rami juveniles nec farinosi nec balsamiferi. Folia valde variabilia; folia surculorum radicalium breviter petiolata elliptica, latitudine longiora, folia macroblastorum et arborum juvenilium ovata usque suborbicularia, folia brachyblastorum et arborum vetustorum longius petiolata, plerumque longitudine latiora transversaliter elliptica vel reniformia, omnino integra vel partim tantum indistincte dentata, utrinque opaca, glauca. Amenta cum foliis juvenilibus coaetanea, foliis (an semper?) non suffulta, floribus non numerosis usque ad 25 manifeste pedicellatis. Bracteae anguste oblongae, dentatae, glabrae, valde caducae, ineunte anthesi jam delapsae. Perianthium florum femineorum fere ad basin usque in lobos 8 acutas uninervios divisum, ante fructificationem deciduum. Axis amentorum, pedicelli et germen breviter pubescentes. Capsula anguste ovato-conica, trivalvis.

Turcomania: Suluklü, Sint. 933 p. p.

Afghanistan: **N**: Akcha, ad fluvium, Neub. 50/110! — **NE**: Kataghan: Jalogir inter Baghlan et Kunduz, Neub. 50/109! — **C**: Doab: Pshang W Doab, 1670 m, Gilli 2446!

Distr. gen.: Asia centralis: Turcomania, Afghanistan, Kazakhstan, Uzbekistan.

In Flußauen im nördlichen Teile des Gebietes wildwachsend; ob auch kultiviert ?

2. ***P. euphratica*** Olivier, Voy. Emp. Ottoman 3: 449 (1807).

Syn.: *P. diversifolia* Schrenk, Bull. Acad. Sci. Petersb. 10: 253 (1842) et Fisch. & C. A. Mey., Enum. Pl. Nov. Schrenk. 2: 15 (1842). *P. ariana* Dode, Mém. Soc. Hist. Nat. Autun 18: 16 (1905). *P. Litwinowiana* Dode, l. c.: 17. *P. transcaucasica* Jarmolenko ex Grossh., Dokl. A. N. Azerb. S. S. R. 11, 9: 379 (1946).

Icon.: C. K. Schneider, Ill. Handb. Laubholzk. 1, fig. 1q—t (1906).

Typus: „Ad fluv. Euphratem", Oliv.

Arbor parva (?) vel mediocris, coma diffusa intricate ramosa, radicibus proliferis saepe silvulas formans. Rami juveniles plerumque glabri vel leviter pubescentes demum glabrescentes, leviter balsamiferi. Folia valde variabilia; folia surculorum radicalium breviter petiolata, anguste linearia, ut videtur semper

integerrima; folia arborum juvenilium et macroblastorum lanceolata vel anguste rhombica, plerumque integerrima; folia arborum vetustorum et brachyblastorum longe petiolata, late ovata, transverse elliptica vel semicircularia vel rheniformia, grosse argute dentata, dentibus utrinque 3—5; folia omnia utrinque opaca vel glaucescentia. Amenta cum foliis juvenilibus coaetanea, aphylla vel rarius foliis nonnullis parvis suffulta, floribus non numerosis c. 13—35, longe pedicellatis. Bracteae anguste oblongae, dentatae, glabrae, valde caducae. Perianthium florum femineorum circiter ad medium usque in lobos inaequales acutos indistincte nervosos divisum, ante fructificationem deciduum. Axis amentorum, pedicelli et germen glabri vel longe pubescentes. Capsula anguste ovato-conica, trivalvis.

Iraq: Kurd.: Arbil: Ad radices M. Baradost prope Shanidar, 800 m, Erdtman & Goedemans in Rech. 15661! — Kut al-Imara: Zurbatiyah, cult. Abbas in Barkley 7635! — Diyala: Khanaqin, Regel 44! Diyala, Sutherland 315!

Persia: **N**: Gil.: Gilan, Michaux. Prope Manjil ad fl. Shahrud, Buhse. Inter Manjil et Pachenar, Bornm. 8249. — **W**: Azerb.: Tabriz, Gill.-Sm. 1373, 1645. Kurd.: Sanandaj, 1600 m, Jacobs 6694! Kermansh.: In valle Jamnasu, Str. Inter Kermanshah et Sanandaj, Hausskn. Kermanshah, Cowan. In valle Gavehrud, 1500 m, Gauba 1922! Ham.: Hamadan, cult., Str. Esf.: Kuh-e Sofeh, Deicke. Khuz.: Prope Shush, Nab. 4414. Inter Ahwaz et Al Badji, Tregubov 207! 77 km N Ahwaz, 30 m, Grant 15921! 120 km N Ahwaz, Stutz 1005! Ahwaz, cult., Koelz 14967!, Gauba 1921! Inter Shush et Andimeshk, Bent & Wr. 426—401! Lur.: Bisheh, 50 km E Khorramabad secus fl. Rud-e Dez, 1200 m, Rech. 5773! 32—80 km S Khorramabad, Stutz 1010!, 1021! Dow Rud, Koelz 17143!, 17173! Najiu, 1700 m, Koeie 573! — **S**: Fars.: Shapur, 900 m, Koeie 1725! Gere inter Bushehr et Shiraz, Ky. 223! Tang-i Chirkun prope Shapur, Stapf 901! Shiraz, Stapf 902! Inter Runiz et Sarvestan, 1500 m, Bornm. 4525. Kerm.: Chashmeh-ye Nakhila, 700 m, Gabr. 143. Ab-e Konji, 900 m, Gabr. 123. Nosratabad, Annandale 14. 11 km NW Abarqu, 148 km SE Kerman, Grant 15301! 50 km E Bam, 800 m, Grant 15303! Lar.: 15 km N Gahkom, 500 m, Grant 15152! Inter Saidabad et Bandar Abbas, Sab. in Gauba 1924! Hajjiabad prope Tarom, 900 m, Rech. 3498!, Popov 51/96!, Sab. in Gauba 1923! Bal.: Baluchistan, Stocks. Makran: Iranshahr, Shar. 266-E! — **E**: Sistan; Czernjak. Khor.: Inter Tappeh-ye Moraveh et Bojnurd, Gauba 1924-a! Prov. Khorasan, Bge. — **C**: Qazv.: Pachenar, Stapf. Yazd: Hajjiabad, Bornm. 4527. Inter Aqda et Chafteh, 1300 m, Bornm. 4528!

Turcomania: Kizyl Arvat, Sint. 1684!, 2214! Gyaurs, Sint. 32, -b. Suluklü, Sint. 933 p. p.

Afghanistan: **NW**: Bala Murghab, Aitch. Badghiz, Aitch. Tirphul, Aitch. — **SW**: Herat: Shindand, 1000 m, Koeie 4089! Inter Farah et Shindand, 1000 m, Koeie 3453! Farah, 700 m, Koeie 4088!, Volk 2914-a! — **SE**: Kandahar: Inter Farah et Girishk, Volk 2914! Marja SW Qala Bist, Rech. 34719! In alveo fluvii Helmand prope Qala Bist, 800 m, Rech. 34725!, 34727! Lashkargah Bazar, 1000 m, Frumkin 58! — **E**: Kabul: Tang-i Gharu, 650 m, Gilli 2445! In Regno Cabulico, Griff. — **NE**: Badakhsh.: Faizabad, Ferdinand s. n.!

Pakistan: Peshawar: Dhok Pathan prope Campbellpore, Siddiqui & Saffar Ali 3748! — S. Wazir.: Palosina, Steward — Quetta: Pishin. Gaz. 356. Sibi, Lace, Gaz. 330. Thal-Chotiali distr. Lace. Quetta, Gaz. 356. Nasirabad, Gaz. 330. Ad fl. Narechi, Lace, Loralai Gaz. 19, 28. Kohlu, H.-B. 19449. Qila Saifullah, Zhob Gaz. 326. Ft. Sandeman, Zhob Gaz. 326. — Kalat: Jhalowan, H.-B. 18348. Inter Khuzdar et Wad, Stocks. 10 km S Khuzdar, Rech. 27396! S Kalat, 1600 m, Hotson 144. SSW Kalat, 1200 m, Hotson 206. — Bela: Prope Kotiro, H.-B. 18482. — Bal.: Saravan, H.-B. 20704. Kharan, H.-B. 23160. Shah Bilaweel, Stocks. Makran, Gaz. 340. Awaran, Hotson M 280.

Distr. gen.: Asia centralis et australior, Africa borealis; in Hispania inquilina.

An Flüssen im ganzen Gebiet wildwachsend, an Bewässerungskanälen und in Ortschaften auch angepflanzt.

Die ungewöhnlich große Variabilität der Blattgestalt liegt vor allem in Unterschieden begründet, die teils von der jeweiligen Sorte der Triebe — Lang- oder Kurztriebe — teils auch vom Alter der Individuen herrühren. Hinzu kommen noch rein individuelle, kahle wie auch schwächer bis stärker flaumhaarige Ausbildungen. Diese Umstände veranlaßten einige Autoren, *P. euphratica* in mehrere Teilarten zu zerlegen. Das nunmehr aus dem Gebiet der Flora Iranica reichlich vorliegende Material weist jedoch keinerlei Merkmalskorrelationen auf, die auf bestimmte Gebiete beschränkt wären. Daher müssen die von Dode begründeten Arten *P. ariana* und *P. Litwinowiana* als Synonyme zu *P. euphratica* gestellt werden. Auch kann *P. amygdalaceifolia* Griff., Itin Not. Posth. Pap. 2: 286, no. 812 (1848) nach Namen und Vorkommen nur zu dieser Art gehören. Lediglich eine im Bereich der historischen Hauptstadt Shapur gesammelte Ausbildung mit gesteigerter Kurzflaumigkeit aller Teile wird höher zu bewerten sein, weil sich durch diese Merkmale eine gewisse Annäherung an *P. pruinosa* ergibt. Dennoch dürfte es kein Bastard mit *P. pruinosa* sein, da deren Areal nicht so weit nach Süden reicht und übrigens auch im Überlappungsbereich der Areale dieser Arten bisher keine Bastarde nachgewiesen werden konnten.

3. ***P. afghanica*** (Aitch. & Hemsl.) C. K. Schneider in Sarg., Plant. Wils. 3: 36 (1917).

Syn.: *P. nigra* L. var. *afghanica* Aitch. & Hemsl., Journ. Linn. Soc. Bot. 18: 96 (1880).

Arbor mediocris vel elata, coma stricte ramosa diffusa, in speciminibus cultis interdum columnari, ramulis sat tenuibus, radicibus non proliferis. Cortex trunci diu pallide griseus, demum ater; rami annotini pallide brunnei, vetustiores pallide cinerei. Folia longe petiolata, basi plerumque obtuse angulata, ambitu ovata, apice acuminata; folia infima ramorum herbaceorum basi magis cuneato-protracta apice brevius acuminata; folium quintum usque septimum basi cuneato-angulatum, apice longius acuminatum, inde latitudine manifeste longius; folia omnia leviter crenato-dentata, utrinque viridia nitidula, cum ramis glabra vel persistenter pubescentia (vide subspecies). Amenta praecocia, modice multiflora, floribus 30—50; axis glabra vel pubescens. Flores breviter pedicellati. Bracteae late ovatae, longe fimbriatae, glabrae, non ciliatae, pallide flavescenti-virides, fimbriis brunnescentibus, sub anthesi deciduae. Perianthium florum femineorum cupuliforme indivisum, margine remote crenatum, persistens. Germen bicarpellatum, ovatum, glabrum. Stigmatis lobi lati.

— — subsp. ***afghanica***

Syn.: *P. afghanica* (Aitch. & Hemsl.) C. K. Schneider subsp. *usbekistanica* (Komar.) Bug., Arboret. Kornickie 12: 158 (1967). *P. usbekistanica* Komar., Journ. Bot. URSS. 19: 509 (1934). *P. cataracti* Komar., l. c.

Typus: Aitch. 161, K!

Rami herbacei, folia et axis amentorum ab initio glabri vel primum puberuli mox glabrescentes.

Talish: sec. Fl. URSS. 5: 230 (1936). In planitie versus mare casp., C. A. Mey.

Persia: W: Kurd.: 31 km N Sanandaj, 2000 m, Grant 16059! Lur.: Azna, 1800 m, cult. Koeie 1726! — S: Fars.: Bagh-i Bagich prope Shiraz, Stapf 900!

Afghanistan: E: Kabul: Hauz-i Mahiha, 2500 m, Koeie 2477! Maidan, Reiner 637! Kabul, cult., Volk 1525! Darulaman, Manger.

Pakistan: Kurram: In valle Kurram, Aitch. 161! Shalozan, cult., Aitch. — S. Wazir.: Dargai Oba versus Sarwekai, Fz.

Distr. gen. subspeciei: Asia centralis, montes Tien Shan, Altai, Pamir, Hindukush.

Bei den oben angeführten Belegen und Literaturangaben fehlen zumeist Angaben der Sammler über die Wuchsform (Kronengestalt); dadurch ist es unmöglich zu entscheiden, bei welchen Belegen bzw. Angaben es sich um spontane bzw. kultivierte Vorkommen handelt.

Zu dieser Unterart gehört der dem nomenklatorischen Typus der Art entsprechende Cultivar „*Afghanica*" (*P. afghanica* s. str.) sowie *P. thevestina* DODE, Bull. Soc. Amis des Arbres Paris (1903) mit aufrechten Ästen und Zweigen und dadurch schmal säulenförmigem Wuchs, eine homologe Erscheinung zum Cultivar „*Italica*" der *P. nigra*, der von diesem aber außer den spezifischen Eigenschaften auch am stets runden (nicht mit Wurzelanläufen versehenen) Stammgrund und übrigens sein nur weibliches Geschlecht immer sicher zu unterscheiden ist. Diese zweifellos uralte Kulturform ist vermutlich in Zentralasien entstanden und hat durch immer wieder erfolgte vegetative Vermehrung durch Stecklinge ein weites Kulturareal erlangt, das bis nach SE-Europa und N-Afrika reicht.

Weil diese Ausbildung nur dünne und mehr quirlig genäherte Äste besitzt, nimmt ihr Stamm zum Wipfel hin nur allmählich an Stärke ab und eignet sich somit als Nutzholz, wogegen am Cultivar *Italica* der *P. nigra* der Stamm infolge unregelmäßiger starker Beastung sich rasch auflöst und keinen besonderen Nutzwert hat.

— — subsp. ***tadshikistanica*** (KOMAR.) BUG., Arboret. Kornickie 12: 182 (1967).

Syn.: *P. tadshikistanica* KOMAR., Journ. Bot. URSS. 19: 509 (1934).

Typus subspeciei: Distr. Baldshuan inter pagos Chasret-Sultan et Asprington, MICHELSON 3536, LE.

Rami herbacei, folia imprimis petioli et axis amentorum persistenter pubescentes.

Distr. gen. subspeciei: Asia centralis.

Im Gebiet der Flora Iranica in typischer Ausbildung bisher nicht gesammelt, doch in Afghanistan zu erwarten. Sonst mit der subsp. *afghanica* vorkommend, doch anscheinend weniger weit westwärts verbreitet.

4. ***P. Sosnowskii*** GROSSH., Not. Syst. Tbil. 10: 2 (1941).

Typus (Syntypi): Tbilissi, insula Madatovi fluvii Kura, OVERIN. Kjurdamir, GROSSHEIM, LE.

Habitu *P. nigrae* L. valde similis, sed foliorum lamina autem angustior et flores brevius pedicellati.

Distr. gen.: Caucasus et Transcaucasia.

Aus dem Gebiete bisher nicht bekannt, bleibt jedoch im NW-Teile (Küstenstriche des Kaspischen Meeres) zu erwarten. In Flußtälern bis etwa 1250 m aufwärts, wild und auch kultiviert. Vom Autor der Art noch anderweitig vermutete Vorkommen (Gebiete der unteren Wolga und Ufa, Donezbecken) ließen sich nach neueren Untersuchungen (BUGALA 1967) nicht bestätigen.

Nach unserer vorläufigen Auffassung ist diese Art recht schwach begründet. Sie wird nach hinreichender Untersuchung wohl besser als Unterart von *P. nigra* L. zu betrachten sein. Bekanntlich kommen auch bei dieser hie und da schmalblättrige Individuen vor und auch die kürzeren Stiele der Blüten dürften praktisch nicht so klare Unterschiede ergeben, wie nach den Literaturangaben anzunehmen wäre.

5. ***P. nigra*** L., Spec. Pl. 1034 (1753).

Arbor mediocris usque elata, usque ad 30 m alta, coma effusa ramis strictis sat validis, planta culta coma columnari vel semicolumnari („pyramidali"). Radix plerumque non prolifera. Cortex trunci primum cinereo-viridis, demum atrato-induratus. Rami annotini pallide brunnei, vetustiores pallide cinerei. Folia turionum e basi protracta vel angulari obovata usque rhombea acuminata,

abrupte acuminata; folia primaria arborum adultorum sequentia (folium quintum usque septimum) e basi leviter angulari vel leviter sinuata late lanceolata vel rhombea, sensim longe acuminata, folia superiora macroblastorum e basi leviter sinuata usque truncata deltoideo-ovata, quam inferiora brevius et abruptius acuminata, omnia sat tenuiter crenato-serrata, utrinque viridia nitidula (quoad indumentum vide subspecies). Amenta (ut in affinibus) paulo praecocia, modice multiflora, floribus c. 30—50. Flores et capsulae manifeste pedicellati; capsula bivalvis.

Persia: W: Azerb.: M. Qareh Dagh prope Hasanbeyglu, Mird. in Gauba 1937! Ham.: Heyran, Sab. 414! — S: Fars.: Sarvestan, Fasa, Manuch. 12045-E! — C: Kashan: Natanz, Sab. 413!
Turcomania: Ashkhabad, Sint. 354.

Distr. gen. speciei: Europa et Asia.

— —subsp. ***nigra***

Typus: „Habitat in Europa temperatiore".

Omnibus partibus ab initio glabris vel juvenilibus tantum leviter puberulis mox glabrescentibus; macroblastis teretibus (an semper?).

Distr. gen. subspeciei: Europa, Asia occidentalis et centralis, praeterea locis numerosis culta et subspontanea.

Hierzu auch der Cultivar „*Italica*": *P. nigra* L. var. *italica* Muenchh., Verz. Bäume u. Staud. (1770) mit fast ebensolch säulenförmigem Wuchs wie *P. afghanica* Cultivar „*Afghanica*", der außer den Arteigenschaften auch durch seinen etwas rippigen (brettwurzeligen) Stammgrund von letzterem gut unterscheidbar ist und übrigens nur im männlichen Geschlecht vorkommt. Ob auch in unserem Gebiet eingeführt?

— — subsp. ***caudina*** (Ten.) Bug., Arboret. Kornickie 12: 146 (1967).

Syn.: *P. caudina* Ten., Fl. Napolit. 5: 280 (1842). *P. nigra* L. var. *pubescens* Parl., Fl. Ital. 4: 289 (1867).

Typus subspeciei: „Vien coltivato estesamente in Cervinara, in Arienzo e ne'paesi circonvicini messi nell 'antica regione Caudina".

Ramulis, petiolis et axibus amentorum quidem persistenter pubescentibus; macroblastis angulatis (an semper?).

Talish: Swant, Hohen.
Persia: N: Gil.: Rudbar, Buhse. Persia borealis, Szov. — C: Tehr.: Shahrestanak, 2200—2300 m, Bornm. Qazv.: Karaj, cult., Gauba.

Distr. gen. subspeciei: Regio Mediterranea, Asia austro-occidentalis.

Die hier vorgenommene systematische Gliederung von *P. nigra*, wie auch die Abtrennung von *P. afghanica* erfolgte in Anlehnung an die Bearbeitung von Bugala (1967), die in taxonomischer Auffassung mancherlei Fortschritte bedeutet. Dennoch lassen neuere, von mir in den umfassenden Lebendsortimenten im Mediterran-Arboretum in Bagni di Tivoli angestellte vergleichende Untersuchungen ahnen, daß für eine endgültige Gliederung dieser schwierigen Verwandtschaft noch andere Eigenschaften als die bisher verwendeten ausschlaggebend sein werden.

6. ***P.*** × ***berolinensis*** C. Koch, Wochenschr. 8: 226 et 239 (1865).

Typus: Ignotus.

Arbor mediocris usque elata; coma primum semicolumnaris, demum dilatata. Cortex trunci diu pallide cinerascenti-virens, demum atratus induratus. Ramuli,

petioli in latere superiori et axis amentorum initio quidem puberuli. Rami primo anno pallescenti-cinerei, etiam in arboribus adultis quoque angulati. Folia mediocria, petiolo incluso 10—12 cm longa, pallescenti-viridia; petiolus in macroblastis tertiam partem, in brachyblastis dimidium laminae longitudinis attingens; lamina e basi angulato- vel rotundato-cuneata interdum autem rotundata rhombico-ovata usque ovata, acuminata, tenuiter crenato-serrata, subtus quam supra manifeste pallidius viridis nec autem albescenti-viridis. Amenta floribus breviter pedicellatis. Capsula bivalvis.

Afghanistan: C: Bamian: In valle Bamian „rote Stadt", 2000 m, sine floribus, Reiner 685!

Distr. gen.: Culta tantum nota.

Diese eigentlich nur von europäischen Arboreten und *Populus*-Pflanzungen bekannte, durch Kreuzung von *P. laurifolia* mit *P. nigra* cv. *Italica* entstandene Ausbildung dürfte wohl nicht als Kulturpflanze nach Afghanistan gelangt sein; vielmehr jedoch kann hier der Bastard *P. afghanica* × *laurifolia* in Betracht kommen. Allein die Unvollkommenheit des einzigen bisher vorliegenden Belegs wie auch die noch bestehende Unsicherheit über die Artberechtigung von *P. afghanica* lassen es ratsamer erscheinen, von einer eventuellen Neubenennung Abstand zu nehmen.

7. ***P. laurifolia*** Ledeb., Fl. Alt. 4: 297 (1833).

Typus: „Ad ripas fluviorum circa radicem montium altaicorum", LE.

Arbor mediocris usque elata; coma ampla ramis sat strictis. Cortex trunci diu pallide cinereus remanens, demum atratus induratus. Rami omnino pallide cinerei, in arboribus juvenilibus et in macroblastis alato-angulati, in vetustioribus normaliter angulati; ramuli et folia juveniles valde balsamiferi, mox glabrescentes. Folia mediocria usque magna in surculis radicalibus breviter petiolata anguste lanceolata, in arboribus juvenilibus et in macroblastis e basi ± rotundata usque truncata vel interdum leviter sinuata ovato-lanceolata, in brachyblastis longius petiolata, e basi plerumque rotundato-cuneata rhombica, omnia sensim longe acuminata, tenuissime serrata, supra viridia, subtus albo-viridia. Amenta breviuscula, crassa, teretia nec conica. Bracteae fimbriis breviter setaceo-acuminatis. Flores subsessiles.

