Typhaceae

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Lfg. Cont. No. 71/30. 1. 1

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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GRAZ-AUSTRIA

Typhaceae

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Typhaceae JUSS., Gen. Plant. 25 (1789) sub „*Typhae*".
Syn.: *Typhinae* AGARDH, Aphor. Bot. 10: 139 (1823).

Lit.: E. BOISSIER, Typha, Flora Orientalis 5: 49–51 (1884). A. ENGLER, Typhaceae in A. ENGLER & K. PRANTL, Natürliche Pflanzenfamilien 2, 1: 183–186 (1889). M. KRONFELD, Monographie der Gattung Typha TOURN., Verhandlungen der Zoologisch-Botanischen Gesellschaft Wien 39: 89–192 (1889). P. ASCHERSON & P. GRAEBNER, Typhaceae, Synopsis der mitteleuropäischen Flora 1: 270–278 (1896–98). P. GRAEBNER, Typhaceae in A. ENGLER, Pflanzenreich IV, 8: 1–18 (1900). B. A. FEDTSCHENKO, Typhaceae, Flora URSS. 1: 209–216 (1934). E. POBEDIMOVA, Species novae generis Typha, Not. Syst. Leningrad 11: 3–17 (1949).

Genus unicum:

1. *Typha*

Typha L., Spec. Plant. 971 (1753). Gen. Plant. ed. 5: 418 (1754).

Flores monoici perigonio nullo in inflorescentiis densissimis cylindricis dispositi. Inflorescentia mascula supra femineam vel femineas 2–3 singula in parte apicali axis sita. Flores masculi e staminibus 3 spathulatis, rarius 1–7 prope basin ± cohaerentibus basi plerumque pilis longis cincti. Grana pollinaria saepe 4 cohaerentia non separantia. Flores feminei gynophoro tenuissimo longo longissime piloso in speciebus nonnullis in axilla bracteae singuli insidentes, e carpello singulo consistentes. Stigma lineare vel saepius spathulatum. Inter flores fertiles saepe ovaria sterilia elongata vel clavata evoluta (= carpodia). — Plantae herbaceae saepe elatiores locorum humidiorum et riparum, rhizomate repente, foliis linearibus in dorso saepe convexis, longissime vaginantibus, supremis inflorescentias in statu juvenili amplectentibus.

Bei der Bestimmung der *Typha*-Arten spielt das Längenverhältnis der Stigmata, Carpodia, der Borsten am Karpophor und, wenn vorhanden, der Brakteolen zueinander eine wesentliche Rolle. Es kommt in dem Muster zum Ausdruck, das alle diese genannten Organe an der Oberfläche der weiblichen Infloreszenz bilden. Zuerst hat davon E. POBEDIMOVA (1949) bei der Neubeschreibung einiger Arten Gebrauch gemacht. Im Schlüssel läßt sich dieses Merkmal aber wegen sprachlicher Schwierigkeiten nur in sehr begrenztem Maße verwenden. Da es in Worten kaum ausgedrückt werden kann, müssen die beigegebenen Zeichnungen bei der Bestimmung unbedingt zusätzlich herangezogen werden.

1 a. Spica feminea albida, omnes partes floris a setis albis superata. .... 4. *T. albida* H. RIEDL
b. Spica feminea dilute usque atro-brunnea, setae quam ceterae partes floris breviores 2
2 a. Folia 30–40 mm lata, vaginis in dorso carinato-angulatis. Spica feminea opace brunnea. Bracteolae evolutae ..... 5. *T. elephantina* ROXB.
b. Folia ad summum 20 mm lata, vaginis in dorso haud carinato-angulatis. Spica vario modo colorata. Bracteolae evolutae vel deficientes 3

3a. Spica feminea opace brunnea, saepe atro-brunnea 4
b. Spica feminea dilutius colorata, cinnamomeo-brunnea vel ± ferruginea 7
4a. Spica feminea diametro transversali plus quam quintuplo longior. Bracteolae evolutae vel deficientes 5
b. Spica feminea diametro transversali ad summum quadruplo longior. Bracteolae evolutae 6
5a. Folia in dorso convexa, 10—20 mm lata. Spica mascula et feminea contiguae. Bracteolae deficientes ..... 1. *T. latifolia* L.
b. Folia in dorso plana, 2—10 mm lata. Spica mascula a feminea remota vel contigua. Bracteolae evolutae ..... 6. *T. angustifolia* L.
6a. Folia caulina ad vaginas reducta ..... 10. *T. minima* Funk
b. Folia caulina laminis suffulta ..... 11. *T. Martini* Jordan
7a. Spica feminea in superficie alveolata, in alveolarum basi apices lati carpodiorum dignoscendi. Spica mascula sub anthesi femineae iam evanida. *T. Grossheimii* quidem in statu juvenili spicae femineae spica mascula densissima antheris a pilis longis superatis facile cognoscenda 8
b. Spica feminea numquam in superficie alveolata 9
8a. Stigmata, carpodia, bracteolae et ovaria rubro-subtuberculato-punctata. Spica feminea pallide brunnea ..... 9. *T. turcomanica* Pobed.
b. Stigmata atque carpodia tantum rubro-punctata nec subtuberculata. Spica feminea fusca ..... 8. *T. Grossheimii* Pobed.
9a. Bracteolae evolutae. Spica feminea tenuis, diametro transversali multoties longior ..... 7. *T. australis* Schum. & Thonn.
b. Bracteolae deficientes. Spica feminea diametro mediocri, longitudine usque ad sextuplo breviore 10
10a. Apex stigmatis abrupte dilatatus, omnes partes ceteras floris feminei valde superans. Antherae contortae ..... 2. *T. caspica* Pobed.
b. Apex stigmatis angustus, neque abrupte dilatatus. Omnes partes floris feminei fere aequilongi. Antherae non contortae.. 3. *T. Laxmanni* Lepech.

Sect. *Typha*

Syn.: *Typha* L. Sect. *Ebracteatae* Schnizlein, Typhae 25 (1845). *Typha* L. Sect. *Ebracteolatae* Kronf., Verh. Zool.-Bot. Ges. Wien 39: 140 (1889) pro tribu; Graebner in Engler, Pflanzenr. IV. 8: 8 (1900), pro sect. — Typus generis et sectionis: *T. latifolia* L.

Bracteae ad flores femineos non evolutae.

1. ***T. latifolia*** L., Spec. Plant. 971 (1753).

Icon.: Tab. 1, fig. 1.
Typus: „Habitat in paludibus Europae".

Planta valida, 1,5—2,5 m alta, foliis cauli subaequilongis, 10—20 mm latis. Spicae masculae et femineae contiguae. Flores masculi ex staminibus 1—5, plerumque 3, antheris ± 2,5 mm longis compositi. Spica feminea primo dilutius, demum atro-brunnea, floribus 10—12 mm longis. Gynophorus 5—6 mm longus. Pili stigma longitudine non superantes. Flores steriles pyriformes fertilibus immixti.

Talish: Lenkoran, Hohen. Astara, Hohen.
Persia: N: Gorg.: Gonbad-e Kavus, Koelz 16613! — W: Azerb.: Ahmadabad, Knapp! Ham.: Borujerd, Koelz 18433!, 18442!, 18443!
Turcomania: Ad fluv. Dejul-su, Litw. 2134!

Afghanistan: N: Mazar-i Sharif: Balkh, in fossis, 380 m, GILLI 91! — E: Kabul: Sarobi, VOLK 1221! — NE: Kataghan: Khanabad, 450 m, KOELZ 13164!
Pakistan: Kurram: Inter Chapri et Manduri, AITCH. 531.

Distr. gen.: Per totam orbem, Africa media et australi, Asia australi, Australia et Polynesia exclusis.

2. ***T. caspica*** POBED., Not. Syst. Leningrad 12: 21 (1950).

Typus: „Azerbeidshan, ad litora maris Caspii, in paludosis, inter Port Iljiez et Kumbaschi", E. POBEDIMOVA 287, LE.

Robusta, usque ad 3 m alta, foliis planis, 8—13 mm latis. Spica mascula et feminea contiguae. Flores masculi ex antheris 1—5, plerumque 2—3, contortis, usque ad 2,5 mm longis, in spica 15—16 mm longa dispositi. Spica feminea 15—18 cm longa, 2—3 cm in diam., post anthesin pallide brunnea, superficie apiculis dilatatis subpellucidis stigmatum fere tecta. Pili gynophori 3 mm tantum longi, stigmate multo breviores. Stigma apicem versus abrupte dilatatum. Flores steriles obconici (carpodia) lutescentes 8—9 mm longi immixti.

Talish: Lenkoran sec. E. POBEDIMOVA, l. c.

Distr. gen.: Ad litora maris Caspii usque ad Lenkoran.

3. ***T. Laxmanni*** LEPECH., Nov. Act. Petrop. 12: 84, 335 (1801).

Syn.: *T. stenophylla* FISCH. & C. A. MEY., Bull. Acad. Sci. Petersb.3: 209 (1845). *T. Laxmanni* LEPECH. var. γ *planifolia* KRONF., Verh. Zool.-Bot. Ges. Wien 39: 169 (1889).
Icon.: Tab. 1, fig. 2.
Typus: Dahuria, LAXMANN in herb. FISCHER Nr. 66, LE.

Planta gracilis, 0,8—1,5 m alta, foliis angustis, 2—7 mm latis. Spica mascula a feminea remota. Flores masculi ex staminibus 1—5, plerumque 3, antheris 1,5 mm fere longis compositi. Spica feminea ± dilute brunnea, floribus usque ad 10 mm longis. Gynophorus 4—6 mm longus. Pili stigmate spathulato-lanceolato multo breviores. Flores steriles clavati fertilibus immixti.

Persia: N: Gorg.: Nezamabad, KOELZ 11610! Maz.: Now Shahr, GAUBA s. n.! Inter Babol Sar et Now Shahr, RECH. 2051! — W: Azerb.: 17 km S Maku, RECH. 14947! Ham.: Shahr Chaman, SAB. in GAUBA 1792! Borujerd, KOELZ 18213!, 18408! Arak: Mowdar, HAUSSKN.! Arak, STR.! — S: Fars.: Aspas, STAPF 1824! Dasht-e Arzhan, STAPF 1823! — E: Khor.: Bar, 1780—2530 m, SCHMID 6287!
Turcomania: Aktepe, LITW. 2132!
Afghanistan: SE: Kalat-i Ghilzai, 2500 m, KOELZ 13204! — E: Kabul: Paghman, NEUB. 1950/788! Kabul, 1780 m, GILLI 93! Gulbahar, REINER 743! — NE: Kataghan: Baghlan, NEUB. 4384! Taliqan, 660 m, KOELZ 13158! — C: Doab: Inter Doab et Eshpushta, 1600 m, GILLI 95! Doab, VOLK 1759!
Pakistan: Kurram: Inter Shinak et Badishkhel, AITCH. 480. — Baluchistan, STOCKS.

Distr. gen.: Gallia, Slowakia, Romania, Rossia europaea australis, Caucasus, ab Anatolia usque ad Sinam.

4. ***T. albida*** H. RIEDL, sp. nov.

Icon.: Tab. 1, fig. 3.
Typus: RECHINGER 35322, W!

Spica unica feminea tantum nota. Caulis teres, striatus, infra spicam feminam

3 mm fere in diam. Spica feminea breviter cylindrica, 5 cm longa, 10—12 mm in diam., albida, in uno latere paulo brunnescens. Flores feminei 4 mm longi. Pili gynophori albi, numerosissimi, stigma paulum, carpodia manifeste superantes. Gynophorus 1,5 mm fere longus. Stigma apice anguste spathulatum, brunneum. Carpodia 2,5—3 mm longa, obovoidea, dilute brunnea. Bracteolae deficientes. Spatium inter spicam masculam et femineam 2—3 cm longum. Antherae sub anthesi florum femineorum iam evanidae. — Species *T. Laxmanni* Lepech. affinis, differt pilis gynophori longioribus, stigmate et carpodio brevioribus, spica feminea breviore tenuioreque. A *T. Shuttleworthii* Koch & Sond. differt spica feminea multo breviore tenuioreque, nec juventute quidem opace brunnea, spicis masculis et femineis haud contiguis.

Afghanistan: SE: Kandahar: Ad margines deserti Registan, 20 km S Kandahar, 1000 m, 27. V. 1967, Rech. 35322!

Distr. gen.: Endem.

Sect. *Bracteatae* Schnizlein, Typhae 24 (1845).

Syn.: *Typha* L. tribus *Bracteolatae* Kronf., Verh. Zool.-Bot. Ges. Wien 39: 140 (1889).

Bracteolae ad flores femineos evolutae. — Typus sectionis: *T. angustifolia* L.

Subsect. *Bracteatae*

Syn.: *Typha* L. subtrib. *Schnizleinia* Kronf., Verh. Zool.-Bot. Ges. Wien 39: 140 (1889).

Plantae robustae 1—4 m altae. Axis spicae masculae pilis instructa.

5. ***T. elephantina*** Roxb., Fl. Ind. 3: 566 (1832).

Typus: Non indicatus

Planta maxima, usque ad 4 m alta, foliis 30—40 mm latis. Spica mascula a feminea remota. Flores masculi e staminibus 1—5, plerumque 3, antheris ± 2,5 mm longis compositi. Spica feminea in statu maturo brunnea vel atro-brunnea, floribus plerumque ± 10 mm longis. Gynophorus ± 5 mm longus. Pili apicem versus acuti, stigmate et bracteola fasciata breviores, albi. Flores steriles clavati fertilibus immixti.

Pakistan: Prope Peshawar, Kurz.

Distr. gen.: Asia: Pakistan, India orientalis, Turcomania, Africa: Algeria, (Aethiopia).

Die in Äthiopien vorkommende Rasse wird von manchen Autoren, so Kronfeld, l. c., als eigene Art, *T. Schimperi* Rohrb. angesehen.

6. ***T. angustifolia*** L., Spec. Plant. 971 (1753).

Typus: „Habitat in Europae paludibus".

Planta valida, 1—1,5 (—3) m alta, foliis ± angustis, 3—10 mm latis. Spica mascula a feminea remota. Flores masculi e staminibus 1—3, plerumque 3, antheris 2—3 mm longis compositi. Spica feminea in statu maturo opacius cinnamomeo-brunnea vel brunnea, floribus 9—10 mm longis. Gynophorus ± 5 mm longus. Pili apicem versus brunnescentes, incrassati, bracteolam subaequantes, stigmate breviores. Flores steriles fertilibus immixti.

Afghanistan: NE: Kataghan: Kunduz, KITAM.

Distr. gen.: Europa. America borealis, Australia, Polynesia, Syria, Libanon, Afghanistan (?), Caucasus, Sibiria pro maxima parte, Aralo-Caspia, Pribalchash, Dsungaria.

KITAMURA, Fl. Afgh. (1960) gibt *Typha angustifolia* L. für das Gebiet von Kunduz an und bringt sogar eine Photographie, die eine Gesellschaft dieser Art darstellen soll. Ich selbst habe keinen Beleg aus dem behandelten Gebiet gesehen und auch KRONFELD, l. c. nimmt ihre Ostgrenze in Asien im Libanon an. Alle überprüften Belege aus Persien und weiter ostwärts gehören zu *T. australis*, was aber nur durch Untersuchung der Haare des Gynophors feststellbar ist. Daher kann ich nach KITAMURA's Abbildung kein sicheres Urteil abgeben. Die Verbreitungsangabe auf russischem Gebiet folgt FEDTSCHENKO (1934) und den übrigen russischen Floren, doch wurden dort einige Taxa von POBEDIMOVA, Not. Syst. Leningrad 11: 3—17 (1949) abgetrennt.

7. ***T. australis*** SCHUM. & THONN., Danske Vidensk. Selsk. Afhandl. 4, ser. 4: 175 (1829).

Syn.: *T. angustata* BORY & CHAUB. in BORY, Expéd. Sci. Morée 3: 338 (1832).
T. aequalis SCHNIZLEIN, Typhae 25 (1845).
Icon.: Tab. 1, fig. 4.
Typus: Guinea, SCHUMACHER.

Planta valida, 1,5—3 m alta, foliis 4—7 (—10) mm latis. Spica mascula a feminea remota, rarissime masculae et femineae contiguae (in nostris numquam vidi). Flores masculi e staminibus 1—5, plerumque 3, antheris 1,5—2 mm longis compositi. Spica feminea pallide brunnea, floribus ± 10 mm longis. Gynophorus ± 3 mm longus. Pili apicem versus acutati, albi, bracteola stigmateque breviores. Flores steriles fertilibus immixti.

Iraq: 40 km NE Beye Fatah, JUMAA BRAHIM in BARKLEY 3650!
Persia: W: Ham.: Borujerd, KOELZ 18428! Khuz.: 40 km W Ahvaz, 2 km SW Said Arab, BENT & WR. 501-103! — E: Khor.: Bezg. RECH. 1396!
Pakistan: Kohat: Inter Hangu et Kohat, RECH. 30990!

Distr. gen.: Europa austro-occidentalis, Africa ut videtur pro maxima parte, Asia ab Anatolia et Sinai usque ad Sinam.

Auf die mutmaßliche Identität von *Typha angustata* BORY & CHAUB. und *T. australis* SCHUM. & THONN. hat GREUTER, Boissiera 13: 195 (1967) hingewiesen und nennt dafür als Gewährsmann GÈZE, Bull. Soc. Bot. Fr. 57: 211—216 (1910). Dieser hat nachgewiesen, daß *T. australis* von *T. angustifolia* L. deutlich verschieden ist. Er konnte aber *T. angustata* von Belegen aus Algerien, die als *T. angustifolia* L. bestimmt und z. T. von KRONFELD (1889) unter *T. australis* zitiert worden waren, nicht unterscheiden. Allerdings hat er nie die völlige Identität der beiden Arten behauptet, wie dies irrtümlich GREUTER angibt, sondern nur als Hypothese angenommen, wie das auch nicht anders möglich war, da er den Typus aus Guinea nicht gesehen hatte. Ich habe nun auch einen als *T. angustifolia* L. etikettierten, von KRONFELD zu *T. australis* gezogenen Beleg DRÈGE 8811 aus Afrika untersucht, der gleichfalls von *T. angustata* nicht unterscheidbar war. Danach ist die Wahrscheinlichkeit noch größer, daß auch dazwischenliegende Funde, wie der Typus aus Guinea, mit *T. angustata* identisch sind. Ich nehme daher für die gesamte Art *T. australis* als den älteren Namen an, doch ist die Identität von *T. australis* und *T. angustata* (ich untersuchte griechische Belege immerhin aus der Nähe der ditio classica letzterer) immer noch nicht endgültig bewiesen. Wie wenig verläßlich die von KRONFELD als Unterschiede zwischen *T. angustata* und *T. australis* angegebenen Merkmale sind, hat GÈZE bereits völlig richtig erkannt. Belege von *T. domingensis* PERS. hingegen zeigen hinreichend große Unterschiede, schon mit freiem Auge erkennbar

etwa im Durchmesser der weiblichen Infloreszenz, daß diese Art selbständig neben *T. australis* bestehen bleiben muß. Zwei amerikanische Belege, die als *T. domingensis* Pers. in Herbarium W bezeichnet waren, gehören eindeutig zu *T. angustifolia* L. Ich stimme mit Gèze darin überein, daß *T. japonica* Schnizlein und *T. Muelleri* Rohrb. *T. australis* sehr ähnlich sind und wohl eher als Rassen zu dieser als zu *T. angustifolia* gerechnet werden müssen.

Die Lage des Fundortes Barkley 3650 konnte nicht eindeutig festgestellt werden. Möglicherweise ist hier der Durchbruch des Tigris durch den Jabal Hamrin gemeint (35°05′ N, 43°35′ E), in welchem Fall der Fundort außerhalb des Flora-Iranica-Gebietes liegt.

8. ***T. Grossheimii*** Pobed., Not. Syst. Leningrad 11: 12 (1949).

Icon.: Tab. 1, fig. 5; tab. 2.
Typus: E. Matveeva 763, LE.

Planta 80—120 cm alta, foliis omnibus lamina plana 5—8 mm lata. Spica mascula a feminea remota, usque ad 26 cm longa, pilis fasciatis antheras superantibus in axi obsita, floribus ex antheris 1—4,2 mm fere longis. Spica feminea cylindrica, 12—20 cm longa, 1,5—2,5 cm in diam., post anthesin pallide brunnea vel subalbicans, alveolata, alveolorum basis apicibus truncatis carpodiorum formata. Flores feminei ± 6 mm longi. Pili gynophori numerosi. Carpodia clavato-dilatata. Bracteolae filiformes, apice subrotundatae, albae, rubro-punctatae. Stigma anguste lineare.

Iraq: Kurd.: Mosul: Wadi Bakok, 35 km N Mosul, Barkley 8995!
Talish: Lenkoran, prope portum Iljiez, ad litore maris Caspii, Matveeva 763.
Persia: N: Gorg.: Nezamabad, Koelz 16611! — S: Fars.: Ad fl. Pulvar, 1600 m, Bornm. 4710! Kerm.: Tezerj, Koelz 14232! Saidabad inter Kerman et Neyriz, 1800 m, Bornm. 4781! — E: Khor.: Inter Shirvan et Bojnurd, Rech. 1815! Tappeh-ye Moraveh, Koelz 16629!
Afghanistan: SW: Farah: Ad margines deserti Dasht-i Margo prope Khurmalik, 800 m, Rech. 19275! — SE: Kandahar: Pirzada, 900 m, Koeie 3359! Kalat-i Ghilzai, 2500 m, Koelz 13205! — E: Kabul: Charasiah, 1780 m, Gilli 92! Kabul, Neub. 1949/787! Panjshir: Inter Tang-i Saidan et Lalandar, 1810 m, Gilli 94! — NE: Kataghan: Baghlan, Volk 684! — C: Doab, Volk 1758!

Distr. gen.: Caucasus, Talish, Iraq, Persia, Afghanistan, Syr-Darya, Amu-Darya, Zeravshan.

9. ***T. turcomanica*** Pobed., Not. Syst. Leningrad 11: 14 (1949).

Typus: Turcomania: Ad ripas fluvii Kuschka prope Afghaniae fines, Sorokin, LE.

A praecedente differt inflorescentia feminea longiore, angustiore, fusca, bracteolis ovoideo-spathulato-dilatatis et characteribus in clave indicatis.

Persia: C: Qazv.: Karaj, 1400 m, Gauba 1135! — E: Khor.: Sultanabad, Koelz 16917!

Distr. gen.: Persia, Turcomania.

Subsect. *Rohrbachia* Kronf., Verh. Zool.-Bot. Ges. Wien 39: 140 (1889).

Plantae graciles, 0,3—1 m altae. Axis spicae masculae pilis destituta. — Typus subsectionis: *T. minima* Funk.

10. ***T. minima*** Funk nomen, Hoppe, Bot. Taschenb. 118, 181, 187 (1794), descr.
Syn.: *T. Laxmanni* sensu Ledeb., Fl. Ross. 4: 3 (1853) p. p., non Lepech. (1801).
T. angustissima Griff., Itin. Notes 11: 342 (1848).

Icon.: Tab. 3.
Typus: Austria, Salzburg, Untersberger Moor, FUNK.

Planta gracilis, 0,3—0,6 m alta, foliis angustissimis, plerumque ± 1,5 mm, ad summum 3 mm latis. Spica mascula a feminea remota, rare contigua. Flores masculi e staminibus 1—3, antheris 1,5—2 mm longis compositi. Spica feminea in statu maturo brunneo-fusca, ellipsoidea, floribus usque ad ± 6 mm longis. Gynophorus ± 3 mm longus. Pili apicem versus capitato-incrassati, stigmate breviores, bracteolam subaequantes. Flores steriles fertilibus immixti.

Iraq: Kurd.: Mosul: Sawara Tuka, BARKLEY 8233!
Persia: N: Gorg.: Inter Naudeh et Shahrud, 1000—2000 m, SCHMID 6130! Maz.: Inter Amol et Zardman, 500—1800 m, SCHMID 5884! — C: Tehr.: Ad fl. Jaji Rud, BRUNS Qazv.: Karaj, RECH. 239!, GAUBA 1136!, 1137!
Afghanistan: SE: Kandahar: Arghandab prope Kandahar, VOLK 1367! — NE: Kataghan: Baghlan, VOLK 784! Pul-i Khumri, AMSEL! 10 km S Pul-i Khumri, 700 m, RECH. 33670! — C: Doab, MEINERTZHAGEN!; 1620 m, GILLI 96!
Pakistan: „Noosk, ad fl. Koonur, Pushut et Soorkhab", GRIFF. 77! — Baluchistan, STOCKS 858!

Distr. gen.: Europa pro maxima parte, Caucasus, Anatolia usque ad Sinam.

Es gibt von dieser Art zwei auffallend verschiedene Ausbildungsweisen im gesamten Areal: bei der einen sind die weiblichen Infloreszenzen nur bis etwa 3 cm lang und meist auch nur weniger als 1 cm im Durchmesser breit, von den männlichen, an deren Basis meist ein deutliches Tragblatt entwickelt ist, durch einen kurzen, aber deutlichen Zwischenraum geschieden. Bei der anderen erreichen sie eine Länge von 4—5 cm und einen Durchmesser von 12—15 mm, schließen unmittelbar oder fast unmittelbar an die gewöhnlich von keinem Tragblatt gestützten männlichen Ähren an und die ganzen Pflanzen sind meist etwas höher und kräftiger entwickelt. In selteneren Fällen kommen Übergänge vor. Nach den Blütenmerkmalen besteht keine Möglichkeit einer systematischen Trennung.

Der Beleg von MEINERTZHAGEN aus Doab stellt eine Besonderheit dar, die vielleicht als eigene Rasse gewertet werden müßte, wenn Näheres über ihre Verbreitung bekannt wird. Die weiblichen Blüten sind nur etwa 2,5 mm lang, die Stengelblätter besitzen eine kurze, bis etwa 5 cm lange, starre Spreite.

11. *T. Martini* JORDAN, Cat. Gratianop. (1851).

Syn.: *T. gracilis* JORDAN, Cat. Gratianop. 24 (1848), non SUHR ex REICHENB. (1847).
Icon.: Tab. 4.
Typus: Gallia, in insulis fluvii Rhône prope Lyon, JORDAN, GRM.

Gracilis, 30—60(—100) cm alta, foliis inflorescentias superantibus usque ad 3 mm latis. Spicae masculae a femineis remotae, in specimine nostro eae contiguae. Flores masculi e staminibus 1(—3), antheris 1,5 mm fere longis compositi. Spica feminea demum brunneo-fusca, cylindracea, floribus 5 mm longis. Gynophorus ± 3 mm longus. Pili apicem versus capitato-incrassati, brunneoli, stigmate et imprimis bracteola breviores. Flores steriles fertilibus immixti.

Iraq: Kurd.: Kirkuk: Darbandikhan, BARKLEY 5213!
Persia: C: Qazv.: Porkhan N Karaj, 1500 m, ŽUMER 1123!

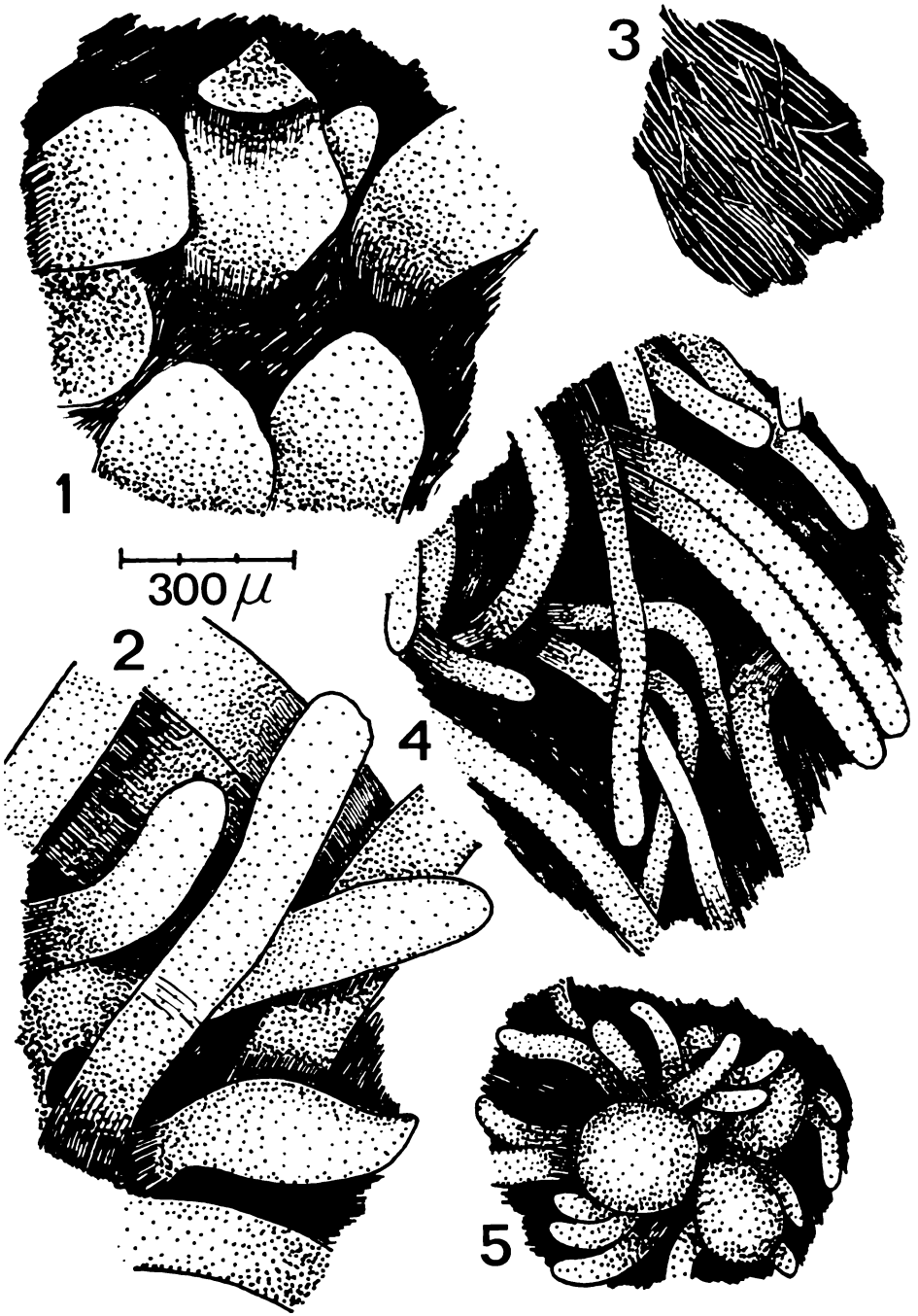
Distr. gen.: Gallia, Iraq, Persia, Mongolia.