Afghanistan: E: Nuristan: Pashki, 2300 m, Edelb. 593!

Distr. gen.: Asia centralis, Afghanistan.

8. ***P. talassica*** Komar., Journ. Bot. URSS. 19: 509 (1934).

Typus: „Ad ripas fl. Ak-su in montibus Talass-Ala-Tau Asiae mediae", LE.

Arbor mediocris (usque elata?); coma ampla. Cortex trunci diu levis cinereus remanens, demum atratus, induratus. Rami annotini teretes. Folia sat parva, petiolo incluso ± 10 cm longa, in arboribus juvenilibus modice longe petiolata, e basi rotundato-cuneata usque subrotundata vel subtruncata anguste ovata, subsensim acuminata, tenuiter serrata, subtus quam supra pallidius viridia nec albescentia, primum puberula, demum ± glabrata. Capsula subsessilis, trivalvis, apicem versus pubescens.

Afghanistan: NE: Munjan: Weran versus Nao, 3000 m, Edelb. 1463!

Distr. gen.: Asia centralis, Afghanistan.

Der kätzchenlose Beleg stimmt zwar mit dem Typusbeleg von *P. talassica* Komar. gut überein, doch bleibt weiteren Untersuchungen vorbehalten, ob diese recht schwach

begründete Art aufrecht erhalten bleiben kann oder aber mit *P. pamirica* Komar. und vielleicht auch mit *P. densa* Komar. zusammenfällt.

9. ***P. pamirica*** Komar., Journ. Bot. URSS. 19: 510 (1934).

Typus: „In districtu Shugnan ad fl. Schach-dara", LE.

Arbor mediocris (usque elata ?) coma ampla. Cortex trunci diu laevis cinereus remanens, demum atratus induratus. Rami in arboribus adultis subteretes, annotini brunnescentes, vetustiores albido-cinerei. Folia parva usque mediocria, longe petiolata, e basi leviter sinuata cordato-ovata, sat abrupte acuminata, breviter tenuiter crenato-serrata, subtus quam supra pallidius viridia, nec autem albido-viridia, ut ramuli juveniles primum quidem puberula. Axis amentorum et pedicelli dense pubescentes. Flores subsessiles. Germen ovatum, tricarpellatum, tuberculato-rugosum, apicem versus pubescens.

Afghanistan: E: Nuristan: In valle Rangul prope Asmar, 2300 m, Kerst. 1105! Chetras, 1900 m, Edelb. 535! — C: Behzud: Farakulum, 3000 m, Koeie 2598!
Pakistan: Chitral: Bogosht, 3000 m, Bowes Lyon 1056! Lutko-Chinko Ghari, 2600 m, Bowes Lyon 769! Ad glacies Chatiboi, 3300 m, Stamm & Wöhrl 244! — N.-Wazir.: Datta Khel, 1400 m, Blatt. & Fz. — S. Wazir.: Wana, 1360 m, cult., Fz.

Distr. gen.: Asia centralis, Afghanistan, Pakistan.

Hierzu sicher auch bisherige Angaben von *P. suaveolens* Fisch., einer nordostasiatischen Art, deren Areal unser Gebiet nicht erreicht und die hier bisher auch angepflanzt nirgends vorgefunden wurde.

10. ***P. ciliata*** Wall. in Royle, Ill. Bot. Himal. Mount. 48a = 98 (1839).

Typus: Kumaon, Wall.

Arbor elata; coma ampla laxiuscule ramosa. Cortex trunci diu levis cinereus remanens, demum atratus induratus. Ramuli in arboribus adultis subteretes, annotini brunnei, vetustiores cineri, juveniles glabri. Folia magna, longe petiolata, in arboribus adultis petiolo incluso c. 20 cm longa; lamina e basi profunde sinuata cordata, acuminata, tenuiter crenato-serrata, laevis vel primum puberula, dense pubescenti-ciliata, supra viridis, subtus albo-viridis. Amenta glabra, floribus ± 35 breviter pedicellatis, fructiferi magni, ± 20 cm longi. Capsula orbiculata, quadrivalvis, sublaevis.

Pakistan: Swat: Ushu, 2400 m, Rech. 19529!

Distr. gen.: Montes Hindukush et Himalaya.

11. ***P. caspica*** Bornm., Feddes Repert. 47: 70 (1939).

Syn.: *P. Bachofenii* Wierzb. ex Reichenb., Icon. Fl. Germ. 11: 29 (1849) ?*P. Bolleana* Lauche in Hüttig, D. deutsch. Gart. 500 (1878) (pro cv. „*Pyramidali*" ?). *P. Paletskyana* Dode, Mém. Soc. Hist. Nat. Autun 18: 21 (1905). *P. Morisetiana* Dode, l. c.: 22. *P. triloba* Dode, l. c.: 21. *P. berkarensis* Poljakov, Not. Syst. Leningrad 12: 9 (1950). *P. canescens* auct. non Sm. (1805). *P. hybrida* auct., non M. B. (1808).

Typus: Bornm. 8250 et 5251.

Arbor mediocris usque elata; coma ampla (in cultis interdum columnaris); radix interdum prolifera. Cortex trunci diu laevis, pallide virescenti-cinereus remanens, demum atratus induratus. Ramuli annotini residuis indumenti ± sordide brunnei, adulti ± cinereo-brunnescentes, primum tomentosi, demum

partim glabrescentes. Folia arborum adultorum mediocria, petiolo incluso 10—15 cm longa, modice longe petiolata, e basi late cuneata, interdum truncata vel rarius angulato-sinuata ovata, acuta, inaequaliter grosse acute interdum sinuato-dentata, demum etiam subtus glabrescentia, viridia; folia superiora macroblastorum brevius petiolata, lamina ± profunde 3—5-lobata, plerumque grosse serrata, subtus persistenter albo-tomentosa. Amenta fructifera 20 cm longa, axi et pedicellis longe pubescentibus. Bracteae ovatae, inaequaliter grosse serratae, brunneae, longe ciliatae. Capsula ovato-conica, bivalvis, laevis.

Talish: Lenkoran, C. A. Mey. 27!
Persia: N: Gorg.: Gomishan, cult. Gauba Bandar-i Gaz, in silvis maritimis, Sint. 1487, 1324-c!, -d!, 2121! Inter Chehel Chai et Hajjilar, Gauba 1928! Inter Gorgan et Ziarat, Sab. in Gauba 1930! Naudeh, 300 m, Gauba 1929! Maz.: Aliabad, Gauba 13. Pol-e Zoghal, 300 m, Gauba 1927! Prope Babol Sar, Gauba 1936! 64 km E Chalus, Stutz 1222! Gil.: Inter Rasht et Kohdom, Bornm. 5251, 8250. Inter Rasht et Lahijan, Gauba 1933! Prope Lahijan, Behb. in Gauba 1932! Kohdom, Gauba 1931! Sistan prope Lahijan, Gauba 1934! Persia borealis, Auch. — W: Azerb.: Prope Khvoy, Knapp. Tabriz, Gill.-Sm. 1314. M. Qareh Dagh prope Hasanbeyglu, Mird. in Gauba 1935! Kermanshah, Cowan — S: Fars.: Bagh-i Bagich, Stapf 904! Shiraz, cult. Koelz 14755! Kerm.: Rabor, 2800 m, Bornm. 4530! Persia australis, Haussкn. — C: Tehr.: Pas Qaleh, Ky. s. n.! Fasham NE Tehran, Remaudiere 81! Qazv.: Karaj, cult., Gauba 955, 1929!
Turcomania: Ashkhabad, Sint. 355! Kizyl Arvat, Sint. 1938!
Afghanistan: NW: Bala Murghab, 470 m, Jakeš s. n.! — SW: Herat, cult. Amsel s. n.! — E: Kabul: Darulaman, Manger 56. Kabul, cult., Gilli 2443! Jaji: Ali Khel, cult. Aitch. 254. Nuristan: Pashki, 2300 m, Edelb. 638!
Pakistan: Kurram, Aitch. 164! — S. Wazir.: Tank, cult., Blatt. & Fz. — Quetta: Pishin, Gaz. 359. Chaman, Gaz. 359. Mach, Bolan Gaz. 119. Loralai, Gaz. 28, 367. Nasirabad, Sibi Gaz. Sibi, Sibi Gaz. 329. Quetta, Lace. — Kalat: Jhalowan, H.-B. 1733. S Kalat, 1500 m, Hotson 146.

Distr. gen.: Caucasus, Transcaucasia, Persia, Afghanistan, Asia centralis.

Ältere für diese Art wahrscheinlich in Betracht kommende Synonyme, die mit angeführt worden sind, bleiben infolge der nicht ausreichenden Beschreibungen ungesichert. Erst Bornmüller's Diagnose und Herkunftsangabe bringen Klarheit, auf welche hier die Annahme seines Namen begründet wird.

Aus den zahlreich vorhandenen Belegen lassen sich kaum Schlüsse auf das natürliche Areal ziehen, da entsprechende Angaben der Sammler, auch solche über die Wuchsform, fehlen; siehe auch Bemerkung zu *P. alba*.

P. caspica wird von verschiedenen Autoren, so auch von Komarov mit *P.* × *canescens* Sm. identifiziert, die jedoch nach ihren intermediären Merkmalen, wie auch nach ihrer natürlichen Verbreitung zweifellos dem Bastard *P. alba* × *tremula* entspricht. Tatsächlich weist *P. caspica* mit jener Hybride eine gewisse Ähnlichkeit auf, ist jedoch durch die tiefgelappten, unterseits weißfilzigen Blätter der Langtriebe hinreichend unterschieden; bei *P.* × *canescens* Sm. sind diese nur seicht gelappt und unterseits ± graufilzig. Auch macht das anscheinend völlige Fehlen der *P. tremula* L. im Areal der *P. caspica* deren Deutung als Bastard höchst unwahrscheinlich.

Hierher gehört sicher auch die von Poljakov aus Kazakhstan beschriebene *P. berkarensis*. Der Typus weist die für *P. caspica* angegebenen Eigenschaften in scheinbar klarerer Prägung auf als die Belege aus dem Gebiet der Flora Iranica. Damit erhebt sich aber die Frage, ob *P. caspica* eine von *P. alba* gut geschiedene Art ist oder ob sie im westlichen Bereich ihres Areals allmählich in diese übergeht und dann nur als Unterart betrachtet werden müßte. Hierüber aber können erst weitere Untersuchungen im Berührungsbereich der Areale Klarheit schaffen.

12. ***P. alba*** L., Spec. Plant. 1034 (1753).

Typus: „In Europa temperatiori".

Arbor mediocris usque elata; coma ampla, in cultis quoque pyramidalis; radix interdum prolifera. Cortex trunci diu laevis pallide cinereus remanens demum atratus induratus. Ramuli annotini magis aequaliter tomentosi et magis aequaliter cinerei quam in specie praecedente, petiolo incluso ± 10 cm longa, in arboribus adultis plerumque quam in specie praecendente minora, longius petiolata, e basi late cuneata usque truncato-ovata, obtusiuscula, ± indistincte usque sinuato-dentata, subtus primum dense albo-tomentosa, demum numquam complete glabrescentia sed residuis appressis tomenti quasi metallico-nitidula; folia superiora macroblastorum brevius petiolata, ± profunde 3—5-lobata. Amenta fructifera quam in specie praecedente breviora, 10—15 cm longa, axi et pedicellis breviter pubescentibus. Bracteae ovatae, vix dentatae, brunneae, longe ciliatae. Capsula ovato-cuneata, bivalvis, glabra.

Distr. gen.: Europa, Africa borealis, Anatolia.

Persia: S: Fars.: Sabz Pushan, verosim. culta, Stapf 903!

Möglicherweise im westlichen Teile des Gebietes vorkommend. Bisherige Angaben gehören größtenteils (oder gänzlich?) zu *P. caspica*. Die wenigen vorliegenden Belege sind zu dürftig um sie sicher zuzuteilen.

Von *P. alba* L. und auch von *P. caspica* Bornm. sind säulenförmig schmalkronige Ausbildungen in Kultur, die als *P. Bolleana* Lauche in Hüttig, D. deutsch. Gart. (1878) bezeichnet worden sind. Wenngleich solche markante Wuchsformen in der Landschaft sehr auffallen, weisen sie doch keine besonderen spezifischen Eigenschaften auf, sondern sind es lediglich Cultivare ihrer entsprechenden Arten. Ihre meist ausgedehnten Kulturareale erklären sich aus der leichten vegetativen Vermehrbarkeit mittels Steckhölzern.

Ob korrekterweise (eng gefaßt) der Cultivar „*Bolleana*" der *P. alba* oder *P. caspica* angehört, bleibt noch unsicher, denn in der Originalbeschreibung werden die wichtigsten spezifischen Eigenschaften nicht erwähnt. Der angegebenen Herkunft nach (Taschkent) sollte *P. caspica* in Betracht kommen, in der mitteleuropäischen Gartenkultur aber, wo dieser Name aufgekommen ist, wird jedenfalls im hauptsächlichen die säulenwüchsige Form der *P. alba* darunter verstanden. Ob auch diese im Gebiet der Flora Iranica in Kultur ist, bleibt noch festzustellen.

2. *Salix*

auctore A. K. Skvortsov, Moskva

Salix L., Spec. Plant. 1015 (1753). Gen. Plant. ed. 5: 447 (1754).

Lit.: N. J. Andersson, On East Indian Salices, The Journal of the Linnean Society of London, Botany 4: 39—58 (1860). N. J. Andersson, Salix in A. P. de Candolle, Prodromus 16: 190—323 (1868). E. Boissier, Salix, Flora Orientalis 4: 1181—1192 (1879). J. Bornmüller, Salix zygostemon Boiss. und S. Medemii Boiss., Gartenflora 62: 242—245 (1913). R. N. Parker, Salix, A Forest Flora for the Punjab, ed. 2: 502—514 (Lahore 1924). B. Floderus, Salix aegyptiaca L., Arkiv für Botanik 25 A, N 11: 1—44 (1933). B. Floderus, Some new Himalayan Willows, Geografiska Annaler 17: 306—316 (1935). R. Görz, Einige kritische Salices aus Persien, Feddes Repertorium 35: 283—292 (1934). R. Görz, Salix in „Flora Turcomaniae" 2: 13—24 (1937; rossice). A. K. Skvortsov, Revisio critica Salicum Turcomaniae, Not. Syst. Herb. Inst. Bot. Acad. Sci. URSS. 20: 68—85 (1960; rossice). A. K. Skvortsov, Conspectus Salicum Asiae Mediae, Notulae Syst. Herb. Inst. Bot. et Zool. Acad. Sci. Uzbekistan 17: 43—74 (1962; rossice). A. K. Skvortsov, Conspectus Salicum Caucasi et Asiae Minoris, Acta Inst. Bot. Acad. Sci. Armeniae 15: 91—140 (1966; rossice). A. K. Skvortsov, Salices novae, Novitates Syst.

Pl. Vascul. 1965: 90—97 (1965). A. K. SKVORTSOV, De salicibus nonnullis himalaicis, Novitates Syst. Pl. Vascul. 1966: 67—74 (1966; rossice). A. K. SKVORTSOV, Salix in „Flora Tadzhikistaniae" 3: sub prelo (1968; rossice). A. K. SKVORTSOV, Salices URSS. (1968; rossice).

Arbores, frutices vel fruticuli dioici. Rami accrescentia sympodiali. Gemmae squama unica tectae. Amenta ± erecta, bracteis integris, floribus sessilibus. Perianthium deest, nectariis 1—3 suffectum. Stamina 2—10, filamentis bracteas superantibus. Pollen adhaesivum, insectis transferendum.

In expositione sequente dimensiones tales adhibuntur: crassitudo ramulorum annotinorum inter gemmas ab apice tertiam et quartam; gemmarum, foliorum, amentorum bractearumque longitudo × latitudo; ratio latitudo: longitudo foliorum (i. e. quoties longitudo laminae eiusdem latitudinem superat); antherarum exoneratarum siccarum longitudo.

Clavis ad determinanda specimina amentis masculis

1a. Stamina 3 vel plura 2
b. Stamina 2, libera vel partim vel perfecte connata 5
2a. Amentum culmine anthesis 5—7(—8) mm in diametro. Stamina 3, ± sursum directa (i. e. sub angulo acuto ab amenti axi). Filamentum in dorsum connectivi transiens, antherae antice dehiscentes, polline exuto curvatae 3
b. Amentum culmine anthesis 6—12 mm in diametro. Stamina 3—10, vulgo patentia (ab amenti axi sub angulo recto) vel etiam paullo deflexa. Filamentum in medium connectivi transiens; antherae lateraliter dehiscentes, etiam evacuatae rectae 4
3a. Amentum ante anthesin usque ad 2 mm crassum. Bracteae 1,0—1,5 mm longae, saepissime late obovatae, apice (sub-)truncatae. Filamenta 2—3 mm, antherae (vacuae e sicco) 0,3—0,5 mm longae ..... 4. *S. songarica* N. J. ANDERSSON
b. Amentum ante anthesin 2—3 mm crassum. Bracteae 1,5—2 mm longae, vulgo lingulatae. Filamenta 3—4 mm, antherae 0,5—0,6 mm longae ..... 3. *S. triandra* L.
4a. Amentum 50—130 mm longum, laxum, floribus quasi verticillatim dispositis ..... 1. *S. tetrasperma* ROXB.
b. Amentum 15—40 mm longum, densum ..... 2. *S. acmophylla* BOISS.
5a. Fruticulus alpinus parvulus prostratus. Amenta ramulos foliiferos terminantia, 10—40×3—5 mm magna, laxa. Bracteae glabrae, apice saltem fuscae ..... 8. *S. flabellaris* N. J. ANDERSSON
b. Frutices elatiores vel arbores. Bracteae ± pubescentes. Amenta densiora vel longiora vel crassiora 6
6a. Filamenta perfecte vel parte superiore saltem libera 7
b. Filamenta perfecte connata 19
7a. Amenta saepe subflaccida. Bracteae pallidae vel e sicco dilute fuscescentes rufescentesve, facie interna et dimidio inferiore faciei externae pilis brevibus ± praeditae, apice autem saepius glabrae. Nectaria saepissime 2 (adaxiale et abaxiale). Filamenta basi pilosa 8
b. Amenta saepissime erecta. Bracteae omnino vel apice saltem nigrofuscae, vulgo pilis rectiusculis tota longitudine aequaliter vel praecipue parte superiore vestitae. Nectarium unicum (adaxiale) 11
8a. Folia vernalia (ramulorum inferiora) basi rotundata vel subcordata,

apice obtusata. Bracteae 0,8—1,6 mm longae, apicem versus ± dilatatae et apice saepissime truncatae ..... 16. *S. denticulata* N. J. Andersson

b. Folia vernalia utrinque angustata, apice acuta vel acuminata. Bracteae majores vel apicem versus angustatae 9

9a. Folia vernalia (in vivo saltem) dilute vel flavescenti-viridia. Bracteae ovatae vel triangulari - lanceolatae. Filamenta 3—4 mm longa ..... 7. *S. babylonica* L.

b. Folia vernalia saturate- vel coerulescenti-viridia. Bracteae 2—3,5 mm longae, apice obtusae, rotundatae vel eroso-denticulatae. Filamenta 4—7 mm longa 10

10a. Amentum ante anthesin (antheris bracteis contectis) 3—4 mm crassum. Bracteae vulgo quam 1 mm angustiora. Antherae 0,5—0,7 mm longae ..... 5. *S. alba* L.

b. Amentum ante anthesin 4—5 mm crassum. Bracteae vulgo 1 mm latiora. Antherae 0,7—1,0 mm longae ..... 6. *S. excelsa* S. G. Gmelin

11a. Amenta coaetanea vel subserotina, foliolis 2—5 confertis sessilibus patentibus basi subcordatis suffulta, ca. 7—15×7—9 mm, densissima. Bracteae parvulae, 1—2×0,6—1 mm, apice rotundatae, breviter pilosae, pilis apicem bracteae 0,3—0,6 mm superantibus ..... 17. *S. caesia* Vill.

b. Amenta praecocia vel subpraecocia, foliolis cataphyllisve basi cuneatis, saepius majora. Bracteae vulgo majores, pilis longioribus vestitae 12

12a. Folia jam prima vernalia (inferiora ramulorum) margine dense glandulosa. Filamenta glabra 13

b. Folia vernalia integerrima vel glandulis solitariis (rarius dense glandulosa, sed tum filamenta pilosa) 14

13a. Folia subtus ± caesio-opaca. Nectarium vulgo trapezoideum vel quadratum, 0,3—0,6 mm longum ..... 9. *S. Karelinii* Turcz.

b. Folia subtus laete viridia sublucida. Nectarium vulgo angustius, rectangulare, 0,5—1,0 mm longum ..... 10. *S. Fedtschenkoi* Görz

14a. Folia vernalia anguste oblanceolata, subtus dense sericeo-micantia, pilis nervis lateralibus ± parallelibus. Nectarium anguste rectangulare vel. lineare, 1,0—1,5×0,15—0,3 mm ..... 14. *S. turanica* Nasarov

b. Folia vernalia aut alia figura aut alia pubescentia. Nectarium brevius... 15

15a. Filamenta vulgo usque ad 1/3—2/3 (vel altius) connata, basi sat dense pilosa ..... 23. *S. sericocarpa* N. J. Andersson *)

b. Filamenta libera, glabra vel pilis solitariis 16

16a. Amenta breviter cylindrica vel ovalia, culmine anthesis 7—10(—12) mm in diametro. Antherae 0,4—0,6 mm longae ..... 15. *S. schugnanica* Görz

b. Amenta culmine anthesis (12—)14—20 mm in diametro. Antherae 0,6—1,0 mm longae 17

17a. Ramuli superioris anni 1,8—2,5 mm crassi. Folia vernalia obovata, subtus ± crispato-pilosa. Amenta culmine anthesis ad 20 mm in diametro. Antherae 0,7—1,0 mm longae ..... 11. *S. aegyptiaca* L.

b. Ramuli 1,3—2,0 mm crassi. Folia vernalia subtus ± appresse pilosa vel glabra. Amenta usque ad 17 mm in diametro. Antherae 0,6—0,8 mm longae 18

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*) *S. zygostemon* Boiss. sat similis esse videtur; adhuc parum cognita, a *S. sericocarpa* amentis masculis haud certe distinguenda.

18a. Folia subtus pilis laxis subpatentibus subsericeis obsita vel glabra. Amenta ovalia vel ovali-cylindrica, culmine anthesis 20—40×13—17 mm. Bracteae apice saepius obtusatae ..... 12. *S. iliensis* REGEL
b. Folia subtus pilis brevibus appressis argenteis. Amenta saepius cylindrica, 30—50×10—14 mm. Bracteae saepius acutae vel acuminatae ..... 13. *S. Wallichiana* N. J. ANDERSSON
19a. Amenta serotina. Bracteae pallidae (in vivo interdum rosaceae, exsiccando interdum rufescentes), raro nonnullae fuscescentes 20
b. Amenta praecocia vel coaetanea. Bracteae omnes apice saltem fuscae vel nigrae 23
20a. Amenti axis densissime lanata. Nectarium apicem versus angustatum (trapezoideum vel triangulare), in vivo purpureum. Filamenta glabra ..... 24. *S. Wilhelmsiana* M. B.
b. Amenti axis breviter pilosa vel subglabra. Nectarium olivaceum vel albidum. Filamenta basi pilosa 21
21a. Amenti pedunculus (sub floribus infimis) 0,8—1,0 mm crassus. Amentum culmine anthesis 6—8 mm in diametro. Bracteae apice vulgo obtusatae vel rotundatae, nonnullae interdum fuscescentes. Filamenta 4—5 mm longa ..... 21. *S. linearifolia* E. WOLF
b. Amenti pedunculus 0,5—0,7 mm crassus. Amentum culmine anthesis 5—6 mm in diametro. Bracteae omnes pallidae, apice saepius truncatae vel erosae 22
22a. Ramuli (praesertim macroblasti) albo-pruinosi .... 20. *S. Capusii* FRANCH.
b. Ramuli rore cereo destituti ..... 19. *S. carmanica* GÖRZ
23a. Amenta densissima 7—15 mm longa. Bracteae 0,6—1,0 mm latae ..... 17. *S. caesia* VILL.
b. Amentum longius. Bracteae saepissime latiores 24
24a. Amenti pedunculus 1—4 mm longus, cataphyllis subtus vulgo glabratis. Bracteae patentes vel subreflexae. Stamina ab axi amenti sub angulo recto patentia ..... 18. *S. elbursensis* BOISS.
b. Pedunculus 2—8 mm longus, cataphyllis subtus vulgo sericeo-villosis. Bracteae imbricatim adpressae. Stamina ab axi amenti sub angulo acuto patentia ..... 22. *S. pycnostachya* N. J. ANDERSSON

Clavis ad determinanda specimina amentis femineis

1a. Bracteae pallidae: in vivo albide-viridescentes vel pallide flavidae vel rarius rosaceae, in sicco saepe fulvescentes vel cinerascentes. Raro bracteae partim brunnescentes — sed tum aut apice truncatae aut capsularum maturitate deciduae 2
b. Bracteae sub anthesi omnino vel apice saltem fuscae vel brunneae (ante anthesin in vivo saepe atropurpureae, post anthesin interdum pallidiores fuscescenti-griseae), semper persistentes 14
2a. Amentum densum. Bracteae persistentes. Capsulae sessiles vel subsessiles 3
b. Amentum saepius ± laxiusculum. Bracteae omnes vel partim capsularum maturitate deciduae. Capsulae manifeste pedicellatae, pedicellis 0,4—3 mm longis 5
3a. Bracteae triangulari-ovatae vel triangulari-lanceolatae ± acutae. Nectaria et stigmata pallida. Capsula partim vel omnino glabra ..... 7. *S. babylonica* L.

b. Bracteae ovatae vel lingulatae, vulgo obtusae vel truncatae. Nectaria stigmataque in vivo purpurascentia, exsiccando brunnescentia. Capsula tota breviter appresse sericea 4

4a. Ramuli glabri. Amenta (sub-)praecocia. Nectarium subquadratum truncatum ..... 18. *S. elbursensis* Boiss.

b. Ramuli tenuiter appresse pilosi. Amenta serotina. Nectarium subtriangulare, apice angustatum ..... 24. *S. Wilhelmsiana* M. B.

5a. Amenti pedunculus saepissime foliatus, foliis ovalibus vel obovatis, basi rotundatis apice obtusis, discoloribus. Bracteae reflexae, 0,8—1,6 mm longae, basin versus cuneato-angustatae ..... 16. *S. denticulata* N. J. Andersson

b. Folia pedunculi ut etiam folia inferiora ramulorum sterilium saepius concoloria, acuta vel subacuta vel pedunculus aphyllus, cataphyllis parvis solum instructus. Bracteae ovariis (sub anthesi saltem) ± appressae, vulgo majores 6

6a. Capsula ovata vel ovalis, apice obtusa, glabra raro intricate lanata. Stigmata divergentia, integra, sulcata vel crasse subbiloba, 0,1—0,3 mm longa 7

b. Capsula attenuato-conica, apice saepius acuta (in stylum sensim transiens), glabra vel appresse sericea. Stigmata 0,3 mm longa vel longiora, biloba vel bipartita 10

7a. Amenta serotina. Nectarium rectangulare vel quadratum (raro bipartitum), apicem versus haud dilatatum nec pedicellum amplectens. Capsulae saepissime ovales, immaturae in vivo et in sicco aureo-virides vel olivaceae 8

b. Amenta subpraecocia vel praecocia. Nectarium obverse trapezoideum, apicem truncatum versus ± dilatatum et pedicellum subamplectens. Capsulae immaturae virides vel glaucescentes vel caesio-pallescentes, exsiccando interdum nigricantes 9

8a. Folia supra saltem laete viridia. Bracteae oblongae vel oblongo-obovatae vel oblanceolatae vel lingulatae, 1,2—2,5 mm longae, vulgo partim persistentes ..... 3. *S. triandra* L.

b. Folia utrinque languide olivaceo-viridia. Bracteae ± obovatae vel fere rotundatae, 0,6—1,2 mm longae, vulgo omnes caducae ..... 4. *S. songarica* N. J. Andersson

9a. Amentum imprimis maturitatem versus laxum, interdum subflaccidum, maturum 50—100 mm longum. Capsulae maturae late ovatae vel fere globosae ..... 1. *S. tetrasperma* Roxb.

b. Amentum densum, erectum, maturum 15—50 mm longum. Capsula matura ovata ..... 2. *S. acmophylla* Boiss.

10a. Bracteae emarcescentes vulgo rufidulae vel fulvo-brunnescentes, capsularum maturitate vulgo omnes deciduae. Stylus apice in stigmata dua genuina, dextrum et sinistrum, divisus 11

b. Bracteae emarcescentes albidae vel cinerascentes vel pallide brunnescentes, nonnullae usque ad capsularum maturitatem persistentes. Stylus apice in partes duas, adaxialem et abaxialem (unamquidque e dimidiis utrinque stigmatis compositam), vel simul in partes aequales stigmaticas quattuor divisus 12

11a. Bracteae ad 0,8—1,0 mm latae. Capsula matura 4—5 mm longa. Stylus + stigma = 0,5—1,0 mm ..... 5. *S. alba* L.

b. Bracteae latiores. Capsula matura 5—7 mm longa. Stylus cum stigmate 0,8—1,0 mm. Capsula sericeo-pilosa, matura ca. 5 mm longa .....
12a. Ramuli (imprimis auxiblasti anni superioris) dense albo-pruinosi ..... 20. *S. Capusii* Franch.
b. Ramuli pruina alba destituti 13
13a. Amentum densius, maturum 30—70 mm longum. Bracteae 1,5—3,0 × 0,8—1,0 mm. Capsula sericeo-pilosa, matura ca. 5 mm longa ..... 21. *S. linearifolia* E. Wolf
b. Amentum laxiusculum, maturum 15—30 mm longum. Bracteae 1,0—1,5 × 0,5—0,8 mm. Capsula saepius glabra vel partim (rarius tota) sericea, matura c. 4 mm longa ..... 19. *S. carmanica* Görz
14a. Fruticulus parvulus prostratus. Amenta serotina, ramulos foliiferos terminantia. Bracteae glaberrimae, rarissime pilis solitariis ..... 8. *S. flabellaris* N. J. Andersson
b. Frutices majores truncis erectis vel ascendentibus, vel arbores. Amenta praecocia vel coaetanea, sessilia vel pedunculis brevibus. Bracteae ± dense pubescentes 15
15a. Capsula glabra vel pilis intricatis crispatis irregulariter obtecta 16
b. Capsula appresse sericeo-pilosa 18
16a. Frutices humiles ramis brevibus crassiusculis. Folia jam infima margine dense glanduloso-serrulata. Amenta densissima, erecta. Bracteae omnino fuscae 17
b. Frutex elatius. Folia infima integerrima. Amenta ± patentia. Bracteae totae brunnescentes vel solum dimidio superiore atrae 23
17a. Folia subtus pallida opaca. Nectarium 0,4—0,6 mm longum pedicellum subaequans ..... 9. *S. Karelinii* Turcz.
b. Folia subtus (ut etiam superne) laete viridia sublucida. Nectarium 0,6—1,0 mm longum pedicellum superans ..... 10. *S. Fedtschenkoi* Görz
18a. Capsula (sub-)sessilis, pedicello 0—0,3 mm longo 19
b. Capsula pedicello longiore suffulta 23
19a. Bracteae atrae, 1,8—3,5 mm longae, saepius acutae, pilis longis (apicem bracteae 1,0—1,5 mm vel ultra superantibus) dense vestitae. Nectarium lineare 0,8—1,5 mm longum. Stylus cum stigmate 1,5—3,0 mm longus ..... 14. *S. turanica* Nasarov
b. Bracteae 1—2 mm longae, apice obtusae vel rotundatae, pilis brevibus tectae vel extus subglabrae. Nectarium 0,3—0,5 mm longum 20
20a. Capsula lanceolato-conica, acuta, in stylum sensim abiens 21
b. Capsula ovata vel elongato-ovata, obtusa, in stylum abrupte constricta . 22
21a. Amentum maturum 30—40 mm longum vel longius. Capsula matura 4,5—6 mm longa. Stigmata 0,3—0,7 mm longa ..... 22. *S. pycnostachya* N. J. Andersson
b. Amentum densissimum, maturum ca. 20 mm longum. Capsula matura ca. 3,5 mm longa. Stigmata 0,2—0,3 mm longa ..... 27. *S. Koeieana* A. Skvortsov
22a. Rami breves divaricati. Amenti pedunculus foliolis confertis basi (sub-) cordatis. Amentum 6—20 mm longum ..... 17. *S. caesia* Vill.
b. Rami longi viminei. Pedunculus foliolis basi cuneatis vel subrotundatis. Amentum 12—35 mm longum ..... 18. *S. elbursensis* Boiss.
23a. Amenta praecocia. Bracteae vulgo totae nigrofuscae, saepius pilis longis

rectiusculis longitudinalibus obsitae. Capsulae (e basi saepe subinflata) anguste elongatae, apice obtusatae *) 24

b. Amenta subpraecocia, coaetanea vel serotina. Bracteae brunnescentes vel solum dimidio superiore nigrae, pilis brevibus ± flexuosis vel ± patentibus praesertim intus et dimidio inferiore tectae. Capsulae ovato- vel lanceolato-conicae, saepissime acutae *) 27

24a. Folia vernalia (anguste-)oblanceolata, latitudine 4—7—plo longiora. Amenta sub anthesi 10—20×4—6 mm, matura 12—35×12—14 mm. Bracteae 1,0—2,0 mm longae, saepius obtusae. Capsulae submaturae anguste elongato-lanceolatae, maturae valvulis crassiusculis recurvatis dehiscentes ..... 15. *S. schugnanica* Görz

b. Folia latiora. Amenta majora. Bracteae saepius majores vel acutae. Capsulae saepe subampullaceae, e basi sphaerica angustato-rostratae, maturae valvis tenuibus circinalibus dehiscentes 25

25a. Folia juniora subtus vulgo pilis appressis argenteo-micantia. Amenta gracilia ± flexuosa, matura 10—15 mm crassa. Bracteae saepe subglabrae ..... 13. *S. Wallichiana* N. J. Andersson

b. Folia pubescentia ± opaca (solum cataphylla ± sericeo-micantia). Amenta erecta, matura 15—20 mm crassa. Bracteae saepius sat dense pilosae 26

26a. Ramuli anni praecedentis ± pubescentes, 1,8—2,7 mm crassi. Cataphylla subtus dense sericeo-villosa. Amenta matura 40—70 mm longa ..... 11. *S. aegyptiaca* L.

b. Ramuli anni praecedentis vulgo glabri 1,3—2 mm crassi. Cataphylla subtus laxe sericea ± viridescentia. Amenta matura 25—45 mm longa ..... 12. *S. iliensis* Regel

27a. Amenta serotina. Bracteae sub anthesi aliae brunnescentes aliae pallidae, in amentis maturis denuo pallidae vel cinerascentes et partim deciduae. Capsula breviter sericea..... 21. *S. linearifolia* E. Wolf

b. Amenta coaetanea vel fere praecocia. Bracteae omnes apice saltem nigrescentes vel brunnescentes, in amentis maturis persistentes et colorem vulgo conservantes. Capsula sericea vel glabra 28

28a. Amenta matura 60—120 mm longa. Bracteae 0,6—1,0 mm latae, vulgo omnino brunnescentes ..... 23. *S. sericocarpa* N. J. Andersson

b. Amenta matura 30—80 mm longa. Bracteae 0,7—1,5 mm latae, vulgo dimidio superiore atrae ..... 22. *S. pycnostachya* N. J. Andersson

Clavis ad determinanda specimina foliis gemmisque maturis provisa, amentis autem carentia

1a. Fruticulus parvulus glaberrimus ramis radicantibus prostratis. Folia estipulata obovata, basi cuneata, margine minute denticulata..... 8. *S. flabellaris* N. J. Andersson

b. Frutices elatiores vel arbores erecti vel suberecti 2

2a. Cortex trunci et ramorum crassiorum (3—4 cm vel ultra in diametro) laminis irregularibus desquamans et tum denuo laevis. Petiolus ad basin laminae glandulis manifestis 1—2 paribus provisus 3

*) Si amenta et capsulae ut in „b" supra descriptae, bracteae autem saepius ut in „a" confer 26. *S. zygostemon* Boiss. (Species non satis nota).

b. Trunci ac rami vetustiores cortice aspero longitudinaliter rimoso, nec desquamante provisi 4

3a. Folia pagina supera saturate viridi, astomatifera vel stomatibus paucis praecipue ad nervos adspersa, pagina infera pallidius viridi vel albescenti, apice attenuate acuminato acutissimo, marginibus omnino manifeste et regulariter serrulatis ..... 3. *S. triandra* L.

b. Folia utrinque fere concoloria olivacea dense stomatifera, apice obtusato vel acutiusculo vulgo callosulo, margine saepius irregulariter serrulato vel fere integerrimo ..... 4. *S. songarica* N. J. ANDERSSON

4a. Perula (squama gemmae) marginibus liberis, facie adaxiali superpositis; gemmae breviter triangulares 5

b. Perula gemmarum calyptriformis, marginibus perfecte connatis 6

5a. Ramuli annotini autumno 1,5—2,3 mm crassi. Folia 20—45 mm lata, latitudine 2,5—7-plo longiora ..... 1. *S. tetrasperma* ROXB.

b. Ramuli annotini 1,0—1,5 mm crassi, magis flexibiles. Folia 7—25 mm lata, latitudine 5—20-plo longiora ..... 2. *S. acmophylla* BOISS.

6a. Rami longe pendentes. Stipulae saepissime bene evolutae, marginibus revolutis ..... 7. *S. babylonica* L.

b. Rami ± erecti vel divaricati, rarius subpenduli. Stipulae alia forma vel omnino deficientes 7

7a. Gemmae florigerae oblongo-ovales vel fere cylindricae, obtusae, 3—4 mm latae, apice ramulum versus directo. Folia elongato- vel lineari-lanceolata, 45—120 × 10—25 mm, marginibus ± deflexis integris, saepe ± undulatis, nervis lateralibus usque ad 20 paribus subtus prominentibus, pagina infera dense sericeo-pilosa (pilis nervis lateralibus ± parallelibus) ..... 14. *S. turanica* NASAROV

b. Gemmae florigerae aut forma alia aut multo angustiores. Folia aut latiora aut denticulata aut indumento alio 8

8a. Folia linearia, marginibus parallelibus, 2—4 mm lata, latitudine 12—30-plo longiora ..... 24. *S. Wilhelmsiana* M.B.

b. Folia proportione vel etiam absolute latiora latitudine ad summum 12-plo longiora, forma diversa, nec autem perfecte linearia 9

9a. Gemmae florigerae maturae a ramulo sub angulo acuto ± divergentes, ovatae acutiusculae. Folia 10—60 × 5—12 mm, integerrima vel sparse minute remote denticulata discoloria (supra viridia, subtus ± caesio-opaca), facie supera astomatifera vel stomatibus sparsis 10

b. Gemmae florigerae saepius lanceolatae vel obtuse ovatae. Folia notis aliis: aut multo latiora, aut manifeste denticulata, aut concoloria supra dense stomatifera 11

10a. Petioli 3—8 mm longi. Folia 25—60 mm longa, latitudine 3,5—7-plo longiora acuta, subtus saepissime appresse sericea.. 15. *S. schugnanica* GÖRZ

b. Petioli 1—4 mm longi. Folia 10—35 mm longa, latitudine 1,5—4-plo longiora, obtusa vel brevissime obsolete mucronulata, saepissime glabra, rarius laxe pubescentia ..... 17. *S. caesia* VILL.

11a. Folia latitudine 5—10-plo longiora aut folia latiora latitudine 2—4-plo longiora et tum apice sensim acuminata 12

b. Folia latitudine 1,3—2,5-plo longiora vel angustiora latitudine 3—4-plo longiora et tum obtusa aut breviter acuminata 21

12a. Gemmae florigerae foliiferis extus simillimae; gemmae apicales paulo minores, ceterae basin ramuli versus sensim decrescentes 13

b. Gemmae florigerae a foliiferis jam extus forma et magnitudine manifeste diversae 17

13a. Folia 10—30 mm lata (vel etiam latiora), margine omnino ± aequaliter serrulata, saepissime discoloria: supra saturate viridia, subtus pallida et ± caesio-opaca 14

b. Folia 3—10 mm lata, vulgo inaequaliter minute serrulata: basin versus denticulis multo remotioribus vel nullis, raro plane integerrima, concoloria, utrinque glaucescenti-opaca 15

14a. Gemmae triangulari-ovatae vel late lanceolatae, saepius acutiusculae, dorso convexo. Folia evoluta saepius 15—20 mm (vel ultra) lata, latitudine 3—6-plo longiora; infima obovata, apice obtusa vel breviter cuspidata, vulgo glabra ..... 6. *S. excelsa* S. G. Gmelin

b. Gemmae oblongo-lanceolatae, obtusatae, dorso paullo convexo vel ± applanato. Folia evoluta saepissime 8—20 mm lata, latitudine 5—9-plo longiora; infima saepius apice sensim acuminata ..... 5. *S. alba* L.

15a. Ramuli albo-pruinosi ..... 20. *S. Capusii* Franch.

b. Ramuli non pruinosi 16

16a. Folia stipulis parvulis lanceolato-subulatis provisa, lamina 40—80 × 5—10 mm ..... 21. *S. linearifolia* E. Wolf

b. Folia estipulata, 20—50 × 3—7 mm ..... 19. *S. carmanica* Görz

17a. Stipulae lineares vel lanceolatae. Folia utrinque glaucescenti-opaca, superne dense stomatifera, margine plano denticulis ± irregulariter dispositis tenuissimis 18

b. Stipulae aut latiores, late lanceolatae, ovatae vel curvatae falcato-lanceolatae, aut plane nullae (etiam earum vibiculae desunt vel haud 0,1 mm magnae). Folia supra viridia astomatifera vel stomatibus sparsis 19

18a. Ramuli annotini autumno 1,0—2,0 mm crassi. Gemmae florigerae 6—12 mm longae. Stipulae usque ad 10 × 3 mm. Folia vulgo 8—20 mm lata ..... 22. *S pycnostachya* N. J. Andersson

b. Ramuli annotini 0,7—1,2 mm crassi. Gemmae florigerae 4—8 mm longae. Stipulae minutae (usque ad 5 × 1 mm, nec ultra), vulgo recurvatae. Folia 5—8(—10) mm lata ..... 21. *S. linearifolia* E. Wolf

19a. Gemmae florigerae oblongae vel oblongo-lanceolatae, apice ramulum versus directo. Stipulae nullae. Folia denticulis marginalibus basin laminae versus multo remotioribus ..... 18. *S. elbursensis* Boiss.

b. Gemmae florigerae apice recto vel a ramulo ± divergente. Stipulae (vel vibiculae post stipularum decessu) semper manifestae. Lamina ± aequaliter denticulata vel integerrima 20

20a. Ramuli obscure vel sordide cinerascentes vel brunnescentes. Folia matura supra plana, subtus nervis lateralibus prominentibus, marginibus ± deflexis ..... 13. *S. Wallichiana* N. J. Andersson

b. Ramuli vulgo laete castanei vel brunnei vel rufescentes. Folia matura in sicco nervis lateralibus utrinque aequaliter tenuiter subprominentibus, marginibus callosulis ..... 23. *S. sericocarpa* N. J. Andersson

21a. Folia utrinque flavescenti-viridia ± lucida stomatifera ..... 10. *S. Fedtschenkoi* Görz

b. Folia discoloria, subtus ± caesio-opaca, supra stomatibus nullis vel sparsis 22

22a. Frutices humiles pauci- et breviter ramosi. Stipulae bene evolutae, ovatae

vel lanceolatae, (sub-)aequilaterae, nervo mediano recto. Folia etiam infima (cataphyllis inclusis) margine densissime minute serrulata 23

b. Frutices elatiores ± longiramosi. Stipulae aut rudimentariae aut lineari-lanceolatae aut inaequilaterae nervo mediano ± curvato. Folia infima saltem margine dentulis remotiusculis vel partim vel perfecte integerrima 24

23a. Ramuli annotini autumno 1,3—2,5 mm crassi. Folia 30—70 × 15—35 mm magna, glabra vel paullo pilosa (juvenilia tantum interdum dense lanata), nervis lateralibus subtus tenuiter prominentibus .... 9. *S. Karelinii* Turcz.

b. Ramuli annotini 1—1,3 mm crassi. Folia 20—30 × 10—15 mm, utrinque dense albo-villosa, nervorum rete subtus prominente ..... 25. *S. nuristanica* A. Skvortsov

24a. Gemmae florigerae 3—6 mm longae. Stipulae rudimentariae 0,2—1,5 mm longae; vibiculae post stipularum delapsum 0,1—0,4 mm magnae. Petioli supra plani vel subsulcati, sectione transversa semilunares. Folia (inferiora saltem) obtusata vel etiam apice rotundata ..... 16. *S. denticulata* N. J. Andersson

b. Gemmae florigerae vulgo quam 6 mm longiores. Stipulae (resp. earum vibiculae) majores. Petioli supra convexi, sectione transversa orbiculares. Folia omnia (iis ramulorum debilium suppressorum exceptis) acuta vel acuminata 25

25a. Gemmae florigerae maturae saepissime ± flavescentes vel rufescentes, ramulis pallidiores, facie adaxiali applanata, carinis lateralibus acutis, apice in rostrum planum et vulgo recurvatum abientes . 12. *S. iliensis* Regel

b. Gemmae florigerae maturae paullo vel minime applanatae, carinis lateralibus mitigatis, erostratae vel rostro minimo haud applanato 26

26a. Folia acuta, subacuta vel abrupte acuminata, matura supra vulgo ± rugosa, subtus nervorum rete prominente et pilis vel patentibus apice curvatis, aut omnino ± crispatis, aut irregulariter appressis ± dense obtecta interdum subglabra ..... 11. *S. aegyptiaca* L.

b. Folia attenuato-acuminata, matura nervis lateralibus tantum ± prominentibus, glabra vel praesertim subtus pilis rectiusculis ± longitudinaliter appressis 27

27a. Nervi laterales utroque latere 11—15, in foliis maturis in sicco superne subtusque aequaliter filiformi-prominentes ..... 23. *S. sericocarpa* N. J. Andersson

b. Nervi laterales utroque latere 7—11, in foliis maturis subtus tantum manifeste elevati..... 13. *S. Wallichiana* N. J. Andersson *)

Sect. *Humboldtianae* Pax in Engler & Prantl, Natürl. Pflanzenfam. 3, 1: 36 (1889)

Syn.: Sect. *Nigrae* C. K. Schneider, Ill. Handb. Laubholzk. 1: 32 (1904). Sect. *Tetraspermae* (N. J. Andersson) C. K. Schneider in Sarg., Plant. Wils. 3, 1: 93 (1916). Sect. *Acmophyllae* (N. J. Andersson) C. K. Schneider, l. c.: 105. Sect. *Bonplandianae* C. K. Schneider, Bot. Gaz. 65: 15 (1918). Sect. *Madagascarienses* Kitamura, Sci. Rep. Tohoku Univ. 13: 81 (1938).