Obgleich bereits JORDAN selbst den Namen *T. gracilis* wegen des Homonyms von SUHR fallen ließ und auch KRONFELD (1889) als Monograph den späteren Namen *T. Martini* annahm, findet man doch *T. gracilis* JORDAN immer noch häufig in der Literatur. Die von REICHENBACH in Icon. Fl. Germ. 9: 2, tab. 320 (1847) beschriebene und abge-

bildete Art von Suhr (es liegt keine Verwechslung mit Schur vor, wie Kronfeld glaubte) ist schwer zu deuten. Sie stellt wohl am ehesten *Typha angustifolia* oder ein verschlepptes Exemplar von *T. australis* dar.

Das Muster an der Oberfläche der weiblichen Infloreszenz dieser und der vorhergehenden Art entspricht weitgehend dem für *T. australis* abgebildeten, sodaß ich diesbezüglich auf Tab. 1, fig. 4 verweise.

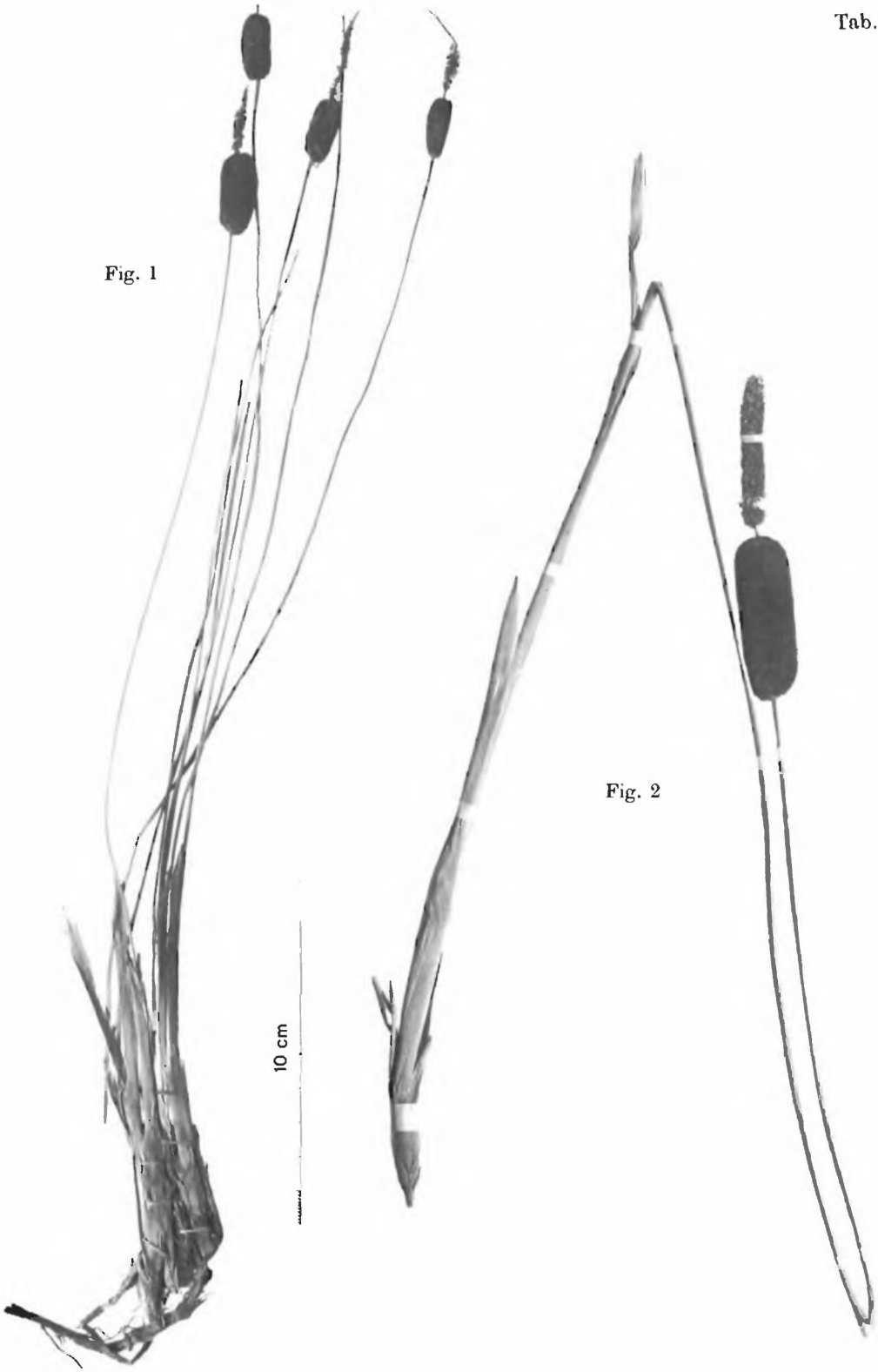
Typhaceae Juss. 1
Tribus *Bracteolatae* Kronf. 4
Subtribus *Schnizleinia* Kronf. 4
Typha L. 1
Sect. **Bracteatae** Schnizlein 4
Subsect. **Bracteatae** 4
Subsect. **Rohrbachia** Kronf. 6
Sect. *Ebracteatae* Schnizlein 2
Sect. *Ebracteolatae* Kronf. 2
Sect. **Typha** 2
aequalis Schnizlein 5
albida H. Riedl 3
angustata Bory & Chaub. 5
angustifolia L. 4
angustissima Griff. 6
australis Schum. & Thonn. 5
caspica Pobed. 3
domingensis Pers. 5
elephantina Roxb. 4
gracilis Jordan 7
Grossheimii Pobed. 6
japonica Schnizlein 6
latifolia L. 2
Laxmanni Lepech. 3
var. *planifolia* Kronf. 3
Laxmanni sensu Ledeb. 6
Martini Jordan 7
minima Funk 6
Muelleri Rohrb. 6
Schimperi Rohrb. 4
Shuttleworthi Koch & Sond. 4
stenophylla Fisch. & C. A. Mey. 3
turcomanica Pobed. 6



Oberflächenmuster der weiblichen Infloreszenzen fig. 1: *Typha latifolia* L. — fig. 2: *T. Laxmannii* LEPECH. fig. 3: *T. albida* H. RIEDL fig. 4: *T. australis* SCHUM. & THONN. — fig. 5: *T. Grossheimii* POBED.

Tab. 2

Typha Grossheimii Pobed. — Koelz 16611



Typha minima FUNK — fig. 1: SCHMID 5884 — fig. 2: SCHMID 6130

Typha Martinii JORDAN — fig. 1: Isotypus — fig. 2: ŽUMER 1123

ıssulaceae
ɔus C. A. JANSSON, Gothenburg et K. H. RECHINGER, Wien
Lfg. Cont. No. 72/30. 1. 1970

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

Crassulaceae

auctoribus C. A. JANSSON, Gothenburg et K. H. RECHINGER, Wien

Crassulaceae A. P. DE CANDOLLE in LAM. & DC., Fl. Fr. ed. 3, 4, 1: 382 (1805).

Lit.: E. BOISSIER, Crassulaceae in Flora Orientalis 2: 766—798 (1872). A. BERGER, Crassulaceae in ENGLER & PRANTL, Natürliche Pflanzenfamilien ed. 2, 18a: 352—483 (1930). A. BORISSOVA, Crassulaceae in Flora URSS. 9: 8—134 (1939).

Herba annuae, biennes vel perennes, rarius lignescentes. Folia indivisa, exstipulata, ± succulenta. Flores actinomorphi; inflorescentia plerumque cymosa, rarius spicata vel racemosa vel flores singuli axillares. Sepala et petala connata vel libera, 3—c. 20. Stamina hypogyna vel epipetala, aequo vel saepius duplo numero petalorum. Carpella supera, aequo numero petalorum, libera vel basi breviter connata, maturitate in folliculos permutata. Nectaria squamiformia inter stamina et carpella plerumque evoluta.

1a. Petala libera vel breviter connata 2
b. Petala per $^1/_3$—$^2/_3$ longitudinis connata 4
2a. Stamina aequo numero sepalorum, petalorum ac carpellorum . 1. *Crassula* L.
b. Stamina duplo numero sepalorum, petalorum ac carpellorum 3
3a. Petala (4—)5. Folia basalia raro rosulata ..... 4. *Sedum* L.
b. Petala numerosa. Folia basalia rosulam densam formantia .... 3. *Sempervivum* L.
4a. Folia peltata ..... 2. *Umbilicus* A. DC.
b. Folia non peltata 5
5a. Folia omnia aequaliter disposita ..... 5. *Pseudosedum* (BOISS.) BERGER
b. Folia basalia rosulata ..... 6. *Rosularia* (DC.) STAPF

1. *Crassula*

Crassula L., Spec. Plant. 282 (1753).
Syn.: *Tillaea* L., Spec. Plant. 128 (1753).

Herba minuta. Folia basi connata, opposita, saepe rubro suffusa. Flores 4— vel 3-meri. Petala libera. Stamina aequo numero petalorum.

1. *C. alata* (VIV.) BERGER in ENGLER & PRANTL, Natürl. Pflanzenfam. ed. 2, 18a: 389 (1930).

Syn.: *Tillaea alata* VIV., Pl. Egypt. Dec. 16 (1830). *T. trichopoda* FENZL ex BOISS., Fl. Or. 2: 767 (1872).
Typus: KOTSCHY 129.

Herba annua, nana, glabra. Caulis ascendens, simplex vel parce ramosus, a basi laxe florifer, saepe plures in caespitem approximati. Folia oblongo-lanceolata, basi connata, apice mucronata. Flores axillares, pedicellis flores demum aequantibus suffulti. Calycis laciniae oblongae, mucronatae.

Talish, sec. Fl. URSS. 9: 13 (1939).

Persia: W: Khuz.: Inter Shush et Dehloran, Nab. 294! Kuhanak inter Shushtar et Dezful, Nab. 293! Sellelat ad fl. Rud-e Gargar prope Shushtar, Nab. 292! — S: Fars.: Prope Dalaki, Ky. 129! Bushehr, in arenosis peninsulae, Stapf 968! Jahrom, Koelz 14649!

Distr. gen.: Aegyptus, Syria, Talish, Persia.

2. *Umbilicus*

Umbilicus A. DC., Bull. Soc. Philom. Paris 49, 3: 1 (1801).

Plantae perennes tuberosae vel rhizomatosae. Folia basalia petiolata, lamina plerumque suborbiculari, glabra; folia caulina quam basalia minora, angustiora. Flores pentameri, numerosi, in paniculam vel racemum terminalem bracteatum dispositi. Calyx minutus quinquepartitus. Corolla tubulosa, urceolata vel campanulata, sympetala, lobis ± erectis. Stamina 10, epipetala, tubo corollae inserta; filamenta brevia. Carpella tenuia, polysperma; styli breves vel nulli.

1 a. Caulis ramosissimus ramis tenuibus intricatis flaccidis. Pedicelli quam flores aequilongi usque longiores. Corolla usque ad vel ultra dimidium fissa .... 1. *U. tropaeolifolius* Boiss.

b. Caulis simplex vel subsimplex. Pedicelli quam flores breviores vel subnulli. Corolla usque ad quartam partem incisa ..... 2. *U. intermedius* Boiss.

1. ***U. tropaeolifolius*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 3: 14 (1843).

Syn.: *U. oxypetalus* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 3: 15 (1843). *Cotyledon tropaeolifolius* (Boiss.) Bornm., Beih. Bot. Centrbl. 32, 2: 389 (1914). ? *Umbilicus gendjnamensis* Stapf, Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 51: 325 (1886).
Icon.: Tab. 1.
Typus: Aucher-Eloy 2658, G.

Caulis (5—)10—20(—30) cm longus, tenuis, flexuosus, flaccidus, a basi copiose longe ramosus, ramis filiformibus flaccidis intricatis divaricatis, fragillimis, paniculam laxissimam formantibus. Folia basalia 2—5 cm diametro, longe petiolata, petiolo lamina pluries longiore, peltata, orbicularia vel subreniformia, late obtuse crenata; folia caulina plerumque 1—3, multo minora et brevius petiolata. Bracteae minutae, lineares. Pedicelli filiformes flexuosi, longitudine variabiles, flore paulo usque triplo longioribus. Calyx basi attenuatus. Corolla calyce 2,5—3-plo longior, pallida, usque ad vel ultra dimidium in lacinias acutas erecto-patulas fissa.

Iraq: Kurd.: Arbil: M. Baradost prope Shanidar, 800 m, Erdtman & Goedemans in Rech. 15632! In faucibus prope Rawandiz, Guest 2096. Kuh Safin prope Shaqlawa, 1200 m, Bornm. 1216! Sul.: Pira Magrun, Haussknc. Susakan, M. Avroman prope Tawilla, 1000 m, Rech. 10190! Palegawra W Sagirma Dagh, 1000 m, Helbaek 651! Kirkuk: E Darbandikhan, Barkley 7757! — In collibus Kurdistaniae, 1150 m, Low 224!
Persia: W: Kermanshah: Rijab prope Qasr Shirin, 900—1200 m, Nab. 275!, 277!; 800 m, Nab. 276! Sar-i Pul, 800 m, Nab. 276! Takht-i Bostan, Str.! Kuh-e Shiriz, Str. Bisotun, 1350—1650 m, Jacobs 6757! Tang-i Dinavar, Str.! 16 km N Kermanshah, 1350 m, Stutz 1312! Lur.: Gilan-e Gharb, Behb. 283!, Shab. 6052-E! Dow Rud, Koelz 18127-a! Shah Bazan, 600 m, Koelz 308! Tidar, 1800 m, Koelz 17552! Bakht.: Gatvand, Mart.-Escal. Saridasht, Koelz 15020! — S: Fars.: Shiraz, Koelz 14734!, Ky. 307. Tang-i Chirkun prope Shapur, Stapf 979! Marv Dasht, 40 km N Shiraz, 1800 m, Grant 15127! Persepolis, Gauba 386! Inter Persepolis et Dowlatabad, 1000—2000 m, Schmid 5507! Kotal-e Pirch Zan, Aucb. 4529. Kazerun, Stapf 969! Tang-i Jiz, Stapf 980! Firuzabad, Kashkouli 6051-E!

Distr. gen.: Endem.

2. ***C. intermedius*** Boiss., Fl. Or. 2: 769 (1872).

Icon.: Tab. 2.
Typus: Syntypi numerosi ex Asia austro-occidentali.

Caulis ± crassus, erectus, simplex (6—)10—30(—40) cm altus, ± fistulosus. Folia basalia 2—5 cm diametro, longe petiolata, petiolo lamina 2—4-plo longiore; lamina orbiculata, peltata, concava, obtuse crenata; folia caulina inferiora basalibus similia sed minora, brevius petiolata, superiora valde decrescentia, cuneato-oblonga vel lanceolata. Racemus plerumque simplex rare inferne breviter ramosus, inferne laxus vel omnino densus, saepius plus quam dimidium caulis longitudinis occupans. Pedicelli brevissimi vel subnulli, ± deflexi. Bracteae lanceolatae, pedicello duplo circiter longiores. Corolla calyce quadruplo longior, urceolato-tubulosa, viridis demum ochroleuca, usque ad quartam partem in lacinias ovatas acutas incisa.

Iraq: Kurd.: Arbil: Prope Rawandiz, Guest 5100. Handiyan ad radices M. Baradost, Thesiger 808! Inter Shanidar et cavernam, 800 m, Erdtman & Goedemans in Rech. 15629! Kuh Safin prope Shaqlawa, 900—1000 m, Bornm. 1215! Mosul: 2 km W Zakho, Barkley 9119! Jabal Khair supra Mirsida, 1500 m, Thesiger 605! Sul.: M. Avroman prope Tawilla, 1400 m, Rech. 10261! Inter Dukan et Mirza Rostam, 1200 m, Rech. 11931! Sulaymaniyah, Graham. Kirkuk: 18 km NE Chamchamal, Barkley 5842! Darband-i Bazian prope Chamchamal, Rech. 12197! — In collibus Kurdistaniae, 800 m, Low 250!

Persia: N: Gil.: Lahijan, Gauba 381! — W: Kermansh.: Tang-i Dinavar, Str.! Bisotun, Str. 2! Kuh-i Nevoh prope Karand, 1800 m, Furse 1901! Rijab, Iranshahr 13131-E! Inter Rijab et Shahan, Iranshahr & Termé 12253-E! Ham.: Kuh-e Garri, Str.! Arak: Kuh Kohrud, Str. Lur.: In faucibus fluvii Kashkan, 1130 m, Archibald 1614! Gilan-e Gharb, Behb. 284! Sheshom, 800—1100 m, Jacobs 6440! — S: Fars.: Firuzabad, Kashkouli 6055-E! Kazerun, Stapf 986!, 988! Tang-i Jiz, Stapf 989! Shiraz, Stapf 987!; 2400 m, Koelz 14736! Shapur, 900 m, Koeie 1551!, Bornm. 3565! Bushehr, Ky. 215. Inter Abadeh et Sivand, Cavara. Lar.: Hajjiabad prope Tarom, 900 m, Rech. 3497! Kerm.: Kuh Seidin, 2000 m, Bornm. 3564! — C: Tehr.: M. Tuchal, Manzariyeh, 1800—2500 m, Żumer & Walle 487! Tehran, Bge., Pravitz 683. Yazd: In montibus prope Yazd, Buhse 1409.

Distr. gen.: Asia austro-occidentalis.

3. *Sempervivum*

Sempervivum L., Spec. Plant. 464 (1753).

Lit.: R. Lloyd Praeger, An account of the Sempervivum group, Royal Horticultural Society (London 1932).

Plantae perennes, foliorum rosulis monocarpicis; stolones axillares evoluti. Folia alterna, integra, sessilia, ciliata, carnosa. Pili saepius glanduliferi. Flores 6—20-meri. Petala stellato-patentia, integra, margine et dorso pubescentia. Stamina duplo numero petalorum: filamenta prope basin quidem pubescentia. Carpella aequo numero petalorum; ovarium pubescens. Stylus distinctus extus curvatus. Semina pyriformia, tenuiter striata.

1a. Petala rosea, late albo-marginata, calyce duplo circiter longiora .... 1. *S. iranicum* Bornm. & Gauba
b. Petala flava, calyce triplo circiter longiora ..... 2. *S. globiferum* L.

1. *S. iranicum* Bornm. & Gauba, Feddes Repert. 49: 257 (1940)

Icon.: l. c. tab. 329, fig. 1.
Typus: Gauba 1513, B!

Caulis florifer 10—20 cm altus, crassiusculus, dense foliatus, papilloso-puberulus et minute glandulosus. Rosulae foliorum 5—7 cm diametro, foliis 25—30 × 10—15 mm, exterioribus oblongis, acutis, interioribus abbreviatis cuspidatis, omnibus glauco-viridibus concoloribus ubique aequaliter dense persistenter subvelutino-puberulis, pilis marginalibus tenerrimis paulo tantum longioribus non ciliatis; folia caulina 25—40 × 12—15 mm, oblonga, breviter acuminata, superiora paulo tantum decrescentia. Inflorescentia cymoso-congesta, ramis 3 furcatis, cymis 3—6-floris, fructiferis 3—4 cm longis. Flores 12—14-meri, petalis explanatis ± 25 mm diametro. Sepala 6 mm longa, quam petala duplo breviora, flavo-viridia, glanduloso-hirtella. Petala 14 × 2 mm, lineari-lanceolata sensim longe acuminata, rosea, late albo-marginata. Filamenta quam petala dimidio breviora, sparse pilosula; antherae atro-purpureae. Carpella 12—14, 2,5 mm longa, in statu fructifero coronulam stellatam 10—12 mm diametro formantia; styli divaricato-refracti.

Persia: N: Gorg.: In declivibus borealibus M. Shahvar prope Hajjilang, in saxosis calc., 2600—2800 m, Rech. 6168! Maz.: In declivibus borealibus jugi Kandavan, 2500 m, Gauba 1513! Pol-e Zanguleh, 2200 m (cult. hort. bot. Karaj), Gauba 1750! Pol-e Zanguleh, in saxosis schist., 2200—2600 m, Rech. 6293! Kalar Dasht, Gauba 379! In valle Haraz: Darli supra Panjab, Wdb. 1589! Gil.: Kuh-e Dalak, Auch. 4523.

Distr. gen.: Endem.

2. *S. globiferum* L., Spec. Plant. 464 (1753).

Typus: "Hab. in Rutheno", D. Gmelin.

Caulis florifer 15—25 cm, crassiusculus, dense foliatus, dense glanduloso-villosus. Rosulae foliorum 2—4 cm diametro, foliis 12—20 × 3—7 mm, exterioribus oblanceolatis acutis et apiculatis, interioribus rotundatis et cuspidatis, omnibus in sicco flavescenti-viridibus interdum superne purpureo-suffusis, ubique breviter glanduloso-papillosis, margine pilis partim rigidioribus glanduliferis et partim longioribus ciliatis: folia caulina 12—30 × 5—10 mm, oblonga vel oblongo-lanceolata inferiora acuminata, superiora acuta, paulo decrescentia. Inflorescentia cymosa, plurifurcata, densiuscula, 4—7 cm diametro, cymis 3—7-floris. Flores plerumque 14-meri, petalis explanatis 18—22 mm diametro. Sepala 3—4 mm longa, quam petala triplo usque fere quadruplo breviora, imprimis prope margines dense breviter glanduloso-pilosa. Petala 10—12 × 1,5 mm, sensim longe acuminata flava. Filamenta quam petala dimidio circiter breviora, inferne pilosula, antherae citrinae. Carpella a me non visa.

Persia: W: Azerb.: M. Qareh Dagh prope Hasan Beyglu, Knapp. Ahar, Kuh Kaleybar, Termé 13123-E! Kuh Hassano, Termé 13124-E!

Distr. gen.: Armenia, Persia boreo-occidentalis, Caucasus, Transcaucasia.

4. *Sedum*

Sedum L., Spec. Plant. 430 (1753).

Lit.: R. L. Praeger, The Journal of the Royal Horticultural Society 46: 1—314 (1921). H. Fröderstrom, The Genus Sedum, I., Acta Horti Gothoburgensis 5, appendix 1—75 (1930); II., l. c. 6, appendix 1—111 (1931); III., l. c. 7, appendix 1—126 (1932); IV., l. c. 10, appendix 1: 181 (1935).

Herbae annuae vel perennes. Folia plerumque alterna, rarius rosulata. Inflorescentia cymosa, rarius paniculata vel spicata. Flores hermaphroditi, saepius 5-meri, rarius 4- vel 6—9-meri. Petala libera vel basi breviter connata, plerumque patentia. Stamina plerumque duplo numero petalorum.

1a. Plantae perennes 2
b. Plantae annuae (vel biennes) 15
2a. Radix crassa lignosa 3
b. Radix non crassa 7
3a. Folia emarcida annorum praecedentium ± columnari-persistentia. Folia ± rosulata, caules floriferos axillares non persistentes gerentia .... 5. *S. pachyclados* AITCH. & HEMSL.
b. Caudex cataphyllis squamiforibus comosus. Caules anni praecedentis saepe indurati persistentes (Sect. *Rhodiola*) 4
4a. Folia linearia usque lineari-oblonga vel lineari-lanceolata, integra. Caules (3—)10—15 cm alti, 1—2 mm diametro. Flores 5-meri 5
b. Folia oblongo-elliptica usque elliptica, ± dentata. Caules (7—)10—16 cm alti, 1,5—6 mm diametro. Flores 4-meri 6
5a. Folia linearia, 6—10 × 1 mm. Flores rubri ..... 1. *S. coccineum* ROYLE
b. Folia linearia usque lineari-oblonga vel lineari-lanceolata, 6—16 × 1,5—2 mm. Flores pallide flavi .. 2. *S. pamiroalaicum* (BORISS.) JANSSON
6a. Folia oblongo-elliptica usque elliptica ± dentata, 8—14 × 2—3 mm. Caules numerosi, 10—15 cm alti, 1,5—2,5 mm diametro. Sepala rubescentia. Petala flava ..... 3. *S. recticaule* (BORISS.) WENDELBO
b. Folia triangularia usque ovata, grosse dentata, 12—20 × 8—12 mm. Caules non numerosi, 12—45 cm alti, 2—5 mm diametro. Sepala virescentia. Petala flava vel rubra ..... 4. *S. heterodontum* HOOK. f. & THOMS.
7a. Folia ± plana, aut obovata aut ovata aut orbicularia aut spathulata ... 8
b. Folia ± teretia 11
8a. Folia superiora cordato-amplexicaulia, integra vel subintegra. Sepala 1,5—2,5 mm longa, petala 3—5 mm longa ..... 6. *S. Ewersii* LEDEB.
b. Folia petiolata vel basi cuneata vel attenuata, distincte crenata vel dentata. Sepala et petala majora 9
9a. Folia petiolata. Petala usque ad 10 mm, carpella usque ad 9 mm longa... ..... 7. *S. spurium* M. B.
b. Folia subpetiolata vel sessilia. Petala usque ad 8 mm, carpella usque ad 6 mm longa 10
10a. Folia subpetiolata, obovata vel suborbicularia. Sepala inaequalia. Surculi steriles repentes, radicantes, 2—12 cm longi..... 8. *S. stoloniferum* GMEL.
b. Folia sessilia, obovato-oblonga. Sepala aequalia. Surculi steriles primum subterranei, pisiformis, radici adnati, demum in surculos supraterraneos breves 2—5 cm longos prolongati ..... 9. *S. obtusifolium* C. A. MEY.
11a. Folia obtusiuscula vel obtusa 12
b. Folia subacuta, acuta, vel acutissima 14
12a. Caules plerumque 10—20 cm alti. Inflorescentia laxe corymboso-paniculata. Sepala 1 mm, petala 2—4 mm longa .....10. *S. album* L.
b. Caules 3—8(—10) cm alti. Sepala 1,5—3 mm, petala 3—8 mm longa 13
13a. Surculi steriles usque ad 4 cm longi, subdense foliati. Inflorescentia dichasialis. Petala usque ad 8 mm longa .... 11. *S. lenkoranicum* GROSSH.

b. Surculi steriles 1—2 cm longi, conferti, densissime foliati. Inflorescentia subumbellato-capitata. Petala usque ad 6 mm longa ..... 12. *S. tenellum* M. B.

14a. Caules floriferi 14—22 cm alti. Folia acutissima, 9—11 mm longa. Inflorescentia dense corymboso-capitata. Petala 5—6.5 mm longa ..... 14. *S. subulatum* (C. A. Mey.) Boiss.

b. Caules floriferi 4—10 cm alti. Folia subacuta, 5—6 mm longa. Inflorescentia dichasialis. Petala 3—5 mm longa ..... 13. *S. gracile* C. A. Mey.

15a. Flores manifeste pedicellati 16

b. Flores sessiles vel subsessiles 18

16a. Petala lutea, 2,5 mm longa. Folia superiora ovata, acuta ..... 19. *S. nanum* Boiss.

b. Petala rosea, 3—3,5 mm longa. Folia omnia obtusa 17

17a. Pedicelli 5—6 mm longi. Sepala apiculata ..... 15. *S. Kotschyanum* Boiss.

b. Pedicelli 0,5—3,5 mm longi. Sepala obtusa .... 16. *S. callichroum* Boiss.

18a. Petala flava vel virescenti-flava. Sepala 2—3.5 mm longa, obtusissima, inaequalia ..... 23. *S. annuum* L.

b. Petala alba vel rufescentia vel nervo mediano rubro vel viridi-lutescente. Sepala breviora, plerumque ± acuta vel apiculata, aequalia 19

19a. Flores plerumque tetrameri. Inflorescentia simplex, spicata ..... 20. *S. tetramerum* Trautv.

b. Flores plerumque pentameri. Inflorescentia plerumque furcata 20

20a. Caulis nanus, 2—6 cm altus. Folia 2,5—5 mm longa, subgloboso-ovata, obtusissima. Inflorescentia pauciflora. Petala 3—4 mm, carpella 3.5—4 mm longa ..... 21. *S. caespitosum* (Cav.) DC.

b. Caulis 5—10(—15) cm altus. Folia 5—20 mm longa, oblonga, lanceolata vel linearia. Petala et carpella longiora 21

21a. Caulis solitarius, infra inflorescentiam non ramosus, nunquam surculosus. Sepala oblonga vel ovato-triangularia 22

b. Caulis plerumque prope basin ramosus vel caules plures, interdum prope basin ± surculosi, biennis vel perennans. Sepala apiculata ..... 17. *S. hispanicum* L.