Gemmae breviter triangulares, squama marginibus liberis. Amenta bracteis

*) *S. zygostemon* Boiss. similis esse videtur; sed adhuc parum cognita haud bene discernitur.

pallidis, in femineis post anthesin caducis. Nectaria in masculis dua opposita vel interdum 3—4 basi subconnata. Stamina numero variante (3—10), filamentis pilosis, antheris parvulis rotundatis aureis. Capsulae breves crassiusculae, styli stigmataque minuti.

1. ***S. tetrasperma*** Roxb., Plants of the Coast of Coromandel 1: 66 et tab. 97 (1795).

Syn.: *S. indica* Roth, Nov. Plant. Spec. Praesert. Ind. Orient ex coll. Doct. Benj. Heynii 366 (1821). *S. pyrina* Wall. ex N. J. Andersson, Sv. Vet. Akad. Handl. 1850: 486 (1851). *S. ichnostachya* Lindl. ex N. J. Andersson, l. c.: 488 (1851). *S. araeostachya* C. K. Schneider in Sarg., Plant. Wils. 3, 1: 96 (1916).
Icon.: N. J. Andersson, Monogr. Sal. tab. 1, fig. 1 (1867). Stewart ex Brandis, Forest Fl. tab. 58 (1874). Dode in Fl. Génér. Indo-Chine 5, fig. 119, 1—5 (1931). Hao, Synops. Chin. Sal. tab. 3, fig. 6 (1936). Täckholm, Student's Fl. Egypt, tab. 66 (1956). Skvortsov, Dansk Bot. Ark. 20, 2: 182 (1962).
Typus: „India", Roxb.

Arbor mediocris vel frutex elatus. Folia juvenilia exsiccando saepe nigrescentia; matura supra ± lucida saturate viridia, subtus pallidius viridia vel caesio-opaca, margine minute denticulata vel integerrima, 80—180 × 25—50 mm. Amenta sessilia vel pedunculis foliatis usque ad 30—40 mm longis. Bracteae 1—2 mm longae, obtusatae vel truncatae, totae vel partim breviter dense hirsutae, exsiccando saepe ± fuscescentes. Capsularum pedicelli 0,5—3 mm longi, saepissime bracteas subaequantes vel longiores. Stylus 0,1—0,3 mm, stigmata 0,15—0,3 mm longa. Floret IX—II.

Pakistan: Quetta: Nasirabad, H.-B. 20656, 20667.

Distr. gen.: Regiones tropicae et subtropicae Indiae, Indochinae, Malaccae, Javae, Sumatrae necnon Sinae australis; in Aegypto culta.

In Beludschistania passim culta videtur, haud spontanea; a Burkill, Working List 71 (1909) indicatur; specimina nulla vidi.

2. ***S. acmophylla*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 98 (1846). Boiss., Fl. Or. 4: 1183 (1879).

Syn.: *S. persica* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 99 (1846); Boiss., Fl. Or. 4: 1183 (1879). *S. basraënsis* Toepffer, Sal. Exs. No. 456 (1920). *S. pseudosafsaf* Camus & Gombault, Bull. Soc. Bot. Fr. 86: 136 (1939) et 89: 24 (1942). *S. Louisii* Camus & Gombault, l. c. 89: 29 (1942). ? *S. Daviesii* Boiss., Diagn. Pl. Or. Nov. Ser. 7: 98 (1846); Boiss., Fl. Or. 4: 1183 (1879).
Icon: N. J. Andersson, Monogr. Sal. tab. 1, fig. 6—7 (1867). Görz in Flora Turkmen. 2, fig. 126 (1937). Camus & Gombault, Bull. Soc. Bot. Fr. 89, fig. 1—14, 19—22 et tab. phot. 2—3 (1942). Skvortsov in Fl. Tadjik. 3, tab. 11 (1968).
Typus (Syntypi): Ky. 323 et 620, G, JE!, LE!, W!

Arbor parva vel mediocris, ramulis vulgo rubicundis, saepe subpendulis. Folia juvenilia (etiam exsiccata) dilute viridia; matura supra laete viridia, subtus dealbata, margine minute acute denticulata vel fere integerrima, apice sensim tenuiter angustato-acuminata, 60—160 × 7—20 mm. Amenta sat brevia densaque. Bracteae etiam exsiccatae pallidae, 1,5—2 mm longae, praecipue intus dense breviter pilosae. Capsularum pedicelli 0,4—1,8 mm longi, bracteas non superantes. Stylus 0,15—0,6 mm, stigmata 0,1—0,2 mm longa. Floret II—III.

Iraq: Kurd.: Mosul: Sirsang, 1050 m, Haines! Amadiyah, Ky. 400! Chiya-e Gara, Ky. 397! — Diyala: Khanaqin, Str.! Inter Khanaqin et Baghdad, Rech. 2145! Mirjani, Sutherland 383!

Persia: N: Gil.: M. Samam inter Bibersin et Pak Deh, Buhse! Inter Kelishom et Pul-i Ambu, Alexeenko! — W: Kurd.: Dezh Shahpur, 1400 m, Jacobs 6485! N Sanandaj, Furse 2086! Ham.: Tafresh, Str.! Kermansh.: Kuh-e Richab, Str.! Kuh-i Tarikha SE Kermanshah, Str.! Jam Tueh, Str.! Jamnasu, Str.! Inter Sanandaj et Kermanshah, Haussкn.! 88 km N Kermanshah, Bent & Wr. 519—701! Esf.: 48 km W Esfahan, Stutz 830! Esfahan, Haussкn.! Lur.: 43 km N Andimeshk, Bent & Wr. 425—201! Bisheh, 1200 m, Rech. 5687! Dow Rud, Koelz 17259!, 17705! Najiu, 1700 m, Koeie 517! Shah Bazan, Koeie 1721!, 1723! — S: Fars.: Shiraz, Tal-e Khosravi, Behb. 1328-E! Pulvar, 1900 m, Bornm. 4549! Kuh Bungi, Stapf 885!, 889! Kuh Bamu, Stapf 886! Konar Takhteh, Stapf 887! Khaneh-ye Zenyan, in valle Rud-e Mand, Stapf 888! Sivand, Stapf 890! Golmakan, Stapf 891 p. p.! Safid Rud, Stapf 893! Kuh-e Dinar, Ky. 620!, 323! Bag-i Bagich, Stapf 895! Prope Shapur, Stapf 896!, Koeie 1724! Haussкn.! Prope Shiraz, Stapf 897!; 1600 m, Grant 15275!, 15483! Inter Bushehr et Shiraz, Ky. 101 (typus *S. persicae* Boiss.)! Kuh-e Barfi, Ky 335 (typus *S. Daviesii* Boiss.)! Inter Fasa et Sarvestan, Gauba & Sab. 1970! 20 km SW Saadatabad, 1800 m, Grant 15427! Kerm.: Khabis, Bge.! Baghin, 2000 m, Bornm. 4550! Zahedan, 1300 m, Rech. 3947! Inter Kerman et Saidabad, 2000 m, Rech. 3087! Lar.: Hajjiabad prope Tarom, 900 m, Rech. 3476! Bal.: Kuh-e Taftan prope Sangon, 1600 m, Rech. 4060!, 4082! Makran: Nikshahr, Shar. 267-E! Persia australis, Haussкn.! — E: Sistan: In palude salina, Henderson 42! Sistan, Ayazi 5627! Khor.: Tabas, Bge.! — C: Tehr.: Prope Pas Qaleh, Ky. 121! Qazv.: Prope Karaj, Rech. 332!, 762! Vessieh, 1600 m, Gauba 1942! Yazd: Deh Bala, 2300 m, Bornm. 4551! Inter Kerman et Yazd, 1400 m, Bornm. 4552! M. Shir Kuh, Bornm. 4553! Kashan: Mahabad, Sab. 415! — Persia, Hoeltzer 87! Bagh-e Khan, Sab. 419!, Algand, Sab. 420! Zallaghi, Sab. 422! Shalil, Gadd, Zarudny 827! Shalalia, Gadd, Zarudny 491!

Turcomania: M. Kjurendagh, Sievers! Kazandshik, ad rivulum, Sint. 2211! Distr. Bacharden: M. Almadshik, Blinovsky! Ipai-dere, Blinovsky! Inter Archman et Nokhur, Fedtsch., Massagetov & Bobrov 626! Kopet Dagh centralis: Garmab, Schenck 887! Shorlok, Blinovsky! Kara-Kala: Ad fl. Sumbar, Sint. 1964! Ad font. Peikamli, Blinovsky!, Skvortsov! Aydere, Boriss. 569!, Blinovsky! Joldere, Lincz. 332! Kurushdei, Blinovsky! Ad fl. Chandyr: Chekan-Kala, Blinovsky! Firyuza, Korsh. 4873!, Lipsky 1305!, Litw. 2408! Androssov!, Blinovsky, Skvortsov! Chuli, Lipsky 1911!, Litw. 2417!, Androssov!, Blinovsky! Ad fl. Keltenchinar, Litw. 2412!, Blinovsky! Ad trajectum Gaudan, Blinovsky! Keljata, Androssov! Ad fl. Tedzhen: in angustiis Gyaurs, Timofeev! Prope Kushka, Androssov!

Afghanistan: N: Mazar-i Sharif: Prope Tashkurghan, Rodin 482! — NW: Herat Inter Chehel Dokhtaran et Herat, Bukinicz! Badghiz: Sim Koh, Aitch. 513 — SW: Farah, cult. Volk 2917!, 2917-a! Prope Khurmalik, 800 m, Rech. 19279! Ghorat: Parjuman, 1850 m, Rech. 19016!, 19017! — SE: Kandahar: Girishk, Volk 2902! Pirzada, Koeie 2109! Inter Mianpushta et Safer ad fl. Helmand, Rech. 34587! — E: Kabul: Inter Kabul et Sarobi, 1400—1500 m, Rech. 16930! 2—15 km W Sarobi, 1000—1300 m, Rech. 34433! Tang-i Gharu, Gilli 2439!, Kerst. 549!, Hdg. & Wdb. 3099! Prope Kabul, Gilli 2440! Laghman: Ad fl. Kabul prope Laghman, Rodin 183! Inter Jalalabad et Nimla, Rodin 232! Kail, Koelz 11664! Jaji: Inter Said Karam et Ahmad Khel, 2200—2600 m, Rech. 32184! Khost: In valle fluvii Matun 10—15 km NW Khost, 1400 m, Rech. 35750! Panjshir: Ad fl. Panjshir prope Basarak, 1900 m, Gilli 2441! Rukha, Volk 200! Nuristan: Wama, 1400 m, Kerst. 783!, Edelb. 452! — Afghanistan, Griff. 4505!

Pakistan: Chitral: Bundai, Harriss 16644! Ad pagum Chitral, Stainton 2166! — Kohat: 20—30 km W Kohat versus Thal, Rech. 30233! — Kurram: Hangu, Y. M. Khan, 29! Alizai, Y. M. Khan 53! In valle Kurram, Aitch. 39!, 49!, 64!, 365!, 503!, 1117! Inter Amal Kot et Sadda, 1400 m, Rech. 30980! — Quetta: Urak, 1800 m, Rech. 27355! Pishin, Lace!

Distr. gen.: Turcia austro-orientalis, Syria, Palaestina, Sinai, Iraq, Persia, Turcomania, Afghanistan, Pakistan, India boreo-occidentalis, usque ad Kumaon.

S. Daviesii Boiss. est forma anomala 2—3-andra vel fortasse hybrida *S. acmophylla* × *excelsa* S. G. Gmelin; conf. Skvortsov 74 (1960). Plantas nonnullas certius hybridas in mont. Kopet Dagh prope Firyuza anno 1956 inveni (Skvortsov!).

Sect. *Amygdalinae* Koch, Syn. Fl. Germ.: 644 (1837)

Syn.: Sect. *Triandrae* Dumort., Bull. Soc. Bot. Belg. 1: 146 (1862).

Cortex ramorum vetustorum laminis irregularibus desquamans (modo *Eucalypti*). Rami valde flexibiles. Gemmae florigerae foliiferis extus simillimae. Petioli ad basin laminae glandulis manifestis provisi. Amenta serotina anguste cylindrica laxiuscula. Bracteae pallidae, in femineis post anthesin caducae. Stamina 3, filamentis basi lanatis, antheris exsiccando curvatis. Capsulae pedicellis 1—2 mm longis, parvulae, maturae 3—4 mm longae, ovate subfusiformes. Styli brevissimi, stigmata brevissima opposite divaricata.

3. ***S. triandra*** L., Spec. Plant. 1016 (1753).

Syn.: *S. amygdalina* L., Spec. Plant. 1016 (1753). *S. Bornmuelleri* Haussk., Mitt. Bot. Ver. Gesamtthüring. 9: 21 (1890). *S. Medwedewii* Dode, Bull. Soc. Bot. Fr. 55: 652 (1908). *S. armena* Schishk., Izv. Univ. Tomsk 81: 436 (1929).

Frutex elatus raro arbor parvula. Stipulae saepissime bene evolutae, latae. Folia lanceolata vel lineari-lanceolata, dense aequaliter serrulata, supra laete viridia, subtus pallidius viridia vel dealbata, saepissime quam in *S. songarica* majora. Amenta pedunculis foliatis, foliis saepissime stipulatis, mascula culmine anthesis 30—80 × 6—8 mm, feminea matura 25—60 × 7—10 mm magna.

Distr. gen. speciei: Africa borealis, Europa fere tota, Caucasus, Sibiria australior, Amur, Mandshuria, Japonia.

1a. Ramuli foliaque glaberrimi ..... subsp. *triandra*.
b. Ramuli foliaque ± hirsuti .. subsp. *Bornmuelleri* (Haussk.) A. Skvortsov

— — subsp. ***triandra.***

Icon.: E. Wolf, Izvest. Lesn. Inst. 4, tab. 1 fig. 1—7 (1900). Dode, Bull. Soc. Bot. Fr. 4: 653 (1909). Vicioso, Salic. Espan. fig. 3 (1951). Beldie in Fl. Rom. 1, tab. 39 fig. 1b, 1d—g (1952). Andreev, Arbores fruticesque Moldaviae 1, fig. 13 (1957; rossice). Machatadze in Dendrofl. Caucas. 2, fig. 14 (1961; rossice). Hegi, Ill. Fl. Mitteleur. 3, 1, (1957). Krall-Viljasoo, Eestis Pajud, fig. 12 (1965).

Typus: „In Helvetia, Sibiria".

Persia: N: Gorg.: Ata Jangal, Michelson 605!, 606! — W: Azerb.: Inter lacum Rezaiyeh et Shahpur, Szov.! Ad fl. Baranduz Chay, Schelkownikow & Schipzinsky 490! Rezaiyeh, 1400 m, Gauba & Sab. 1968! Qareh Dagh, Buhse! Kurd.: S Sanandaj, 1890 m, Archibald 1945! Ad fl. Qislag Rud prope Sanandaj, Str.! Ham.: Borujerd, Str.! In jugo Shah, M. Kuh-e Alvand, Furse! Lur.: Oshtoran Kuh, Str.! Dow Rud, Koelz 17258! Borj, 2100 m, Koeie 1722! — „Ad torrent. M. Zagros ubique", Haussk.! — S: Fars.: Ad fl. Pulvar, 1900 m, Bornm. 4542! Kuh-e Barfi prope Shiraz, Ky.!

Turcomania: Kopet Dagh: Ad fl. Sumbar prope Daine et in angustiis Utsch-Dyketschler, Blinovsky!

Afghanistan: E: Kabul: Ad fl. Paghman prope Gusargah, 1770 m, Gilli 2434! — C: Panjao: 12 km E Panjao, 2650—2800 m, Rech. 36162! Behzud: Siah Sang prope Farakulum ad fl. Helmand, 2900 m, Rech. 36095!, 36096!

Distr. gen. subspeciei: Africa septentrionalis, Europa, Caucasus, Persia, Turcomania, Afghanistan, Sibiria australior usque ad Jacutiam centralem (sed Transbaicalia excepta).

— — subsp. ***Bornmuelleri*** (HAUSSKN.) A. SKVORTSOV, comb. nov.

Syn.: *S. Bornmuelleri* HAUSSKN., Mitt. Bot. Ver. Gesamtthüringen 9: 21 (1890). Typus subspeciei: „Asia Minor, Amasia, in humidis fl. Jeschil Irmak", BORNM., JE!

Iraq: Kurd.: Mosul: Ad ripam Tigridis prope Mosul, BORNM. 653!, HAND.-MZT. 1271!
Distr. gen. subspeciei: Anatolia, Iraq, rarissime in Armenia sovietica.

Praeter has subspecies duas, subsp. *nipponica* (FRANCH. & SAV.) A. SKVORTSOV a lacu Baical usque ad Japoniam occurrit.

4. ***S. songarica*** N. J. ANDERSSON, Monogr. Sal.: 53 et tab. 3 fig. 34 (1867).

Syn.: *S. hypericifolia* GOLOSKOKOV in Fl. Kazakhstan, 3: 434 (1960).
Icon.: NASAROV, Fl. URSS. 5, tab. 9 fig. 5 (1936). DROBOV in Fl. Uzbekistan 2, tab. 1 fig. 3 (1953). POLJAKOV in Fl. Kazakhstan 3, fig. 12 (1960).
Typus: „In Songaria ad Ajagus et in ripis fl. Tschu et Ili, SCHRENK", LE!

Frutex elatus vel arbor trunco brevi, coma lata. Ramuli vulgo tenuiores quam *S. triandrae*. Stipulae saepius desunt. Folia lanceolata, glaberrima, languide viridia vel olivacea, in vivo crassiuscula subcarnosa, margine ± irregulariter denticulata vel incisuris parvulis vel integerrima. Amenta quam *S. triandrae* tenuiora, mascula vulgo ± flexuosa.

Persia: E: Khor.: Ad fluvium Hari Rud sec. AITCH., Trans. Linn. Soc. London 3, 1: 111 (1888).
Turcomania: Kopet Dagh centralis ad fl. Shorlok, BLINOVSKY! Ad fl. Murghab prope Takhta-Bazar, DENEGIN!
Afghanistan: N: Mazar-i Sharif: Akcha, NEUB. 111!

Distr. gen.: Turcomania ad fl. Murghab et Amu-Darya, Tadjikistan occidentalis, Uzbekistan (Kara Kalpakia inclusa), Kazakhstan australis.

Ad fl. Piandsh probabilissime invenietur: in URSS. ad Piandsh cursu medio prope Soghar et cursu inferiore non procul a confluente cum Vaksh jam reperta.

Sect. *Salix*

Syn.: Sect. *Albella* DUBY in DC., Bot. Gall. 2 ed.: 425 (1828). Sect. *Fragiles* KOCH, Syn. Fl. Germ. 624 (1837). Sect. *Albae* Kerner, Verh. Zool. Bot. Ges. Wien 10: 185 (1860).

Arbores sat magnae. Truncus cortice griseo longitudinaliter fisso. Gemmae florigerae foliiferis extus simillimae. Folia lanceolata sensim acuminata regulariter dense serrulata crassiuscula, nervis nec supra nec infra prominentibus. Amenta coaetanea vel subserotina, densa, crassiuscula. Bracteae pallidae, exsiccatione ± rufescentes, in femineis post anthesin caducae. Stamina 2 filamentis basi hirsutis. Capsulae manifeste pedicellatae, conico-lanceolatae, magnitudine mediocri, glabrae, stylo evoluto, stigmatibus bilobis vel bifidis ± divergentibus (nec opposite divaricatis).

5. ***S. alba*** L., Spec. Plant.: 1021 (1753).

Icon.: Fl. URSS. 5, tab. 9, fig. 4 (1936). Fl. R. P. Romin. 1, tab. 39, fig. a—d (1952). HEGI, Ill. Fl. Mitteleur. ed. 2., 3, 1, tab. 80, fig. 1 (1957). DOSTAL, Klič

ČSR fig. 1244 (1958). — Černiavski et al., Arbor. frutic. Bulgar., fig. 85 (1959; bulgar.). — Krall et Viljasoo, Eestis Pajud, fig. 11 (1965).
Typus: „Ad pagos et urbes Europae".

Arbor ad 25—30 m alta. Rami graciliores quam speciei sequentis, interdum subpenduli, saepissime rubro-brunnei. Ramuli juniores ± appresse pilosi. Stipulae anguste lanceolatae vel subulatae, cito caducae. Petioli supra sulcati, ad basin laminae-praesertim foliorum ramuli superiorum glandulis ± conspicuis provisi. Folia utrinque dense stomatifera. Amenta pedunculis foliolatis, foliolis vulgo integerrimis obovatis vel oblanceolatis acuminatis. Stamina sub angulo acuto ab axin amenti divergentes, antheris ovalibus in vivo aureis, exsiccatione interdum rufescentibus).

Iraq: Kurd.: Arbil: Shaqlawa, Barkley & Brahim 7097! Mosul: Sirsang, 1050 m, Haines 1123! Kirkuk: Darband-i Bazian, Haussk.! Sul.: M. Qara Dagh, 1200 m, Haines 1523!
Talish: Amburdara, Schipczinsky! Inter Vela-Chulia et Dshangameran, Schipczinsky! Lenkoran: Geladara, Matveeva 562!
Persia: W: Kurd.: 31 km N Sanandaj, 2000 m, Grant 16065! Ham.: Inter Songor et Hamadan, Str.! Kermansh.: Kuh-e Richab. Str.! Bisotun, culta, Jacobs 6249! In valle Jamnasu, Str.! Inter Kermanshah et Karand, in M. Kuh Gahvareh, Str.! Lur.: Oshtoran Kuh, Str.! Persia austro-occidentalis, 2100—2400 m, Haussk.! — C: Tehr.: Darakeh, Esfand. 6916-E!
Afghanistan: E: Kabul, culta, Volk 1524!

Distr. gen.: Africa septentrionalis, Europa media et australis, Anatolia, Iraq, Persia, Afghanistan, Caucasus, Talish, Sibiria australior orientem versus usque ad Minussinsk.

Formis numerosis transitoriis forsan hybridis cum specie sequente connecta; cf. Skvortsov, l. c. 79 (1960) et fig. 1; 119 (1966). Specimina ad *S. excelsam* vergentia hic enumerantur:

Persia: N: Gil.: Manjil, ad fl. Safid Rud, Buhse 976! — W: Azerb.: Rezaiyeh, 1400 m, Gauba & Sab. 1968! Mahabad, Gauba & Sab. 1969! Kaleybar, Mird. 1974! Ham.: Soltan Bolagh, Sab. 417! Lur.: Dow Rud, 2400 m, Koelz 18350! — C: Tehr.: In valle Hafthauz, 1300—1500 m, Aell. 1082! Shahrestanak, 2400 m, Linds. 568! — Algand, Sab. 421! Bagh-e Khan, Sab. 418!

6. ***S. excelsa*** S. G. Gmelin, Reise Rußland 3: 308 et tab. 34, fig. 2 (1774).

Syn.: *S. australior* N. J. Andersson, Monogr. Sal. 43 (1867). *S. fragilis* auct. fl. orient., non L. (1753). *S. variifolia* Freyn & Sint., Bull. Herb. Boissier 2, 11: 907 (1902). S. *oxica* Dode, Bull. Soc. Bot. Fr. 55: 653 (1908). *S. neodaviesii* Bornm. & Görz ex Görz, Feddes Repert. 35: 283 (1934). *S. dischgensis* Görz, Feddes Repert. 35: 284 (1934). *S. Litwinowii* Görz ex Nasarov, Fl. URSS. 5: 708 (1936). *S. euapiculata* Nasarov, Fl. URSS. 5: 713 (1936).
Icon.: Machatadze in Dendrofl. Caucas. 2, fig. 18 (1961).
Typus: Persia: Rasht, S. G. Gmelin, LE!

Arbor ad 25—30 m alta. Rami quam in *S. alba* crassiores, in cacumine arborum vetustiorum ad basin sat fragiles. Gemmae ovatae vel lanceolatae dorso convexo. Folia utrinque dense stomatifera. Amenta, bracteae, antherae, capsulae, styli stigmataque vulgo majores quam speciei praecedentis. Floret III—IV.

Talish: Mussakend, Voronina! Baladshary, Voronina! Lenkoran, Pastuchov!; coll. ign.! Inter Vela-Chulia et Dsangameran, Schipzinsky 494!

Persia: N: Gorg.: Shah Pasand, 200 m, Grant 17340! Bandar-i Gaz, Michelson 56! Prope Gonbad, Michelson 599! Silva Ata Jangal, Michelson 814! Inter Gorgan et Hoseynabad, Buhse! Supra Naudeh, Gauba & Sab. 1957! Aliabad, Gauba 1949! Chehel Cahi, 250 m, Gauba & Sab. 1956! Ad fl. Ketul, Gauba! Maz.: Chalus, culta, Esfand.! S Chalus, 900 m, Stutz 1184! Kojur, 1200 m, Gauba s. n.! In valle Oshtorak, 2200 m, Gauba & Sab. 1958! Ad fl. Talar prope Shirgah, 300 m, Gauba & Mird. 1953! Ad fl. Talar, Kriesche in Rech. 2308!, 2322! Babol, Gauba 1951!, 1954! In valle Haraz S Karehsang, 100 m, Wdb. 277-a!; 1000 m, Wdb. 1667! Pol-e Zoghal, 400 m, Gauba! Hazar Jerib, Shar. 331! Nowshahr, Sab. 12044-E! Gil.: Lahijan, Gauba s. n.! Gauba & Mird. 1960!, Sistan prope Lahijan, Behb. in Gauba 1967! Safid Rud, Buhse! Inter Kelishom et Pul-i Amba, Alexeenko! Harsevil prope Manjil, 700 m, Gauba 1955! Astara, 100 m, Gauba! — W: Azerb.: M. Qareh Dagh, Mird. in Gauba 1975! Prope Maragheh, Schelkownikow & Schipzinsky 255! Kurd.: 35° 32′ N, 46° 17′ E, Jacobs 6485!, 6485-a! Sanandaj, Jacobs 6724! Ham.: Kuh-e Garri, Str.! Kermansh.: Kuh-i Parrow, Str.! Inter Ghasse et Tang-e Pataq, Shar.! Inter Tang-e Pataq et Karand, Shar.! Sarab-e Nilufar, 25 km W Kermanshah, Bent & Wr. 404—102! Kermanshah, Jacobs 6249!, 6249-a. Arak: Arak, culta, Str.! Lur.: M. Oshtoran Kuh ad lac. Göl-e Keher, Str.! Azna, 1800 m, cult., Koeie 1720! Najiu, 1900 m, Koeie 540! — S: Fars.: 20 km W Saadatabad, 1800 m, Grant 15426! Kuh Bungi prope Dasht-e Arzhan, Stapf 894! Dasht-e Arzhan, Stapf 892 (typus *S. dischgensis* Görz)! Golmakan, Stapf 891 p. p.! Kerm.: Inter Kerman et Saidabad, 2000 m, Rech. 3086! — E: Khor.: Kuh-e Neyshabur infra Akhlamad, Rech. 4665! Ad fl. Atrak inter Shirvan et Bojnurd, Rech. 1790! — C: Tehr.: Tehran, cult., Rech. 2642! Gach Sar, 2000 m, Tregubov 206! Pas Qaleh prope Darband, Rech. 1089! Firuzabad, 1450 m, cult., Gauba & Sab. 1966! Qazv.: Karaj, Rech. 232!, 237!, Gauba 1938!, 1961!, 1992!, 1986!, 1989! 10 km W Karaj, Stutz 698! M. Hazarband, 2500 m, Gauba & Sab. 1959! Damgh.-Semn.: Inter Damghan et Rashm, Buhse! Abdollahabad inter Semnan et Varamin, 1200 m cult., Rech. 2773! Semnan, cult. Rech. 2789!, 2790! Shahr.-Bust.: In declivibus australibus M. Shahvar, 2400 m, Rech. 6214! Kashan: Prope Qohrud, Str.! Yazd: Deh Bala, 2300 m, Bornm. 548 (typus *S. neodaviesii* Bornm. & Görz)!

Turcomania: Kazandzhik, cult. Blinovsky! Kizyl-Arvat, cult., Skvortsov! Kara-Kala et viciniae, cult. et spont., Sint. 1792!, Czernjak. 280!, 341!, Blinovsky! Skvortsov! Suluklü, Sokolov 204! Kopet Dagh centralis: Karaul, Egorova! Inter Nokhur et Aydere, Lipsky 3827! Aydere, Blinovsky! Joldere, Lipsky 3121!, 3133!, Blinovsky! Kulkulab, Blinovsky! Dushak, Blinovsky! Ad fl. Arvaz, Gubanov & Vlassov! Sumbar superior: Kerkau-dere, Blinovsky! Utch-Tykechler, Blinovsky! Aktepe ad fl. Atrak, Lipsky 3940! Bacharden, cult., Blinovsky! Keltenczinar, Litw. 2412! Firyuza, cult. et spont. Litw. 2416!, Blinovsky!, Skvortsov! Chuli, Lipsky 1823!, 1681!, Blinovsky! Ashkhabad, cult., Korsh. 6481!, Blinovsky!, Skvortsov! Distr. Kaachka, ad fl. Chaatcha, Blinovsky! Ad fl. Keljat Chay, Blinovsky! Kaachka, cult. Blinovsky!, Denegin! Kushka, cult. Blinovksy! Takhta Bazar, cult. Blinovsky!

Afghanistan: N: Mazar-i Sharif: Balkh, Rodin 489! Inter Chashmeh Shafal et Akupruk, 800—1000 m, Rech. 16267! — NW: Bala Murghab: Bala Murghab ad fl. Murghab, 470 m, Jakeš! Herat: Obeh, 1700 m, Koeie 3611! Chashmeh Obeh, 1800 m, Rech. 19242! — E: Paghman, ad fluv. Paghman, 2520 m, Gilli 2436!, Volk 339! In angustiis Paghman, 2700 m, Rodin 57! Sar-i Chashma, Rodin 67! Kabul, cult., Volk!, Gilli 2435! Panjshir: Prope Gulbahar, 1700 m, Gilli 2437! Reiner 673! Ghorband: In valle Ghorband, Neub. 289! — NE: Takhar: Prope Taliqan, 780 m, Podlech 10387! Kataghan: Baghlan, Rodin 335! 15 km W Khanabad, Rodin 386! Kunduz, Rodin 372! — C: Bamian: In nemoribus fluvii 12 km E Bamian, 2320 m, Rech. 36979!, 36980! Ad cataractum Kuh Naiak, Lindb. 1065! Kuh-i Baba, Thesiger 131! Deh Kundi: In decl. australibus jugi Waras, 2400 m, Rech. 36705! Shahrestan, 2200 m, Rech. 36731!

Pakistan: Kurram: In valle Kurram, Aitch. 211!, 241!, 1118! Quetta: Spin Karez, 1800—1900 m, Rech. 29252! Hanna, 1800 m, cult., Stewart 28155! Quetta, Lace!

Distr. gen. speciei: Syria, Libanon, Anatolia orientalis, Iraq, Persia, Transcaucasia australis et orientalis, Afghanistan, Pakistan, Asia Media sovietica (usque ad lacus Aral et Balkhash), Kashmir, Kashgaria. Ab antiquissimis temporibus in toto fere Oriente culta, propterea aream primigenam speciei difficillime est invenire. In parte majore areae hodiernae verosimiliter solum modo culta et passim e cultura effugita.

Formis intermediis (forsan hybridis) cum *S. alba* praesertim in Turcia, Transcaucasia et Persia occidentali connecta; cf. supra adnot. ad *S. albam*.

— — var. ***Rodinii*** A. Skvortsov, Nov. Syst. Pl. Vasc. 1965: 97 (1965).

Syn.: *S. variifolia* Freyn & Sint., Bull. Herb. Boissier 2, 11: 907 (1902).

Typus: Rodin 87, LE!, MW!, A!

A formis communibus *S. excelsae* foliis magnis 100—170×40—70 mm, latissimis, latitudine 2—2,5-plo longioribus necnon stipulis fere semicordatis distinguitur.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1452!, 1488!, 2122 (specim. authentica *S. variifoliae* Freyn & Sint.)! — S: Fars.: Tal-e Khosravi, Behb. 1327-E!, 1329-E!

Afghanistan: E: Kabul: Hauz-i Mahiha, 2500 m, Koeie 2488! In angustiis Sar-i Chashma, Rodin 68!, 69! Gardez: M. Safed Kuh, in jugo Altimur, 2600—2700 m, Rech. 31942! Ghazni: Sang-i Masha, Rech. 17480! In valle Ghorband, 170 km a Kabul, Rodin 87! — C: Behzud: A Behzud versus fluv. Kabul, 2900 m, cult., Bukinicz! Ghorband: In jugo Shibar, 2500—2750 m, Rech. 36933!

Distr. gen. varietatis: Endem.

Sect. *Subalbae* Koidz., Bot. Mag. Tokyo 27: 88 (1913)

Syn.: Sect. *Subfragiles* (Seemen) Nakai, Fl. Sylv. Kor. 18: 163 (1930).

Arbores. Gemmae florigerae foliiferis jam extus dissimiles. Folia lanceolata tenuiter acuminata, plana, nervis non prominentibus, margine minute acutissime serrulata. Amenta breviter cylindrica, parva, densa. Bracteae pallidae persistentes. Stamina 2 filamentis brevibus, antheris parvis subglobosis. Capsulae ovatae sessiles parvae.

7. ***S. babylonica*** L. Spec. Plant. 1017 (1753).

Syn.: *S. lasiogyne* Seemen, Sal. Japon.: 32 (1903). *S. Matsudana* Koidz., Bot. Mag. Tokyo 29: 312 (1915). *S. jeholensis* Nakai, Rep. Sci. Exped. Manchukuo 4, 4: 74 (1936).

Icon.: Stewart ex Brandis, Ill. Forest Fl. tab. 59 (1874). Seemen, Sal. Japon. tab. 3 fig. A—E, tab. 4 fig. A—C (1903). Nakai, Fl. Sylv. Kor. 18, tab. 39 et 40 (1930). Maire, Fl. Afr. Nord 7, fig. 1133 (1961). Skvortsov in Fl. Tadjik. 3, tab. 12 fig. 1—3 (1968).

Typus: „In Oriente".

Arbor ad 15 m alta, in regione nostra ramis pendentibus. Folia ramulorum inferiora latiora dentulis sparsis, superiora anguste vel lineari-lanceolata, attenuato-acuminata, dense minute serrulata, glabra vel pilis sparsis ± appressis, supra astomatifera vel stomatibus sat densis. Amenta vel subsessilia, basi cataphyllata vel pedunculis foliatis, axi dense hirsuta, 10—30 mm longa. Bracteae pallidae, apicem versus angustatae, persistentes, pilis rectiusculis ± pubescentes, interdum subglabrae. Antherae 0,4—0,6 mm longae. Capsula sessilis, ovata, matura usque ad 4 mm longa, glabra vel praesertim basi ± appresse-pilosa.

Stylus 0,2—0,4 mm, stigmata (sub-)biloba 0,2—0,4 mm longa. In regione „Florae Iranicae" solummodo culta.

Talish: Lenkoran, coll. ign.!
Persia: N: Maz.: Galand Rud, Sab. 12042-E! Gil.: Rasht, Buhse! Prope Rudbar, Gauba & Sab. 1952! Inter Bandar-e Pahlavi et Rasht, Rech. 19 (an *S. babylonica* × *alba*?)! Gilan et Mazanderan, frequenter culta, Buhse! — C: Qazv.: Karaj, Gauba 1962! — Persia, Hoeltzer!
Turcomania: Kara Kala, Czernjak. 340!, Skvortsov! Firyuza, Lipsky 1461! Ashkhabad, Litw. 2414!, Korsh. 6482!, Blinovsky! Keltenczinar, Litw. 2415!
Afghanistan: E: Kabul: Darulaman, 1700 m, Kerst. 446! Ad fl. Logar, Gilli 2438! Ghazni: Sar-i Ab 2700 m, Rech. 37197! Sang-i Masha, 2400 m, Rech. 17513!
Pakistan: Quetta, Lace!

Distr. gen.: In regionibus subaridis Sinae centralis indigena (prov. Kansu, Ninghsia, Shensi, Shansi, Suiyuan, Jehol). In regionibus calidioribus totius fere mundi colitur.

Specimina afghanica omnia forsan hybrida *S. babylonica* × *excelsa* S. G. Gmelin; omnia amentis carent.

Sect. *Lindleyana* C. K. Schneider in Sarg., Plant. Wils. 3: 144 (1916)

Fruticuli pygmaei. Folia parva vel minima, subtus nervis paullo vel nullo modo elevatis. Gemmae florigerae extus foliiferis simillimae. Amenta ramulos foliiferos terminantia, parva, pauci- vel rariflora. Nectaria in masculis dua. Filamenta basi ± pilosa vel glabra, antherae parvae. Capsulae parvae.

Salicum himalayensium cognitionis imperfectae causa, ambitus sectionis adhuc sat incertus est; eo speciem sequentem ad sect. *Lindleyanae* ad interim modo refero. Contra opinionem C. K. Schneideri, l. c. 142, hanc speciem S. *berberifoliae* Pall. haud affinem esse puto.

8. ***S. flabellaris*** N. J. Andersson, Sv. Vet. Akad. Handl. 1850: 497 (1851).

Icon.: Klotzsch & Garcke, Bot. Ergebnisse Reise Prinz Waldemar von Preußen tab. 90 (1862).
Typus: „In humidis herbosis sub jugis versus Soognum, 4000 m", Jacquemont, P.

Fruticulus glaberrimus usque ad 15 cm altus, truncis procumbentibus radicantibus, ramis ± ascendentibus. Folia plane estipulata, petiolis sulcatis, obovata, apice rotundata vel brevissime subacuminata, 7—35 × 6—25 mm margine minute denticulata. Amenta pedunculis 8—25 mm longis foliatis suffulta, erecta, 10—45 mm longa. Bracteae membranaceae, apice rotundatae vel subtruncatae, ± concavae et capsulis accumbentes, flavescentes vel saepius ± fuscescentes. Nectaria in masculis saepissime dua, in femineis unica. Filamenta 1,5—2,5 mm longa, antherae subglobosae, 0,3—0,5 mm longae. Capsula sessilis, ovata, matura 3—4,5 mm longa. Stylus 0,1—0,3 mm, stigmata c. 0,2 mm longa.

Afghanistan: E: Nuristan, Inter Kushtos et Ashpi 2500—3400 m, Neub. 675!
Pakistan: Chitral: Drosh, Bowes Lyon 210!

Distr. gen.: In alpinis montium Himalaya septentrionali-occidentalium usque ad Tihri-Garhwal.

Sect. *Hastatae* Kerner, Verh. Zool. Bot. Ges. Wien 10: 241 (1860)

Frutices. Gemmae florigerae foliiferis jam extus dissimiles. Stipulae saepissime bene evolutae et diu persistentes, (sub-)aequilaterae, lanceolatae vel ovatae vel

fere rotundatae. Petioli supra plani vel convexi. Folia sat lata, margine denticulata, matura subtus nervis paullo prominentibus. Nectarium 1 rectangulare. Capsula saepissime glaberrima, acute lanceolata, in stylum evolutum sensim transiens; stigmata biloba vel bifida, 0,3—0,6 mm longa.

9. ***S. Karelinii*** Turcz., Bull. Soc. Nat. Mosc. 27: 196, 393 (1854).

Syn.: *S. prunifolia* Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 452 (1842), non Smith (1804). *S. hastata* auct. non L. (1753): *S. hastata* L. var. *himalayensis* N. J. Andersson, Monogr. Sal.: 173 (1867). *S. himalayensis* Flod., Geogr. Annaler 17: 306 (1935). *S. adenophylloides* Flod., l. c.: 310 et fig. 2 (1935).

Typus: Alatau Dshungaricum, Kar. & Kir. 1970, W!, LE! et alibi.

Frutex 15—120 cm altus, ramis brevibus crassiusculis. Ramuli hornotini saepissime ± tomentoso- vel arachnoideo-pubescentes, vetustiores glabrescentes. Gemmae florigerae ovatae, obtusae, 6—10×3,5—5 mm. Stipulae ovatae, rarius lanceolatae vel subtriangulares, margine crebre glanduloso-denticulatae. Petioli 4—10 mm longi. Lamina foliorum (ob-)ovata, ovato-lanceolata vel elliptica, basi rotundata vel subcordata, apice breviter (sub-)acuminata, latitudine 1,4—2,5-plo longior, discolor, subtus pallide opaca, supra astomatifera, glaberrima vel utrinque vel supra solum pilis tenuissimis longiusculis subaraneosis ± vestita; margine crebre denticulata. Amenta praecocia vel subpraecocia, pedunculis brevibus (3—12 mm), 1—1,8 mm crassis, cataphyllis vel foliolis 1—5 praeditis, erecta, densa, dense villosa. Bracteae fuscae vel nigrae 1,6—3 mm longae, saepius acutae. Filamenta glabra, 4—6 mm longa. Antherae 0,6—0,8 mm longae. Capsula pedicello 0,3—0,6 mm longo nectarium subaequante vel longiore suffulta, anguste conica, matura 5—8 mm longa. Stylus 0,6—1,5 mm, stigmata 0,2—0,4 mm longa.

Afghanistan: **E**: Nuristan: Supra Kamdesh, 3000—3200 m, Gilli 2423!, 2424!, 2425! Chetras, Edelb. 854! Pashki, 2800—3200 m, Edelb. 706!, 987! In jugo Papruk versus Shtiwe, Kerst. 1415!

Pakistan: Chitral: Barum Gol, Shokor Shal, 3500 m, Wdb.! Marmano Shal, 3700—4300 m, Wdb.! Hamishi Ghochar, 4300 m, Wdb. Och Anzog, 3600 m, Wdb. (pl. hybrida)! Chinko Ghari, 2700 m, Bowes Lyon 768! Ojhor, 3600 m, Bowes Lyon 859! Ojhor Gol, 3000 m, Bowes Lyon 846! Gangalwat Gol, 3600 m, Stainton 2719!

Distr. gen.: Karakorum, Tien Shan, Pamir-Alaj, Himalaya usque ad Nepaliam centralem, in alpinis et subalpinis.

Speciei alpinae caucasicae *S. apodae* Trautv. valde affinis; a specie autem arcto- et subarcto-alpina eurasiatica *S. hastata* L. magis remota.

10. ***S. Fedtschenkoi*** Görz, Salicaceae Asiat. 1: 21, 25 (1931) et Feddes Repert. 32: 121 (1933).

Icon.: Skvortsov in Fl. Tadjik. 3, tab. 13 (1968).

Typus: „Schugnan, ad trajectum Schtam", B. Fedtsch., LE!, TAK! et alibi.