22a. Caulis validus crassiusculus. Petala 4—5 mm longa, alba saepe ± rubella. Carpella 4—5 mm longa ..... 22. *S. rubens* L.

b. Caulis tenuior. Petala 5—6 mm longa, nervo mediano viridi, in sicco ± lutescentia. Carpella 5—6 mm longa ..... 18. *S. pentapetalum* Boriss.

Sect. *Rhodiola* (L.) Scopoli, Introd. Hist. Nat. 255 (1777).

Syn.: Genus *Rhodiola* L., Spec. Plant. 1035 (1753). Gen. Plant. ed. 5:457 (1754).

Plantae perennes. Radix plerumque crassa ± lignosa. Caudex bene evolutus, carnosus, saepe cataphyllis squamiformibus membranaceis ± deltoideis comosus. Caules anni praecedentis emortui saepe indurati persistentes. Folia variabilia subulata teretia usque plana, integra vel ± dentata. Flores monoici vel dioici, 4- vel 5-meri.

1. **S. *coccineum*** Royle, Ill. Bot. Himal. Mount. 222—223 (1839).

Syn.: *Rhodiola coccinea* (Royle) Boriss., Fl. URSS. 9: 41 (1939).
Icon.: Royle, l. c.: tab. 48, fig. 3.

Typus: Ignotus.

Planta dioica. Caudex elongatus, saepe ramosus, residuis caulium vetustorum scoparius. Caules numerosi, (3—)8—14 cm longi, 1 mm diametro. Folia 6—10 × 1 mm, linearia. Inflorescentia hemisphaerica ± compacta. Flores 5-meri. Sepala circiter dimidiam longitudinem petalorum aequantia, triangularia, obtusa, virentia. Petala 3—4 mm longa, rubra, lineari-lanceolata. Stamina quam petala plerumque paulo longiora; filamenta flava; antherae subglobulares, flavae. Carpella erecta, matura semierecta.

Pakistan: Chitral: M. Tirich Mir: Barum Gol: Infra Zapotili, 3500 m, WDB. s. n.! Supra Jamishi Ghochar, 4300 m, WDB. s. n.! South Barum Glacier, 4500 m, WDB. s. n.! Golen Gol, 4250 m, BOWES LYON 70! Rosh Gol, 5400 m, STAINTON 2815!

Distr. gen.: Pakistan occidentalis, Tien Shan, Dsungaro-Tarbagatai, Pamir-Alaj, Kashgar.

2. *S. pamiroalaicum* (BORISS.) JANSSON, comb. nov.

Syn.: *Rhodiola pamiroalaica* BORISS., Fl. URSS. 9: 477 (1939).
Icon.: BORISS., l. c.: tab. 8, fig. 6.
Typus: Pamiro-Alaj: Darwaz, KORSHINSKY 2535, LE.

Planta dioica. Caudex crassus bene evolutus, ramosus, residuis caulium emortuorum anni praecedentis rigidis comosus. Caules numerosi, 10—15(—20) cm alti, 2 mm crassi. Folia linearia usque lineari-oblonga vel lineari-lanceolata, 6—16 × 1,5—2 mm. Inflorescentiae ± compactae vel rarius imprimis in plantis femineis laxae. Pedicelli c. 2 mm longi. Sepala linearia vel ovata, dimidium petalorum aequantia, virescentia. Petala 4—5 mm longa, linearia vel lanceolata, pallide flava. Stamina quam petala evidenter longiora; filamenta flavescentia; antherae intense flavae, globulares. Carpella petala aequantia, matura usque ad 6 mm longa.

Afghanistan: E: Panjshir: Darreh Rastagal supra Mukeni, 3400—4200 m, HDG. & WDB. 5160 p. p.! In jugo Wanasgul, 4500 m, TRESIGER 1554! In declivibus occidentalibus jugi Papruk, 3000—4200 m, KERST. 1413! Netshingel, 4000 m, EDELB. 1999! Nuristan orientalis, EDELB. 1064!, 1079! In jugo Urura supra Kushtos, 3000 m, NEUB. 608! — NE: Wakhan: In valle Urghend, 3700 m, ROEMER 239! Munjan: Darrah-i Parshui, 4250 m, FREY F 254—(136) p. p.!
Pakistan: Chitral: Khot An, N Mastuj, 3900 m, STAINTON 2870! Ad glaciem Chatiboi, 4360 m, STAMM & WÖHRL 124!, 125!

Distr. gen.: Afghanistan, Pakistan occidentalis, Pamir-Alaj, Kuldsha, Kashgar, Mongolia occidentalis.

This species sometimes occurs in the same localities as *S. hederodontum* of the same section. Field observations made by collectors as WENDELBO and ROEMER indicate a certain hybridization between these species. In ROEMER 239 there is one specimen showing intermediate characters.

3. *S. recticaule* (BORISS.) WENDELBO, Nytt Mag. Bot. 1: 35 (1952).

Syn.: *Rhodiola recticaulis* BORISS., Fl. URSS. 9: 478 (1939).
Typus: Utsch Kol, Pamir, KORSHINSKY 2540, LE!

Planta dioica. Caudex crassus, lignosus, interdum ramosus, cataphyllis ad minimum 6 mm longis brunneis membranaceis triangularibus obtusis. Caules floriferi numerosi, 8—16(—24) cm longi, 1,5—2,5 mm diametro. Folia 5—10 × 2—3 mm, alterna, elliptica vel oblongo-elliptica, ± dentata. Flores breviter pedicellati, 4-meri. Sepala oblongo-elliptica, dimidium petalorum aequantia, primum

viridia, demum rubra. Petala oblonga-elliptica, obtusa. Stamina 4—5 mm longa, quam petala semper longiora; filamenta et antherae flavae.

Afghanistan: E: Kabul: Paghman: N Kotal-i Kotandar, 4300 m, GILLI 1928 p. p.! Paghman, 4000—4500 m, NEUB. 507/1950!, 508/1950! Takht-i Turkoman prope Hauz-e Chas, 4200 m, THESIGER 224! Panjshir: In jugo Chamar, 4350 m, THESIGER 1321!, 1325!, 1359! Darreh Rastagal, 3500—4200 m, HDG. & WDB. 5160 p. p.! Nuristan: In jugo Urura, 3900 m, NEUB. 605/1951! — NE: Wakhan: In valle Futur, 3900 m, ROEMER 87 p. p.! Munjan: Darrah-i Parshui, 4800 m, FREY 254: (136) p. p.! — C: Bamian: Koh-i Baba supra Zard Darreh, 4320 m, GILLI 1927!

Pakistan: Chitral: Tirich Mir: Barum Gol supra Jamishi Ghochar, 4300 m, WDB. s. n.! Och Anzog, 3600 m, WDB. s. n.! Sora Lasht, 3900 m, BOWES LYON 1087! Yarkhun, 3900 m, BOWES LYON 982!

Distr. gen.: Afghanistan, Pakistan occidentalis, Pamir-Alaj, Tien Shan, Kashgar.

Certain intermediate characters in some of the specimens listed above, e. g. BOWES LYON 982, indicate hybridisation with *S. heterodontum* in localities where the two species occur together.

4. ***S. heterodontum*** HOOK. f. & THOMS., Journ. Linn. Soc. Bot. 2: 95 (1858).

Syn.: *Rhodiola heterodonta* (HOOK. f. & THOMS.) BORISS., Fl. URSS. 9: 32 (1939).
Icon.: FRÖDERSTRÖM, l. c.: tab. 13, fig. 2 (1932) sub var. BORISS., l. c.: tab. 3, fig. 3.
Typus: Syntypi plures e montibus Himalaya occidentalibus, THOMSON et al., K!

Plantae dioicae. Caudex crassus, lignosus, interdum ramosus, saepe residuis strictis caulium anni praecedentis comosus. Caules floriferi 12—45 cm alti, 2—5 mm diametro. Folia 12—10×8—12 mm, triangularia usque ovata, grosse dentata, valde compacta, ramis pedicellisque brevibus. Flores 4-meri. Sepala 3—4 mm longa, lineari-ovata, subacuta, virescentia. Petala 4—6 mm longa, linearia, obtusa, flava vel rubra. Stamina quam petala manifeste longiora; filamenta flava vel saepe rubescentia; antherae primum rubrae, deinde flavae.

Afghanistan: E: Laghman: Alishang, in parte superiore Darrah Rastyon, 3000 m, EKB. & WDB. W 9646! Paghman: N Kotal-i Kotandar, 4300 m, GILLI 1928 p. p.! Paghman, 4000 m, HDG. & WDB. 5076! Unai: Kuh-i Qhalandaran, 3700 m, HDG. & WDB. 4500! Panjshir: In declivibus borealibus jugi Chamar, 4500 m, THESIGER 1328! Darreh Rastagal supra Mukeni, 4200 m, HDG. & WDB. 5166! Jaji: Seratigah, 4300 m, AITCH. 851! Nuristan: In declivibus orientalibus jugi Papruk, 3000—3400 m, KERST. 1436! Ghazni: M. Saperlebuli, 3200—4200 m, W. RECH. 37331! — NE: Wakhan: In valle Futur, 3900 m, ROEMER 87 p. p.! In valle Urghend, 3700 m, ROEMER 239! Kataghan: Sar-i Hauz, 3300—3800 m, RECH. 37511! Badakhshan: In declivibus orientalibus jugi Anjuman, 4350 m, PODLECH 12338! — C: Bamian: Koh-i Baba, prope Bamian, 4050 m, G. GILLI 1929-b! Zard Darreh, 4000 m, WEILER in GILLI 1929-a!

Pakistan: Chitral: Tirich Mir: Barum Gol: Shokor Shal, 3500 m, WDB. s. n.! Chitral Gol, 2700 m, STAINTON 2688! Gasin Gol, 3500 m, BOWES LYON 950!

Distr. gen.: Afghanistan, Pakistan occidentalis, Mongolia, Tibet, Dsungaro-Kashgar.

In the original description of this species HOOKER & THOMSON distinguished two varieties based on the shape of the leaves. In material from the actual area there are specimens corresponding to both varieties. Anyhow, the variation in leaf-shape is very ample and seems to have no geographical connection.

A small-grown form from eastern and north-eastern parts of Afghanistan (WENDELBO 4500, 5076, RECHINGER 37331, 37511, GILLI 1929-b) is worth a special attention. It has not the same stout growth as is typical in the other specimens listed here. The in-

florescences are not so many-flowered and compact, somewhat laxer and the petals are red in the specimens cited. With the present material and without any further field observations, however, there is scarcely any reason to divide the species into subordinate taxa.

A probable hybridisation with *S. recticaule* and *S. pamiroalaicum* is indicated under these two species.

5. *S. pachyclados* AITCH. & HEMSL., Journ. Linn. Soc. Bot. 18: 58 (1881).

Icon.: l. c. 19: tab. 10, fig. 6—10 (1882). FRÖDERSTRÖM, l. c. 5: tab. 1, fig. 1, 22; fig. 1—13 (1930).
Typus: AITCHISON 649, K!

Perenne, radice elongata incrassata. Caules floriferi 1—3 cm longi, paucifoliati, arcuato-ascendentes, fragiles. Folia basalia plana, breviter petiolata, ovata usque orbicularia, superne late sinuato-sublobata; folia caulina late spathulato-ovata, obtusiuscula. Inflorescentia 2—10-flora. Sepala late triangulari-oblonga, subobtusa. Petala 6—7 mm longa, oblonga, integra, breviter apiculata. Stamina quam petala breviora, epipetala 1,5 mm supra basin petalorum inserta. Squamae subquadratae. Carpella 5—6 mm longa, subgibbosa, a basi fere libera.

Afghanistan: E: Laghman: Alishang: In parte superiore Darrah Rastyon, 3000 m, EKB. & WDB. W-9652! Jaji: Safed Kuh, M. Sikaram, 3400 m, HDG. & WDB. W-8982! Nuristan: In jugo Ashpi, KARIM NUSHIN in NEUB. 48/504! Inter Kushtos et jugum Ashpi, 2400 m, NEUB. 1951/703!
Pakistan: Kurram: Safid Kuh, Karman, AFENDI 48! Ad rupes inter Shalozan et Shend Toi, AITCH. 496!

Distr. gen.: Endem.

Sect. *Telephium* S. F. GRAY, Nat. Arr. Brit. Pl. 2: 539 (1821).

Plantae perennes. Radix brevis saepe ramosa, ramis saepe tuberoso-incrassatis. Caules annui erecti vel interdum repentes, e bulbis juxta basim caulium anni praecedentis orti. Folia plerumque lata, plana. Flores monoici, 5-meri.

6. *S. Ewersii* LEDEB., Fl. Alt. 2: 191 (1830).

Icon.: LEDEB., Icon. Pl. Fl. Ross.: tab. 58 (1829). FRÖDERSTRÖM, l. c.: fig. 228—235 (1932).
Typus: „... ad fl. Bolschaja Uba, Buchtorma et Kokoryo et ad lacum aureum (Teletzkoe Osero)".

Perenne. Radix bene evoluta, copiose longe ramosa. Caules 6—20 cm longi, floriferi annui, non ramosi, erecti vel diffusi. Folia opposita vel subopposita, integra vel indistincte dentata, sessilia, carnosa, forma variabilia, ovata vel obovata usque orbicularia, superiora saepe cordata semiamplexicaulia. Inflorescentiae e cymis subumbellatis compositae. Sepala lineari-lanceolata, dimidium petalorum aequantia. Petala 3—4 mm longa, ovato-lanceolata, late patentia, purpurascentia, nervo dorso prope basin manifeste viridi. Stamina quam petala aliquantum breviora; filamenta rosea vel rubra; antherae atrorubrae. Carpella erecta vel suberecta, rubescentia.

Afghanistan: E: Kabul: In valle Nijrao supra Shekhan, 3210 m, GILLI 1925! Laghman: Alishang, in parte media Darrah Rastyon, 2700 m, EKB. & WDB. W 9716! Panjshir: Mukeni, 2700 m, HDG. & WDB. 5285! In valle Porandeh prope Basarak, 2250 m, GILLI 1924! Nuristan: In valle Rangul, 3600 m, THESIGER 1450!, 1489!; 4200 m, THESIGER

1412!, 1454! In valle Wanasgul, 3000 m, Thesiger 1577! Inter Kotal-e Agok et Waigel, Neub. 940/1951! Inter jugum Ashpi et Kushtos, 2500 m, Neub. 680/1951! In valle Linar, 3600 m, Thesiger 1526! Pashki, 2300 m, Edelb. 589!, 605! In declivibus occidentalibus jugi Semenek, 3400 m, Kerst. 1499! — NE: Munjan, Edelb. 1302! Wakhan: In valle Badjen, 4100 m, Roemer 361! Darrah-i Parshui, 3600 m, Frey 433: (159)! Badakhshan: Prope pagum Anjuman, 3100 m, Podlech 12382!
Pakistan: Chitral: Inter Drosh et Painogh, 3180 m, Bowes Lyon 173! In jugo Shera Shing, 4200 m, Stainton 3206! M. Tirich Mir: Barum Gol: Och Anzog, 3600 m, Wdb. s. n.!, Randers-Heen s. n.! — Kurram: Shend Toi et Sikaram, 2700—3600 m, Aitch. 936!, 1000!

Distr. gen.: Afghanistan, Pakistan occidentalis, Tien Shan, Pamir-Alaj, Mongolia occidentalis.

Sect. *Sedum*

Syn.: Sect. *Seda Genuina* Koch, Syn. Fl. Germ. 259 (1835). Sect. *Eusedum* Boiss., Fl. Or. 2: 775 (1872).

Plantae perennes radice genuina carentes. Caules sublignosi vel herbacei, repentes vel erecti: surculi floriferi annui nudi vel sparse foliati. Folia variabilia subulata, teretia usque lata, plana. Flores monoici. 4—9-meri, plerumque 5-meri.

7. **S. *spurium*** M. B., Fl. Taur.-Cauc. 1: 352 (1808).

Syn.: *S. oppositifolium* Sims, Bot. Mag. tab. 1807 (1815).
Icon.: Fröderström, l. c.: fig. 46—55.
Typus: Caucasus, LE.

Perennes. Surculi steriles numerosi, 5—15 cm longi, ramosi, papillosi. Caules floriferi 10—20 cm longi, saepe flexuosi, ascendentes vel arcuato-erecti, superne papillosi. Folia 15—30 mm longa, opposita, obovata vel orbicularia, petiolata, antice crenata, basi cuneata, in petiolum brevem vel indistinctum contracta. Inflorescentia densiuscule corymbosa foliata. Bracteae oblanceolatae vel oblongae, papillosae. Flores subsessiles. Sepala 4—4,5 mm longa, deltoideo-lanceolata, apice subobtusa, papillosa. Petala 7—10 mm longa, erecta, apice leviter recurvata, carinata, subovata, breviter mucronata, alba vel rosea. Stamina quam petala quarta circiter parte breviora, epipetala 1—1,5 mm supra basin petalorum inserta. Sqamae longitudine latiores, c. 0,5×1 mm. Carpella turgida, per 0,5—1 mm connata, 5—9 mm longa. Semina oblonga, anguste alata.

Talish: Achewlar, Buhse 844. In montibus Talish, C. A. Mey. Swant, Hohen.
Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2400 m, Gauba 1517! Gil.: Astara, in jugo Heyran, Mir Kamali 6744! In jugo Hajji Amir, 29 km NE Ardabil, 1600 m, Grant 16394! Asbine, 1400 m, Gauba 383! Ahar, Kuh Garmaduz, Termé 13122-E! Kuhha-ye Sabalan, Buhse.

Distr. gen.: Armenia, Persia borealis, Talish, Caucasus: praeterea saepe cultum et subspontaneum.

8. **S. *stoloniferum*** S. G. Gmel., Reise Rußland 3: 311 (1774).

Icon.: Fröderström, l. c. fig. 369—375.
Typus: Gilan, S. G. Gmelin.

Perenne; surculi steriles 2—12 cm longi, repentes radicantes, foliis apice confertis; caules floriferi 12—45 cm alti, ascendentes, laeves. Folia opposita, 10—25 mm longa, non calcarata, pseudopetiolata; lamina plana obovata usque

suborbicularis, crenata vel dentata. Inflorescentia laxe cymosa, ramis elongatis dichotome divaricatis. Bracteae 4—8 mm longae, late oblanceolatae. Calycis tubus 1 mm longus; sepala 2.5—4.5 mm longa, oblanceolata, laevia, inaequalia. Petala 6—8 mm longa, lanceolata, late patentia, breviter mucronulata, rosea. Stamina 3.5—4 mm longa; antherae angustae. Squamae subquadratae, leviter emarginatae. Carpella connata, 0.5—1 mm longa, sub fructu stellata, 5—6 mm longa. Semina ovoidea, laevia, 1 × 0.5 mm.

Talish: Inter Lenkoran et Swant, HOHEN. In montibus Talish, C. A. MEY.
Persia: N: Gorg.: Ziarat, GAUBA 384! Bandar-i Gaz, SHAR. 374! Maz.: In silvis vallis fluvii Chalus, 1500 m, GAUBA 1513! Kuh-i Nizwa prope Orim, 2100 m, WDB. 1078! 40 km S Babol, 500 m, STUTZ 1245! Gil.: In montibus Gilan, AUCH. 4258. Gilan, S. G. GMELIN, LINDS. 1054. Amarlu, Bivarzin, DARYA-DEL 12250-E! Navrud, ESFAND. 6473-E! — W: Azerb.: M. Qarch Dagh prope Ali Bolaghi, KNAPP. — Lajim, 1300 m, MOONEY 6629! Sinhsarad, 1000 m, MOONEY 6591!

Distr. gen.: Anatolia, Talish, Persia borealis, Caucasus.

9. *S. obtusifolium* C. A. MEY., Verz. Pfl. Cauc. 150 (1831).

Syn.: *S. Bornmülleri* HAUSSKN. ex BORNM., Beih. Bot. Centrbl. 19, 2: 258 (1906). *S. rhodanthum* BORNM., Österr. Bot. Zeitschr. 49: 16 (1899), non A. GRAY (1862).
Icon.: FRÖDERSTRÖM, l. c. fig. 376, 383.
Typus: Talish, C. A. MEYER.

Perenne, surculi steriles primum subterranei pisiformes, demum elongati tenues 2—5 cm longi, autumno rosulam foliorum hiemalium proferens (sec. PRAEGER); caules floriferi 6—12 cm longi, erecti, laeves. Folia 2—40 mm longa, opposita, non calcarata, spathulato-oblonga, ± plana usque obovata crenulata. Bracteae parvae oblongae. Sepala 3—3.5 mm longa, aequalia, oblonga, subacuta, saepe apice mamillata. Petala 6—8 mm longa, late lanceolata, longe mucronata, alba vel rosea. Stamina quam dimidia petala paulo longiora; antherae angustae. Squamae 0.3 × 0.9 mm, longitudine latiores, emarginatae. Carpella per 0.5 mm connata, rubescenti-mamilloso-punctata, fructifera 5 mm longa. Semina ovoidea, laevia.

Talish, 1800 m, C. A. MEY.

Distr. gen.: Talish, Armenia borealis.

10. *S. album* L. Spec. Plant. 432 (1753).

Icon.: FRÖDERSTRÖM, l. c. fig. 151—160.
Typus: Europa.

Perenne, laxe caespitosum, surculis sterilibus repentibus radicantibus; caules floriferi 5—20(—30) cm alti, ascendentes vel erecti, ramosi, foliati. Folia (4—) 6—10 mm longa, subteretia, oblonga vel ovata, superne paulo applanata, obtusa vix calcarata, glauca vel rufescentia, alterna. Inflorescentia corymboso-paniculata. Flores pentameri, breviter pedicellati. Sepala 1 mm longa, non calcarata, late obovata, obtusa, trinervia, basi connata. Petala 2—4 mm longa, basi per 1 mm connata, lanceolata, acutiuscula, alba costa mediana rosacea. Stamina 10, petala subaequantia; antherae purpureae. Squamae breviter stipitatae, late spathulatae, leviter emarginatae. Carpella 3—4 mm longa, intus papillosa; styli breves; folliculi oligospermi. Semina c. 1 × 0.4 mm, mamillata.

Persia: W: Azerb.: Bazargan, 2000 m, GRANT 16239! In jugo SE Shapur, 1750 m,

Petrovitz 69! M. Karnaru prope Shahpur. Knapp. M. Sahand prope Isperechan. Knapp. Kuh-e Mishu Dagh. Gill.-Sm. 2361.

Distr. gen.: Europa. Regio Mediterranea, Asia occidentalis.

11. *S. lenkoranicum* Grossh., Monit. Jard. Bot. Tiflis 3: 173 (1915).

Icon.: Grossh., l. c.: fig. 19 (1915).
Typus: Talish, LE.

Perenne. Tota planta glabra. Caules floriferi 4—10 cm longi, parce foliati, in parte inferiore procumbentes, lignescentes, ramosi, in parte superiore ascendentes non ramosi; surculi steriles 2—4 cm longi, dense foliati. Folia ramorum floriferum 4—5 mm, ea ramorum sterilium 3—4 mm longa, lineari-oblonga, calcarata, obtusa, pallide viridia. Inflorescentiae dichasiales, ramis 4—6-floris. Flores plurimi breviter pedicellati, extremi ramorum autem pedicellis 2—3 mm longis provisi. Sepala $^1/_3$ petalorum longitudinis attingentia, triangularia, acuta, pallide viridia. Petala 6—8 mm longa, lanceolata, acuminata, alba, leviter roseo-suffusa. Stamina quam petala breviora; filamenta albida; antherae atro-rubrae. Carpella anguste lanceolata, etiam maturitate erecta; styli longi.

Talish, sec. Grossh.
Persia: N: Maz.: Gaduk, 2000 m, Behb. 6054-E! Kuh-i Nizwa prope Orim, 2100 m, Wdb. 1085! Gil.: Amarlu, Ramash, Darya-Del 12249-E!

Distr. gen.: Caucasus, Talish, Persia borealis.

12. *S. tenellum* M. B., Fl. Taur.-Cauc. 3: 315 (1819).

Icon.: Fröderström, l. c.: fig. 212—220 (1932).
Typus: "Hab. in Caucasi alpestribus in aditu ad portas Caucasiacas circa Lars lectum".

Perenne. Caules floriferi 3—8 cm alti, in parte inferiore lignosi ± nudi, in parte superiore ascendentes, steriles breviores, dense foliati. Folia 3—7 mm longa imbricata, linearia usque oblonga, calcarata, obtusiuscula, semper pallide viridia. Inflorescentiae partiales parvae, densae subumbellatae, 3—7-florae. Pedicelli quam flores paulo breviores. Flores 5-meri. Sepala $^2/_3$ petalorum attingentia, oblongo-lanceolata, obtusa usque subacuta, calcarata, pallide viridia. Petala 3—6 mm longa, ovato-lanceolata, acuta usque acuminata, in parte inferiore alba, in parte superiore rubro-suffusa. Stamina quam corolla manifeste breviora; antherae flavae. Carpella ovoidea, corollam subaequantia, rubescentia; styli breves.

Iraq: Kurd.: Arbil: Algurd Dagh, 3000—3800 m, Rech. 11882!, Haley 165!, Guest 3047!
Persia: N: Maz.: Kojur: M. Uloj, 3200—3400 m, Rech. 6502! Now Shahr, Stutz 1186! In declivibus borealibus jugi Kandavan, 2900 m, Wdb. 2197!, Auch. 4532, Ky. 465.

Distr. gen.: Caucasus, Persia borealis, Armenia.

13. *S. gracile* C. A. Mey., Verz. Pfl. Cauc. 151 (1831).

Icon.: Fröderström, l. c.: fig. 394—403 (1932).
Typus: "In montibus Talüsch".

Perenne. Tota planta glabra. Caules in parte inferiore procumbentes, leviter lignescentes, ramosi, in parte superiore ascendentes, copiose ramosi et dense foliati; rami steriles breviores densissime foliati. Folia 4—8 mm longa, sublanceolata usque oblonga, obtusa, subacuta, interdum prope apicem papillosa; folia ramorum

sterilium minora, plerumque breviter calcarata, pallide viridia, saepe rubromaculata vel -striata. Inflorescentiae plerumque biramosae, ramis 4—6-floribus. Flores sessiles vel subsessiles. Sepala dimidium petalorum attingentia, elliptica, acuta, viridia. Petala 3—5 mm longa, patentia, ovato-lanceolata, acuta usque acuminata, alba, dorso rubro-punctata vel -striata et viridi-nervosa. Stamina quam petala aliquantum breviora; filamenta albida; antherae atrorubrae. Carpella stamina aequantia; styli breves.

Talish sec. C. A. MEY., HOHEN. Swant. HOHEN.
Persia: N: Maz.: In valle fluvii Chalus, 2500 m, GAUBA 1796! In declivibus borealibus jugi Kandavan, 2400 m, GAUBA 1514! Gil.: M. Sarnam, BUHSE. Ispili, LINDS. 1236. Gilan, AUCH. 4731. — W: Azerb.: M. Qareh Dagh, Hasan Beyglu prope Ali Bolaghi, KNAPP. Asbine, 1400 m, GAUBA 377! Ahar, TERMÉ 13126!

Distr. gen.: Talish, Persia boreo-occidentalis, Caucasus.

14. *S. subulatum* (C. A. MEY.) BOISS., Fl. Or. 2: 783 (1872).

Syn.: *Cotyledon subulata* C. A. MEY., Verz. Pfl. Cauc. 150 (1831). *Umbilicus subulatus* LEDEB., Fl. Ross. 2: 173 (1843).
Typus: Talish, C. A. MEYER.

Perenne, glabrum, glaucescens. Surculi steriles ascendentes, 3—5 cm longi. Caules floriferi 14—23 cm longi, tenues, simplices, foliati. Folia 9—11 mm longa, late calcarata, subimbricata, linearia, teretia, acutissima. Inflorescentia dense corymboso-capitata, ramis brevissimis scorpioideis; pedicelli brevissimi. Sepala 2—3 mm longa, ovata, subacuta. Petala 5—6,5 mm longa alba, ima basi per c. 1 mm connexa, oblonga, mucronata. Stamina quam petala paulo breviora. Squamae 0,5×0,75 mm, late orbiculares, crenatae. Carpella per 0,75 mm connata, 5—6 mm, stylo sat longo. Semina non visa.

Talish: In lapidosis montium, 1400—2200 m, C. A. MEY.

Distr. gen.: Endem.

Sect. *Epeteium* BOISS., Fl. Or. 2: 776 (1872).

Herbae annuae, interdum biennes vel perennantes. Folia plana vel saepius teretia, plerumque alterna. Inflorescentia ± ramosa, cymosa vel corymbosa. Flores (4—)5(—9)-meri.

15. *S. Kotschyanum* BOISS., Diagn. Pl. Or. Nov. Ser. 1, 6: 56 (1845).