Frutex humilis, speciei praecedenti habitu et notis morphologicis similis (quamquam haud proxime affinis). Ramuli annotini saepissime glabri ± lucidi. Gemmae florigerae ovatae 5—8×3—4 mm magnae. Stipulae lanceolatae, saepe ± curvatae, rarius ovatae vel subtriangulares. Lamina foliorum elliptica, basi cuneata vel rotundata, apice saepius acuta latitudine 2—3-plo longiora, utrinque fere concolor flavescenti-viridis, in foliis maturis utrinque ± lucida, supra dense stomatifera, margine crebre (vel saepe sat irregulariter) serrulata. Amenta praecocia, iis *S. Karelinii* habitu sat similia. Nectarium 0,5—1,0×0,15—0,3 mm, pedicello

capsulae longius; pedicellus 0,3—0,5 mm. Antherae 0,4—0,6 mm longae. Capsula matura 5—6 mm longa; styli 0,5—1,0 stigmata 0,3—0,6 mm longa.

Afghanistan: E: Nuristan: Ad fluv. Semenek, 3650 m, KERST. 1516!

Distr. gen.: Pakistan: Gilgit, Afghanistan: Nuristan, Tadjikistan: Pamir, Darvaz, jugum Petri Primi.

Sect. *Vetrix* DUMORT., Bijdr. Natuurk. Wetensch. 1, 1: 55 (1825)

Syn.: Sect. *Cinerella* DUBY in DC., Bot. Gall., ed. 2: 423 (1828) p. p. Sect. *Capreae* KOCH, Syn. Fl. Germ. 650 (1837) p. p. Sect. *Rugosae* KERNER, Verh. Zool. Bot. Ges. Wien 10: 242 (1860).

Arbores mediocres vel frutices. Gemmae florigerae foliiferis extus eximie dissimiles, apice recto vel abaxialiter verso. Stipulae inaequilaterae. Petioli supra convexi (sectione transversa orbiculari). Folia ± lata, ± irregulariter denticulata vel integerrima, matura subtus nervorum rete ± prominente, supra astomatifera. Amenta vulgo praecocia, bracteis fuscis vel nigris, ± villosis. Nectarium unicum truncatum. Filamenta glabra vel basi pilis paucis praedita. Pedicelli saepissime bene evolutae. Capsulae e basi subrotunda angustatae (interdum sublineares), in speciminibus nostris semper breviter sericeo-pilosae, apice in stylum brevem abrupte transientes, maturae valvulis angustis circinalibus dehiscentes. Stigmata crassiuscula stylum subaequantia vel eo paulo longiora, bifida (sed laciniis saepe cohaerentibus).

11. ***S. aegyptiaca*** L., Cent. Plant. 1: 33 (1755).

Syn.: *S. nitida* S. G. GMELIN, Reise Rußland 3: 283, tab. 28 (1774). *S. phlomoides* M. B., Fl. Taur.-Cauc. 2: 415 (1808) et 3: 628 (1819) p. p. *S. Medemii* BOISS., Diagn. Pl. Or. Nov. Ser. 1,7: 100 (1846). *S. cinerea* L. var. *Medemii* BOISS., Fl. Or. 4: 1189 (1879). *S. caprea* scrutatorum florae Iranicae omnium, non L. (1753).

Icon.: S. G. GMELIN, l. c. FLOD., Ark. Bot. 25 A, 11, fig. 1—2 et tab. 2—3 (icon. photogr. specim. authent.). Deutsche Baumschule Aachen 10, 3: 81, fig. 39 (1958).

Typus: „In Aegypto", HASSELQUIST, UPS, L.

Frutex magnus vel arbor usque ad 8—10 m alta. Lignum sub cortice vibicibus linearibus prominentibus 2—15 mm longis. Ramuli annotini 1,8—2,7 mm crassi. Gemmae florigerae ovales vel ovatae, brevissime acuminatae vel obtusatae, 6—12×4—6 mm. Folia sat magna, 50—120×25—55 mm, subtus centro pilis patentibus ± curvatis, marginibus tamen pilis rarioribus et ± appressis vestita, matura nervorum rete subtus prominente. Amenta praecocia, crassa, dense villosa. Bracteae 2—3,5 mm longae, pilis apicem bracteae 1,5—3 mm superantibus. Filamenta 7—10 mm longa; antherae 0,7—1 mm longae. Capsulae maturae 7—9 mm, styli 0,3—0,6 mm, stigmata (0,4) 0,5—0,7 mm longa.

Iraq: Kurd.: Mosul: Sirsang, 1050 m, verosim. cult., HAINES 1321!

Talish: Lenkoran, C. A. MEY., RADDE!, PRILIPKO!, SKVORTSOV! Vela-Chulia, MATVEEVA 253!, SCHIPCZINSKY 424! Gelglov, LOMAKIN! Alexeevka, PRILIPKO! Kirsovski Sovkhoz, KURMOSCHKIN! Inter Lenkoran et Lerik, SKVORTSOV (specimina numerosa)! Lerik, ILJINSKAYA & KIRPICZNIKOV!, SKVORTSOV! Kasmaljan, SKVORTSOV (specimina numerosa)! Astara: Archivan, BOBROV & TZVELEV 382!

Persia: N: Gorg.: Bandar-i Gaz, SINT. 1434!, 1434-b! Chehel Chai, GAUBA & SAB. 1980! Behshahr, GAUBA 1979! Inter Gorgan et Ziarat, GAUBA & SAB. 1944! Gorgan, culta, BUHSE! Inter Gorgan et Hoseynabad, BUHSE! Ziarat, BGE.! In silva Ata Jangal, MICHELSON! Maz.: In valle Haraz S Karehsang, 100 m, WDB. 277-b! In valle fluvii

Talar, Rech. 5589! Ramsar, Gauba & Esfand. 1981! Nur, 700 m, Gauba & Behb. 1985! Galand Rud, Sab. 12043-E! Pol-e Zanguleh, 2300 m, Gauba & Sab. 1984!, Sab. 416! Kojur: Inter Nemasieh et Zanus, 2000 m, Rech. 6565! In valle fluvii Chalus, 1600 m. Rech. 2083!; 2200—2600 m, Rech. 6295!, 6310!, 6352!, 6358! Gil.: Astara, 500 m, Gauba s. n.!; 1400 m, Gauba & Sab. 1948! Harsevil prope Manjil, Gauba & Mird, 1982! Manjil, 1200 m, Mird. in Gauba 1983! Inter Bandar-e Pahlavi et Astara, Mird. 1947! — W: Azerb.: In declivibus occidentalibus jugi Hajji Amir, 1600 m, Grant 16321! M. Qareh Dagh prope Hasanbeyglu, Mird. in Gauba 1976! Kaleybar, Mird. in Gauba 1977! Esfahan, in dumetis, Haussk.! — S: Fars.: Shiraz, culta, Grant 17147! Inter Bushehr et Shiraz, Ky. 113 (typus *S. Medemii* Boiss.)! Prope Shiraz, Ky. 802!, 820! Kerm.: Kerman, in hortis, 1900 m, Bornm.! — C: Tehr.: M. Tuchal: Pas Qaleh prope Darband, 1500—2000 m, Rech. 1143!, 2605! Qazv.: M. Hazarband, 2400 m, Gauba & Sab. 1971!, 1978! 25 km N Karaj, 1950 m, Stutz 1128! Karaj, cult., Rech. 2176!, Gauba 1943!, 1945!, 1946! Yazd: Prope Taft, 1900 m, Bornm.! In hortis ad Qom, 900 m, Bornm. 4536! — Persia, cult., Buhse!

Turcomania: Bacharden: Prope Nokhur, Sokolov 49!, 250! Kara Kala: In valle Joldere, Sint. 2034!, Lipsky! In valle Aydere, Blinovsky! Ad fl. Sumbar curs. super.: Kerkaudere, Blinovsky!, Daine, Blinovsky! Utch-Dykechler, Blinovsky!, Khosly, Blinovsky! Firyuza, cult., Blinovsky!

Afghanistan: N: Mazar-i Sharif: Prope Balkh, ad vias, cult., Rodin 488! — SE: Kandahar: In hortis Baba Wali, 1020 m, Gilli 2420!

Pakistan: Pishin: Quetta, verosim. culta, Lace!

Distr. gen. speciei: Anatolia australi-orientalis (provinciae Bitlis, Hakiari), Transcaucasia australi-orientalis (Zangezur, Karabagh), Persia borealis. In aliis terris orientalibus musulmanicis ab Aegypto usque ad Kaschmiriam et Uzbekistaniam ob amenta mascula fragrantia, ad potum moschatum faciendum adhibita, passim culta (olim frequenter, nunc rarius).

— — var. ***longifrons*** Bornm., Bot. Centrbl. Beih. Abt. 2, 24: 94 (1908).

Typus: In Weimar culta e Arak, ubi quoque culta erat, a Strauss allata, Bornm., JE!, W!

A formis communibus *S. aegyptiacae* foliis longioribus angustioribusque latitudine 3—5-plo longioribus, amentis masculis gracilioribus differt.

In hortis europaeis passim culta; etiam in horto botanico Duschanbensi observavi et inde in Mosqua vivam habeo; e Persia autem nulla specimina vidi.

12. ***S. iliensis*** Regel, Acta Horti Petrop. 6: 464 (1880). Syn.: *S. pseudolivida* Görz, Trudy Tadzhikskoj Bazy Akad. Nauk 2: 171 (1936). *S. depressa* L. var. *iliensis* Poljakov et var. *macropoda* Poljakov in Flora Kazakhstan 3: 29 (1960). *S. caprea* et *S. livida* scrutatorum florae Asiae Mediae, non L. nec Wahlenb.

Icon.: Protopopov in Fl. Kirghiz. 4, tab. 2, fig. 2 (1953). Skvortsov in Fl. Tadjik. 3: tab. 12, fig. 4—5 (1968).

Typus: Sarybulak prope Kuldscha, 4—6000', Regel. LE!

Frutex mediocris, raro arbor parva usque ad 5—6 m alta, coma lata. Lignum sub cortice laeve vel vibicibus brevibus (2—5 mm longis) dispersis. Ramuli annotini 1,3—2,0 mm crassi. Gemmae florigerae lanceolatae, 5—10 × 3—5 mm, carinis lateralibus conspicuis, apice in rostrum applanatum saepissime obtusum et ± recurvatum abientes. Folia saepissime elliptica vel subrhomboidea, basi et apice fere aequaliter attenuata, rarius (ob-)ovata vel (ob-)lanceolata, 35—75 × 18—40 mm, utrinque pilis tenuibus sat irregularibus ± vestita vel glaberrima, matura nervis lateralibus subtus tenuiter prominentibus. Amenta praecocia vel subpraecocia.

Bracteae 1,5—2,5×0,5—1 mm, vulgo obtusae, fuscae (rarius dimidio superiore nigrae), pilis apicem bracteae 1—2 mm superantibus. Filamenta 4—7 mm, antherae 0,5—0,7 mm longae. Capsula pedicello 1—3 mm longo, matura 7—8 mm longa. Stylus 0,1—0,3 mm, stigmata 0,3—0,5(—0,6) mm longa.

Afghanistan: E: Kabul: In valle Panjshir supra Mukeni, 3500 m, Hdg. & Wdb. 5164! — NE: Munjan: Inter Weran et Nao, 3000 m, Edelb. 1470! Wakhan: In valle Qazi Deh, 3200 m, Roemer 181!
Pakistan: Chitral: Barum Gol, Shokor Shal, 3500 m, Wdb. s. n.! Och Anzog, Wdb. s. n.!

Distr. gen.: Afghanistan, Pakistan, Tien Shan, Pamir Alaj.

13. ***S. Wallichiana*** N. J. Andersson, Sv. Vet. Akad. Handl. 1850: 477 (1851).

Icon.: N. J. Andersson, Monogr. Sal. tab. 5, fig. 4 (1867). Stewart ex Brandis, Ill. Forest Fl. tab. 61 (1874).
Typus: „In Nepalia, Kumaon, Sillet, a. 1821", Wallich sub nomine *S. grisea* Wall., Cat. No. 3700, nom. nud., L, K, LE!

Arbor parva vel frutex. Lignum sub cortice laeve. Ramuli annotini 1,2—2 mm crassi. Gemmae florigerae lanceolatae, rarius ovatae, 5—10×2—3,5 mm, apice acutiusculo recto. Folia inferiora elliptica, apice et basi aequaliter attenuata vel obtusata; caetera ovata vel lanceolata, basi late cuneata vel rotundata, apice sensim tenuiter acuminata; subtus juvenilia saltem pilis sericeis appressis facie tota aequaliter vestita matura interdum glabra. Amenta praecocia, pedunculis 1—10 mm longis cataphyllis 1—4 anguste ellipticis praeditis. Bracteae 1,2—2,2×0,4—0,8 mm. Antherae 0,6—0,8 mm longae. Pedicelli 0,7—1,5 mm, capsulae maturae 5—7 mm, styli 0,1—0,5 mm, stigmata 0,2—0,5 mm longa.

Afghanistan: E: Kabul: Prope Kabul, ad canales, 1770 m, Gilli 2421! Nuristan: Wama, 2090 m, Edelb. 352!, 375!, 421! Derin, Edelb. 1722!, 1798! Kamdesh, 2400 m, Gilli 2422! Pashki, 2300 m, Edelb. 617!, 921! In valle Pech, 1380 m, Kerst. 819! In valle Kantivo, 2460 m, Kerst. 940! — NE: Afghanistan, Griff. 4501!
Pakistan: Chitral: Brumboret Gol, 2400 m, Bowes Lyon 608!, 609!, Stainton 2239!, Kerst. 2091! Chitral Gol, 2700 m, Stainton 2686! — Swat: Prope Kalam, 2000—2200 m, Rech. 30779!, 3000 m, Rech. 30842! In valle Jabba E Kolalai, 1600—2200 m, Rech. 30741! — Kurram: In valle Kurram, Aitch. 389!, 574! In faucibus Shend Toi, Aitch. 341!

Distr. gen.: Afghanistan, Pakistan, Kashmir, Nepal, Assam, ?Setschwan.

Sect. *Vimen* Dumort., Bijdr. Natuurk. Wetensch. 1, 1: 56 (1825)

Syn.: Sect. *Viminella* Duby in DC., Bot. Gall., ed. 2: 424 (1828). Sect. *Viminales* Koch, Syn. Fl. Germ. 647 (1837).

Arbores mediocres vel frutices elati ramis virgatis. Gemmae florigerae a foliiferis diversissimae, elongato-ellipticae vel fere cylindricae, apice recto vel ramulum versus curvato. Stipulae lineares vel lanceolato-falcatae. Petioli supra convexi. Folia ± angusta, marginibus integris vel paullo denticulatis, nervis lateralibus numerosis subtus prominentibus, facie infera pilis sericeo-micantibus vestita. Amenta praecocia vulgo sessilia. Nectarium unicum lineare. Capsulae saepissime sessiles vel subsessiles. Styli stigmataque elongati.

14. ***S. turanica*** Nasarov, Fl. URSS. 5: 709 (1936).

Syn.: *S. viminalis splendens* 1° *songarica* N. J. Andersson in DC., Prodr. 16, 2: 265 (1868).

Icon.: Poljakov in Flora Kazakhstan 3, fig. 13 (1960). Skvortsov in Fl. Tadjik. 3, tab. 12, fig. 6–10 (1968).

Typus: „Songaria ad ripas fluv. Ili et Ajaguz", Schrenk, LE!

Frutex elatus vel arborescens. Cortex trunci ramorumque saepissime eburneus vel argentato-cinerascens. Ramuli annotini 1,5–2,5 mm crassi. Gemmae florigerae c. 8–13×2,5–4 mm, obtusae. Folia lanceolata, 45–120×10–25 mm latitudine 4–10-plo longiora, supra opaca ± cinerascenti-viridia, subtus argenteo-sericea, margine deflexo. Amenta praecocia, (sub-) sessilia, dense villosa, mascula culmine anthesis 25–50×10–15 mm. Bracteae fuscae vel nigrae, c. 1,8–3,0× 0,8–1,5 mm, pilis longis rectis vestitae. Nectarium lineare, 0,8–1,6×0,1–0,2 mm Filamenta glabra. Antherae 0,5–0,8 mm longae. Capsula sessilis, ovata, acuta, matura 5–6 mm longa, in stylum 0,8–2,0 mm longum transiens. Stigmata 0,5–0,8 mm longa, lineari-bifida.

Afghanistan: E: Nuristan: Pashki, 2300 m, Edelb. 561!, 2065! Inter Pashki et Shtive, 2300–2500 m, Kerst. 1392! – NE: Munjan: Sanglich, 3500 m, Koelz 12651! – C: Bamian: Inter jugo Kotal Deraz Kol et Panjao, 2800–3280 m, Rech. 18660! Kuh-i Hisar: Inter Sauzak Sumaj et Serdak, 2600–2900 m, Rech. 36412! Behzud: Siah Sang prope Farakulum, ad fluv. Helmand, 2900 m, Rech. 36087! Panjao: 12 km E Panjao, 2650–2800 m, Rech. 36163-a!, -b!

Pakistan: Swat: Utror, 2500 m, Rech. 19532!

Distr. gen.: Afghanistan, Pakistan, Kashmir, Pamir-Alaj, Tien Shan, Heptapotamia, Mongolia austro-occidentalis.

Sect. *Incubaceae* Kerner, Verh. Zool.-Bot. Ges. Wien 10: 264 (1860)

Syn.: Sect. *Repentes* Pax in Engler & Prantl, Natürl. Pflanzenfam. 3, 1: 37 (1889) p. p. Sect. *Argenteae* Coutinho, Bol. Soc. Brot. 16: 21 (1899).

Frutices mediocres vel parvi, ramis tenuibus. Gemmae florigerae ovatae ± acuminatae. Stipulae subaequilaterae, acutae. Folia raro 12–15 mm latiora, saepissime integerrima, pilis appressis sericeis ± dense vestita. Amenta praecocia vel subpraecocia. Capsulae pedicello evoluto, styli stigmataque breves.

15. ***S. schugnanica*** Görz, Trudy Tadzhikskoj Bazy Akad. Nauk 2: 173 (1936).

Icon.: Skvortsov in Fl. Tadjik., tab. 14, fig. 1–3 (1968).

Typus (Syntypi): „Darwas: Mazar, Lipsky 3816; Schugnan: Schtam", O. & B. Fedtschenko, LE!

Frutex 0,3–1,5 mm altus. Folia (lineari-)lanceolata, acuta, 35–60(–80)× 7–12(–15) mm, utrinque vel subtus saltem pilis longitudinalibus sericeis obsita, integerrima vel margine glandulis solitariis. Amenta praecocia, sessilia vel pedunculis usque ad 6–8 mm longis suffulta, mascula culmine anthesis 15–25×8–10 (–12) mm, feminea matura 15–40×12–14 mm. Bracteae nigrescentes, c. 1–2× 0,6–1 mm villosae. Nectarium quadratum vel rectangulare, 0,3–0,5 mm longum. Antherae in sicco 0,4–0,6 mm longae. Capsulae pedicellis 0,6–1,3 mm longis suffultae, lanceolatae, maturae 5–7 mm longae. Styli 0,1–0,3 mm, stigmata 0,3–0,5 mm longa.

Afghanistan: E: Panjshir: In jugo Anjuman, 3800 m, Hdg. & Wdb. 5458! Darrah

Shalzur, 3800 m, Hdg. & Wdb. 5402! — **NE**: Munjan: In jugo Munjan, 3600 m, Koelz 12721! — **C**: Bamian: Ad lacum Band-i Zolfikar, 2900 m, Rech. 18462!
Pakistan: Chitral: Servir, 3500 m, Bowes Lyon 795!

Distr. gen.: Afghanistan, Pakistan, Pamir-Alaj, Kuen-Lun.

A *S. rosmarinifolia* L. haud perfecte distinguitur et potissimum pro subspecie illius putanda.

Sect. *Denticulatae* C. K. Schneider in Sarg., Plant. Wils. 3, 1: 117 (1916)

Syn.: Sect. *Longiflorae* C. K. Schneider, l. c. 120. Sect. *Catayanae* Hao, Synops. Chin. Salix 78 (1936).

Gemmae florigerae ovatae, parvae, foliiferis paulo majores. Folia (sub-) estipulata, sat parva, elliptica breviter denticulata vel integerrima. Amenta coaetanea vel serotina, pedunculis elongatis foliatis, gracilia ± laxiflora et saepe ± flexuosa, bracteis parvis obtusis. Nectaria in masculis vulgo dua. Filamenta brevia, basi pilosa, antherae parvae. Capsulae breviter pedunculatae vel subsessiles, parvulae ovatae, stylis stigmatibusque minutis.

16. ***S. denticulata*** N. J. Andersson, Sv. Vet. Akad. Handl. 1850: 481 (1851).

Syn.: *S. himalensis* Klotzsch ex N. J. Andersson, l. c.: 482. *S. elegans* Wall. ex N. J. Andersson, Proc. Linn. Soc. Bot. 4: 51 (1860).
Icon.: Klotzsch & Garcke, Bot. Ergebnisse Reise Prinz Waldemar von Preußen: tab. 89 (1862). Collett., Fl. Siml.: fig. 156 (1902).
Typus: „Prope Kamaon", Blinkworth sub nomine *S. Kamaunensis* Lindl. ex Wall., Cat. No. 3701, nom. nud., K, LE!

Arbor parva vel frutex mediocris. Petioli superne plani, breviter tomentosi, 2—6 mm longi. Lamina foliorum 30—65×12—24 mm, saepissime glaberrima costa superne breviter tomentosa excepta, margine denticulata (foliis inferioribus interdum exceptis), matura supra ± lucida, subtus caesio-albescens, nervis lateralibus in sicco utraque facie tenuissime elevatis. Amenta pedunculis 8—60 mm longis suffulta, saepissime foliis nonnullis normalibus praeditis, mascula culmine anthesis 25—70×4—7 mm, feminea sub maturitate 40—120×8—9 mm. Bracteae tenuiter membranaceae, 0,8—1,6×0,4—0,8 mm, in sicco rufescentes vel dilute fuscescentes, glaberrimae vel pilis breviusculis ornatae, in amentis femineis maturis saepe partim deciduae. Filamenta 2—3 mm, antherae 0,3—0,5 mm longae. Capsulae pedicellis 0,3—0,7 mm longis suffultae, lanceolatae, glaberrimae, maturae 4—5 mm longae. Stylus 0,1—0,3 mm, stigmata divaricate divergentia subbiloba, 0,1—0,2 mm longa.

Pakistan: Kurram: In valle Kurram, Aitch. 413!

Distr. gen.: Afghanistan orientalis, Pakistan (Swat), Kashmir, Montes Himalaya usque ad Nepaliam.

In Swat probabilissime invenietur.

Sect. *Helix* Dumort., Bijdr. Natuurk. Wetensch. 1, 1: 56 (1825)

Syn.: Sect. *Purpureae* Koch, Syn. Fl. Germ. 646 (1837). Sect. *Caesiae* Kerner, Verh. Zool.-Bot. Ges. 10: 205 (1860). Sect. *Monandrae* Nakai, Bull. Soc. Dendrol. France 66: 50 (1928). Subgen. *Helice* Dumort., Bull. Soc. Bot. Belg. 1: 145 (1862).

Arbores mediocres vel frutices, ramulis saepissime vimineis flexibilibus. Stipulae lanceolatae, subulatae vel omnino deficientes. Folia saepissime angusta,

integerrima vel serrulata denticulis parvis, plana, nervis haud elevatis. Amenta ± tenuia, bracteis breviter pilosis vel subglabris. Nectarium 1, breviter rectangulare vel trapezoideum vel quadratum.Filamenta saepius perfecte (rarius partim) connata, basi pilosa. Capsulae parvae vel mediocres, breviter pedicellatae vel sessiles, stylis stigmatibusque sat brevibus.

17. **S. *caesia*** Vill., Hist. Pl. Dauph. 3: 768, tab. 50, fig. 11 (1789).

Syn.: *S. myricaefolia* N. J. Andersson, Sv. Vet. Akad. Handl. 1850: 483 (1851). *S. divergens* N. J. Andersson in DC., Prodr. 16, 2: 316 (1868). *S. minutiflora* Turcz. ex E. Wolf, Acta Horti Petrop. 21: 141 (1903). *S. pubescens* Hao, Synops. Chin. Salix: 108 (1936). *S. tuvinensis* Gudoschn., Animadvers. Syst. Herb. Tomsk 83: 3 (1965).
Icon.: Vill., l. c. Reichenb. Icon. Fl. Germ. 11, tab. 565, fig. 2005 (1849). Fenaroli, Fl. d. Alpi, fig. 63 (1955). Hegi, Ill. Fl. Mitteleur., ed. 2, 3, 1, fig. 36 (1957). Skvortsov in Fl. Tadjik. 3, tab. 14, fig. 4—5 (1968).
Typus (isotypus): „Sur le Lautaret, le long des ruisseaux", LE!

Frutex 0,2—1,0 mm altus, ramis brevibus divaricatis. Gemmae generativae vegetativis dissimiles, breviter crasse ovatae, 3—5 mm longae. Stipulae desunt vel minutae ovato-lanceolatae. Folia parva, oblongo-ovalia vel obovata, basi late cuneata vel rotundata vel cordata, apice vulgo obtusata, supra opaca astomatifera, margine vulgo integerrima. Amenta brevia densissima. Stamina filamentis partim vel perfecte connatis (raro perfecte liberis), aurantiaco-purpureis, basi dense pilosis, antheris 0,4—0,6 mm longis. Capsula pedicello 0—0,3 mm longo suffulta, dense brevissime sericeo-pilosa. Stylus 0,2—0,4 mm, stigmata c. 0,2 mm longa.

Distr. gen.: Montes Pamir, Karakorum, Kashmir, Kuen-Lun, Tien Shan, montes Sibiriae australis ab Altaj usque ad Jacutiam meridionalem; Mongolia septentrionalis; Alpes Europae.

In Wakhan, Afghanistan, probabilissime invenietur; in URSS ad confines afghanicas ad lacum Zorkhul et ad fluv. Aksu jam reperta.

18. **S. *elbursensis*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 12: 117 (1853).

Syn.: *S. purpurea* L. var. *pallescens* et var. *virescens* N. J. Andersson in DC., Prodr. 16, 2: 307 (1868). *S. Roopii* Grossh., Fl. Kawk ed. 2, 2: 23 (1945). *S. purpurea* auct. fl. iranicae necnon caucasicae, non L. (1753).
Icon.: Dendrofl. Caucas. 2, fig. 12 (1961).
Typus: Ky. 154, G, LE!, W!, JE!

Arbor parva vel frutex, ramis longis vimineis. Gemmae florigerae a foliiferis jam extus diversissimae, c. 4—8×2—2,8 mm. Folia 40—100×5—18 mm, latitudine 5—10-plo longiora, latitudine maxima in dimidio superiore laminae sita, supra saturate viridia astomatifera vel stomatibus ± sparsis provisa, subtus pallidiora vel saepius albida. Amenta cylindrica, densa, mascula culmine anthesis 20—40×7—9 mm, feminea matura 15—35×7—8 mm. Bracteae apice rotundatae; in masculis apice saltem nigrescentes, 1,2—1,5×1—1,5 mm, praesertim intus dense pilosae, in femineis virides vel ± brunnescentes, 0,7—1,5×0,6—1 mm, paulo pilosae. Filamenta perfecte connata, flava, ima basi pilosa. Antherae in sicco 0,5—0,6 mm longae. Capsula ovata, pedicello 0—0,3 mm suffulta, matura 3—4 mm longa. Stylus 0,1—0,3 mm, stigmata 0,2—0,3 mm longa.

Persia: N: Maz.: In valle fluvii Chalus, 2200—2600 m, Rech. 6308! Gil.: Rudbar, Gauba & Sab. 1972! — W: Kermansh.: Ad lacum Sarab-e Nilufar, Bent & Wr. 404—102 p. p.! — C: Tehr.: M. Tuchal NW Tehran, 1300—1500 m, Aell. 1083! Darband, 1200—2000 m, Ky. 154!, Schmid 5137! Ferosad et Junesar, 1600 m, Parsa 205! Qazv.: In valle fluvii Karaj, Gauba 1963! N Karaj, 2360 m, Stutz 1103! In horto bot. culta, Gauba 1987!, 1988! Kuh Dashteh prope Karaj, 1800 m, Rech. 343! — Persia australis „in dumetis Abergun", Hausskn.!

Distr. gen.: Persia, Caucasus fere totus (Adzharia ac Talish exclusis), Anatolia orientalis.

De validitate taxonomica speciei et de notis, quibus a *S. purpurea* L. discernitur, vide Skvortsov, Nov. Syst. Pl. Vasc. 1966: 48 (1966) et seq.

19. ***S. carmanica*** Bornm. ex Görz, Feddes Repert. 35: 285 (1934); confer etiam Bornm., Beih. Bot. Centrbl. 33: 202 (1915).

Typus (syntypi): „Persia, culta in hortis: Sultanabad (Strauss), prov. Yesd (Bornm. 4554), prov. Kerman (Bornm. 4555, 4556)". Pro lectotypo speciminem Bornm. 4555 („Prov. Kerman, in hortis ad Baghin, 2000 m") hic propono. JE, LE!, W!

Arbor parva ramis gracilibus subpendulis. Stipulae vix evolutae, 0,1—0,5 mm longae. Petioli 1,5—4 mm longi. Folia oblanceolata vel anguste elliptica, 20—45 × 2,5—7 mm, plana, utrinque opaca coerulescentia dense stomatifera, margine tenui minutissime serrulato. Amenta serotina, pedunculis 2—7 mm longis cataphyllis vel foliolis provisis suffulta, mascula nondum cognita (in specimine unico masculo adhuc reperto, Bornm. 4556, amenta jam delapsa), feminea laxiuscula, 8—25 mm longa. Bracteae c. 1,0—1,4 × 0,5—0,7 mm, pallidae, obtusae vel truncatae, capsularum maturitate caducae. Capsulae pedicellis 0,5—1,0 mm longis suffultae, patentes, ovato-lanceolatae, acutae, maturae 4(—4,5) mm longae, glabrae vel breviter appresse sericeae. Stylus 0,25—0,4 mm, stigmata 0,25—0,3 mm longa, biloba, lobis divergentibus.

Persia: S: Kerm.: Baghin, Bornm. 4555. In hortis ad Kerman, 1900 m, Bornm. 4556! Kerman, 1800—2000 m, Parsa 354! — C: Yazd: In hortis ad Mohammadabad, 1500 m, Bornm. 4554!

Afghanistan: SW: Herat, cult., Amsel! — SE: E Kandahar, introducta, Watt 3517!

Distr. gen.: Endem.

Quamquam e speciminibus cultis nota est et *S. Capusii* Franch. necnon speciei tianschanicae *S. Niedzwieckii* Görz maxime affinis, certissime bona est species et nativa, sed populationibus silvestribus rarissimis, adhuc haud repertis. Inter specimina a me inspecta clones diversos non minus quam 4 discrevi.

20. ***S. Capusii*** Franch., Ann. Scienc. Nat. Ser. 6, 18: 251 (1884).

Syn.: *S. coerulea* E. Wolf, Acta Horti Petrop. 21: 157 (1903). *S. Egberti-Wolfii* Toepffer, Österr. Bot. Zeitschr. 66: 402 (1916).

Icon.: E. Wolf, l. c. Nasarov, Fl. URSS. 5, tab. 8., fig. 3 (1936). Skvortsov in Fl. Tadjik. 3, tab. 15, fig. 4—9 (1968).

Typus: „In ripis fluv. Zeravshan prope Dardar et ad lacum Iskander-kul", Capus 1200, P!; 1201, P!, LE!

Arbor ad 6—8 m alta coma lata vel frutex latus divaricatus. Ramuli tenues annotini 0,7—1,1 mm crassi, albo-pruinosi. Gemmae florigerae a foliiferis extus haud distinguendae, ovatae, usque ad 5 × 2,5 mm. Stipulae deficientes vel minutae

subulatae. Petioli 1—4 mm longi. Folia lanceolata vel oblanceolata, tenuiter acuminata, 25—65×3—9 mm, utrinque caesio-coerulescentia, opaca, dense stomatifera, glabra vel sericeo-pilosa, margine tenui minute serrulata. Amenta serotina pedunculis foliolatis, mascula culmine anthesis 15—40×4—6 mm, feminea matura 10—40×8—10 mm, omnes sat laxa et saepe subflaccida. Bracteae apice rotundatae, eroso-subdentatae vel truncatae, 1—1,8×0,5—0,7 mm, pallidae, capsularum maturitate marcescentes et partim vel omnes deciduae. Nectarium pallidum usque ad 0,5 mm longum. Stamina filamentis pallidis, perfecte connatis, 2,5—3,5 mm longis, dimidio inferiore dense hirsutis, antheris 0,3—0,4 mm longis. Capsulae pedicello 0,5—1,5 mm longo suffultae, anguste lanceolato-conicae, acutae, sericeo-pilosae vel glaberrimae, maturae 3,5—5 mm longae. Stylus 0,3—0,6 mm longus, stigmata biloba bifidave 0,3—0,5 mm longa.

Afghanistan: **NE**: Munjan: Sanglich, 3500 m, Koelz 12625! Skarzar, 2600 m, Koelz 12805! — **C**: Doab: Inter Doab et jugum Shibar, Neub. 112! Darreh-i Shikar, 15 km S Doab, 1500 m, Hdg. & Wdb. 3408! Prope Doab, 1600 m, Rech. 16647!
Pakistan: Chitral: In ditione M. Tirich Mir, Agram, 3000 m, Stainton 2617!

Distr. gen.: Afghanistan, Pakistan, Pamir-Alaj.

21. ***S. linearifolia*** E. Wolf, Acta Horti Petrop. 21: 160 cum fig. (1903).

Syn.: *S. Olgae* Regel, Izv. Obsh. ljub. Estv. Antr. Etnogr. 34, 2: 79 (1882), p. p. tantum. *S. Blakii* Görz, Feddes Repert. 36: 31 (1934). *S. blakolgae* Drobov, Not. Syst. Herb. Inst. Bot. et Zool. Acad. Sci. Uzbekistan 5: 8 (1941).
Icon.: E. Wolf, l. c. Skvortsov in Fl. Tadjik. 3, tab. 15, fig. 1—3 (1968).
Typus: „Hissar, M. Babatag prope Ak-Metschet", A. Regel, LE!

Frutex sat altus vel arbor modesta. Folia 40—85×5—10 mm latitudine 5—12-plo longiora, acuta, utrinque coerulescenti-opaca, dense stomatifera, glabra vel pilis sericeis longitudinaliter appressis, margine tenui integro vel minute denticulato. Amenta serotina, pedunculis 3—20 mm longis tenuibus foliolatis suffulta, mascula culmine anthesis 25—50×6—8 mm, feminea matura 30—80×9—12 mm. Bracteae 1,5—3×0,8—1 mm, pallidae vel nonnulae (nec omnes) in amento apice fuscescentes, ± dense brevius pubescentes, in amentis femineis post anthesin denuo pallescentes, emarcescentes et saltem partim deciduae. Filamenta perfecte connata, basi dense hirsuta, 4—5 mm longa. Antherae c. 0,5 mm longae. Capsula pedicello 0,4—1,3 mm longo suffulta, lanceolato-conica, tenuiter appresse-sericea, matura 4—5 mm longa. Stylus 0,2—0,6 mm longus; stigmata biloba 0,2—0,5 mm longa.

Afghanistan: **N**: Afghanistan borealis, Meinertzhagen! — **NW**: Herat: Khwajachisht, 1600 m, Koeie 3633! Chashmeh Obeh, 1800 m, Rech. 19237!, 19252! In valle fluvii Hari Rud prope Obeh, 1400 m, Bukinicz! — **E**: Kabul: M. Paghman supra Paghman, 2400 m, Podlech 10804!, 10804-a! Prope Jabal-us Siraj, 1500 m, Gilli 2433! Nuristan: Pashki, 2300 m, Edelb. 560!, 2066!, 2067!, 2068! Wama, Edelb. 453! — **C**: Doab, Meinertzhagen p. p.!, Volk 476!
Pakistan: Chitral: Brumboret Gol N Drosh, 2000 m, Stainton 2247!

Distr. gen.: Afghanistan, Pakistan, Turcomania orientalis (Montes Kuhitang), Pamir-Alaj occidentalis (Pamir excluso), Tien Shan occidentalis (Karatau Syrdariense incluso).

22. ***S. pycnostachya*** N. J. Andersson, Journ. Linn. Soc. Bot. 4: 44 (1860).

Syn.: *S. sarawschanica* Regel, Ivz. Obsh. ljub. Estv. Antr. Etnogr. 34,2: 80 (1882). *S. margaritifera* E. Wolf, Acta Horti Petrop. 21: 162 (1903). *S. macrostachya*

E. WOLF, l. c.: 163. *S. Komarovii* E. WOLF, l. c.: 195. *S. iranica* BORNM. ex TOEPFFER, Sal. Exs. no. 471 (1920). *S. holargyrea* GÖRZ, Trudy Tadzhikskoj Bazy Akad. Nauk 2: 175 (1936). *S. Korshinskyi* GÖRZ, l. c.: 178. *S. ferganensis* NASAROV, Fl. URSS. 5: 713 (1936). *S. rubrobrunnea* DROBOV, Not. Syst. Herb. Inst. Bot. et Zool. Acad. Sci. Uzbekistan 5: 8 (1941). *S. pamirica* DROBOV, l. c.: 16.
Icon.: E. WOLF, Acta Horti Petrop. 21: 162, 165, 166, 167 (1903). SKVORTSOV in Fl. Tadjik. 3, tab. 14, fig. 7—12 (1968).
Typus: „India: Zanskar, 13000' ", THOMSON, K!

Frutex sat magnus vel arbor ad 8—10 m alta. Folia (ob-)lanceolata vel linearilanceolata, 40—100×6—25 mm latitudine 3,5—8-plo longiora, utrinque fere concoloria ± glaucescenti-opaca rarius subtus pallidiora, glaberrima vel ± sericeo-pilosa, margine integerrima vel denticulis minutis saepius sat irregularibus. Amenta coaetanea vel subpraecocia, sessilia vel breviter pedunculata, mascula culmine anthesis 25—50×7—9 mm, feminea matura 30—80×8—10 mm. Bracteae apice saltem fuscescentes vel nigrescentes, 1,0—2,5×0,7—1,6 mm, vulgo obtusae, praecipue intus pilis rectiusculis vestitae, persistentes. Filamenta perfecte connata, 4—5 mm longa, pallida, basi dense hirsuta. Antherae 0,5—0,6 mm longae. Capsula pedicello 0,1—0,8 mm longo suffulta, lanceolato-conica, acuta, sericeo-pilosa vel glaberrima, matura 4—6 mm longa. Stylus 0,3—0,7 mm longus, stigmata biloba 0,3—0,7 mm longa.

Persia: **S**: Kerm.: Kuh-e Laleh Zar, 3300—3500 m, BORNM. 4549 (typus *S. iranicae* BORNM. ex TOEPFFER)!, GABR. 222! Inter Kerman et Saidabad: Mashiz, 2000 m, cult., RECH. 3003!, 3004! — **E**: Khor.: Inter Neyshabur et Mashhad, BGE.! Kuh-e Neyshabur supra Akhlamad, 1600—1800 m, RECH. 4667! Kuh-i Bezg, 1900 m, RECH. 1413! — **C**: Shahr.-Bust.: M. Shahvar supra Nokarman, 2300 m, RECH. 5907!
Afghanistan: **NW**: Herat: Obeh, 2100 m, KOEIE 3662! — **E**: Kabul: In angustiis Paghman, 2700 m, RODIN 56! M. Paghman, 1980 m, GILLI 2429!; 2260 m, NEUB. 4711!; 2520 m, GILLI 2430!, 2431! In declivibus australibus jugi Salang, 2300—2600 m, RECH. 31383! In valle Salang prope Olang, 2500 m, PODLECH 10779!, 10779-a! Panjshir: Supra Kur-Petau, 3100 m, PODLECH 12471! Prope Mukeni, 2500 m, HDG. & WDB. 5149! Ghorband: In valle fluvii Ghorband, 170 km a Kabul, RODIN 85! Ghazni: Inter Miradina et jugum Ghoutch Kol, 3000 m, RECH. 17590! Dasht-i Nawar: Okak, 3000 m, RECH. 17724! Inter Ghazni et Shashgao, JOHNSTON! Gardez: Gardez, 2400 m, KOELZ 11905! Nuristan: In valle Kantivo, 2460—3300 m, KERST. 955!, 978! Kulam, 2150 m, SCHEIBE 99! In valle Rangul supra Pushol, 2250 m, KERST. 1111!, 1112!, SCHEIBE 118-b! Pashki, 2300—2400 m, EDELB. 562!, 1031! — **NE**: Wakhan: Sar-i Skhaur, 2650 m, ROEMER 32! Sust, 3000 m, ROEMER 393! Qazi Deh, 3200 m, ROEMER 182! Munjan: Nao, 2750 m, EDELB. 2229! Kataghan: In valle Andarab: Darrah-i Shu, 2600 m, PODLECH 11010! Godarrah, 1850 m, PODLECH 11019! In valle Fergan-Bul, 2000 m, PODLECH 11904! Badakhshan: Panj Shahr, 1500 m, KOELZ 12385! — **C**: Bamian: Band-i Amir, 2500—2900 m, RECH. 18330!, 18331!, NEUB. 477!, 4671!, GILLI 2432!, VOLK 2270! Bamian, 2950 m, HDG. & WDB. 4591! C. REGEL!, In jugo Ak Robat, 2500 m, VAVILOV! Ad fluv. Shumbol prope Bulola, 2280 m, GILLI 2442! In nemoribus fluvii 12 km E Bamian, 2320 m, RECH. 36981!, 36982!, 36983! Behzud: Siah Sang prope Farakulum ad fluv. Helmand, 2900 m, RECH. 36067!, 36088! Panjao: 12 km E Panjao, 2650—2800 m, RECH. 36160!, 36161!
Pakistan: Chitral: Shokor Shal, 3500 m, WDB. s. n.! Agram, Arkari Gol ad Tirich Mir, 3200 m, STAINTON 2635! — Swat: In valle Jabba E Kolalai, 1600—2200 m, RECH. 30738! — Kurram: In valle Kurram, AITCH. 110!, 116!, 1207!

Distr. gen.: Persia, Afghanistan, Pakistan, Kashmir, Gilgit, Turcomania orientalis (Montes Kuhitang), Pamir-Alaj, Tien Shan occidentalis, Kashgaria et Tibet occidentalis.

23. **S. *sericocarpa*** N. J. Andersson, Journ. Linn. Soc. Bot. 4: 43 (1860).

Syn.: *S. daphnoides* Vill. var. *indica* N. J. Andersson, Sv. Vet. Akad. Handl. 1850: 475 (1851). *S. oxycarpa* N. J. Andersson, Journ. Linn. Soc. Bot. 4: 45 (1860). *S. insignis* N. J. Andersson, l. c.: 47 p. p. saltem. *S. dolichostachya* Flod., Geogr. Annaler 17: 311 (1935).

Icon.: Stewart ex Brandis, Ill. Forest Fl. tab. 62 amenta feminea et folia, haud mascula (1874).

Typus: „Kashmir, alt. 6000 ped.", J. Thomson, K!

Arbor ad 8—10 m alta vel frutex sat magnus. Ramuli annotini 1,4—2,2 mm crassi. Gemmae florigerae a vegetativis valde diversae, ovatae saepius acutae, 5—8×3—4,5 mm magnae. Stipulae saepissime bene evolutae, inaequilaterae, falcatae, oblique semicordatae vel rarius anguste triangulares. Folia elliptica vel lanceolata, basi cuneata vel rarius subrotundata, apice ± attenuate acuminata, 60—120×15—45 mm, latitudine 2,5—6,5-plo longiora, matura saepissime glaberrima costa superne vulgo breviter tomentosa excepta, margine denticulata vel rarius integerrima. Amenta subpraecocia, pedunculis crassiusculis 5—20 mm longis, 1—1,5 mm crassis, saepius foliolatis suffulta, mascula culmine anthesis 35—50×7—10 mm, feminea matura 50—120×11—14 mm. Bracteae totae ± brunnescentes vel ± fuscescentes, rarius dimidio superiore nigrescentes, 1,5—2,3×0,6—1 mm. Stamina filamentis parim connatis, basi ± pubescentibus, antheris 0,6—0,8 mm longis. Capsula pedicello 0,3—1 mm longo suffulta, in parte orientaliore areae speciei saepe sessilis, conico-lanceolata acuta, ± sericea vel glaberrima. Stylus 0,2—1 mm longus; stigmata biloba 0,2—0,5 mm longa.

Afghanistan: E: Nuristan: In valle Kulam, 2150 m, Kerst. 1040 (specimen aliquot dubium)!

Distr. gen.: Afghanistan, Pakistan, Kashmir, Punjab orientali-septentrionalis, Nepal occidentalis.

Sect. *Cheilophilae* Hao, Synops. Chin. Sal. 102 (1936) emend. A. Skvortsov.

Syn.: Sect. *Variegatae* Hao, l. c.: 109. Sect. *Helix* auct. non Dumort. p. p. C. K. Schneider in Sarg., Plant. Wils. 3, 1: 165 (1916). Nasarov, Fl. URSS. 5: 149 (1936) et al.