Syn.: *S. villosum* L. var. *pentandrum* DC. subvar. *Kotschyanum* (BOISS.) RAYMOND-HAMET, Candollea 4: 50 (1929).
Icon.: FRÖDERSTRÖM, l. c. fig. 230—240.
Typus: KOTSCHY 423, W!

Annuum. Caulis tenuis, erectus, 2,5—4 cm altus, superne tenuiter ramosus. Folia inferiora alterna, superiora ± opposita, omnia breviter calcarata, oblonga, semiteretia, subobtusa, 2—4 mm longa. Inflorescentia pauciflora. Pedicelli filiformes, arcuato-flexuosi, 5—6 mm longi. Flores plerumque isomeri, rarius anisomeri. Sepala 1—1,5 mm longa, oblonga vel ovata, subacuta. Petala 3—3,5 mm longa, oblonga usque obovata, breviter apiculata, margine rosea. Stamina 5 vel interdum 10, quam petala paulo breviora, epipetala prope basin petalorum inserta; antherae minutae, latiusculae, atratae. Squamae 0,5×0,5 mm, anguste stipitatae, superne

abrupte dilatatae, emarginatae. Carpella c. 3 mm longa, subovoidea, stylis longiusculis, glanduloso-pubescentia, 3—4-sperma. Semina 0.9 × 0.3 mm, oblonga.

Persia: W: Lur.: Kuh-e Saverz, 4000 m, Haussknecht. — S: Fars.: „In locis humidis meridiem versus spectantibus in M. Sabst Buschom (Sabz Pushan) prope Shiraz", Ky. 423!

Distr. gen.: Endem.

16. *S. callichroum* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 56 (1845).

Icon.: Fröderström, l. c. fig. 244—253.
Typus: Kotschy 743, W!

Annuum, omnino glabrum. Caules floriferi nani, 25—40 mm alti, tenues, simplices, in caespitem saepius aggregati (sec. Boissier). Folia pauca, 1,5—3,5 mm longa, alterna, semiteretia, oblonga usque ovata, obtusa. Inflorescentia 2—5-flora; pedicelli filiformes, 0,5—3,5 mm longi. Sepala c. 1 mm longa, late ovata, obtusa. Petala c. 3 mm longa, subovata, breviter apiculata (acuta), rosea, carina intensius colorata (sec. Boissier). Stamina 10, epipetala 0.4—0.5 mm supra basin petalorum inserta; antherae minutae, dilatatae, „nigrae". Squamae c. 0.55 × 0.35 mm, subquadrato-spathulata, emarginata. Carpella c. 3 mm longa, suboblonga, stylo breviusculo; folliculi 3—5-spermi. Semina oblonga, 1,1 × 0,35 mm.

Persia: W: Kurd.: M. Shahu, 2650 m, Haussknecht. — S: Fars.: „Gregarie inter muscos ad fontes montis Kuh-Daena" (Kuh-e Dinar), Ky. 743! Kuh-e Dinar: Gardaneh Sichani, Behb. 1352-E!

Distr. gen.: Endem.

17. *S. hispanicum* L. in Jusl., Cent. 1: 12 (1755).

Syn.: *S. glaucum* Waldst. & Kit., Descr. Pl. Rar. Hung. 2: 198 (1805). *S. sexfidum* M. B., Fl. Taur.-Cauc. 1: 354 (1808). *S. pallidum* M. B., l. c. 1: 353 (1808).
Icon.: Fröderström l. c., fig. 642—649.
Typus: Hispania.

Annuum, interdum bienne vel perennans, interdum prope basin surculos parvos steriles proferens, glabrum vel superne interdum omnino minute glanduloso-pilosum. Caules floriferi 7—15 cm alti, arcuato-ascendentes, inferne simplices vel imprimis prope basin ramosi. Folia alterna, 4—18 mm longa, linearia, semiteretia, subacuta, glauca, patula. Inflorescentia plerumque 2—3-furcata, cymis unilateralibus. Flores 5—6 (—9)-meri, subsessiles, numerosi. Sepala 1—1,5 mm longa, late triangularia usque semiorbicularia, apiculata, glabra vel glanduloso-pilosa. Petala 5—6 mm longa, lanceolata acuminata, alba, nervo mediano rubello. Stamina plerumque 12—14, quam dimidium petalorum plerumque paulo longiora, epipetala 0,4—1 mm supra basin petalorum inserta; antherae atropurpureae. Squamae 0,6 × 0,5 mm, spathulato-quadratae, profunde emarginatae. Carpella 2—3 mm longa, per 0,5—1,5 mm connata, plerumque intus pilosa.

Iraq: Kurd.: Arbil: Kuh Safin prope Shaqlawa, 1200 m, Bornm. 1219-b!
Talish: Swant. 1330 m, Hohen. Lenkoran, C. A. Mey.
Persia: N: Maz.: W Zardman, 800 m, Wdb. 338! Hazar Jerib, Shar. 376! Now Shahr, 30 m, Stutz 1186!, Archibald 2305! Babol Sar, Mooney 6547! In faucibus fluvii Chalus, 1000 m, Furse 2827! 64 km E Chalus, Stutz 1225! Hasanabad, Sab. 13132-E! Kuh-i Nizwa: Inter Orim et Taru, 2100 m, Wdb. 1170! Prope Orim, 2100 m, Wdb. 1035! Gil.: Navrud, Espand. 6472-E! In valle fluvii Safid Rud prope Rudbar, 300—400 m, Bornm. 7018! Inter Rudbar et Bibersin, Buhse. Lahijan, Gauba 380!, Linds. 912. Kaluraz, Lipsky. Inter Astara et Rasht, Furse 2481! 32 km S Astara, in arenosis litoris Caspii,

FURSE 2499! Gilan, ACCH. 4520. - W: Azerb.: In jugo Hajji Amir 28 km NE Ardabil, 1600 m, GRANT 16308! Kaleybar, 1400 m, GAUBA 388! In jugo Goja Bel, TERMÉ 13127-E! M. Karnaru, Shahpur, KNAPP. Kermansh.: Bisotun, STR. 110! Qasr-i Shirin, NAB. 289! Supra Rijab prope Qasr-i Shirin, 900—1000 m, NAB. 288! Inter Qasr Chashmeh et Sar-e Pol-e Zahab, SHAR. 2596-E! Khuz.: Pusht-i Kuh supra Dehloran, NAB. 287! Shushtar, NAB. 290! Lur.: Bisheh, 1100 m, KOEIE s. n.! Shah Bazan, 500 m, KOEIE 404! — S: Fars.: Shapur, KOEIE s. n.! Persepolis, KY. 288! Shiraz, HAUSSKN. — C: Qazv.: Pachenar, 600—700 m, BORNM. 7017!
Turcomania: Firyuza, CZERNJAK. 224. M. Risarash, CZERNJAK. 205.

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

18. *S. pentapetalum* BORISS., Fl. URSS. 9: 481 (1939).

Icon.: l. c., tab. 5, fig. 1.
Typus: A. BORISSOVA 99, LE.

Annuum. Caulis erectus, solitarius, 5—10 (—15) cm altus, foliatus, ± glandulosus. Folia 10—20 × 1—3 mm, alternantia, sessilia, oblongo-lanceolata, crassa, parce glandulosa. Inflorescentia tertiam partem superiorem caulis occupans, plerumque 2—3-fida, pluriflora, floribus subsessilibus secundis. Bracteae foliis caulinis subsimiles. Flores pentameri. Sepala corolla 3—4-plo breviora, oblongo-triangularia. Petala 5—6 mm longa, oblonga vel lineari-lanceolata, acuminata, glabra, alba, nervo mediano viridi, in sicco pallide luteo. Stamina 10, corolla breviora, antheris atroviolaceis. Squamae parvae, superne dilatatae, 2—3-lobae. Carpella 5, stellato-divergentia, 5—6 mm longa, oblongo-lanceolata, subulato-rostrata, verruculosa, ventre parce glanduloso-puberula. Semina minutissima, ovata.

Persia: sec. Fl. URSS., l. c.
Turcomania: M. Kopet Dagh, inter Keljata et Prokhladnoje, BORISS. 99.
Afghanistan: E: Kabul: 2 km E Sarobi, 1100 m, HDG. & WDB. W-7584! Nuristan: Waigel, 1500 m, EDELB. 867! Inter Asmai et Barikot, 840 m, GILLI 1926-b!
Pakistan: Chitral: Arandu SW Drosh, 1300 m, STAINTON 2300! — Swat: In valle Jabba E Kolalai, 1600—2200 m, RECH. 30750!, 30763!

Distr. gen.: Persia, Caucasus orientalis, Turcomania, Afghanistan, Pakistan (Swat, Chitral).

It is open to discussion whether *S. pentapetalum* is indeed specifically distinct from *S. hispanicum*.

19. *S. nanum* BOISS., Diagn. Pl. Or. Nov. Ser. 1, 6: 57 (1845).

Icon.: FRÖDERSTRÖM l. c., fig. 254—263.
Typus: KOTSCHY 623, W!

Annuum, nanum, omnino glabrum. Caulis florifer 20—25 mm altus, tenuis, erectus, simplex. Folia 3—4 mm longa, inferiora lanceolata, superiora ovata, semiteretia, subacuta. Inflorescentia laxe corymbosa, (1—2-) 5—15-flora. Pedicelli usque ad 5 mm longi. Sepala 1 mm longa, triangulari-ovata, acuta. Petala 2,5 mm longa, oblonga, acuta, lutea, carina interdum rubella (sec. BOISSIER). Stamina 10, epipetala 0,4 mm supra basin petalorum inserta. Squamae 0,5 × 0,55, obovata usque spathulato-quadrata, profunde emarginata. Carpella 1,8—2,5 mm longa, brevistyla, 3—5-sperma. Semina 0,8 × 0,3 mm, oblonga.

Persia: W: Kurd.: M. Shahu, in humidis, HAUSSKN. s. n.! Lur.: Kuh-e Saverz, HAUSSKN. s. n.! — S: Fars.: „In lateribus septentrionalibus alpis Kuh-e Dinar, 1800 m", KY. 623!

Distr. gen.: Anatolia, Persia.

20. *S. tetramerum* Trautv., Acta Horti Petrop. 7: 454 (1881).

Syn.: *Macrosepalum turkestanicum* Regel & Schmalh. in Regel, Descr. Pl. Nov. Fedtsch., Izv. Obsh. ljub. estv. antr. Etnogr. 34, 2: 25 (1882). *Sedum aetnense* Tineo in Guss. var. *tetramerum* (Trautv.) Raymond-Hamet, Bull. Jard. Bot. Imp. Petersb. 14: 143 (1914).

Icon.: Fröderström, l. c.: fig. 754—762 (1932).

Typus: Prope Baku, LE.

Plantae annuae, glabrae. Radices debiles, tenuiter fibrosae, caules erecti, 3—5 cm longi, plerumque simplices. Folia 3—5 mm longa, ovata usque elliptica, subacuta, manifeste calcarata, margine ciliata. Inflorescentiae 1—6-florae, simpliciter spicatae. Flores subsessiles. Sepala quam petala manifeste longiora, calcarata, oblongo-lanceolata, acuta vel subacuta. Petala quattuor, 3—4 mm longa, oblongo-lanceolata, acuminata, alba. Stamina quam petala breviora. Carpella quam sepala aequilonga, in parte basali connata, ovoidea, semierecta, papillosa.

Persia: S: Fars.: Takht-e Jamshid, Koelz 14454!

Turcomania: In angustiis Firyuza, Litw. 1122! In montibus prope Ashkhabad, Litw. 1112! In montibus ad Nephton, Litw. 1111!

Afghanistan: N: Murghab, 700 m, Koie 3788! — E: Kabul: Sarobi, Volk 2507! — NE: Kataghan: In parte inferiore vallis Farkhar, 1300 m, Podlech 10537! Taliqan, 720 m, Podlech 10266-a!

Distr. gen.: In montibus a Caucaso usque ad Tien Shan.

21. *S. caespitosum* (Cav.) DC., Prodr. 3: 406 (1828).

Syn.: *Crassula caespitosa* Cav., Icon. Descr. 1: 50 (1791). *Tillaea rubra* L., Spec. Plant. 129 (1753). *Sedum rubrum* (L.) Thell., Feddes Repert. 10: 290 (1912), non Royle ex Edgew. (1851).

Icon.: Fröderström, l. c. fig. 722—725 (sub *S. rubro*).

Typus: „In Matriti viciniis, praecipue en la Casa del Campo, Soto de Migas calientes."

Annuum. Caulis 2—6 cm altus, erectus, simplex vel prope basin ramosus. Folia 2,5—5 mm longa, late elliptica usque obovoidea, in vivo subgloboso-ovata, obtusissima, alterna. Inflorescentia pauciflora. Bracteae 3—4 mm longae, subovoideae. Flores 5— (vel 4—) meri, isomeri. Calycis tubus latus; sepala c. 1 × 1,2 mm, minuta, non calcarata, longitudine latiora, triangularia, acuta. Petala 3—4 mm longa, omnino libera, anguste lanceolato-triangularia, alba, nervo mediano rubro percursa. Stamina 5 (vel 4). Squamae 0,5—0,75 mm longae, lineari-subspathulatae, obtusae. Carpella matura 3,5—4 mm longa, stellata, per 0,7—1 mm connata, intus convexa, polysperma. Semina 0,6—0,9 × 0,4—0,45 mm laevia.

Iraq: Kurd.: Kirkuk: Jarmo, Helbaek 710! Kirkuk, Bornm. 1219.

Talish: Lenkoran, C. A. Mey., Hohen. Sallian, C. A. Mey. Swant, Hohen.

Persia: N: Maz.: In valle Haraz, W Zardman, 800 m, Wdb. 338! Gil.: Supra Rudbar, 300—400 m, Bornm. 7019.

Turcomania: Ashkhabad supra Nephton, Sint. 414.

Distr. gen.: Regio Mediterranea, Europa austro-orientalis, Asia austro-occidentalis.

22. *S. rubens* L., Spec. Plant. 432 (1753).

Syn.: *Crassula rubens* L., Syst. Nat. ed. 10: 969 (1759). *S. Steudelii* Boiss., Fl. Or. 2: 790 (1872).

Icon.: Fröderström, l. c. fig. 600—607.

Typus: Europa.

Annuum, surculis sterilibus nullis. Caules 5—10 (—15) cm longi, suberecti saepe arcuati, validi, infra inflorescentiam non ramosi, inferne glabri, in regione florifera pubescentes. Folia 5—15 mm longa, inferne saepe imbricata, plerumque mox decidua, oblanceolata usque oblonga, laevia vel superne papillosa. Inflorescentia racemosa, simplex vel 2—4-fida, ramis erectis vel recurvis. Bracteae 5—7 mm longae. Flores 5-meri. Sepala c. 1 mm longa, late triangularia usque ovata, pubescentia. Petala 4—5 mm longa, late lanceolata usque subovata, superne attenuata et valde acuminata, alba vel rufescentia. Stamina 5—10, quam dimidium petalorum paulo longiora, epipetala prope basin petalorum inserta; antherae rufescentes. Squamae spathulato-quadratae, 0,4—0,7 × 0,4—0,5 mm. Carpella ovoidea, 4—5 cm longa.

Talish: Lenkoran, C. A. MEY.
Persia: N: Gorg.: In silvis S Gorgan, GAUBA 390! Minudasht, SHAR. 442! Dinalu, 3000 m, KOELZ 16524! Maz.: 40 km S Chalus, 1000 m, STUTZ 1179! Gil.: Ispili, LINDS. 1214. — W: Azerb.: Ahar, Garmaduz, TERMÉ 13128-E! Kermansh.: Bisotun, 1500 m, JACOBS 6246! Lur.: Shah Bazan, 500 m, KOEIE 400!, 404! Pol-e Kalchor, 1100 m, ARCHIBALD 1615! 33°06′ N, 47°43′ E, 750 m, JACOBS 6365! — S: Fars.: Khafr inter Shiraz et Lar, 1400 m, GAUBA 389! Pirch Zan inter Shiraz et Bushehr, GAUBA 378! Tang-i Abdui, STAPF 993! Dalaki, STAPF 990!, 991! C: Tehr.: M. Damavand supra Ask, 2400 m, GAUBA 385! Qazv.: Karaj: Kuh Jarub, TERMÉ 13118-E!
Turcomania: Ashkhabad, in montibus, LITW. 1116! In angustiis Karanki, LITW. 1120! M. Ludsch, 2150 m, LITW. 1123!

Distr. gen.: Insulae Canarienses, Regio Mediterranea, Asia austro-occidentalis.

23. *S. annuum* L., Spec. Plant. 432 (1753).

Icon.: FRÖDERSTRÖM, l. c. tab. 32, 33, 1—3; fig. 429—456.
Typus: Europa.

Annuum vel interdum surculis parvis sterilibus perennans; caules floriferi erecti vel ascendentes, a basi valde ramosi, 3—15 cm alti. Folia 3—6 mm longa, alterna, in parte superiore ramorum imbricata, obtuse calcarata, teretia, late lineari-oblonga usque obovata, laevia. Inflorescentia simplex vel 2—3-furcata. Bracteae majusculae, 4—5 mm longae. Flores subsessiles. Sepala 2—3,5 mm longa, non calcarata, spathulato-oblonga usque obovata, obtusissima, longitudine inaequalia. Petala 4—5 mm longa, late lanceolata usque subovata, flava vel virescenti-flava. Stamina quam petala paulo breviora. Squamae 0,5 × 0,5 mm, late stipitato-subquadratae, ± emarginatae. Carpella matura stellata, per 0,7—1 mm connata, 4—5 mm longa, ovoidea, brevistyla. Semina c. 0,9 × 0,4 mm, ovoidea.

Talish, C. A. MEY, Swant, HOHEN.
Persia: W: Azerb.: Ahar: Garmaduz, TERMÉ 13128-E!

Distr. gen.: Europa, Groenlandia, Asia occidentalis.

Species dubiae vel pro regione nostra dubiosae

S. adenocalyx BLATTER, Journ. Bomb. Nat. Hist. Soc. 37: 152 (1934).
Pakistan: N. Wazir.: Lowargi Narai, 2200 m, BLATT. & FZ. 1307, 1307-a.

S. corymbosum GROSSH., Monit. Jard. Bot. Tiflis 3—4: 171 (1915).
Talish, Persia borealis.

S. lineare Pau & Vicioso, Trab. Mus. Nac. Cienc. Nat. Ser. Bot. Madrid 14: 24 (1918).

Persia: W: Bakht.: Gatvand. Mart.-Escal. In valle Bazoft. Mart.-Escal.

5. *Pseudosedum*

Pseudosedum (Boiss.) Berger in Engler & Prantl, Natürl. Pflanzenfam. 18a: 465 (1930).

Syn.: *Umbilicus* A. DC. sect. *Pseudosedum* Boiss., Fl. Or. 2: 775 (1872).

Herbae glabrae perennes. Radices 2 vel plures, saepe incrassatae et tuberosae. Caules floriferi plerumque plures, stricte erecti, sub incunte anthesi dense foliati. Folia linearia, 0,5—2 cm longa, basi ± dilatata, calcarata, mox decidua. Inflorescentia plerumque corymboso-cymosa applanata. Flores 5—6-meri. Sepala libera, plerumque $^1/_3$ vel $^1/_4$ longitudinis corollae attingentia, plerumque oblongo-ovata, obtusa vel acuta. Corolla tubulosa vel campanulata: petala per $^1/_2$—$^2/_3$ longitudinis connata, in parte libera lanceolata acuta. Stamina 10—12, corollam aequantia vel paulo breviora. Carpella anguste ovoidea, erecta vel suberecta, in stylos plerumque apicem petalorum attingentes attenuata.

The species of this genus are distributed over an area from SW Persia to the regions east and north of the Caspian Sea and to Central Asia in the East with the center in the southernmost republics of URSS. Totally 12 species are reported all of them growing on more or less rocky ground. In this survey Borissova's systematic treatment has been followed, Acta Inst. Bot. Acad. Sci. URSS. 1: 105—116 (1933), but it is worth mentioning that the systematic limits between the species are somewhat diffuse and that the whole genus might as well be regarded as monotypic with one species divided into a number of subspecies.

1a. Petala per $^2/_3$ longitudinis connata ..... 4. *P. multicaule* (Boiss. & Buhse) Boriss.
b. Petala per dimidium longitudinis c. vel brevius connata 2
2a. Sepala triangularia, acuta ..... 2. *P. acutisepalum* Jansson
b. Sepala oblongo-ovata, obtusa 3
3a. Inflorescentia densa; pedicelli 0—2 mm longi. Radices tenues, 1—2,5 mm diametro. Caudex brevis vel vix evolutus ..... 3. *P. condensatum* Boriss.
b. Inflorescentia magis aperta; pedicelli 2,5 mm longi. Caudex crassus, plerumque bene evolutus 4
4a. Stamina episepala corollam aequantia. Radices numerosae, fasciculatae ..... 1. *P. longidentatum* Boriss.
b. Stamina quam petala breviora. Radix principalis crassa, 2—4 × 1 cm vel crassior, in ramos plures incrassatos divisa ..... 5. *P. Koelzii* Jansson

1. *P. longidentatum* Boriss., Acta Inst. Bot. Acad. Sci. URSS. 1: 109 (1933).

Icon.: Boriss., l. c. fig. 2.

Typus: Prope Vernyi, Killoman s. n., LE!

Radices numerosae, fasciculatae, raro tuberosae, 3—7 mm diametro. Caudex crassus, plerumque bene evolutus. Caules floriferi plures, 20—40 cm longi, 2,5—8 mm diametro. Folia linearia, 5—20 × 1—2 mm. Inflorescentia corymboso-cymosa. Pedicelli 2—5 mm longi. Flores 6-, rarius 5-meri. Sepala plerumque $^1/_4$—$^1/_5$ corollae longitudinis attingentia, oblonga, obtusa usque subacuta. Corolla 10—14 mm longa, sub anthesi tubulosa, sub fructu magis campanulata: petala per dimidium

longitudinis vel brevius connata, rosea. Stamina 12, episepala petala longitudine aequantia, epipetala subbreviora; antherae appendiculatae, 1 mm longae. Carpella anguste ovoidea, matura, erecta; styli apicem petalorum attingentes, interdum longiores.

Afghanistan: N: Mazar-i Sharif: 21 km SE Tashkurghan, 600 m, RECH. 34019! Akupruk, 700–800 m, RECH. 16326! — NW: Maimana: Darreh Zang prope Belchiragh, 1400 m, HDG. & WDB. 3737!, LINDB. 443! 15 km NW Belchiragh inter Kata Qala et Zarshoy, 900 m, EKB., HDG. & WDB. W-8327! Badghiz: 4 km E Darrah-i Bum, 1100 m, EKB., HDG. & WDB. W-8169! — E: Kabul: Sher Darwasa, 1800 m, HDG. & WDB. 2907!, GILLI 1931!, NEUB. 505/1950! Koh-i Asmai, 1700 m, KERST. 34! Tang-i Gharu, 1600 m, GILLI 1930!, VOLK 1540!, NEUB. 4107! Kuh-e Chelsotun, 2210 m, GILLI 1932! In jugo Unai, 3200 m, DÜCKELMANN in GILLI 1934! Paghman, 3000 m, VOLK 331! Panjshir: Gulbahar, 2000 m, KERST. 74! Logar: Sebroderakan prope Shewaki, 2500 m, GILLI 1933! Ghazni: In faucibus Nawar Kotal inter Okak et Behzud, 3150 m, RECH. 17846! Okak, 3000 m, RECH. 17685! Baraki Nawar, NEUB. 506/1950! Ghorband: Kuh Khvadaj Ghar, LINDB. 508/1959! Ghorband, 2500 m, MEINERTZHAGEN! Gardez: M. Safed Kuh W jugi Altimur, 2600–2700 m, RECH. 31966! — C: Panjao: 20 km SW Panjao versus jugum Waras, 2500 m, RECH. 36530! Panjao, 2700 m, HDG. & WDB. 4941! Deh Kundi: Sar-i Nil, 3000 m, EDELB. 1959! Bamian: Band-i Amir, 2800 m, REINER 676!

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

2. ***P. acutisepalum*** JANSSON, sp. nov.

Icon.: Tab. 3.

Typus: RECHINGER 18874, W!

Radices 2 vel plures, non tuberosae, 2–4 mm diametro. Caudex crassus, proportione longus, basibus caulium vetustorum persistentibus. Caules floriferi bini vel verosimiliter plures, ad minimum 15 cm longi, 1.5–2 mm crassi. Folia ignota. Inflorescentia corymboso-cymosa. Pedicelli 1–3 mm longi. Flores 6-meri. Sepala $^1/_3$ petalorum longitudinis aequantia, triangularia, manifeste acuta. Corolla 10–12 mm longa, campanulata, sub anthesi non visa, sub fructu aliquantum ventricosa; petala per dimidium longitudinis connata. Stamina 12, corollam aequantia; antherae oblongae, non appendiculatae, 1 mm longae. Carpella ovoidea, matura erecta; styli apicem petalorum attingentes; semina numerosa, 1–1,4 mm longa, oblonga.

Afghanistan: C: Ghorat: In jugo Shutur Khan Kotal inter Qala Abangaran et Qala Sharak, in saxosis calc., 2725 m, 27. VII. 1962, RECH. 18874!

Distr. gen.: Endem.

3. ***P. condensatum*** BORISS., Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 110 (1933).

Icon.: BORISS., l. c.: 111, fig. 3.

Typus: Schugnan, Tadzhikistan, TUTURIN & BESSEDIN 109-a, LE!

Radices numerosae, fasciculatae vel subfasciculatae, tenues, 1–2,5 mm diametro. Caudex plerumque brevis vel vix evolutus. Caules floriferi plerumque 2 vel plures, raro singuli, 15–25 cm longi, 1–2 mm diametro. Folia 7–20 × 1 mm. Inflorescentia densa, multiflora, corymboso-cymosa, plerumque breviter ramosa. Pedicelli 0–2 mm longi, raro longiores. Flores 6-meri. Sepala 2,5–3 mm longa, $^1/_3$ petalorum longitudinis attingentia. Corolla 8–10 (–12) mm longa, subtubulosa vel campanulata, sub fructu non ventricosa; petala per $^1/_2$ longitudinis connata, atroviolacea, plerumque leviter divergentia. Stamina 12, corollam aequantia,

episepala sublongiora; antherae appendiculatae, 0,6–0,7 mm longae. Carpella anguste ovoidea, matura semierecta; styli apicem petalorum attingentes.

Afghanistan: N: Mazar-i Sharif: Chashmeh-i Shafal, 500 m, Rech. 34109! 20–25 km SE Mazar-i Sharif, 500–700 m, Rech. 34165! M. Ali Kuh, 18 km S Mazar-i Sharif, 1300 m, Ekb., Hdg. & Wdb. W-8499! — SE: Orozgan: Inter Orozgan et Malestan, 2900 m, Rech. 35211! — E: Nuristan: Kantivo, 2100 m, Edelb. 697! Ghazni: In jugo inter Sariab et Dasht-i Nawar, 3100 m, Rech. 37255! Gardez: 9–20 km SE Gardez versus jugum Sata Kandao, 2300 m, Rech. 35421! — NE: Wakhan: In valle Langar, 3500 m, Roemer 402! Munjan: Darrah-i Parshui, 3700 m, Frey F 254: (136) p. p.! Kataghan: Inter Pul-i Khumri et Doshi, Jörgensen 581! 10 km S Pul-i Khumri, 700 m, Rech. 33681! In valle Khinjan, 2200 m, Podlech 10903!; 2600 m, Hdg. & Wdb. W-8561! Badakhshan: Kuh-i Ishkamish, 1350 m, Podlech 10645! Lacus Shiva: Mian Kuh, Lindb. 750! — C: Doab, 1930 m, Meinertzhagen! Khash Kul, ad pontem trans fluvium Helmand, 2460 m, Hdg. & Wdb. W-8659!

Pakistan: Chitral: Tirich Mir: Barum Gol supra Shokor Shal, 3600 m, Wdb. s. n.! Ad fluvium Turikho, Istar, 2100 m, Stainton 2511! Brumboret Gol N Drosh, 1500 m, Stainton 2227!

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

4. ***P. multicaule*** (Boiss. & Buhse) Boriss., Acta Inst. Bot. Acad. Sci. URSS. Ser. 1, 1: 112 (1933).

Syn.: *Umbilicus multicaulis* Boiss. & Buhse, Nouv. Mém. Soc. Nat. Mosc. 12: 93 (1860).
Icon.: Boriss., l. c.: 113, fig. 6.
Typus: Inter Esfahan et Tehran, Buhse 1433, LE!

Radices plerumque 1–2, 5–10 mm diametro. Caudex crassus, bene evolutus, residuis caulium vetustorum persistentibus. Caules floriferi 7 vel plures, (7–) 10–20 cm longi, 0,5–3 mm crassi, dense foliati. Folia 4–16 × 1–3 mm, linearia usque oblonga, subcylindrica. Inflorescentia longitudine multo latior, corymboso-cymosa, multiflora. Pedicelli 3–6 mm longi. Flores 6-meri. Sepala plerumque $^1/_4$ petalorum longitudinis attingentia, oblonga, obtusa. Corolla 10–12 mm longa, campanulata, sub fructu ventricosa; petala per $^2/_3$ longitudinis connata, pallide rubra. Stamina 12, quam corolla manifeste breviora; antherae appendiculatae, 0,6–1 mm longae. Carpella anguste ovoidea, matura semierecta; styli apicem petalorum attingentes.

Persia: N: Maz.: 64 km NE Damavand, 1800 m, Stutz 1267! — W: Ham.: Aq Bolagh-e Aqdaq 100 km N Hamadan, Rioux & Golv. 251! Kermansh.: Kuh-e Richab, Str.! M. Kuh Milleh Michan inter Kermanshah et Karand, Str.! Arak: Kuh-i Safid Khaneh, Str.! Arak, Str.! M. Alvand, Golpayegan, Str.! Nahavand, Str.! Kuh Gasavand, Str.! Kuh Rasvand, Str.! Prope Khomeyn, Str.! Lur.: Inter Dow Rud et Azna, 2800 m, Bent & Wr. 530–301! — S: Fars.: E Saadatabad, 2010 m, Archibald 1457! — E: Khor.: Ozbagu, Ruttner 64!, 302! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600–1800 m, Rech. 4656! C: Tehr.: Inter Esfahan et Tehran, Buhse 1433!
Turcomania: Prope Ashkhabad: M. Kobas prope Gaudan, Litw. 1113! M. Ludsch, Litw. 1121!

Distr. gen.: Persia, Turcomania.

5. ***P. Koelzii*** Jansson, sp. nov.

Icon.: Tab. 4.

Typus: KOELZ 15664, W!

Radix singula, crassissima, 2—4 × 1 cm, in ramos plures incrassatos divisa. Caudex crassus, bene evolutus, residuis caulium vetustorum persistentibus. Caules floriferi 2 vel plures, 15—25 cm longi, dense foliati. Folia 5—12 × 1 (—2) mm, basi interdum usque ad 3 mm lata, linearia vel anguste lanceolata. Inflorescentia densa, multiflora, corymboso-cymosa, applanata. Pedicelli 2—6 mm longi. Flores 6-meri. Sepala $^1/_3$—$^1/_4$ longitudinis petalorum attingentia, oblonga, obtusa. Corolla 13—15 mm longa, tubulosa usque campanulata; petala per dimidium longitudinis connata, rosea. Stamina 12, quam corolla breviora; antherae appendiculatae, 0,6—0,8 mm longae. Carpella anguste ovoidea, matura semierecta usque erecta; styli apicem petalorum fere attingentia.

Persia: W: Lur.: Dow Rud, 1650 m, 21. V. 1940, KOELZ 15664!; 1800 m, KOELZ 17406!

Distr. gen.: Endem.

6. *Rosularia*

Rosularia (DC.) STAPF, Bot. Mag. 149 sub tab. 8985 (1923).

Syn.: *Umbilicus* sect. *Rosularia* DC., Prodr. 3: 399 (1828).

Herbae sempervirentes rosulas densas formantes, plurimae perennes exceptione tantum annuae, saepe stoloniferae caespites laxos vel interdum pulvinos formantes. Radix plerumque in parte superiore incrassata, interdum tuberosa. Caules floriferi erecti, tenues, sparse foliati. Folia rosularum plana, ± spathulata, elliptica, linearia vel obovata, basi attenuata, margine saepe ciliata. Inflorescentia plerumque paniculata usque corymboso-paniculata, saepissime multiflora. Flores hermaphroditi, 5—8-meri, ± campanulati. Sepala carnosa, triangulari-ovata usque oblongo-lanceolata. Petala oblongo-ovata usque oblongo-lanceolata, basi vel saepe usque ad dimidium connata. Carpella libera, erecta vel suberecta, plerumque polysperma. Stamina 10—16, epipetala paulo longiora. Squamae ± quadrangulares.

1a. Flores 6—8-meri ..... 8. *R. alpestris* (KAR. & KIR.) BORISS.
b. Flores 5-meri 2
2a. Caules floriferi in rosulis centrales, a basi fere ramosi 3
b. Caules floriferi laterales, in parte superiore tantum ramosi 4
3a. Inflorescentia unilateralis. Folia rosularum glabra .....
..... 6. *R. elymaitica* (BOISS. & HAUSSKN.) BERGER
b. Flores glomerati. Folia rosularum pubescentia. Rosulae e foliis magnis dense confertis compositae ..... 7. *R. globulariifolia* (FENZL) BERGER
4a. Tota planta glabra 5
b. Planta in regione inflorescentiae quidem pilosa 7
5a. Inflorescentia anguste paniculata .....
..... 11. *R. paniculata* (REGEL & SCHMALH.) BERGER
b. Inflorescentia corymbosa 6
6a. Folia rosularum late elliptica, plerumque acuta .....
..... 13. *R. glabra* (REGEL & WINKLER) BERGER
b. Folia rosularum spathulata usque ± linearia, obtusa vel truncata .....
..... 2. *R. persica* (BOISS.) BERGER
7a. Inflorescentia anguste paniculata, interdum ad spicam spuriam reducta ..
..... 12. *R. subspicata* (FREYN & SINT.) BORISS.
b. Inflorescentia paniculato-corymbosa 8
8a. Inflorescentia pauciflora, floribus 1—3 ..... 5. *R. Rechingeri* JANSSON
b. Inflorescentia multiflora 9

9a. Flores plerumque sessiles vel brevissime pedicellati ..... 3. *R. sessiliflora* Jansson
b. Flores pedicellis ad minimum 2 mm longis suffulti 10
10a. Folia caulina folia rosularum aequantia 11
b. Folia caulina quam folia rosularum multa minora 12
11a. Folia obtusa vel subacuta, 5—10×2—5 mm.. 9. *R. pilosa* (M. B.) Boriss.
b. Folia acuta vel acuminata, 10—35×8—13 mm ..... 10. *R. sempervivoides* (Fisch.) Boriss.
12a. Radix tenuis, in parte superiore non vel vix incrassata ..... 14. *R. adenotricha* (Wall. ex Edgew.) Jansson
b. Radix in parte superiore turbinato-incrassata 13
13a. Flores 7—11 mm longi. Sepala plerumque $^1/_3$—$^1/_4$ petalorum longitudinis attingentia ..... 1. *R. Sempervivum* (M. B.) Berger
b. Flores 5—6 mm longi. Sepala plerumque dimidium petalorum longitudinis attingentia vel longiora ..... 4. *R. modesta* (Bornm.) Jansson

Sect. *Rosularia*

Syn.: Sect. *Eu-Rosularia* Berger in Engler & Prantl, Natürl. Pflanzenfam. ed. 2, 18a: 465 (1930).

Herbae perennes, radice turbinato-incrassata. Inflorescentia paniculato-corymbosa, laxa. Flores 5-meri (rare 6-meri). Corolla anguste campanulata vel tubulosa, rubra, rosea, alba vel flava, plerumque striata; petala ad minimum per tertiam partem inferiorem connata; carpella prope basin connata.

1. ***R. Sempervivum*** (M. B.) Berger in Engler & Prantl, Nat. Pflanzenfam. 18a: 466 (1930).

Syn.: *Cotyledon Sempervivi* M. B., Tabl. Prov. Côte Occid. Mer Casp. 115 (1798). *C. libanoticus* Labill., Ic. Pl. Syr. 3: 3 (1809). *Umbilicus Sempervivum* (M. B.) DC., Prodr. 3: 399 (1828). *U. libanoticus* (Labill.) DC., Prodr. 3: 399 (1828). *U. lineatus* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 10: 14 (1849). *U. libanoticus* (Labill.) DC. var. *Steudelii* Boiss., Fl. Or. 2: 772 (1872). *U. radiciflorus* Steud. in Ky. ex Boiss., Fl. Or. 2: 772 (1872). *Sedum Sempervivum* (M. B.) sensu Raymond-Hamet var. *genuinum* Raymond-Hamet, Candollea 4: 25 (1929) nec al. *Rosularia radiciflora* (Steud.) Boriss., Fl. URSS. 9: 120 (1939).
Icon.: Fl. URSS. 9: tab. 7, fig. 3a (1939).
Typus: „Habitat in saxis montium altiorum rarius".

Folia rosularia, 1,5—6×0,7—1,4 cm, spathulata usque ± linearia, basi attenuata, apice obtusa vel truncata, margine ciliata. Inflorescentia corymbosa usque paniculato-corymbosa, multiflora. Pedicelli 2—6 mm longi, pilosi. Flores 5-meri. Sepala $^1/_3$— $^1/_4$corollae longitudinis attingentia, ovato-lanceolata. Corolla 7—11 mm longa, campanulata, purpurea; petala in dimidio inferiore connata, striata, secus nervum medianum minute glandulosa, apice breviter acuminata et leviter extus curvata. Squamae quadratae, emarginatae. Carpella erecta, in stylos distinctos attenuata, plerumque sparse pilosa.

Talish: Swant, 1000—1650 m, Hohen. In montibus Talish, C. A. Mey.
Iraq: Kurd.: Mosul: In cacumine Zawita, 2000 m, Rech. 12011! M. Zawita, 1600 m, Rech. 10906! Gali Dinarta, 900 m, Anders 1390! Chiya-e Gara, Ky. 332! In montibus supra Al Qosh, Thesiger 752! Arbil: Shanidar, Erdtman & Goedemans in Rech. 15881! Jabal Khantur, 1300—1480 m, Rech. 12050!, 12053! In faucibus supra Pushta-

shan, 1500—2000 m, RECH. 11803! Prope Rawandiz, RECH. 11244!, NAB. 283!, 283-a! Chiya-i Mandau, 2400 m, GUEST 2802! Kuh Safin, 1060 m, BORNM. 1217! Sul.: M. Avtoman, HAUSSKN.! Prope Tawilla, 1400—2000 m, RECH. 10262!, 15880! M. Shahu, HAUSSKN.! In collibus Kurdistaniae, 1050 m, Low 200!

Persia: N: Gorg.: Prope Ziarat, BGE.! Chehel Dokhtar, SHAR. 375! Maz.: Inter Amol et Zardman, SCHMID 5842! In declivibus borealibus jugi Kandavan, GAUBA 1515! — W: Kermansh.: 73 km NNW Taq-i Bostan, RECH. 14660! Bisotun, 1350—1650 m, JACOBS 6759! Sarab-e Karand, 2020 m, IRANSHAHR & TERMÉ 12252-E! Qasr Shirin: Rijab, 900 m, NAB. 281! Sar-i Pul, 700 m, NAB. 280!, STR. Lur.: Shah Bazan, 700—1200 m, KOEIE 1500! Inter Azna et Borujerd, 1350 m, FURSE 1843! Dow Rud, KOELZ 17615!, 17654-a! Bisheh, 1200 m, KOEIE s. n.! Malavi inter Khorramabad et Andimeshk, BENT & WR. 507—302! Arak: In faucibus Girdu, STR. Bakht.: Damaver, 3600 m, KOELZ 15170! Peshmshurun, KOELZ 15117! — S: Fars.: Chenar Rah Dar, STAPF 929! Ad lacum Maharlu, 35 km SE Shiraz, 1500 m, GRANT 15084! 40 km N Shiraz, 1800 m, GRANT 15128! Pasargade, 15 km N Sandatabad, 2000 m, GRANT 15764! Persepolis, GAUBA 392! Inter Persepolis et Dowlatabad, SCHMID 5477! Firuzabad, KASHKOULI 6053-E! — C: Tehr.: M. Damavand, 2900 m, GILLI s. n.! M. Tuchal, 2600 m, ŽUMER 182! In valle Shahrestanak, 2200 m, BORNM. 7016! Qazv.: Prope Karaj, ESFAND. 6769-E!, GAUBA 316!, 382! Vessieh, 1500 m, RECH. 430! Qazvin, 1200 m, PRAVITZ 929.

Distr. gen.: Iraq, Persia, Caucasus.

There is a remarkable variation in this species as for hairiness, size and colour of the flowers, striation of the petals, and length and shape of the rosette-leaves. Thus there are forms with glabrous leaf surfaces and ciliate leaf margins. There also occur markedly emarginate leaves. The colour of the corolla, usually purplish, may be pale rose to whitish. In spite of this variation the present collections give little or no reason to distinguish any subordinate taxa.

2. ***R. persica*** (BOISS.) BERGER in ENGLER & PRANTL, Natürl. Pflanzenfam. 18a: 466 (1930).

Syn.: *Umbilicus persicus* BOISS., Diagn. Pl. Or. Nov. Ser. 1: 3 (1843). *U. libanoticus* (LABILL.) DC. var. *glaber* BOISS., Fl. Or. 2: 772 (1872). *Sedum Sempervivum* (M. B.) RAYMOND-HAMET var. *glabrum* RAYMOND-HAMET, Candollea 4: 25 (1929).

Typus: AUCHER-ELOY 4522, G!

Folia rosularia 2—6 cm longa, spathulata usque ± linearia, obtusa, glabra, margine breviter ciliata. Inflorescentia glabra, corymbosa usque paniculato-corymbosa. Pedicelli 3—8 mm longi. Sepala anguste lanceolata, tertiam partem corollae longitudinis attingentia vel paulo longiora. Corolla campanulata, rosea; petala in tertia parte inferiore connata, stricta, glabra.

Persia: W: Azerb.: M. Karnaru prope Shahpur, KNAPP! Ser prope Rezaiyeh, KNAPP. Kuh-e Mishu Dagh, GILL.-SM. 2438!, 2592! Esf.: Prope Esfahan, 1700 m, BORNM. 3566! Ham.: In montibus prope Borujerd versus Nahavand, STR. Arak: Prope Arak, STR. 34!, coll. ign. 12248-E! M. Alvand prope Golpayegan, STR. Girdu, STR. Mowdar, STR. M. Rasvand, STR. Lur.: Kuh-e Eshger, 3000 m, HAUSSKN.! Chenar, HAUSSKN.! Seh Gaveh, HAUSSKN. Bakht.: Gatvand in valle Bazoft, MART.-ESCAL. — S: Fars.: Kuh Bamu, STAPF 981! Kuh-e Barfi, STAPF 982! Tang-i Jiz, STAPF 984! Shiraz, STAPF 985!, KY. 310! Pireh Zan, AUCH. 4522! Abadeh, PAQ. 12247-E! Ardakan, KASHKOULI 12251-E! — C: Tehr.: M. Tuchal, Manzariyeh, 1800—2500 m, ŽUMER & WALLE 483! Darband, 1800—2200 m, ŽUMER 736! Pas Qaleh, KY. 284.!

Distr. gen.: Libanon, Syria, Anatolia australis, Persia.

R. persica is closely related to *R. Sempervivum* (M. B.) BERGER. The latter differs particularly in the hairiness of the inflorescenses and of the calyx, mostly also of the leaves. Neither does *R. persica* show the same wide variation as *R. Sempervivum*.

3. ***R. sessiliflora*** Jansson, Acta Horti Gotob. 28: 184 (1966).

Icon.: Jansson, l. c.: fig. 1e—g, 3; Tab. 5, fig. 1.
Typus: Volk 2614, W!

Folia rosularia 1,5—3,5 cm longa, lingulato-spathulata, apice obtusa, margine sparse ciliata, ceterum glabra. Caules floriferi minute puberuli, 4—5 cm alti. Flores 5—6 mm longi, sessiles vel subsessiles. Sepala triangulari-ovata, acuta, puberula. Petala verosimiliter rosea vel rubra, in sicco rubro-striata, a basi usque ad tertiam partem connata. Squamae 1 mm longae, lingulato-spathulatae. Carpella rubro-striata, in statu fructifero semierecta, stylis brevissimis.

Afghanistan: E: Kabul: Sarobi, Volk K-209!, 2614!

Distr. gen.: Endem.

This species is related to *R. Sempervivum* (M. B.) Berger which differs in well developed pedicels, 2—6 mm long, longer styles and mostly corymbose to paniculate-corymbose inflorescences.

4. ***R. modesta*** (Bornm.) Jansson, comb. nov.

Syn.: *Cotyledon modesta* Bornm., Beih. Bot. Centrbl. 58, 2: 273 (1938).
Icon.: Tab. 5, fig. 2.
Typus: Bornmüller 3567, B!

Folia rosularia 1,5—2 × 0,3—0,5 cm, lingulato-spathulata subacuta vel interdum obtusa, margine sparse ciliata ceterum glabra; folia caulina 0,6—1 × 0,1—0,2 cm, linearia vel sublinearia, obtusa, glabra. Caules floriferi 6—10 cm alti. Inflorescentia corymbosa, 5—8-flora. Pedicelli breves, sparse minute pilosi. Sepala dimidium petalorum longitudinis attingentia vel longiora, ovato-lanceolata, acuta, sparse minute ciliata. Petala 5—6 mm longa, oblongo-lanceolata, acuta, rosea, in tertia parte inferiore connata. Stamina $^2/_3$ petalorum attingentia. Squamae quadratae, leviter emarginatae.

Persia: S: Kerm.: Kuh-e Jebal Barez inter Bam et Jiroft, 2100 m, Rech. 3841! Kuh-i Seidin, 2000 m, Bornm. 3567!

Distr. gen.: Endem.

This species is obviously closely related to *R. Sempervivum* (M. B.) Berger. It differs mainly in the small size, the proportionately longer sepals, which are more than $^1/_2$ of the petals in length and the shape of the rosette-leaves, especially the subacute apex. A more definite taxonomic valuation of this type should be based on a rich material from the actual area.

5. ***R. Rechingeri*** Jansson, Acta Horti Gotob. 28: 182 (1966).

Icon.: Jansson, l. c.: fig. 1a—d, 2; Tab. 6.
Typus: Rechinger 11883, W!

Folia rosularia 6—11 mm longa, spathulato-oblonga, glabra, saepe sublinearia, apice obtusa, margine non ciliata. Caules floriferi 1—4 cm alti. Pedicelli brevissimi. Flores infundibuliformes, 7—11 mm longi, 1—3, minute glanduloso-puberuli. Sepala triangulari-ovata, acuta, minute glanduloso-puberula, tertiam vel quartam partem longitudinis petalorum aequantia. Petala pallida, rubro-striata, raro alba, secus nervum medianum glanduloso-puberula, a basi usque ad tertiam partem connata. Stamina $^2/_3$ corolla longitudinis, epipetala ceteris sublongiora. Squamae 1 mm longae, lineares, leviter emarginatae. Styli tenues, aliquantum curvati.

Iraq: Kurd.: Arbil: Algurd Dagh: In declivibus occidentalibus in saxosis metamorphis et serpentinicis, 3000—3800 m. RECH. 11883! Chiya-i Mandau, 2400 m, GUEST 2802!

Distr. gen.: Anatolia, Iraq.

This species occurs outside the Flora Iranica area in the following locality: Anatolia: Kurd.: Ad septentr. de Geziret-ibn Omar, Halakur Dagh, in fissuris rupium calc., 2550 m, NAB. 279!, 279-a!

6. ***R. elymaitica*** (BOISS. & HAUSSKN.) BERGER in ENGLER & PRANTL, Natürl. Pflanzenfam. 18a: 465 (1930).

Syn.: *Umbilicus elymaiticus* BOISS. & HAUSSKN. in BOISS., Fl. Or. 2: 770 (1872). *Cotyledon elymaiticus* (BOISS. & HAUSSKN.) BORNM., Beih. Bot. Centrbl. 32, 2: 389 (1914). *Sedum elymaiticum* (BOISS. & HAUSSKN.) RAYMOND-HAMET, Candollea 4: 30 (1929).

Typus: "Kuh Eschker", HAUSSKNECHT. G!

Folia rosularia 1,5—3 · 0,5—0,9 cm, spathulata, glabra, margine non ciliata. Caules 15—20 cm alti floriferi a basi dense ramosi. Inflorescentia densiflora, pyramidalis, minute glanduloso-puberula. Pedicelli flores aequantes, leviter curvati. Flores secundi. Sepala lanceolata, dimidium petalorum longitudinis attingentia vel longiora, glanduloso-puberula. Petala 4—6 mm longa, pallide rubra, in dimidio inferiore connata, imprimis secus nervum medianum glanduloso-puberula. Carpella erecta, sparse pilosa; styli breves.

Persia: W: Kermansh.: Bisotun, STR. s. n.! M. Kuh-i Shiriz, STR.! Lur.: Kuh-i Eshger, 3000 m, HAUSSKN.! Chenar, HAUSSKN. Seh Gaveh, 2700 m, HAUSSKN.! Arak: M. Alvand prope Golpayegan, STR. — S: Fars.: Tal-e Khosravi, BEHR. 1353-E!

Distr. gen.: Endem.

7. ***R. globulariifolia*** (FENZL) BERGER in ENGLER & PRANTL, Natürl. Pflanzenfam. 18a: 465 (1930).

Syn.: *Umbilicus globulariaefolius* FENZL, Pugillus Plant. Nov. Syr. & Tauri Occ. 1: 15 (1842). *Sedum globulariaefolium* (FENZL) RAYMOND-HAMET, Candollea 4: 25 (1929).

Icon.: Tab. 7.

Typus: "Hab. in Syriae prope Svedie ostia Orontis", KOTSCHY 203. W!

Rosula foliorum magna dense caespitosa: folia rosularum 2—5 cm longa, glandulosa sparse ciliata, spathulata usque fere linearia, apice obtusa vel interdum subacuta. Caules floriferi in rosulis centrales, a basi fere in inflorescentias pyramidales divisi; inflorescentia dense glanduloso-puberula, multiflora. Flores 3—8-ni racemoso-glomerati. Sepala puberula, ovato-lanceolata, plerumque paulo ultra dimidium longitudinis petalorum attingentia. Corolla 4—6 mm longa, late campanulata. Petala in tertia parte inferiore connata, purpurea. Carpella glabra, corollam aequantia.

Persia: W: Lur.: Tidar, 1800 m, KOELZ 17559!

Distr. gen.: Anatolia, Syria, Persia occidentalis.

Sect. *Sempervivella* (STAPF) JANSSON, comb. nov.

Syn.: *Sempervivella* STAPF, Bot. Mag. 149, tab. 8985 (1923), genus.

Herbae parvae perennes. Radix in parte superiore rotundata vel turbinata. Stolones numerosi tenues. Folia rosularia oblonga, acuta vel obtusa. Inflorescentia

corymbosa, pauciflora, laxa. Flores 6—8-meri. Corolla ampla brevis, rubra, rosea vel alba, sub anthesi aperta; petala brevissime tantum connata. Carpella libera.

8. ***R. alpestris*** (Kar. & Kir.) Boriss., URSS. 9: 129 (1939).

Syn.: *Umbilicus alpestris* Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 354 (1842). *Sempervivum acuminatum* Decne. in Jacquem., Voy. Part. Bot. 64, tab. 74 (1844). *S. mucronatum* Edgew., Trans. Linn. Soc. 20: 48 (1845). *Sedum umbilicoides* Regel, Acta Horti Petrop. 1: 263 (1877). *S. Olgae* Regel & Schmalh. ex Regel, Descr. Pl. Nov. Fedtsch. 24, 2: 26 (1882). *Cotyledon alpestris* (Kar. & Kir.) O. & B. Fedtsch., Consp. Fl. Turkest. 3: 73 (1909). *Sedum acuminatum* (Decne.) Raymond-Hamet, Candollea 4: 23 (1929). *Sempervivella acuminata* (Decne.) Berger in Engler & Prantl, Natürl. Pflanzenfam. 18a: 467 (1930). *S. mucronata* (Edgew.) Berger in Engler & Prantl, Natürl. Pflanzenfam. 18a: 467 (1930). *Sedum Schlagintweitii* Fröderström, Acta Horti Gotob. 6: 28 (1931). ? *Sedum nuristanicum* Kitam., Acta Phytotax. Geobot. 17: 138 (1958).

Icon.: Fröderström, l. c.: tab. 16 (1931).

Typus: "In rupibus subalpinis Alatau ad. fl. Sarchan et Aksu", LE.

Folia rosularia oblongo-lanceolata, 2,5—5 × 0,6—1 cm, acuta vel interdum acuminata, margine sparse ciliata, ceterum glabra. Folia caulina 0,6—1 × 0,2—0,4 cm, anguste linearia vel oblongo-lanceolata, glabra. Inflorescentia corymbosa, plerumque multiflora, glabra. Pedicelli flores plerumque aequantes. Flores 6—8-meri. Sepala $^1/_2$ vel $^1/_3$ petalorum longitudinis attingentia, ovata, acuta, glabra vel minute glanduloso-pubescentia. Petala 6—7 mm longa, alba usque pallide rosea, nervo mediano distincto, leviter striata, oblongo-lanceolata, prope basin tantum connata, sub anthesi patentia. Stamina violacea, $^2/_3$ petalorum attingentia. Squamae 0.5—1 mm longae, quadratae vel interdum spathulatae, saepe leviter emarginatae. Carpella ovata, maturitate erecta.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, 2300—2600 m, Rech. 31370! In valle Panjshir, 2800 m, Hdg. & Wdb. 5383! Laghman: Alishang, in parte superiore vallis Darrah Rastyon, 2900 m, Ekb. & Wdb. W-9650! Nuristan: Pashki, 2300 m, Edelb. 1320! In jugo Urura, 3000 m, Neub. 650/1951! In jugo Jauda, Edelb. 2041! — NE: Munjan: Sanglich, 2000—3600 m, Edelb. 1486! Wakhan: Khandud, 4000 m, Renz! In valle Futur, 4000—4200 m, Roemer 57! Badakhshan: In declivibus orientalibus jugi Anjuman, 3700 m, Hdg. & Wdb. 5457!

Pakistan: Chitral: Tirich Mir: Shokor Shal, Barum Gol, 3500 m, Wdb. s. n.! Och Anzog, 3600 m, Randers-Heen s. n.! Rosh Gol, 3150 m, Stainton 2800! Inter glacies Chatiboi et Peshm, Wöhrl s. n.! — Kurram: In ascensu versus Sikaram et Seratigah, 3000—3600 m, Aitch. 935!

Distr. gen.: In montibus Afghanistan boreo-orientalis, Pakistan borealis, Himalaya, Alatau, Tien Shan, Pamir-Alaj.

Sedum nuristanicum Kitam., Fl. Afgh. 167—169, fig. 57 (1960), was compared with *S. pachyclados*. His drawing, however, is of a plant that shows many similarities to *Rosularia alpestris*, and it may well be a depauperate specimen belonging to that species. *S. pachyclados* is a very different-looking plant.

Sect. *Sempervivoides* (Boiss.) Boriss., Fl. URSS. 9: 117 (1939).

Syn.: *Sedum* sect. *Sempervivoides* Boiss., Fl. Or. 2: 776 (1872). *Sedum* sect. *Prometheum* Berger in Engler & Prantl, Natürl. Pflanzenfam., ed. 2, 18a: 459 (1930).

Herbae hapaxanthae annuae vel biennes, radicibus filiformibus non incrassatis. Inflorescentia paniculato-corymbosa. Caulis florifer initio quidem dense foliatus. Flores 5-meri. Corolla rubra vel alba.

9. ***R. pilosa*** (M. B.) BORISS., Fl. URSS. 9: 117 (1939).

Syn.: *Sedum pilosum* M. B., Fl. Taur.-Cauc. 1: 352 (1808).
Icon.: N. E. BROWN, Bot. Mag. 139: tab. 8503 (1913).
Typus: "Habitat in rupibus, circa portas caucasicas".

Biennis. Folia 5–10 × 2–5 mm, obtusa, glanduloso-pubescentia, basalia dense rosulata, oblongo-obovata, caulina oblongo-elliptica, alterna, patentia, sat approximata. Caulis 5–10 cm altus. Inflorescentia 5–18-flora, 2–4 cm lata, corymboso-cymosa, ± hemisphaerica, densa. Pedicelli 2–5 mm longi. Flores 5-meri. Sepala 3,5–5 mm longa, anguste elliptica, obtusa usque subacuta, glanduloso-pubescentia. Petala 6–8 mm longa, rosea. Stamina 3–4 mm longa. Squamae minutae, oblongo-ovatae. Carpella 4 mm longa, erecta.

Talish, sec. Fl. Kawk. 4, tab. geogr. 316 sub *Sedo pilioso*.

Distr. gen.: Anatolia, Caucasia, Talish.

10. ***R. sempervivoides*** (FISCH.) BORISS., Fl. URSS. 9: 118 (1939).

Syn.: *Sedum sempervivoides* FISCH. ex M. B., Fl. Taur.-Cauc. 3: 313 (1819). *S. Sempervivum* LEDEB. in SPRENG., Syst. Veg. 2: 434 (1825); DC., Prodr. 3: 786 (1828).
Icon.: SIMS, Bot. Mag. 51: tab. 2474 (1824). FRÖDERSTRÖM, l. c.: tab. 9, fig. 3–4; fig. 74–81 (1932).
Typus: Habitat in Iberia, D. WILHELMS.

Biennis, primo anno rosulas foliorum parvas 1–2.5 cm diametro densas tantum proferens, secundo anno rosulae ante anthesin duplo accrescentes. Folia rosularia 10–35 × 8–13 mm, late ovata, acuta vel acuminata, utrinque pubescentia et margine ciliata; folia caulina rosularibus magnitudine et pubescentia similia, per anthesin totam persistentia. Caulis florifer validus, pubescens. Inflorescentia copiose ramosa, multiflora, corymbosa. Flores 5-meri. Pedicelli flores aequantes. Sepala ovata, dense pilosa, acuta, rubra, $^1/_4$–$^1/_3$ petalorum attingentia. Flores 6–7 mm longi, 5. Petala 6–7 mm longa, saturate rubra, ovato-lanceolata, acuta, secus nervum medianum pubescentia, in parte superiore extus curvata. Stamina $^2/_3$ petalorum attingentia; filamenta rubra; antherae flavae. Squamae longitudine latiores, spathulatae, leviter emarginatae. Carpella late ovata, circumcirca pilosa, fructifera semierecta.