Arbores parvulae vel frutices, ramulis tenuibus ± sericeo-pilosis. Folia numerosissima estipulata petiolis brevissimis 1—3 mm longis suffulta, parva, sordide viridia, ± appresse sericeo-pilosa. Amenta serotina, parva, densa, axi dense albo-tomentosa, bracteis pallidis obtusis persistentibus. Nectarium 1, trapezoideum vel triangulare. Filamenta perfecte connata, brevia, glabra. Capsulae parvae, sessiles, stylis stigmatibusque minutis.

Sectio parva compacta, praeter nostram e speciebus 3 composita: *S. microstachya* Turcz., *S. cheilophila* C. K. Schneider, *S. variegata* Franch. Notis nonnullis (praesertim filamentis connatis) sect. *Helici* similis, sed haec similitudo verius convergentione effecta est.

24. **S. *Wilhelmsiana*** M. B., Fl. Taur.-Cauc. 3: 627 (1819).

Syn.: *S. angustifolia* Willd., Spec. Plant. 4, 2: 699 (1806) non Wulfen (1789). *S. dracunculifolia* Boiss., Diagn. Pl. Or. Nov. Ser. 1,7: 99 (1846). *S. Trautvetteriana* Regel, Acta Horti Petrop. 6, 2: 465 (1880).

Icon.: Trautvetter, Salicetum, tab. 3 (1836). Fl. URSS. 5, tab. 8, fig. 1 (1936).

Fl. Azerbaijan 3, tab. 2, fig. 1 (1952). Fl. Uzbekistan 2, tab. 1, fig. 2 (1953). Fl. Tadjik. tab. 15, fig. 10—12 (1968).

Typus: „Iberia", WILHELMS, LE!

Frutex divaricatus ramulis tenuibus arcuatis apice saltem pilis ± appressis sericeis vestitis. Gemmae florigerae foliiferis dissimiles, numerosae, 40—50 in quoque ramulo, oblongo-lanceolatae, 4—7×2—2,3 mm, perula membranacea ± rufescente, apice recto vel ramulum versus directo. Stipulae vel earum vibiculae 0,1—0,2 mm magnae vel omnino deficientes. Folia linearia, 25—65×1,7—4,5 mm, utrinque fere concoloria, dense stomatifera, pilis longitudinaliter appressis sericeis ± vestita, nervis lateralibus sub angulo acutissimo a costa mediana divergentibus, margine denticulis minutis remotiusculis. Amenta mascula anthesis culmine 15—25×5—6 mm, feminea matura 15—30×7 mm. Bracteae pallidae, in sicco saepe subfulvidae, 1—1,8×0,6—1 mm. Filamenta sub anthesi vulgo angulo recto ab axi amenti patentia, 2—2,5 mm longa. Capsula dense sericeo-pilosa, matura 3—4 mm longa. Stylus 0—0,3 mm longus; stigmata biloba, 0,2—0,3 mm longa.

Persia: W: Azerb.: M. Qareh Dagh, BUHSE 734! Prope lac. Rezaiyeh ad fluv. Baranduz, SCHIPZINSKY & SCHELKOVNIKOV 678! Ad pagum „Itschke-su", SCHIPZINSKY & SCHELKOVNIKOV 489! Bakht.: Gahar, 2400 m, KOELZ 17950! Lur.: M. Oshtoran Kuh, STR.! — Gulbar, 1200 m, HAUSSKN.! — S: Fars.: Ad fluv. Pulvar prope Qavamabad, 1900 m, BORNM. 4532! Khaneh-ye Zenyan, STAPF 898!, 899! Kuh-e Dinar, Ky. 621 (typus *S. dracunculifoliae* BOISS.)! — C: Tehr.: In valle Loura, KY. 544! Qazv.: Karaj, cult. in horto bot., GAUBA 1964-a!, RECH. 2178!

Afghanistan: E: Kabul: Guzar Gah, NEUB. 287!, 288! Jaji: Ali Khel, AITCH. 111! Ghorband: In valle fl. Ghorband, 150 km a Kabul, RODIN 115! Nuristan: Parigel, 1800 m, KERST. 1184! — NE: Badakhshan: Panj Shahr, 1500 m, KOELZ 12384! Kataghan: In valle Andarab, 1180—1550 m, BUKINICZ! — C: Bamian: In valle fluv. Bamian „Urbs Rubra", 2000 m, REINER 683! Doab: Doab, VOLK 499!; MEINERTZHAGEN p. p.! Ad fl. Surkhab inter Doab et Eshpushta, 1500 m, GILLI 2426!, 2427! In valle Kamard, 1620 m, GILLI 2428! Ghorat: In valle supra Zarni inter Taiwara et Parjuman, 2000 m, RECH. 19006!

Distr. gen.: Anatolia maxime orientalis, Transcaucasia (regiones centrales aridiores), Persia, Afghanistan, Daghestan (rarissime), Uzbekistan (Karakalpakia inclusa), Tadzhikistan, Kirghizia, Kazakhstan australis, Kashgaria, Tibet occidentalis.

Species non satis notae

25. ***S. nuristanica*** A. SKVORTSOV, Nov. Syst. Pl. Vasc. 1965: 94 (1965).

Typus: KERST. 1512, W!

Frutex humilis. Ramuli annotini 1—1,3 mm crassi, brunnei, pilis albis lanato-intricatis ± dense obtecti. Gemmae florigerae a vegetativis diversae, ovatae, obtusae, ca. 6 mm longae. Stipulae lanceolatae, acutae, fere aequilaterae, diu persistentes (complures anni praecedentis detexi). Petioli 2—4 mm longi, albo-lanati, superne sulcati. Lamina foliorum evolutorum ovalis vel late lanceolata, acuminata, 20—30×10—15 mm, utrinque dense albo-villosa, sub indumento supra astomatifera plana, subtus nervorum rete prominente, margine crebre acute serrulata. Amenta nondum cognita.

Afghanistan: E: Nuristan: In declivibus occidentalibus jugi Semenek, 3400 m, KERST. 1512!

Amentis ignotis affinitas huius plantae haud certe aestimatur. Ob stipulas persistentes ac nervorum rete subtus prominente speciem distinctam e sect. *Lanatae* habere

opinor. Sed etiam formam anomalissimam *S. Karelinii* Turcz. esse posse haud plane negare audeo.

26. ***S. zygostemon*** Boiss., Diagn. Pl. Or. Nov. Ser. 12: 118 (1853).

Typus: Kotschy 135, G, LE!

Frutex ut videtur sat elatus. Ramuli juveniles breviter tomentosi, anni praecedentis flavide brunnei, 1,2—1,8 mm crassi. Stipulae bene evolutae, inaequilaterae, costa ± curvata. Folia ca. 45—80×13—15 mm magna, juniora utrinque ± sericeo-tomentosa (an matura glabrescentia?), superne astomatifera, subtus inferiora saltem viridia (non pruinosa), margine denticulata. Amenta subpraecocia, pedunculis 2—4 mascula vel 5—10 feminea mm longis et 1,0—1,7 mm crassis, 1—4 cataphyllis subtus sericeis praeditis, densa, mascula culmine anthesis 30—45×12—15 mm, feminea submatura 40—60×12—15 mm. Bracteae 1,5—2,5×0,8—1,5 mm, apice nigrescentes, pilis rectiusculis apicem bracteae 1—2 mm superantibus sat dense vestitae. Nectarium 1, breviter rectangulare. Filamenta usque ad 1/3—2/3 connata, circiter ad dimidium usque pilosa, antheris flavis in sicco 0,8—1,0 mm longis. Capsulae pedicellis 1,0—1,5 mm longis suffultae, lanceolato-conicae acutae, sericeae, immaturae in typo ad 5 mm longae (maturae certe longiores!). Stylus 0,3—0,5 mm longus, stigmata lineari-bifida (sed laciniis ± cohaesis) 0,6—0,8 mm longa.

Praeter specimina originalia Kotschyana mascula et feminea ad hanc speciem cum majore minoreve dubio specimina sequentia refero:
Persia: W: Bakht.: Gahar, 2100 m, Koelz 17880! — S: Bal. In ditione M. Taftan prope Sangan, 1600 m, Rech. 4085! — C: Tehr.: Ad cataractas Ser Abi Sher prope Pas Qaleh, Ky. 135! Shahrestanak, 2200 m, Gauba 1939!

Quamquam ipse Boissier in Fl. Or. 4: 1188 (1879) et serius auctores alii: Bornmueller, Gartenflora 62: 242 (1913) et Beih. Bot. Centrbl. 33: 203 (1915); Floderus, Ark. Bot. 25 A, N 11: 31 (1933); Görz, Feddes Repert. 35: 286 (1934) — hanc speciem hybridam *S. aegyptiaca* × *S. elbursensis* vel etiam *S. pycnostachya* × *S. Wallichiana* esse crediderunt, notae morphologicae speciminum authenticorum origine hybrida explicari non possunt; cum hybridis certis plantae Kotschyanae male congruunt. Propterea has plantas speciem etsi rarissimam, attamen nativam, non hybridam esse censeo. E speciebus eurasiaticis *S. sericocarpae* Anderss. (an potius *S. myrsinifoliae* Salisb. ??) affinis esse apparet. Specimen Koelz 17880 a typo foliis angustioribus subintegerrimis, pedicello ad 2,5 mm et stylo 0,6—0,7 mm longo discrepat; fieri potest, ut species distincta sit. Specimen Rech. 4085 amentis caret. Specimen Gauba 1939 ad hybridam *S. aegyptiaca* × *S. elbursensis* vergit.

27. ***S. Koeieana*** A. Skvortsov, Nov. Syst. Pl. Vasc. 1965: 95 (1965).

Typus: Koeie 2533 feminea, C!, W!

Frutex, ut videtur, sat elatus, ramis gracilibus, annotinis 0,7—1,0 crassis, lutescentibus vel brunnescentibus, glaberrimis. Gemmae florigerae a vegetativis extus ut videtur sat diversae, ovatae, in planta feminea c. 3 mm longae, in masculis verisimiliter majores. Folia anguste lanceolata, 20—30×3—5 mm (in typo) vel 25—45×5—7 mm (in specimine Lace 3453) magna, utrinque fere concoloria, pallide vel caesio-viridia opaca, plana, nervorum rete inconspicuo, glabra (vel solum juvenilia paullo sericea), margine dentulis minutis acutis ornata, utrinque dense stomatifera. Amenta subsessilia (pedunculo 1—4 mm longo), densa, mascula culmine anthesis 15—20×8—10 mm, feminea matura c. 20×7 mm. Bracteae persistentes, obtusae, breviter ± pilosae; in typo femineo brunnescentes

ca. 1,0—1,5×0,6—0,7 mm magnae, elongato-ovales; in specimine LACE 3453 masculo 1,5—1,7×1,0 mm magnae, ovales, omnino fere nigrescentes. Filamenta semiconnata, basi pilosa, 4—5 mm longa. Antherae flavae ovales vel subglobosae, 0,5—0,7 mm longae. Capsula sessilis, ovata, acuta, breviter sericea, matura ca. 3,5 mm longa. Stylus 0,4—0,7 mm, stigmata biloba 0,2—0,3 mm longa.

Afghanistan: C: Behzud: Farakulum, ad fluv. Helmand, 2700 m, KOELZ 2533! Pakistan: Quetta, Pishin, LACE 3453!

Distr. gen.: Endemica.

Species, ut videtur, bona. Ad sect. *Helix* referenda.

Hybrida

S. *aegyptiaca* L. × ***elbursensis*** BOISS.

Foliorum forma et magnitudine inter parentes intermedia; amentis sat crassis et villosis, filamentis ± connatis. Cf. etiam annotationem ad 26. *S. zygostemon* BOISS.

Persia: N: Maz.: In valle fluvii Chalus, 2200—2600 m, RECH. 6336! — W: Ham.: Hamadan, MIRD. 1973! Arak: Arak, culta, STR.! — C: Qazv.: Kuh Dashteh, 1800 m, RECH. 306! Karaj, in hortō bot. culta, RECH. 2177!, GAUBA 1940! Yazd: Prope Taft, 2000 m, BORNM. 4540!

S. *Karelinii* TURCZ. × ***turanica*** NASAROV.

Pakistan: Chitral: Ad glaciem Chatiboi, 3450 m, STAMM & WÖHRL 106!

Addenda

1. ***Populus***

9. ***P. pamirica*** KOMAR.

Afghanistan: E: Panjshir: In valle Panjshir 6 km supra Kur-Petau, 3100 m, PODLECH 12475! — NE: Kataghan: In valle Farkhar, 2300—2700 m, GRÖTZBACH 59! Badakhshan: Darrah-i Parshui, 3550 m, FREY 429!, 432!

2. ***Salix***

9. ***S. Karelinii*** TURCZ.

Pakistan: Chitral: Ad glaciem Chatiboi, 3550 m, STAMM & WÖHRL 133! Ad glaciem Pechus, 4050 m, STAMM & WÖHRL 10!, 11! Pechus in valle Yarkhun, 3250 m, STAMM & WÖHRL 158!

14. ***S. turanica*** NASAROV.

Pakistan: Chitral: Ad glaciem Chatiboi, 3500 m, STAMM & WÖHRL 132!

22. ***S. pycnostachya*** N. J. ANDERSSON.

Pakistan: Chitral: In valle Yarkhun, Ghararem, 3200 m, STAMM & WÖHRL 146!

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Amygdalus arabica Olivier — Jacobs 6237

Amygdalus brahuica Boiss. subsp. *afghanica* (Pachom.) Browicz — Rech. 36903

SYSTEMATISCHE ANORDNUNG DER FAMILIEN

Familien mit vorangestellter Continuatio-Nummer sind bereits erschienen.

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
	PTERIDOPHYTA					
	Equisetaceae	1	2	143	(2)	(2)
	Lycopodiaceae	2	1	142	(1)	(1)
	Marsileaceae	5	5	144	(4)	(4)
	Ophioglossaceae	3	3	140	(6)	(6)
	Polypodiaceae	4	4	141	(3)	(3)
	Salviniaceae	6	6	145	(5)	(5)
	GYMNOSPERMAE					
50	Cupressaceae	9	8	136	(8)	(8)
3	Ephedraceae	10	10	138	(10)	(10)
14	Pinaceae	8	9	135	(7)	(9)
12	Taxaceae	7	7	137	(9)	(7)
	ANGIOSPERMAE					
24	Acanthaceae	138	110	84	86	135
61	Aceraceae	86	83	30a	42a	76
	Aizoaceae	48	27	50	57	106
	Alismataceae	16	127	115	124	146
	Amaranthaceae	45	23	93	92	112
	Amaryllidaceae	27	134	128	114	162
	Ampelidaceae	91	91	32	41	66
63	Anacardiaceae	81	81	46	43	75
	Apiaceae	113	94	54	58	127
	Apocynaceae	125	117	82	75	82
25	Aquifoliaceae	82	86	70	38	58
1	Araceae	22	143	120	122	158
	Araliaceae	112	93	55	59	19
26	Aristolochiaceae	40	35	103	97	96
	Asclepiadaceae	126	118	74	76	84
	Asparagaceae	26	133	129	116	155,7pp.
48	Asperifoliaceae	129	104	80	79	142
	Asteraceae	146	126	61	65	131
	Balanophoraceae	42	20	102	103	63
	Balsaminaceae	89	85	25	33b	140
	Berberidaceae	54	40	3	13	96
	Betulaceae	33	11	112	108	25
44	Bignoniaceae	137a	108a	76a	85a	86a
48	Boraginaceae	129	104	80	79	142
57	Brassicaceae	60	46	7	16	101
45	Buddleiaceae	123	115	75	77	80
	Burseraceae	75	78	33	36	72
	Butomaceae	17	128	116	124a	145
27	Buxaceae	80	31	105	104a	23
	Caesalpiniaceae	68b	59b	38b	45b	13
	Callitrichaceae	79	32	47	50b	117
13	Campanulaceae	145	125	62	66	130
	Cannabaceae	37	17a	106	105	30
	Capparidaceae	59	45	8	17	36
10	Caprifoliaceae	141	121	57	61	20
	Caryophyllaceae	50	29	13	23	105
64	Celastraceae	83	87	35	39	60
28	Ceratophyllaceae	52	42	15	110	94
	Chenopodiaceae	44	22	92	93	111
46	Cistaceae	99	49	10	19	33
	Compositae	146	126	61	65	121
2	Convolvulaceae	127	102	78	80	133
54	Cornaceae	114	92	56	60	18
	Corylaceae	33	11	112	108	27
	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
	Cupuliferae	33-4	11-2	111-2	108	25-7
8	Cuscutaceae	128	103	79	80a	141
39	Cynocrambaceae	111	25	91	105c	113
	Cyperaceae	20	139	134	126	169
	Cytinaceae	41	36	101	96	98
29	Datiscaceae	101	54	49	56	43
	Dioscoreaceae	28	137	131	115	164
	Dipsacaceae	143	123	60	64	129
30	Ebenaceae	121	100	69	72	68
48	Ehretiaceae	129	104	80	79	87
55	Elaeagnaceae	103	61	97	100	64
16	Elatinaceae	96	52	18	26	103
11	Ericaceae	116	99	63	67	51
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
	Fagaceae	34	12	111	108a	26
	Ficoidaceae	48	27	50	57	106
	Frankeniaceae	97	51	17	22	38
	Fumariaceae	58	44	6	15a	100
41	Gentianaceae	124	116	76	78	118
	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
	Gramineae	19	140	135	127	170
47	Grossulariaceae	64	57	52	47	17
49	Guttiferae	95	55	19	27	54
18	Halorag(id)aceae	109	67	46	50	115
53	Hamamelidaceae	65	33	53	49	21
	Helleboraceae	53	39	1	11	90
	Hippocastanaceae	87	84	30b	42b	77
31	Hippuridaceae	110	68	45	50a	116
19	Hydrangeaceae	64	57	52	47	16a
	Hydrocharitaceae	18	129	114	111	146

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
49	Hypericaceae	95	55	19	27	54
25	Ilicineae	82	86	70	38	58
	Illecebraceae	50	29	13	23	109
	Iridaceae	29	135	126	113	163
	Juglandaceae	32	13	109	107	28
	Juncaceae	25	136	133	118	168
	Juncaginaceae	14a	130	117a	125b	148
	Labiatae	131	112	87	89	144
	Lamiaceae	131	112	87	89	144
	Lauraceae	56	37	98	98	11
	Leguminosae	68	59	38	45	13-5
	Lemnaceae	23	144	119	123	159
58	Lentibulariaceae	136	107	65	84	137
	Liliaceae	26	133	128	116	155
	Linaceae	71	72	23	31	47
45	Loganiaceae	123	115	75	77	79
	Loranthaceae	39	19	100	101	61
51	Lythraceae	104	62	43	53	114
	Malvaceae	93	69	20	28	46
	Meliaceae	76	79	31	37	73
	Menispermaceae	55	38	2	12	95
41	Menyanthaceae	124	116	76	78	119
	Mimosaceae	68a	59a	38a	45a	14
	Molluginaceae	48	27	50	57	105
	Monotropaceae	115	98	64	67a	52
	Moraceae	36	15	107	105a	31
	Moringaceae	62	48	37	44	37
	Myrsinaceae	117	97	67	70	67
32	Myrtaceae	107	64	40	52	55
	Najadaceae	15	132	118	125	153
	Nyctaginaceae	46	26	95	91	35
33	Nymphaeaceae	51	41	4	14	93
7	Oenotheraceae	108	66	44	54	115
52	Oleaceae	122	119	71	73	81
7	Onagraceae	108	66	44	54	115
	Orchidaceae	30	141	125	112	167
5	Orobanchaceae	135	108	83	83	136
40	Oxalidaceae	69	73	24	33a	139
60	Paeoniaceae	53	39	1	11	89
	Palmae	21	142	121	119	165
34	Papaveraceae	57	43	5	15	99
	Papilionaceae	68c	59c	38c	45c	15
20	Parnassiaceae	64	57	52	47	126
	Pedaliaceae	134	109	77	85	86
	Periplocaceae	126	118	74	76	83
19	Philadelphaceae	64	57	52	47	16
35	Phytolaccaceae	47	24	90	94	110
15	Plantaginaceae	139	114	89	90	122
21	Platanaceae	66	34	110	106	22
	Plumbaginaceae	119	95	88	68	121
	Poaceae	19	140	135	127	170
	Podophyllaceae	54	40	3	13	93
	Polygalaceae	77	80	12	21	41
56	Polygonaceae	43	21	94	95	108
	Portulacaceae	49	28	14	24	107
	Potamogetonaceae	14	131	117	125a	150
9	Primulaceae	118	96	66	69	120
22	Punicaceae	105	65	42	53	57
	Pyrolaceae	115	98	64	67a	50
	Rafflesiaceae	41	36	101	96	98
	Ranunculaceae	53	39	1	11	91
	Resedaceae	61	47	9	18	102
	Rhamnaceae	90	90	36	40	65
	Rhizophoraceae	106	63	41	51	56
66	Rosaceae	67	58	39	46	12
	Rubiaceae	140	120	58	62	85
	Ruppiaceae	14	131	117	125a	151
	Ruscaceae	26	133	129	116	157
36	Rutaceae	73	76	28	34	70
65	Salicaceae	31	14	113	109	24
37	Salvadoraceae	84	88	72	74	59
	Santalaceae	38	18	99	102	62
38	Sapindaceae	88	82	30	42	74
	Sapotaceae	120	101	68	71	69
42	Saxifragaceae	64	57	52	47	124
	Scheuchzeriaceae	–	130	117a	125b	148
	Scrophulariaceae	133	106	82	82	134
	Selaginaceae	137	108	85	87	–
	Simar(o)ubaceae	74	77	29	35	71
	Smila(ca)ceae	26	133	130	116	156
	Solanaceae	132	105	81	81	132
59	Sparganiaceae	13	146	123	121a	160
	Staphyleaceae	85	89	30c	42c	78
	Sterculiaceae	94	71	21	29	45
4	Tamaricaceae	98	50	16	25	39
39	Theligonaceae	111	25	91	105c	113
	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
	Typhaceae	11	147	124	121	161
	Ulmaceae	35	16	108	105b	29
	Umbelliferae	113	94	54	58	127
	Urticaceae	37	17	106	105	32
11	Vacciniaceae	116	99	63	67	53
23	Vahliaceae	64	57	52	47	125
62	Valerianaceae	142	122	59	63	128
43	Verbenaceae	130	111	86	88	98
	Violaceae	100	53	11	20	40
	Vitaceae	91	91	32	41	90
	Zannichelliaceae	14	131	117	125a	152
	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48