Talish: Swant, C. A. MEY., HOHEN.
Persia: W: Azerb.: Kuh-e Mishu Dagh, GILL.-SM. 2360! — Persia, STAPF 992!

Distr. gen.: Caucasus, Transcaucasia, Anatolia, Talish, Persia.

Sect. *Orientalia* BORISS., Fl. URSS. 9: 122 (1939).

Herbae perennes, radice in parte superiore globoso-incrassata. Inflorescentiae multiflorae, anguste corymbosae vel paniculatae, interdum ad racemos vel spicas fere reductae. Flores 5-meri; corolla brevis, campanulata, rubra vel flava; petala breviter connata. Carpella in parte basali connata.

11. ***R. paniculata*** (REGEL & SCHMALH.) BERGER in ENGLER & PRANTL, Natürl. Pflanzenfam. 18a: 466 (1930).

Syn.: *Umbilicus paniculatus* REGEL & SCHMALH., Acta Horti Petrop. 5: 583 (1879). *U. platyphyllus* BOISS., Fl. Or. 2: 773 (1872), non SCHRENK (1841). *Cotyledon paniculata* (REGEL & SCHMALH.) O. & B. FEDTSCH., Consp. Fl. Turkest., Beih. Bot. Centrbl. 28, 2: 20 (1911). *Sedum radicosum* BOISS., Diagn. Pl. Or. Nov. Ser. 1, 10: 15 (1849).
Icon.: FRÖDERSTRÖM, l. c.: tab. 57, fig. 2: fig. 90—98 (1932) sub *Sedo radicoso* BOISS.
Typus: "In Kokaniae valle fluvii Sarawschan", O. FEDTSCHENKO.

Tota planta glabra. Folia rosularum 2—5 × 0,6—2 cm, late spathulata, obtusa; folia caulina 0,6—1,2 × 0,2—0,4 cm, lineari-(ovato-)lanceolata. Caulis florifer saepe validus, erectus, 15—40 cm altus. Inflorescentia paniculata, elongata. Bracteae 2—5 mm longae. Pedicelli flores plerumque aequantes. Flores 5-meri. Sepala $^1/_4$—$^1/_3$ petalorum aequantia, ovata, acuta vel obtusiuscula. Petala 6—7 mm longa, oblongo-lanceolata, acuta, leviter striata, in quarta parte inferiore connata, pallide rubra vel interdum albida. Stamina $^2/_3$ corollae attingentia; antherae violaceae. Squamae 0,5 mm longae, spathulatae, leviter emarginatae. Carpella corollam aequantia, erecta, longistyla.

Persia: E: Khor.: M. Kopet Dagh inter Quchan et Lotfabad in jugo Alam Ali, 2000 m, RECH. 1671!, GAUBA 391!
Turcomania: Ashkhabad: Suluklü ad fines Persiae, SINT. 910!, 911!

Distr. gen.: Persia boreo-orientalis, Turcomania, Pamir-Alaj, Tien Shan.

12. ***R. subspicata*** (FREYN & SINT.) BORISS., Fl. URSS. 9: 123 (1939).

Syn.: *Umbilicus subspicatus* FREYN & SINT., Bull. Herb. Boissier 6: 195 (1906). *Cotyledon subspicata* (FREYN & SINT.) O. & B. FEDTSCH., Consp. Fl. Turkest., Beih. Bot. Centrbl. 28, 2: 20 (1911).
Typus: SINTENIS 1071, LE; isotypus LD!

Folia rosularia 3,5—4 × 0,8—1 cm, spathulata, obtusa vel acuta, nonnulla 0,6—2 × 0,2—0,5 cm, sparse ciliata. Caulis florifer erectus, 20—30 cm altus. Inflorescentia elongata, paniculata, minute glanduloso-pubescens; cymae parvae plerumque valde reductae racemiformes. Pedicelli longitudine variabiles, 0,2—2 cm. Flores 6—7 mm longi, 5-meri. Sepala dimidium petalorum aequantia, ovato-lanceolata, acuta, glabra vel minute glanduloso-pubescentia. Petala 6—7 mm longa, oblongo-lanceolata, acuta, in quarta parte inferiore connata, colore in vivo ignoto, in sicco ochroleuco. Squamae quadratae, leviter emarginatae. Carpella corollam aequantia, erecta, longistyla.

Turcomania: Ashkhabad: Suluklu, SINT. 1071!

Distr. gen.: Turcomania, Pamir-Alaj.

This species is without doubt very close to *R. paniculata* (REGEL & SCHMALH.) BERGER. It differs in having a reduced panicle which looks rather like a raceme or spike, a pubescent flowering stem and proportionately longer sepals. Several specimens taken from the type locality of *R. subspicata* show intermediate characters in these respects. The available material is, however, too small for a definite valuation of this taxon. Besides the type locality there exists only A. BORISSOVA's (1939) report about its occurrence in Pamir-Alaj.

13. *R. glabra* (REGEL & WINKLER) BERGER in ENGLER & PRANTL, Natürl. Pflanzenfam. 18a: 466 (1930).

Syn.: *Umbilicus glaber* REGEL & WINKLER, Acta Horti Petrop. 6: 302 (1879). *Cotyledon glabra* (REGEL & WINKLER) O. & B. FEDTSCH., Consp. Fl. Turkest. 3: 70 (1909).

Icon.: Gartenflora: tab. 1019, fig. 1 (1880).

Typus: Turkestania orientalis, A. REGEL, LE.

Tota planta glabra. Folia rosularia 2—3,5 × 0,7—2 cm, spathulata usque elliptica, acuta vel breviter acuminata, interdum obtusiuscula; folia caulina 0,8—2 × 0,4—1 cm, elliptica usque oblonga. Inflorescentia multiflora, late paniculata usque corymbosa. Flores 5-meri. Sepala tertiam partem corollae attingentia, ovato-lanceolata, acuta. Corolla 0,7—1 cm longa, campanulata; petala usque ad dimidium connata, elliptica usque oblonga, acuta, flavescentia usque pallide viridia, apicem versus plerumque purpurascentia. Stamina corollam aequantia vel paulo superantia; antherae flavae. Squamae leviter spathulatae. Carpella 5, etiam matura erecta, oblongo-lanceolata.

Afghanistan: E: Kabul: Sarobi, VOLK 1609!, 1738! Ghorband, VOLK 575! — NE: Badakhshan: Yavarzan, 30 km S Kishm, 1350 m, HDG. & WDB. W-9277! Takhar: 8 Rustak, Darrah-i Ranch, EKB. W-9120!

Distr. gen.: Afghanistan, Pamir-Alaj.

14. *R. adenotricha* (WALL. ex EDGEW.) JANSSON, comb. nov.

Syn.: *Sedum adenotrichum* WALL. ex EDGEW., Trans. Linn. Soc. 20: 48 (1846). *Cotyledon tenuicaulis* AITCH. & HEMSL., Journ. Linn. Soc. Bot. 18: 57 (1880). *C. papillosa* AITCH. & HEMSL., l. c.: 58. *Sedum anoicum* PRAEG., Journ. Bot. 57: 52 (1919).

Icon.: AITCH. & HEMSL. l. c. 19: tab. 10, fig. 1—5 sub *Cotyledon tenuicaulis* (1882).

Distr. gen. speciei: In montibus Afghanistan orientalis, Pakistan occidentalis, Himalayae.

— — subsp. ***adenotricha***

Syn.: *Sedum adenotrichum* WALL. var. *genuinum* RAYMOND-HAMET, Candollea 4: 3 (1929).

Typus: Kumaon, WALLICH cat., B.

Folia rosularia 4—20 × 2—5 mm, spathulata, obtusa, margine laevia; folia caulina rosularibus similia sed minora, 3—9 × 1,5—3 mm. Caulis florifer tenuis, erectus vel inclinatus, leviter glanduloso-pubescens vel glaber. Inflorescentia corymbosa pauciflora. Pedicelli 3—10 mm longi, glanduloso-pubescentes vel glabri. Flores 5-meri. Sepala $^1/_3$ usque $^1/_2$ corollae attingentia, ovato-lanceolata, acuta. Petala usque ad dimidium (vel tertiam partem) connata, alba vel rosea, oblongo-lanceolata, acuta, interdum leviter striata. Stamina $^3/_4$ corollae attingentia; antherae flavae. Squamae latitudine subduplo longiores, aliquantum emarginatae. Carpella stamina aequantia; styli breves sed distincti.

Afghanistan: E: Kabul: Tang-i Gharu, 1570 m, GILLI 1917!, NEUB. 3173!; 1640 m, GILLI 1918! NEUB. 3173! Paghman, 2480—2700 m, GILLI 1919!, HDG. & WDB. 4394! Laghman: Alishang: In parte superiore Darrah Rastyon, 2900 m, EKB. & WDB. W-9651! Panjshir: Gulbahar, 2000 m, KERST. 82! Ruka, 2000 m, KOEIE 2944! Jaji: Ali Khel, AITCH. 538! Inter Dre Kalla et Qasim Khel, RECH. 32336! Sirkei Kotal, 3000 m, HDG. & WDB. W-8902! Khost: Inter Chakmanni et Ahmad Khel, 1850 m, RECH. 35628! Gardez: Safed Kuh: In declivibus occidentalibus jugi Altimur, 2850—3200 m, RECH. 31866!

Nuristan: Pashki, Edelb. 712! Inter Barikot et Kamdesh, 900 m, Gilli 1915! In montibus supra Kamdesh, 2800 m, Gilli 1916! Kushtos, 1800 m, Neub. 4624! Inter Kushtos et Murmur, 1700 m, Neub. 3331! Wama, 1400 m, Kerst.! Nuristan orientalis, Edelb. 1993! Pakistan: Chitral: Shishi Gol E Drosh, 1650 m, Stainton 2383! Mirkhani SW Drosh, 1350 m, Stainton 2287! Tirich Mir: Barum Gol infra Zapotili, 1050 m, Wdb. s. n.! — Swat: Inter Barikot et Mingora, 700—900 m, Rech. 30472!, 30473! Inter Mingora et Khawazakhiela, 850—950 m, Rech. 30512! In valle Jabba E Kolalai, 1600—2200 m, Rech. 30749! — Kohat: Cherat E Peshawar, 700—950 m, Rech. 30241! — Kurram: In valle Zeran, 2000 m, Afendi 115! M. Sikaram, Aitch. 937! In valle Kurram, Aitch 243!

Distr. gen. subspecici: In montibus Afghanistan orientalis, Pakistan occidentalis et Himalayae.

— — subsp. *Viguieri* (Raymond-Hamet) Jansson, stat. nov.

Syn.: *Sedum adenotrichum* Wall. var. *Viguieri* Raymond-Hamet, Candollea 4: 3 (1929). *S. Viguieri* (Raymond-Hamet) Fröderström, Acta Horti Gotob. 6 appendix: 27 (1931).

Icon.: Fröderström, l. c.: fig. 189—198.

Typus subspeciei: S. A. Harris 16154, DD.

Tota planta rosulis foliorum dorso petalorum et carpellis inclusis glanduloso-pubescens; margo foliorum dense ciliatus. Planta valida.

Afghanistan: SE: Orozgan: Inter Tirin et Orozgan, Rech. 35170! — E: Kabul: 2—15 km W Sarobi, 1000—1300 m, Rech. 34406! Prope Sarobi, 1050 m, Gilli 1920!, Volk 2560! Munar Shakrie, Neub. 390/1951! Sebroderakan, Shewaki, 1970 m, Gilli 1923! In declivibus australibus jugi Salang, 3300 m, Rech. 37454! Inter Jabal us-Siraj et Taghma, 1680 m, Gilli 1922! Paghman: In valle Paghman, 2200—2900 m, Neub. 3222!, 510/1950!, Koeie 2292!, Rech. 17108!, Podlech 11588!, Hdg. & Wdb. 4354! Laghman: Alishang: Darrah Atekochakila supra Bangali, 1800 m, Ekb. & Wdb. W-9618! In parte media Darrah Rastyon, 2700 m, Ekb. & Wdb. W-9715! Nangarhar: 5 km W Jalalabad, 750 m, Hdg. & Wdb. W-7481! Panjshir: Mukeni, Hdg. & Wdb. 5289! Ruka, 1000 m, Koeie 2943! Nijrao: Bagrami, Neub. 242/1951! Gardez: M. Safed Kuh, 2600—2700 m, Rech. 31967! Logar, Volk 1737! Nuristan: Wama, 1500 m, Edelb. 957! — C: Bamian: Darreh-i Shikar, 30 km S Doab, 2300 m, Hdg. & Wdb. 3419!, W-9525!; 2000 m, Rech. 36985!

Pakistan: Chitral: Lutko, 2250 m, Bowes Lyon 1098! Mastuj track: Kaghosi, 1500 m, Stainton 2406! Ashret, Harriss 16154!

Distr. gen. subspecici: Endem.

— — subsp. *linearifolia* Jansson, subsp. nov.

Icon.: Tab. 8.

Typus subspeciei: Rechinger 18551, W!

Folia angustissima, manifeste linearia, plerumque quam 1 mm non latiora, minute glanduloso-pubescentia. Sepala dimidium corollae aequantia, interdum longiora. Styli indistincti, stigmata in carpellis sessilia.

Distr. gen. subspeciei: Endem.

Afghanistan: SE: Kandahar: Pirzada, 1000 m, Koeie 2111! — E: Kabul: Sar-i Chashma, 3000 m, 22. VII. 1962, Rech. 18551! Hauz-i Mahiha, 2500 m, Koeie 3079! Panjshir: Gulbahar, Neub. 1950/590!, Gilli 1921! — C: Ghorat: Infra Parjuman, 1850 m, Rech. 19033! Deh Kundi: NE Shahrestan, 2200 m, Rech. 36790!

Auf welche der Unterarten sich die Angaben von Lace und Blatter & Fz.: Pakistan: S. Wazir.: Razmak, 2600 m, Blatt. & Fz. 1801, 1870, Shindar, 3000—3700 m, Fz. 1546 und Baluchistan, Lace, beziehen, läßt sich, ohne die Belege gesehen zu haben, nicht entscheiden.

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elymaiticus (Boiss. & Hausskn.) Bornm. 25
glabra (Regel & Winkler) O. & B. Fedtsch. 29
libanoticus Labill. 22
modesta Bornm. 24
paniculata (Regel & Schmalh.) O. & B. Fedtsch. 28
papillosa Aitch. & Hemsl. 29
Sempervivi M. B. 22
subapicata (Freyn & Sint.) O. & B. Fedtsch. 28
subulata C. A. Mey. 13
tenuicaulis Aitch. & Hemsl. 29
tropaeolifolius (Boiss.) Bornm. 2
Crassula L. 1
alata (Vir.) Berger 1
caespitosa Cav. 16
rubens L. 16
Macrosepalum
turkestanicum Regel & Schmalh. 16
Pseudosedum (Boiss.) Berger 18
acutisepalum Jansson 19
condensatum Boriss. 19
Koelzii Jansson 20
longidentatum Boriss. 18
multicaule (Boiss. & Buhse) Boriss. 20
Rhodiola L. 6
coccinea (Royle) Boriss. 6
heterodonta (Hook. f. & Thoms.) Boriss. 8
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Sect. **Orientalia** Boriss. 27
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elymaitica (Boiss. & Hausskn.) Berger 25
glabra (Regel & Winkler) Berger 29
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paniculata (Regel & Schmalh.) Berger 28
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sempervivoides (Fisch.) Boriss. 27
Sempervivum (M. B.) Berger 22
sessiliflora Jansson 24
subspicata (Freyn & Sint.) Boriss. 28
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Sect. *Eusedum* Boiss. 10
Sect. *Prometheum* Berger 26
Sect. **Rhodiola** (L.) Scopoli 4
Sect. *Seda Genuina* Koch 10
Sect. **Sedum** 10
Sect. *Sempervivoides* Boiss. 26
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adenocalyx Blatter 17
adenotrichum Wall. ex Edgew. 29
var. *genuinum* Raymond-Hamet . 29
var. *Viguieri* Raymond-Hamet .. 30
aetnense Tineo
var. *tetramerum* (Trautv.) Raymond-Hamet 16
album L. 11
annuum L. 17
anoicum Praeg. 29
Bornmülleri Hausskn. ex Bornm. 11
caespitosum (Cav.) DC. 16
callichroum Boiss. 14
coccineum Royle 6
corymbosum Grossh. 17
elymaiticum (Boiss. & Hausskn.) Raymond-Hamet 25
Ewersii Ledeb. 9
glaucum Waldst. & Kit. 14
globulariaefolium (Fenzl) Raymond-Hamet 25
gracile C. A. Mey. 12
heterodontum Hook. f. & Thoms. 8
hispanicum L. 14
Kotschyanum Boiss. 13
lenkoranicum Grossh. 12
lineare Pau & Vicioso 18
nanum Boiss. 15
nuristanicum Kitam. 26
obtusifolium C. A. Mey. 11
Olgae Regel & Schmalh. ex Regel ... 26
oppositifolium Sims 10
pachyclados Aitch. & Hemsl. 9
pallidum M. B. 14
pamiroalaicum (Boriss.) Jansson ... 7
pentapetalum Boriss. 15

pilosum M. B. 27
radicosum M. B. 28
recticaule (Boriss.) Wendelbo 7
rhodanthum Bornm. 11
rubens L. 16
rubrum (L.) Thell. 16
Schlagintweitii Fröderström 26
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Sempervivum Ledeb. 27
var. *genuinum* Raymond-Hamet .. 22
var. *glabrum* Raymond-Hamet ... 23
sexfidum M. B. 14
spurium M. B. 10
Steudelii Boiss. 16
stoloniferum S. G. Gmel. 10
subulatum (C. A. Mey.) Boiss. 13
tenellum M. B. 12
tetramerum Trautv. 16
umbilicoides Regel 26
Viguieri (Raymond-Hamet) Fröderström 30
villosum L.
var. *pentandrum* DC.
subvar. *Kotschyanum* (Boiss.) Raymond-Hamet 13
Sempervivella Stapf 25
acuminata (Decne.) Berger 26
mucronata (Edgew.) Berger 26
Sempervivum L. 3
acuminatum Decne. 26
globiferum L. 4
iranicum Bornm. & Gauba 4
mucronatum Edgew. 26
Tillaea L. 1
alata Vir. 1
rubra L. 16
trichopsila Fenzl ex Boiss. 1
Umbilicus A. DC. 2
Sect. *Pseudosedum* Boiss. 18
Sect. *Rosularia* DC. 21
alpestris Kar. & Kir. 26
elymaiticus Boiss. & Hausskn. 25
gendjnamensis Stapf 2
glaber Regel & Winkler 29
globulariaefolius Fenzl 25
intermedius Boiss. 3
libanoticus (Labill.) DC. 22
var. *glaber* Boiss. 23
var. *Steudelii* Boiss. 22
lineatus Boiss. 22
multicaulis Boiss. & Buhse 20
oligopetalus Boiss. 2
paniculatus Regel & Schmalh. 28
persicus Boiss. 23
platyphyllus Boiss. 28
radiciflorus Steud. 22
Sempervivum (M. B.) DC. 22
subapicatus Freyn & Sint. 28
subulatus Ledeb. 13
tropaeolifolius Boiss. 2

Umbilicus tropaeolifolius Boiss. — Sharif 6052-E

Tab. 4

Pseudosedum Koelzii JANSSON — KOELZ 17406

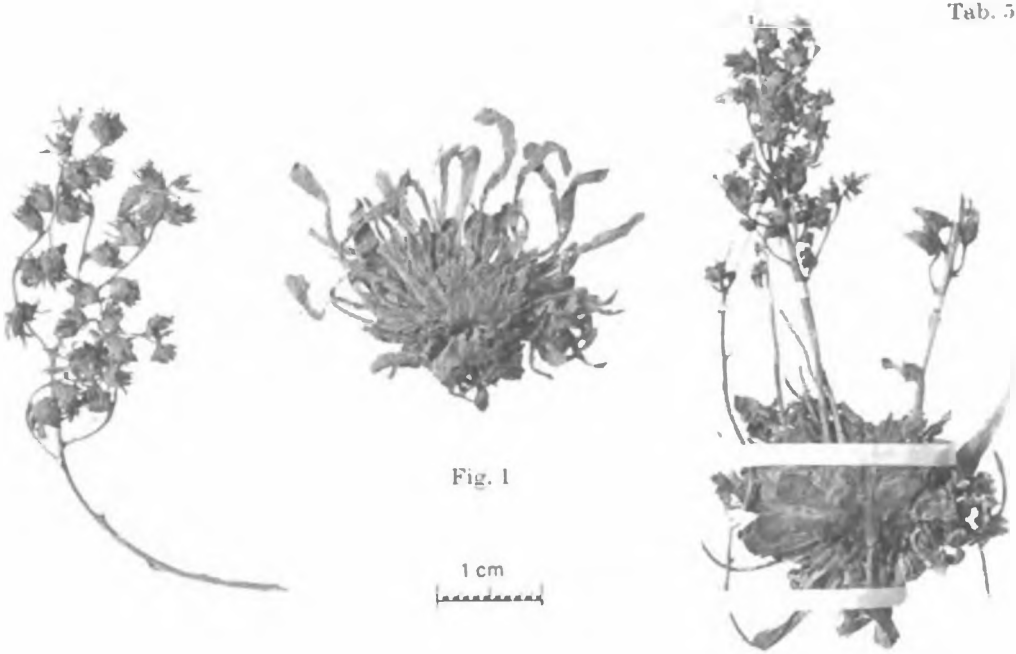

Fig. 1

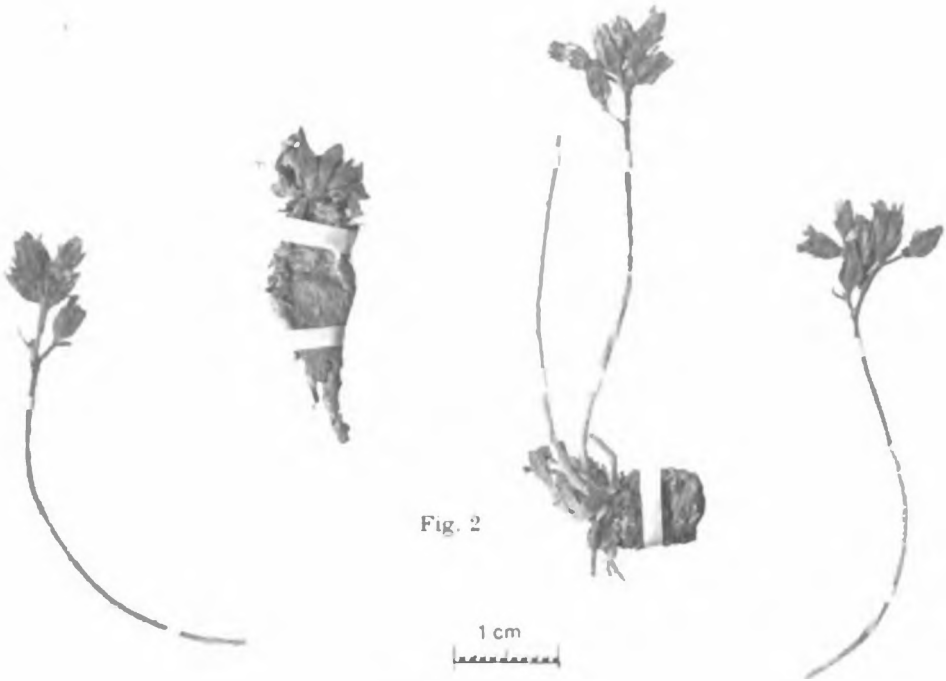

Fig. 2

Fig. 1: *Rosularia sessiliflora* JANSSON — VOLK 2614
Fig. 2: *R. modesta* (BORNM.) JANSSON — RECH. 3841

Rosularia Rechingeri JANSSON — RECH. 11883

Rosularia globularifolia (FENZL) BERGER — KOELZ 17559

Rosularia adenotricha (WALL.) JANSSON subsp. *linearifolia* JANSSON — GILLI 1921

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					
1	Cupressaceae	9	8	136	(8)	(8)
1	Ephedraceae	10	10	138	(10)	(10)
1	Pinaceae	8	9	135	(7)	(9)
1	Taxaceae	7	7	137	(9)	(7)
	ANGIOSPERMAE					
1	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
7	Amaryllidaceae	27	134	128	114	162
1	Ampelidaceae	91	91	32	41	66
3	Anacardiaceae	81	81	46	43	75
	Apiaceae	113	94	54	58	127
	Apocynaceae	125	117	82	75	82
5	Aquifoliaceae	82	86	70	38	58
1	Araceae	22	143	120	122	158
	Araliaceae	112	93	55	59	19
5	Aristolochiaceae	40	35	103	97	96
3	Asclepiadaceae	126	118	74	76	84
	Asparagaceae	26	133	129	116	155.7pp.
8	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
4	Bignoniaceae	137a	108a	76a	85a	86a
8	Boraginaceae	129	104	80	79	142
7	Brassicaceae	60	46	7	16	101
5	Buddleiaceae	123	115	75	77	80
	Burseraceae	75	78	33	36	72
	Butomaceae	17	128	116	124a	145
7	Buxaceae	80	31	105	104a	23
	Caesalpiniaceae	68b	59b	38b	45b	13
	Callitrichaceae	79	32	47	50b	117
3	Campanulaceae	145	125	62	66	130
	Cannabaceae	37	17a	106	105	30
68	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
72	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
69	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
70	Gramineae	19	140	135	127	170
47	Grossulariaceae	64	57	52	47	17
49	Guttiferae	95	55	19	27	54
18	Haloragi(d)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
70	Poaceae	19	140	135	127	170

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson
	Podophyllaceae	54	40	3	13	[illegible]
	Polygalaceae	77	80	12	21	[illegible]
56	Polygonaceae	43	21	94	95	[illegible]
	Portulacaceae	49	28	14	24	[illegible]
	Potamogetonaceae	14	131	117	125a	[illegible]
9	Primulaceae	118	96	66	69	[illegible]
22	Punicaceae	105	65	42	53	[illegible]
	Pyrolaceae	115	98	64	67a	[illegible]
	Rafflesiaceae	41	36	101	96	[illegible]
	Ranunculaceae	53	39	1	11	[illegible]
	Resedaceae	61	47	9	18	[illegible]
	Rhamnaceae	90	90	36	40	[illegible]
	Rhizophoraceae	106	63	41	51	[illegible]
66	Rosaceae	67	58	39	46	[illegible]
	Rubiaceae	140	120	58	62	[illegible]
	Ruppiaceae	14	131	117	125a	[illegible]
	Ruscaceae	26	133	129	116	[illegible]
36	Rutaceae	73	76	28	34	[illegible]
65	Salicaceae	31	14	113	109	[illegible]
37	Salvadoraceae	84	88	72	74	[illegible]
	Santalaceae	38	18	99	102	[illegible]
38	Sapindaceae	88	82	30	42	[illegible]
	Sapotaceae	120	101	68	71	[illegible]
42	Saxifragaceae	64	57	52	47	[illegible]
	Scheuchzeriaceae	–	130	117a	125b	[illegible]
	Scrophulariaceae	133	106	82	82	[illegible]
	Selaginaceae	137	108	85	87	[illegible]
	Simarubaceae	74	77	29	35	[illegible]
	Smilacaceae	26	133	130	116	[illegible]
	Solanaceae	132	105	81	81	[illegible]
59	Sparganiaceae	13	146	123	121a	[illegible]
	Staphyleaceae	85	89	30c	42c	[illegible]
	Sterculiaceae	94	71	21	29	[illegible]
4	Tamaricaceae	98	50	16	25	[illegible]
39	Theligonaceae	111	25	91	105c	[illegible]
63	Therebinthaceae	81	81	46	43	[illegible]
	Thymelaeaceae	102	60	96	99	[illegible]
	Tiliaceae	92	70	22	30	[illegible]
71	Typhaceae	11	147	124	121	[illegible]
	Ulmaceae	35	16	108	105b	[illegible]
	Umbelliferae	113	94	54	58	[illegible]
	Urticaceae	37	17	106	105	[illegible]
11	Vacciniaceae	116	99	63	67	[illegible]
23	Vahliaceae	64	57	52	47	[illegible]
62	Valerianaceae	142	122	59	63	[illegible]
43	Verbenaceae	130	111	86	88	[illegible]
	Violaceae	100	53	11	20	[illegible]
74	Vitaceae	91	91	32	41	[illegible]
	Zannichelliaceae	14	131	117	125a	[illegible]
	Zosteraceae	14	131	117	125a	[illegible]
	Zygophyllaceae	72	75	27	32	[illegible]

Asclepiadaceae

auctore K. H. RECHINGER, Wien

Lfg. Cont. No. 73/30. 1. 1

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

Asclepiadaceae

auctore K. H. Rechinger, Wien

Asclepiadaceae R. Brown, Mem. Wern. Soc. 1: 12 (1810), „*Asclepiadeae*".
Lit.: J. Decaisne, Etudes sur quelques espèces de la famille des Asclépiadées, Annales des Sciences Naturelles 2, Sér. 9: 257–278 et 321–348 (1838). J. Decaisne, Asclepiadeae in De Candolle, Prodromus Systematis Naturalis Regni Vegetabilis 8: 490–665 (1844). E. Boissier, Asclepiadeae in Flora Orientalis 4: 49–64 (1879). J. D. Hooker, Asclepiadeae in Flora of British India 4: 1–78 (1885). K. Schumann, Asclepiadaceae in A. Engler & K. Prantl, Die Natürlichen Pflanzenfamilien IV, 2: 189–306 (1895). E. G. Pobedimova, Asclepiadaceae in Flora URSS. 18: 663–718 (1952).

Herbae erectae vel scandentes vel frutices foliis oppositis integris vel aphylli. Flores radiati, hermaphroditici. Calyx quinquepartitus, persistens. Corolla rotata vel campanulata, laciniis in alabastro plerumque tortis, fauce squamis vel glandulis 5 saepe paracorollam formantibus provisa. Stamina 5, dorso saepe appendice corollina provisa, non raro cum gynoecio in gynostegium connata. Ovaria dua, supera, ad suturam ventralem ovulis numerosis pendulis anatropis. Pollen cohaerens, pollinia cum „translatoribus" stigmatis coalita. Fructus e folliculis duobus compositus. Semina apice comosa, endospermio parco.

1a. Filamenta plerumque libera. Pollinia granulosa 2
b. Filamenta in tubum connata. Pollinia cerina 3
2a. Corollae lobi valvati ..... 2. *Hemidesmus* R. Br.
b. Corollae lobi dextrorsum imbricati ..... 1. *Periploca* L.
3a. Antherae appendice membranacea provisae 4
b. Antherae sine appendice membranacea 13
4a. Pollinia pendula 5
b. Pollinia erecta raro horizontalia numquam pendula 12
5a. Corona corollina ..... 3. *Glossonema* Decne.
b. Corona staminalis 6
6a. Frutex ramis erectis lignosis ..... 5. *Calotropis* R. Br.
b. Caules volubiles vel erecti herbacei 7
7a. Corona simplex 8
b. Corona duplex ..... 13. *Pergularia* L.
8a. Corona quinquelobata 11
b. Corona annularis vel cupularis 9
9a. Plantae foliatae herbaceae vel suffruticosae 10
b. Planta aphylla frutescens repens ..... 8. *Sarcostemma* R. Br.
10a. Corona tubularis, lobis introrsis et extrorsis ..... 6. *Cynanchum* L.
b. Corona non tubularis, ± profunde incisa, lobis porrectis ..... 7. *Vincetoxicum* von Wolf
11a. Corolla usque ad medium divisa ..... 4. *Oxystelma* R. Br.
b. Corolla usque ad basin fere divisa ..... 9. *Pentatropis* Wight & Arn.
12a. Coronae lobi facie interioris partis liberae apicalis processu subulato provisi ..... 13. *Pergularia* L.

b. Coronae lobi sine processu subulato ..... 12. *Marsdenia* R. Br.
13a. Corona duplex, corollina et staminalis. Frutex subaphyllus scoparius ... . 10. *Leptadenia* R. Br.
b. Corona duplex, staminalis. Caules ramique succulenti quadrangulares ... . 11. *Caralluma* R. Br.

1. *Periploca*

Periploca L., Spec. Plant. 211 (1753). Gen. Plant. ed. 5: 100 (1754).
Lit.: K. Browicz, The genus Periploca L. A Monograph, Arboretum Kornickie 11: 5—104 (1966).

Frutices erecti vel scandentes. Inflorescentia cymosa. Corolla rotata saepe barbata vel lanata, laciniis patulis vel reflexis; corona annulum formans. Staminum filamenta distincta; antherae dorso barbatae. Pollinia solitaria a granulis quattuor cohaerentia. Folliculi cylindracei laeves. Stamina comosa.

1a. Rami foliati. Folia 4—8×3—5 cm, ovata, tenuiter membranacea. Cymae in ramulis terminales ..... 1. *P. graeca* L.
b. Fructices subaphylli. Folia inconspicua, valde caduca. Cymae axillares .. 2
2a. Frutex stricte ramosus erectus. Rami non nodosi. Corolla intus atropurpurea ..... 2. *P. aphylla* Decne. in Jacquem.
b. Frutex semiscandens. Rami nodoso-articulati. Corolla aurea .... 3. *P. Hydaspidis* Falconer

1. ***P. graeca*** L., Spec. Plant. 211 (1753).

Icon.: Browicz, l. c. 15, fig. 2; 24, fig. 4 et 5.
Typus: „Syria".

Frutex elatus volubilis. Folia 4—8×3—5 cm, ovata vel ovato-oblonga, obtusa, tenuiter membranacea, glabra, tenuissime reticulato-nervosa, breviter petiolata. Cymae ramulos terminantes laxiflorae. Corolla 20—25 mm diametro, intus purpurea, extus virens; laciniae oblongae retusae, margine barbatae, squamis corollinis basi dilatatis biauriculatis in aristam indivisam abeuntibus. Folliculi 9—12 cm longi, acuminati, subparalleli.

Iraq: Kurd.: Mosul: Zawita, Robertson 56. Prope Amadiyah, Eig & Feinbrunn. Sirsang, 1150 m, Haines 523; 1000 m, Haines s. n.! Mosul, Ky. 285. Arbil: Shaqlawa, 900 m, Gillett 8034, 11581. Kuh Safin prope Shaqlawa, 100 m, Bornm. 1542! Zirva, Gillett 9803, Hajji Omran, 1800 m, Chapman 11921. In jugo Sardarrian, 1000 m, Nab. 141. Sul.: Qara Dagh, Gillett 7919, Eig & Feinbrunn. Sulaymaniyah, Eig & Feinbrun.
Talish: Kisilagach, Hohen. Lenkoran, Hohen. Astara, Hohen. Talish, C. A. Mey.
Persia: N: Gorg.: Ramian, 600 m, Gauba & Sab. Bandar-i Gaz, Sint. 1403. Maz.: 64 km E Chalus, Stutz 1224! Now Shahr, Sab. 12037-E! Ramsar, Gauba 1200! Kojur: Inter Kinch et Dasht Nazir, 800 m, Rech. 6659! In valle Chalus: Inter Aliabad et Zardman, 700 m, Wdb. 1477! Gil.: Inter Rasht et Kaluraz, Cavara. Harsevil prope Manjil, 800 m, Gauba & Sab. Rasht, Bornm., Lipsky. Inter Rasht et Rudbar, Buhse 970. 20 km SE Hashtpar, 10 m, Grant 16433! Lahijan, Mooney 6606!, Linds. 883. Inter Kelishom et Pul-i Ambu, Alexeenko 405. Gilan, in silvis, Auch. 4923! Gilan, Chodzko.

Distr. gen.: Regio Mediterranea orientalis, Anatolia, Syria, Libanon, Palaestina, Iraq, Persia borealis, Caucasus.

2. ***P. aphylla*** Decne. in Jacquem., Voy. Part. Bot. 109, tab. 116 (1844).

Icon.: Browicz, l. c. 55, fig. 18; 57, fig. 19.

Frutex erectus stricte ramosus subaphyllus, succum lacteum continens; ramuli teretes sordide virides elongati, apicem versus attenuati, juveniles canescenti-velutini mox glabrati. Folia minuta, usque ad 6 mm longa, pauca, ovata, mucronulata, canescentia, subsessilia, mox decidua. Cymae secus ramulos in axillis foliorum abortivorum subsessiles, confertiflorae. Calycis hirtuli laciniae ovatae. Flores odorati. Corolla 10—15 mm diametro, intus atropurpurea, extus virescens, lobis reflexis, intus dense barbatis; squamae corollinae trilobo-biauriculatae, lobo intermedio in aristam indivisam abeunte. Folliculi 7—10 cm × 6 mm, teretes, rigidissimi, juventute velutini, mox glabrati, apice attenuati, opposite horizontaliter divergentes. Semina comosa.

Distr. gen. speciei: Transjordania, Iraq, Persia, Afghanistan, Pakistan, India, Arabia, Aegyptus (?), Sinai.

Die Art läßt sich steril von der habituell ähnlichen *Leptadenia pyrotechnica* (FORSSK.) DECNE. im lebenden Zustand durch die dünneren, mehr freudig grünen, glatten Zweige und den Milchsaft unterscheiden.

— — subsp. ***aphylla***.

Typus: „Djillalpur", JACQUEMONT 113, K.

Inflorescentia in ramulis lateralibus brevissimis usque ad 2 cm longis aphyllis vel basi foliis cito deciduis praeditis dispositae, densae et compactae, floribus subsessilibus. Planta plerumque ± pubescens.

Iraq: Diyala: Jabal Hamrin, SUTHERLAND 450! Tursaq, HAINES s. n.! 10 km E Mandali, RECH. 12777!, HAINES 539! Koma Sang, RAWI 20589. — Kut-al Imara: 30 km SE Badrah, RECH. 9132! — Amarah: Shatt at-Tib, 70 km N Amarah, 50—200 m, RECH. 8917!, GUEST 17617!
Persia: W: Khuz.: Inter Cham-e Zeydun et Behbehan, HAUSSKN. 16 km SW Masjed Soleyman, GUEST 25425. 200 km N Ahvaz, STUTZ 1009! "Dez Dam" NE Andimeshk, BENT & WR. 426—301!, WDB. 54! Pazanan, GAUBA & SAB. Lur.: Posht Kuh, Halat-e Mehran, BEHB. 188! — S: Fars.: Borazjan, GAUBA & SAB. Konar Takhteh inter Borazjan et Dalaki, STAPF 276, 277, 343! Inter Kazerun et Dalaki, 100—1000 m, HAUSSKN. Kazerun, HAUSSKN. Inter Bushehr et Shiraz prope Dalaki, KY. 209!, BORNM. 3891! Lar.: Jazireh-ye Hengam, CHEESMAN, WYKEHAM PERRY. Qeshm. BEHB. 572-E! Hormoz, BORNM. 516. Isin, 150 m, KOELZ 14182! Ad Sinum Persicum, AUCH. 4931!, FLOYER. N Bandar Abbas, 500 m, GRANT 15153! 600 km SE Bastak, 400 m, GRANT 16977! Kerm.: Madenu, KOELZ 14234! Makran: Inter Chah Bahar et Tis, GAUBA & SAB. Prope Sarbaz, GADD 79. Pip, MIRD. Biaban: Kuhistak, POPOV GP/51/2! Bal.: M. Karevandar inter Khvash et Iranshahr, 1500—1600 m, RECH. 4027! — E: Khor.: Tabas, SAB. 363!
Afghanistan: SW: Herat: S Herat, 1000 m, KOEIE 2225! — SE: Kandahar: Pirzada, 900 m, KOEIE 2056! — E: Kabul: Prope Sarobi, 1050 m, GILLI 3056!, 3057! Inter Sarobi et Darunta, VOLK 1922/1080! Inter Kabul et Jamrud, J. W. JOHNSTON! Giri, 2600 m, KOELZ 11521! Laghman: In declivibus boreo-orientalibus M. Siah Kuh prope Kaghai-e Laghman, 790 m GILLI 3055! Nangarhar: Inter Chigha Sarai et Kandai, RECH. 32445! Khost: In valle fluvii Shamol prope Domandi, 1550 m, RECH. 35774! Khost, HAGER in RECH. 37782! Nuristan: In valle fluvii Kunar, 900—1000 m, NEUB. 4526! Gusalak, 1000 m, EDELB. 45! Inter Waigel et Nishai, NEUB. 742/1951! Inter Nishai et Ningalam, NEUB. 793/1951! Ad confl. fluv. Rangul et Kulam, 2000 m, THESIGER 1548. — Afghanistan, GRIFF. 3751!
Pakistan: Chitral: Drosh, 1500 m, STAINTON 2251! — Dir: Laram, 2000 m, GATACRE 17327. — Swat: Mingora, 1000 m, S. ALI 26105 — Malakand: In collibus supra Dargai, 400 m, RECH. 19634! — Peshawar: Attock, STEWART. Mardan, 1650 m, RODIN 5510 — Kurram: Hangu, Y. M. KHAN 39! In valle Kurram, LACE. — N. Wazir.: Miram Shah,

Blatt. & Fz., Stewart. Datta Khel, Blatt. & Fz. Shewa Post, Blatt. & Fz. Boya, Blatt. & Fz. Razani, Blatt. & Fz. — S. Wazir.: Barwand, 1330 m, Duthie. Sora Rogha, Fz. Jandola, Fz. Sarwekai, Fz. Dargai, Fz. Wana, Blatt. & Fz. — Dera Ismail Khan: Palosin, Stewart. — Quetta: 8 km W Harnai, 900 m, Lamond 1278! Harnai, Wam Tangi, 1150 m, Lace 3512!, 3614! Loralai, 1500 m, Jafri & Akbar 2280!, Gaz. 358. 20—25 km W Loralai, 1500 m, Lamond 1229! In valle 12 km N Murgha Kibzai, 1600 m, Rech. 29798! Inter Loralai et Sanjawi, 1500—1600 m, Rech. 29440! Kohlu, H.-B. 19424, Duki, R. Holland 236. Bolan, Gaz. 119. In jugo Bolan, H.-B. 19470. Zhob, Gaz. 321. Shahrig, Sibi Gaz. 321. — Kalat: Saruna, Jhalowan, H.-B. 1723. Inter Wad et Bela, 1100—250 m, Rech. 27447! 10 km S Khuzdar versus Wad, 1150 m, Rech. 27414!, Lamond 199! In jugo Burida SSW Kalat, 1400 m, Hotson 158 A bis. Giddar Dhora, 1600 m, Hotson 158. Bela: Las Bela, H.-B. 18709. — Bal.: Chagai, Gaz. Kani, Aitch. 47. Nushki, 1000 m, Crookshank 30. Baluchistan, Stocks. Masson. Makran: Kulanch, H.-B. 18642. Panjgur, H.-B. 18466. In planitie Balgathar inter Hoshab et Panjgur, 600 m, Rech. 28042! In valle fl. Dasht Kaur, 50 m, Popov 87! W Awaran versus Hoshab, Rech. 27677! — Sind: Inter Thano Bula Khan et Kotri, Lamond 814! Sind, Stocks 589. — Karachi, Jafri.

Distr. gen. subspeciei: In tota area speciei.

— — subsp. ***laxiflora*** (Bornm.) Browicz, Arboretum Kornickie 11: 63 (1966).

Syn.: *P. aphylla* Decne. var. *laxiflora* Bornm. ex Drar, Enum. Pl. Collect. at Gebel Elba 10 (1936).

Typus: Oman: In rupestribus ad Maskat, Bornmüller 511, W!

Inflorescentiae in ramulis lateralibus tenuibus elongatis 10 cm longis vel longioribus foliis alternantibus remotis praeditis dispositae, laxae. Planta plerumque ± glabra vel initio tantum ± puberula.

Persia: S: Makran: Tang-e Sorkh, Shar. 577-E! Makran, Predteczenskij 233.

Distr. gen. subspeciei: Transjordania, Persia, Arabia australis, Aegyptus, Sudan.

3. ***P. Hydaspidis*** Falconer, Proc. Linn. Soc. 1: 115 (1841); Annals and Mag. Nat. Hist. 8: 449 (1842).

Icon.: Browicz, l. c. 87, fig. 33.

Typus: „Secus ripas extra Kashmeer prope Kutao Kelah", Falconer 991, K.

Glabra, semiscandens. Rami tenues, fasciculati, nodoso-articulati. Folia 40 × 1—3 mm, caducissima, remota, appressa, tenuiter linearia, subacuta; petioli 1—2 mm longi. Cymae axillares erectae, multiflorae. Flores breviter stricte pedicellati. Calyx membranaceus, glaber, expansus c. 2 mm diametro, laciniis ovatis. Corolla expansa 5—6 mm diametro, aurea, lobis oblongis intus villosis, squamis corollinis subulatis hirsutis.

Pakistan: Swat: Wanglaur, 1150 m, R. R. Stewart 28002. — Swat: Prope Shinak, 1250 m, Aitch. 550 !

Distr. gen.: Pakistan occidentalis, India, Kashmir.

Habituell der *Ephedra ciliata* Fisch. & C. A. Mey. ähnlich, Zweige jedoch zarter.

2. *Hemidesmus*

Hemidesmus R. Br., Mem. Wern. Soc. 1: 56 (1881).

Frutex scandens. Folia opposita. Cymae axillares confertae subsessiles. Calyx 5-partitus, segmentis acuminatis, intus basi glanduliferus. Corolla parva rotata, profunde 5-fida, carnosa; tubus brevissimus; lobi crassi, valvati. Corona

e squamis 5 composita; squamae breves, crassae, cum corollae lobis alternantes. Filamenta libera vel basi subconnata; antherae parvae, apice cohaerentes, membrana inflexa terminatae. Pollinia per paria cohaerentia. Stylus pentagonus, apice applanatus. Folliculi longi, tenues, teretes, laeves.

1. ***H. indicus*** (L.) R. BR., Mem. Wern. Soc. 1: 57 (1811).

Syn.: *Periploca indica* L., Spec. Plant. 211 (1753).
Icon.: DELESSERT, Icon. Plant. 5: 55 (1846).
Typus: „Hab. in Zeylona".

Caules numerosi, tenues, glabri vel pubescentes, ad nodos incrassati. Folia 5—10×0,8—4 cm, valde variabilia, elliptico-oblonga usque lineari-lanceolata, apiculata, glabra, supra atroviridia, saepe albo-variegata, subtus pallidiora, reticulato-nervosa, breviter petiolata. Pedicelli breves, copiose bracteati. Calyx c. 2,5 mm longus, extus glaber, lobis ovatis acutis membranaceo-ciliolatis. Corolla 5—6,5 mm longa, extus virescens, intus purpurea; lobi ovato-oblongi, acuminati. Folliculi 10—15×6,5 mm, cylindrici, in apicem acutum attenuati, subrecti. Semina applanata, nigra, comosa.

Pakistan: N. Wazir.: Spinwam Fort, 900—1000 m, BLATT. & FZ. 714. — Kalat: Manguli, 800 m, HOTSON 245.

Distr. gen.: Pakistan, India, Ceylon.

3. *Glossonema*

Glossonema DECNE., Ann. Scienc. Nat. Ser. 2, 9: 335 tab. 12 (1838).

Herbae humiles canescentes pubescentes ramosae. Folia ovata. Cymae confertae. Calyx quinquepartitus. Corolla expansa quinquepartita. Corona staminea petaloidea, simplex, profunde quinqueloba, gynostegium aequans. Antherae membrana rotundata terminatae. Pollinia clavata pendula. Stigma obtuse conicum, subbilobum. Folliculi utrinque acuminati, laxe verrucoso-spinosi.

1. ***G. varians*** (STOCKS) BENTH., Gen. Pl. 2: 748 (1876).

Syn.: *Mastigostigma varians* STOCKS, Hook. Icon. Pl. 9: tab. 863 (1852).
Typus: Baluchistan, STOCKS, K.

Herba perennis pluricaulis ramosa, 8—20 cm alta, omnino pilis brevibus appressis canescens; caulis rami foliaque in vivo carnosi. Folia usque ad 4×3 cm, ovato-elliptica, petiolata, apice breviter acuminata, margine crispata, nervis lateralibus vix visibilibus. Cymae in axillis foliorum superiorum sessiles, 3—8-florae. Pedicelli calycem subaequantes. Calycis pubescentis laciniae lineares, acutae, c. 2 mm longae. Corolla 7—8 mm diametro, glabra, in vivo aurantiaca, lobis oblongis. Folliculi usque ad 40×12 mm, medio incrassati, utrinque acuminati, laxe verrucosi, appresse canescenti-pilosi. Semina comosa.

Persia: S Lar.: Bandar Khamir, Ab-e Garm, SOLTANI 6394-E! Insula Qeshm, BEHB. 573-E! Bal.: Tang-e Sorkh, SHAR. 576-E!, 314-E! Persia austro-orientalis maritima, AUCH. 4927.

Pakistan: N.-Wazir.: Dosalli Fort, BLATT. & FZ. Razani, BLATT. & FZ. — S. Wazir.: Razmak, BLATT. & FZ. Razmak Narai, BLATT. & FZ. — Dera Ismail Khan: M. Sulaiman, in faucibus calc. Dhana Sar, 60—80 km E Fort Sandeman, 1750—1900 m, RECH. 30132!, LAMOND 1496! — Quetta: Gumbaz, RECH. 29656! Kohlu, H.-B. 19428. Infra Mach, 600—800 m, RECH. 18767!, LAMOND 876! — Kalat: Jhalowan, H.-B. 19839. Khuzdar,

1400 m, Hotson 350. Sitani, 1750 m, Hotson 126, 129. — Makran: Mand-i Parag, Hotson M 274. Gar, Hotson M 274-A. 60 km S Panjgur versus Hoshab, 800 m, Rech. 28070!, Lamond 545! Makran, Palmer — Bal.: Ornach, 1000 m, Hotson 143-B. Baluchistan, Stocks — Karachi: Drigh Road, Jafri s. n.! Hawkes Bay, Jafri 2601!

Distr. gen.: India, Pakistan, Persia australis.

Die Angabe „annua" bei Boissier, Fl. Or. 4: 51 (1875) und bei Jafri, Fl. Karachi 250 (1966) ist falsch.

Species incomplete nota

G. Haussknechtii Bornm., Beih. Bot. Centrbl. 61 B: 80 (1942).

Typus: Insula Kishm, Bornmüller s. n.

Wuchs niedergestreckt. Blätter gegenständig, kreisrund, in den c. 1 cm langen Blattstiel plötzlich verschmälert, von angepreßten Haaren grau schimmernd, undeutlich gezähnelt, 2—2,5 cm im Durchmesser. Blüten purpurrot, einzeln oder zu zweien in den Blattachseln. Frucht unbekannt.

4. *Oxystelma*

Oxystelma R. Br., Mem. Wern. Soc. 1: 40 (1811).

Herbae perennes vel frutices scandentes glabrae. Folia opposita. Calyx parvus, quinquepartitus, intus glandulosus. Corolla speciosa rotata, tubo brevi fauce annulo papilloso instructa, limbo patulo usque ad medium diviso; lobi deltoidei, acuti, ciliati; corona staminea 5-lobata, lobis acutis gynostegium exsertum superantibus. Stamina ad basin corollae tubi inserta, filamentis brevibus connatis; antherae erectae, inflexo-apiculatae. Pollinia clavato-compressa, pendula. Stigma muticum. Folliculi saepe solitarii. Semina comosa.

1. ***O. esculentum*** (L. fil.) R. Br., Mem. Wern. Soc. 1: 40 (1811).

Syn.: *Periploca esculenta* L. fil., Suppl. 168 (1781).

Typus: „Habitat intra spinetas ad littora fluminum Zeylanae et Malabariae", Konig.

Caulis tenuissimus, scandens, usque ad 1 m longus. Planta subglabra. Folia 5—10 × 0,5—1 cm, linearia vel anguste lineari-lanceolata, basi cuneata, apicem versus attenuata et subapiculata, membranacea, tenuiter multinervia, nervis intra marginem anastomosantibus; folia summa angustissime linearia. Cymae longe pedunculatae, axillares, 2—8-florae, laxae. Pedicelli tenues, flexuosi, quam flores longiores. Calyx brevis, laciniis acute triangularibus. Corolla expansa 18—23 mm diametro, rosea, purpureo-venosa, ciliata. Folliculi 5—7,5 cm longi, oblongi vel ovoidei, inflati, membranacei, glabri.

Pakistan: Peshawar: Gullozai ad fl. Kabul, Burtt 1035! — Kalat: Gajar, 1150 m, Hotson 230. Korak (Pelar), 600 m, Hotson 230-B. Karachi, Jafri.

Distr. gen.: Iraq, Pakistan, India, Indonesia.

Species incomplete nota

O. Alpini Decne. in DC., Prodr. 8: 543 (1844).

Pakistan: Kalat: Korak (Pelar), 630 m, Hotson 230-A.

5. *Calotropis*

Calotropis R. Br., Mem. Wern. Soc. 1: 39 (1809).

Frutices vel arbusculae cortice suberoso, succum acridum lacteum continentes. Folia carnosa opposita, subsessilia, magna. Inflorescentia cymoso-subumbellata, axillaris. Calyx usque ad basin partitus, sepalis intus glandulosis. Corolla hemisphaerica late ovata, tubo brevi angulato angulis introrsum saccatis, limbo in lobos 5 latos fisso; corona staminea e foliolis lateraliter compressis 5 gynostegio verticaliter adnatis inferne gibbosis constans. Antherae membrana latiuscule terminatae. Pollinia compressa cultriformia apice attenuato affixa. Stigma late pentagonum. Folliculi ventricosi, herbacei.

1 a. Lobi coronae angusti, quam columna staminalis breviores, infra apicem integrum obtuse auriculati ..... 2. *C. gigantea* R. BR.
b. Lobi coronae lati, columnam staminalem aequantes vel superantes, infra apicem bifidum non auriculati ..... 1. *C. procera* (WILLD.) R. BR.

1. ***C. procera*** (WILLD.) R. BR. in AITON, Hort. Kew. ed. 2: 78 (1811).

Syn.: *Asclepias procera* WILLD., Spec. Plant. 1: 1263 (1797). *Calotropis persica* GAND., Bull. Soc. Bot. Fr. 65: 59 (1918).

Typus: „Habitat in Persia".

Frutex copiose crasse ramosus, trunco ramisque tortuosis, juvenilis albotomentellis demum glabrescentibus. Folia usque as 15×11 cm, basi ± cordata vel rotundata subsessilia, in vivo crasse carnosa, in sicco crasse membranacea, plana, integerrima, juvenilia pubescentia, adulta glabrata, apice late rotundata vel breviter acuminata. Calyx usque ad basin in sepala acuta glabra divisus, nervis lateralibus utrinque ± 5. Corolla 2—2,5 cm diametro, alba et purpureo-violacea, lobis patulis margine subrevolutis. Corona c. 6 mm longa, gynostegium depressum aequans, lobis bifidis infra apicem non auriculatis. Folliculi 7,5—10 cm longi et lati, ellipsoidei vel ovoidei, plerumque ± recurvi, polyspermi.

Persia: W: Lur.: Andimeshk, BENT & WR. 426—201! Khuz.: Prope Dalaki et Shush, HAUSSKN. Inter Shush et Dehloran, NAB. Shushtar, NAB. Dezful, NAB. — S: Fars.: Borazjan, KOEIE 902. Inter Borazjan et Dalaki, STAPF 344! Inter Bushehr et Kazerun, 100 m, GRANT 15115! Kumaraj, BORNM. 507. Kerm.: Prope Khabis, BGE. Lar.: Ad Sinum Persicum, AUCH. 4932. Bandar Abbas, BORNM. 507-b. Baghu prope Bandar Abbas, GABRIEL 7! Isin, 165 m, KOELZ 14166! Hajjiabad prope Tarom, RECH. 3283! SE Lar, 500 m, GRANT 15150! Makran: Sindirk, Sarneh, GABRIEL 50! Chah Bahar, GAUBA 1201! Iranshahr, SHAR. 575-E! Inter Nikshahr et Chah Bahar, SHAR. 571-E! Nikshahr, HOTSON. Konar Bast W Kuhak, 1200 m, HOTSON. Bam Posht N fluv. Mashkel, HOTSON.

Afghanistan: E: Khost, in collibus saxosis, 1200 m, RECH. 35529! Nangarhar: Inter Sarobi et Jalalabad, 800 m, RECH. 19350! Jalalabad, KOELZ 11387! Inter Sarobi et Darunta, VOLK 1903! Nuristan: Inter Asmar et Barikot, 900 m, EDELB. 1612! In valle Kunar prope Chigha Sarai, 820 m, GILLI 3062! Inter Chigha Sarai et Kandai, RECH. 32420! — Afghanistan, GRIFF.

Pakistan: Kurram: Inter Thal et Badishkhel infra 1000 m, AITCH. 485. N. Wazir.: Miram Shah, FZ. Dwa Warkha, STEWART — S. Wazir.: Khirgi, STEWART. — Quetta: Sibi, 100 m, LACE 4096! — Dera Ismail Khan: M. Sulaiman, 100 km E Fort Sandeman, 700—900 m, RECH. 29995! — Bal.: Bela: Ad fl. Hab, H.-B. 18415. Inter Sonmiani et Uthal, RECH. 27560!, LAMOND 265! Kalat: 10 km S Khuzdar, RECH. 27404! — Sind: 10—15 km S Sehwan, LAMOND 851! — Karachi: Hawkes Bay, BURTT 1564! Malir, PODLECH 10064!

Distr. gen.: Asia austro-occidentalis, Africa subtropica et tropica.

2. ***C. gigantea*** R. BR. in AITON, Hort. Kew. ed. 2, 2: 78 (1811).

Icon.: Bot. Mag. 112: tab. 6862 (1886).

Typus: „Nat. of the East Indies".

Frutex elatus usque ad 3 m altus, cortice albido-flavescente; rami validi, juveniles appresse lanato-puberuli. Folia 10—20×6,5—10 cm, elliptico- vel obovato-oblonga, basi cordata, apice acuta, glauca, in vivo crasse carnosa, in sicco coriacea, juvenilia appresse puberula. Calyx usque ad basin in sepala ovata acuta lanata divisus. Corolla c. 2—3 cm diametro, lobis 1,3—1,5 cm longis. Corona c. 1,3 cm longa, quam gynostegium brevior, apice rotundata, infra apicem breviter biauriculata. Folliculi 9—10 cm longi, crassi, carnosi, virides, polyspermi.

Pakistan: Quetta: Qila Saifullah, Zhob Gaz. Fort Sandeman, Zhob Gaz. 25, 326. Sibi, Gaz. 329. Ad fl. Bolan, Gaz. 120. Loralai, Gaz. 28, 367. — Makran, Gaz. 340.

Distr. gen.: Pakistan, India, Malaya, Sina australis.

6. *Cynanchum*

Cynanchum L., Spec. Plant. 212 (1753). Gen. Plant. ed. 5: 104 (1754).

Herbae perennes volubiles. Folia cordata. Corolla rotata profunde quinquepartita. Corona staminea tubuloso-campanulata, gynostegium includens, laciniis 10, exterioribus 5 longioribus, interioribus 5 exterioribus oppositis brevioribus. Antherae apice membranaceae. Pollinis massae ovatae pendulae divergentes. Stigma pentagonum bituberculatum. Folliculi laeves, abortu saepius solitarii.

1. ***C. acutum*** L., Spec. Plant. 212 (1753).

Caulis herbaceus volubilis inferne glabriusculus, superne puberulus. Folia petiolata, cordata, forma et magnitudine valde variabiles. Cymae axillares pedunculatae. Calyx 1,5—2 mm longus, laciniis triangularibus. Corolla ± 9 mm diametro, rosea rarius alba, laciniis oblongis obtusiusculis. Folliculi 6—16 cm longi, angusti, glabri.

Talish: Lenkoran, Hohen. Kisilagach, Hohen. Astara, Hohen. Insula Sara, C. A. Mey. Persia borealis, Hausskn. — W: Azerb.: Rezaiyeh, Knapp. Tabriz, Gill.-Sm. Esf.: Esfahan, 1600 m, Deicke 78. Arak: Kuh Kohrud, Str. In montibus prope Tafresh, Str. Lur.: Shah Bazan, Koeie 352 — E: Khorasan, Bge. — C: Tehr.: Inter Ab-i Garb et Aliabad, Bruns. Qazv.: Alangeh, Gauba 562-a. Karaj, Gauba 762. Ravandeh, Gauba 762-B.

Pakistan: Kalat: Bhani, SSW Kalat, 1330 m, Hotson 207. Gajar, 1150 m, Hotson 229. — Makran: Panjgur, 1000 m, Hotson M 232 B.

Distr. gen. speciei: Regio Mediterranea Europae, Africae et Asiae, Asia austro-occidentalis et centralis, Sibiria occidentalis.

— — subsp. ***acutum***.

Typus: „Sicilia, Hispania, Astracan".

Folia usque ad 9×7 cm, late ovato-cordata, latitudine plerumque (1—) 1,5 (—2)-plo longiora, sinu basali angusto, lobis basalibus vix divergentibus, a lamina vix separatis. Coronae appendices saepius elongatae lanceolatae, raro breviter linguiformes. Folliculi 6—14 cm longi.

Talish: Lenkoran, Matveeva 761!

Persia: N: Gorg.: Gorgan, Koelz 16159! Bandar-i Gaz, Sint. 1405! Maz.: In valle fluvii Haraz: Gaznak, 1600 m, Wdb. 1438! In jugo Lar inter Amol et Gaznak, 1000 m, Rees 115! Persia borealis, Szov.! — W: Azerb.: M. Qareh Dagh, Buhse 747! Esf.: Gav Khuni, Stapf 346! — C: Qazv.: Prope Karaj, Rech. 6698! Kuh Hazarband, 2300 m,

DAVIS 848-K! Vardeh, Kuh Dashteh, 1600 m, RECH. 789! M. Halkedar prope Mardabad, 1300 m, RECH. 1043! — Shurab, HAUSSKN. s. n.!
Afghanistan: E: Nuristan: In valle Basgul, 1240 m, KERST. 1405!

Distr. gen. subspeciei: Regio Mediterranea, Asia austro-occidentalis usque ad Persiam borealem et Turcomaniam.

— — subsp. ***sibiricum*** (WILLD.) RECH. f., stat nov.

Syn.: *C. sibiricum* WILLD., Ges. Naturf. Freunde Berlin Neue Schr. 2: 124 (1779), nec al. *C. longifolium* DECNE. in DC., Prodr. 8: 547 (1844), non MART. *C. acutum* L. var. *longifolium* LEDEB., Fl. Ross. 3: 48 (1846).
Typus: Sibiria.

Folia usque ad 10×3 cm sed plerumque multo angustiora, lamina ± anguste lineari, basi lobis a lamina bene separatis oblongis usque suborbiculatis valde divergentibus provisa, sinu basali lato aperto. Coronae appendices ± breves linguiformes vel (rarius ?) longiores lanceolatae. Folliculi 12.5—16 cm longi.

Iraq: Mosul: Prope Mosul, KY. 444!

Persia: W: Ham.: Borujerd, STR.! Prope Hamadan, HAUSSKN.! Arak: Kuh Kohrud, STR. — S: Bal.: Prope Sangan in M. Taftan, 1600 m, RECH. 4055! — E: Sistan: Zabol, 600 m, RECH. 4105! — C: Tehr.: In valle Hableh Rud supra Bonehkuh, MANUCH. 6569-E!

Turcomania: Firyuza, SINT. s. n.! Jakoblewka, SINT. s. n.! Suluklü, SINT. 1703!

Afghanistan: N: Akcha, NEUB. 1950/145! — NW: Maimana: Prope Maimana, NEUB. 4235! Herat: In valle fluvii Hari Rud, AITCH. 423!, 725! — SW: Herat: Kuh Davandar prope Karokh, LINDB. 629! In valle fluvii Hari Rud infra Chisht, 1500 m, RECH. 19208! — SE: Kandahar: Inter Kandahar et Kalat-i Ghilzai, 600 m, RECH. 19280! In valle fluvii Helmand inter Qala Bist et Darweshan, 700—800 m, RECH. 34543! Pirzada, 900 m, KOEIE 2106! Ad margines deserti Registan prope Baghat, 600 m, RECH. 34655! — E: Kabul: Bagrami, NEUB. 1951/281! Nangarhar: Jalalabad, NEUB. 1951/840! Nuristan: In valle Alingar, 2000 m, THESIGER 1691! — NE: Munjan: Parwara, 2800 m, KOELZ 12810! Kataghan: Takhar: Khost-o Fereng, in faucibus fl. Chal, 1500 m, PODLECH 11965! In valle fluvii Kunduz inter Doshi et Doab, 800—1300 m, RECH. 16590! In valle S Tashkurghan, NEUB. 1950/245! — C: Doab: Doab, 1400—1500 m, LINDB. 759/1959!, KOELZ 13515!, KOEIE 2869!, VOLK 522!, GILLI 3061!

Pakistan: Chitral: Yarkhun, 2650 m, BOWES LYON 82! Inter Chapalli et Brep, 2500 m, STAMM & WÖHRL 273! Bang Gol N Mastuj, 2600 m, STAINTON 3065!

Distr. gen. subspeciei: Sibiria occidentalis, Asia centralis, et austro-occidentalis usque ad Persiam et Iraq.

Die Unterscheidung zwischen *C. acutum* und *C. sibiricum* ist bei extremen Formen leicht, aber vor allem dadurch erschwert, daß die Blütenmerkmale nicht fix mit den Blattmerkmalen korreliert sind. In der Blattform bildet das eine, dem *C. acutum* entsprechende Extrem eine Reihe von Exemplaren aus dem nördlichen Persien, bei denen die Blätter breit dreieckig-herzförmig und kaum oder nur wenig länger als breit sind, z. B. RECH. 789, 6698, WDB. 1438, Blätter 9×7 cm, Basalzipfel ca. 3×3 cm, weniger ausgeprägt DAVIS 848-K aber auch aus Chitral z. B. KERSTAN 1405. Das andere Extrem wird gebildet durch RECH. 34655, Blätter 5—6×0,2—0,3 cm, Basalzipfel abstehend, bis 0,5—0,2 cm. Dazwischen gibt es alle Übergänge, so etwa die verschiedenen von SINTENIS gesammelten Belege aus Turkmenien, auch GILLI 3061 aus Zentral-Afghanistan. Die breitblättrigen Formen mit wenig differenzierten Basallappen herrschen im Mittelmeergebiet und in den klimatisch weniger kontinentalen Gebieten Westasiens, z. B. in West-Persien und im Elburz vor, die schmalblättrigen in Zentralasien und im Süden des Flora-Iranica-Gebietes. Unter diesen Umständen erscheint mir eine Bewertung als Unterarten den Tatsachen am besten gerecht zu werden. Immerhin wäre es lohnend, durch Kulturversuche

festzustellen, ob und in wie weit die Merkmale der beiden Sippen durch Standortseinflüsse modifiziert werden.

7. *Vincetoxicum*

Vincetoxicum von Wolf, Gen. Plant. 130 (1776); Moench, Meth. 327 (1794), non Walt. (1788).

Syn.: *Cynanchum* auct. p. p. non L., Spec. Plant. 212 (1753). Gen. Plant. ed. 5: 104 (1754). *Alexitoxicum* St. Lager, Ann. Soc. Bot. Lyon 7: 67 (1880). *Antitoxicum* Pobedimova, Not. Syst. Leningrad 15: 208 (1953).

Lit.: O. Schwarz, Nomenklatorische Notizen, Feddes Repertorium 47: 288 (1939). S. G. Pobedimova in Flora URSS. 18: 663—718 (1952). H. P. Fuchs, Zur Nomenklatur der Gattung Vincetoxicum F. C. Medikus non Th. Walter, Verh. Naturf. Ges. Basel 72: 243—349 (1961). S. G. Pobedimova, Taxon 11: 173—174 (1962). R. Ross, The generic names published by N. M. von Wolf, Acta Bot. Neerl. 15: 147—161 (1966). A. A. Bullock, Kew Bulletin 21: 351—352 (1967).

Herbae perennes, erectae. Folia ovato-lanceolata. Flores in cymas axillares dispositi. Corolla infundibuliformis, quinquefida, fauce lobulis 5 vel 10 carnosis provisa. Antherae poris dehiscentes. Folliculi laeves.

1a. Corolla intus omnino glabra ..... 1. *V. funebre* Boiss. & Ky.
b. Corolla intus pubescens 2
2a. Corolla aut ab initio atropurpurea aut lurida exsiccatione fuscescens 3
b. Corolla viridis, flava, lutescens vel rosea 5
3a. Folia consistentia tenuia, nervatura distincta, pennato-reticulata; folia inferiora quidem longiuscule petiolata .. 2. *V. scandens* Sommier & Levier
b. Folia consistentia ± crassa, nervatura crassa saepe ± indistincta, non pennato-reticulata; folia omnia breviter petiolata 4
4a. Folia omnia latitudine 1—1,5-plo, superiora ad summum duplo longiora, inferiora et media basi cordata, apice ± abrupte acuminata .... 3. *V. pumilum* Decne.
b. Folia infima brevia, media et superiora latitudine ad minimum triplo longiora, omnia basi attenuata, apicem versus sensim angustata .... 4. *V. Arnottianum* (Wight) Wight
5a. Cymae longissime pedunculatae, pedunculo folio suffulcrante aequilongo vel longiore. Folia basi latissima leviter cordata, etiam folia summa petiolo laminae latitudinem aequante suffulta 7
b. Cymae subsessiles vel inferiores breviter pedunculatae, pedunculo folio suffulcrante semper multo breviore. Folia supra basin latissima, basi rotundata vel attenuata, petiolo laminae latitudine breviore suffulta 6
6a Planta humilis 10—15 cm alta. Caulis gracilis. Folia latitudine 1,5—3-plo longiora ..... 6. *V. cardiostephanum* (Rech. f.) Rech. f.
b. Planta elatior, plerumque ultra 25 cm alta. Caulis validus. Folia latitudine 3—5 (—7)-plo longiora ..... 5. *V. glaucum* (Wall.) Rech. f.
7a. Planta glabra. Coronae lobi acuminati, subauriculati, introrsum lingula acutiuscula erecta aucti ..... 8. *V. Jacquemontianum* (Decne.) Rech. f.
b. Planta indumento brevi canescens. Coronae lobi crassi, obtusi .... 7. *V. petrense* (Hemsl. & Lace) Rech. f.

1. ***V. funebre*** Boiss. & Ky. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 11: 79 (1849).

Syn.: *Cynanchum funebre* (Boiss. & Ky.) Kusn., Fl. Cauc. Crit. 4, 1: 461 (1905).

Antitoxicum funebre (BOISS. & KY.) POBEDIMOVA, Fl. URSS. 18: 691 (1952). *Alexitoxicum funebre* (BOISS. & KY.) POBEDIMOVA, Not. Syst. Leningrad 15: 691 (1953). *Vincetoxicum medium* DECNE. in DC., Prodr. 8: 523 (1844) p. p., quoad pl. orient.
Icon.: Tab. 1.
Typus: KOTSCHY 359, W!

Pluricaule, caulibus 40—60 cm altis, crassiusculis, saepe simplicibus erectis, in summa parte floriferis subbifariam pilosulis. Folia 6×5 cm, brevissime crassiuscule petiolata, ovato- vel orbiculato-cordata, apice acuminata, subtus secus nervos et marginem pubescentia, superiora quam inferiora proportione paulo vel vix angustiora, omnia breviter petiolata. Cymae axillares longiuscule pedunculatae, ± confertae. Pedicelli 1—2 (—3) mm longi, ± puberuli. Calyx c. 2,5 mm longus, laciniis triangulari-acutis. Corolla c. 7 mm diametro, atropurpurea, omnino glabra, laciniis triangularibus apice rotundatis. Corona staminea gynostegio subaequilonga, usque ad medium in lobos quinque triangulari-deltoideos crassiusculos fissa. Folliculi usque ad 6×1,5 cm glabri, laeves, a medio apicem versus attenuati.

Persia: N: Gorg.: Ziarat, BGE. Maz.: Pol-e Zanguleh, 2400 m, GAUBA 1624. Zardman, SHAR. 6567-E! In valle Haraz: Inter Haraz et Panjab, 1400 m, WDB. 679! — W: Azerb.: M. Qareh Dagh: Hasan Beyglu, KNAPP. — E: Khor.: Kuh-i Tabadkan versus vallem fluvii Hari Rud, CZERNJAK. M. Hazar Masjed, CZERNJAK. Inter Chandyr vallem Sumbar, BORISS. — C: Tehr.: Polur, BRUNS. Prope Garmabdar, 2400 m, BORNM. 7627. Inter Gach Sar et Chalus, SCHMID 5732! M. Damavand prope Reneh, 2000—2300 m, GAUBA 1198!, GILLI s. n.! In fauce Nasserou prope Garm Ab, 3050 m, KY. 359!

Distr. gen.: Persia, Transcaucasia, Caucasus.

2. ***V. scandens*** SOMMIER & LEVIER, Acta Horti Petrop. 12: 158 (1892).

Syn.: *Cynanchum scandens* (SOMMIER & LEVIER) KUSN., Fl. Cauc. Crit. 4, 1: 446 (1905). *Antitoxicum scandens* (SOMMIER & LEVIER) POBEDIMOVA, Fl. URSS. 18: 680 (1952). *Alexitoxicum scandens* (SOMMIER & LEVIER) POBEDIMOVA, Taxon 11: 174 (1962).
Icon.: Tab. 2.
Typus: Syntypi plures e Caucaso occidentali, SOMMIER & LEVIER.

Perenne. Caulis saepe usque ultra 1 m altus, internodiis elongatis laxe foliatus, imprimis in parte superiore tenuis, ± flexuosus, interdum ± volubilis. Caulis foliaque valde glabrescentes usque subglabri. Folia omnia consistentia tenuissima herbacea, nervatura tenui sed distincte pennato-reticulata; inferiora usque ad 10×5 (—6) cm, basi rotundata, apice acuta vel acuminata, media et superiora sensim paulo breviora sed proportione multo angustiora, latitudine 3—4-plo longiora, longe sensim attenuata; petiolus foliorum inferiorum 1—1,5 cm longus, superiorem sensim brevior. Cymae longiuscule tenuiter pedunculatae, laxiusculae, superiores quoque pauciflorae. Pedicelli tenuiter filiformes flexuosi, flore (1,5) 2—3 (—4)-plo longiores, puberuli ± glabrescentes. Calyx ± 1,5 mm longus, laciniis ± anguste lanceolato-triangularibus acutis. Corolla 6 (—8) mm diametro, atropurpurea, laciniis oblongo- vel lanceolato-triangularibus ± sensim acuminatis intus puberulis. Corona staminea profunde in lobos circulares fissa. Folliculi submaturi usque ad 8×1 cm, longe sensim attenuati.

Talish: Lenkoran, C. A. MEY. Swant, 1300 m, C. A. MEY., HOHEN. In montibus Talish BUHSE.
Persia: N: Gorg.: In silva Golestan, 650 m, MOONEY 6517! Inter Robat-e Qozloq et

Gorgan, 300—1600 m, Schmid 6011! Inter Gorgan et Ziarat, Gauba 1199! Khairat, 1000 m, Koelz 16588! Gorgan, Shar. 365! Maz.: In valle Haraz: Karehsang, 100 m, Wdb. 546!, 1519! In valle Chalus: 1300 m, Stutz 1157! Prope Pol-e Zanguleh, Rech. 6620!; 2300 m, Bornm. 1747. Dasht Nazir, 1000 m, Gauba s. n.! Neiriz Bastam, Sab. 154! Gil.: Navrud, Tregubov 163!, Steiner 18!, Esfand. 6566-E! Inter Lahijan et Qazvin, Alexeenko 216. — W: Azerb.: Kaleybar, Mird. Asbine, Mird. s. n.! — C: Tehr.: In declivibus australibus M. Damavand, Pol-e Chab, 1800 m, Bornm. 1765. Qazv.: In valle fluvii Karaj prope Varian, 1700 m, Rech. 520!

Distr. gen.: Rossia europaea austro-orientalis, Tauria, Persia borealis, Talish, Caucasus.

3. ***V. pumilum*** Decne. in DC., Prodr. 8: 525 (1844).

Syn.: *Cynanchum pumilum* (Decne.) Bornm., Englers Bot. Jahrb. 46: 234 (1934). *Antitoxicum pumilum* (Decne.) Pobedimova, Fl. URSS. 18: 692 (1952). *Alexitoxicum pumilum* (Decne.) Pobedimova, Taxon 11: 174 (1962).
Icon.: Tab. 3 et 4.
Typus: "Secus flumen 'Rezil' (recte Kizil) Ouzen", Michaux, Aucher Eloy 1508, P.

Perenne. Caules plures, 20—40 cm alti, erecti vel ascendentes, validiusculi, simplices, raro pauciramosi. Caules foliaque valde glabrescentes. Folia (2—) 3—5×2—4 cm, ovato-cordata, inferiora et media latitudine paulo longiora, basi cordata, apice breviter acuminata, superiora latitudine c. sesquilongiora, basi rotundata, apice longius acuminata, consistentia crassiuscula, sicca opaca, nervatura sat indistincta, omnia breviter crassiuscule petiolata. Cymae sessiles vel subsessiles, densiusculae. Pedicelli floribus vix longiores, sparse papilloso-puberuli. Calyx c. 1,5 mm longus, laciniis lanceolatis puberulis acutiusculis. Corolla c. 8 mm diametro, lurida; laciniae oblongae obtusiusculae, intus albo-puberulae. Corona fere ad basin usque in lobos 5 oblongos obtusos partita. Folliculi 4—6×1—2 cm.

Persia: N: Gorg.: Gonbad-e Kavus, Shah Pasand, Shar. 6568-E! Gil.: Ad fl. Qezel Owzan, Michaux, Auch. 1508. — E: Khor.: Kopet Dagh: Supra Quchan, 1700 m, Rech. 644 [1]), Czern. Inter Quchan et Alam Ali, 1600 m, Rech. 4773! Inter Robati-Safid et Torbat-e Heydariyeh, Rech. 1570 [1])! In montibus serpentinicis inter Torbat-e Heydar-i yeh et Assadabad, Rech. 4403! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4650 [1])! Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 5017! Kotal-e yek Chenar, Koelz 16701 [1])! — C: Shahr.-Bust.: In jugo Khash Aylan, 70 km E Shahrud, 2000—2200 m, Rech. 5482! Prope Shahrud, Bge.
Turcomania: Ashkhabad, Suluklü, Sint. 944 [1])! In angustiis Karanki, Litw. 1663! Kulkulab, Sint. 823 [1])! Kizyl Arvat, Sint. 944-c [1])! Kopet Dagh, Baba Zoy, Kult. s. n. [1])! Gaudan, Litw. 1662!

Distr. gen.: Endem.

4. ***V. Arnottianum*** (Wight) Wight, Icones Pl. Ind. Or. tab. 1614 (1850).

Syn. *Cynanchum Arnottianum* Wight, Contrib. 58 (1834).
Icon.: Tab. 5.
Typus: "In itinere ad Cashmere", Royle.

Perenne, pluricaule, caulibus 30—50(—60) cm altis, crassiusculis, saepe jam infra medium floriferis, erectis, interdum subflexuosis, simplicibus vel pauciramosis. Tota planta breviter canescenti-pubescens, ± glabrescens, in sicco flavescenti- vel

[1]) Fruchtexemplare, Bestimmung etwas zweifelhaft.

olivaceo-viridis. Folia 3—5 × 0,8—1,5(—2) cm, inferiora ovato-oblonga, superiora oblonga-lanceolata, basi breviter apice longius attenuata, brevissime petiolata. Cymae densiusculae subglobosae sessiles. Pedicelli 2—4 mm longi, puberuli. Calyx c. 2 mm longus, puberulus, laciniis triangularibus acutis. Corolla ± 5 mm diametro, atropurpurea, laciniis oblongis obtusiusculis, intus albo-pubescentibus. Corona staminea gynostegio subaequilonga, profunde in lobos quinque oblongos obtusos inter se subdistantes divisa. Folliculi 5—6 × ± 1 cm, juniores parce pubescentes demum glabrati, basi subinflati, apicem versus sensim acuminati.

Pakistan: Quetta: Fort Sandeman, coll. ign. 20589! 30 km a Fort Sandeman versus Murgha Kibzai, in planitie arenoso-lapidosa, 1500 m, LAMOND 1440! 12 km N Murgha Kibzai, 1600 m, RECH. 29803! — Kalat: 24 km S Surab, RECH. 27383! Surab, 1900 m, HOTSON 102, M 373-A. Benn Chah, 3050 m, HOTSON M 373-A bis. 10 km S Khuzdar, RECH. 27410! Makran: Panjgur, in alveo arenoso, POPOV 199! Bijban Chah, 1250 m, HOTSON M 316. Bal.: In montibus, STOCKS.

Distr. gen.: Pakistan occidentalis, Montes Himalaya occidentalis, Kashmir.

5. ***V. glaucum*** (WALL. in WIGHT) RECH. f., comb. nov.

Syn.: *Cynanchum glaucum* WALL. in WIGHT, Contrib. 58 (1834). *C. cabulicum* BORNM., Bot. Jahrb. 66: 233 (1934).
Icon.: Tab. 6.
Typus (Syntypi) "Ad Simla, Dalhousie, in itinere ad Cashmere", ROYLE.

Perenne, ima basi induratum, pluricaule. Caules (20—)30—60 cm alti, plerumque simplices, validi, erecti vel ascendentes, a medio vel a tertia parte inferiore floriferi. Tota planta minute puberula ± glabrescens. Folia consistentia crassiuscula, in vivo ± nitidula, in sicco opaca, flavescenti-viridia, nervatura interdum subindistincta, breviter petiolata; inferiora e basi leviter cordata late ovato-acuminata, 4—7 × 3—5 cm, superiora sensim breviora et proportione angustiora, basi rotundata usque cuneata, apice longe sensim attenuata. Cymae inferiores quidem pedunculatae, superiores sessiles, laxiusculae usque densiusculae. Pedicelli quam flores ± duplo longiores, pubescens. Calyx c. 1,5 mm longus, puberulus, laciniis oblongo- usque triangulari-lanceolatis acutis. Corolla c. 6 mm diametro, viridis, interdum brunnescens, intus puberula. Corona staminea lobis 5 obtusis ± concavis gynostegio sublongioribus. Folliculi 5—6 × 1—1,5 cm, apicem versus sensim longe attenuati.

Persia: E: Khorasan, BGE.

Afghanistan: SW: Herat: Jija, 1500 m, KOEIE 4433! — E: Kabul: Paghman, 2100—2800 m, NEUB. 1950/765!, KOELZ 12076!, KOEIE 2302!, RECH. 17141!, GILLI 3059!, PODLECH 11591! Prope Kabul, 1800—1900 m, RECH. 16986!, 31044!, HDG. & WDB. 2707!, 4300!, KERST. 424!, GILLI 3058!, VOLK 957!, HONIGBERGER s. n.! Babur, 1800 m, MANGER. Farza, 1850 m, HDG. & WDB. 3283! Gulbahar, NEUB. 1950/764!, VOLK 230! In valle Nijrao: Supra Shekhan, in regione *Pinis Gerardianae*, 2750 m, GILLI 3060! Ghazni: In jugo Sardalu, inter Qarabagh et Sang-i Masha, 2600 m, RECH. 17373! Nuristan: Gusalak, 1000 m, EDELB. 2190!, 2194! Shtive, 2800 m, EDELB. 1050! — Afghanistan, GRIFF. 3760!

Pakistan: Chitral: Ziwar Gul, 3300 m, BOWES LYON 1041! Reshun, inter Chitral et Mastuj, 2000 m, STAINTON 2448! — Kurram: Biaut Khel, Kaiwas, 2650 m, AITCH. Prope Hariab, AITCH. 582. — S. Wazir.: Tank, WILLIAMS 9202!

Distr. gen.: Afghanistan, Pakistan occidentalis, montes Himalaya occidentales, Tibet occidentalis.

Über die Variabilität der Art und ihr Verhältnis zu *C. canescens* (Willd) Decne. vergleiche man Rechinger, Dan. Biol. Skr. 10,3: 79 (1958).

6. ***V. cardiostephanum*** (Rech. f.) Rech. f., comb. nov.

Syn.: *Cynanchum cardiostephanum* Rech. f., Anz. Math.-Nat. Kl. Österr. Akad. Wiss. 105: 241 (1968).
Icon.: Tab. 7.
Typus: Rech. 35614, W!

Perenne, pluricaule, glabrum. Caulis humilis, 10—15 cm altus, erectus, tenuis, simplex, multifoliatus. Folia 20—50 × 7—10 mm, supra basin latissima, apicem acutissimam versus sensim attenuata, pallide viridia, petiolo laminae latitudine plerumque multo breviore. Cymae pauciflorae, sessiles. Pedicelli inaequilongi, (1—)2—4(—6) mm longi, tenues, rigidi, glabri, deflexi. Calyx c. 2,5 mm longus, laciniis anguste lanceolatis, acutis, minutissime ciliolatis. Corolla ineunte anthesi c. 4 mm longa, pallide viridis, usque ad medium in lobos apice rotundatos divisa, lobis intus glabris, tubo intus in parte superiore puberulo; corona staminea gynostegio paulo longior, lobis cordato-truncatis profunde emarginatis, incisionibus inferne cordato-dilatatis separatis. Folliculi seminaque ignoti.

Afghanistan: E: Jaji: In declivibus borealibus jugi Narai Kotal versus Chakmani, in apertis quercetorum (*Qu. Baloot*), substr. serpentin., 2100 m, 4. VI. 1967, Rech. 35614!

Distr. gen.: Endem.

7. ***V. petrense*** (Hemsl. & Lace) Rech. f., comb. nov.

Syn.: *Cynanchum petrense* Hemsl. & Lace, Journ. Linn. Soc. Bot. 28: 326 (1891).
C. humile sensu Aitch., Journ. Linn. Soc. Bot. 18: 79 (1881), non Falconer.
Icon.: Tab. 8, fig. 1.
Typus (Syntypi): Stocks 920, W!; Aitchison 44; Lace 3825, E!

Suffrutescens, pluricaule; caules (8—)10—22 cm alti, flexuosi, ascendentes, pallidi, albido-pubescentes, prope basin ramosi. Folia 10—20(—25) × (3—)5—10 mm, basi truncata vel subcordata ibique latissima, apicem versus sensim longe attenuata, canescenti-viridia, subtus vix pallidiora, ± laxe albido-puberula, longe petiolata, petiolo folii latitudinem subaequante. Cymae longissime tenuiter pedunculatae, pedunculo usque ad 4 cm longo. Pedicelli 2—7 mm longi, inaequales, tenues, puberuli. Calycis laciniae 2 (—2,5) mm longae, quam corolla evidenter breviores, triangulari-lanceolatae. Corolla c. 6 mm diametro, crassiuscula, laciniis late ovato-triangularibus, intus puberulis, pallidius marginatis; coronae lobi columnam superantes, crassi, obtusissimi, lateribus retroflexis, intus obtuse ligulati. Fructus ignotus.

Pakistan: Kurram: Shinak, Aitch. 44! — Quetta: Pil Hills, 3300 m, Lace 3825! — "Upper Baluchistan", Stocks 920!

Distr. gen.: Endem.

8. ***V. Jacquemontianum*** (Decne. in Jacquem.) Rech. f., comb. nov.

Syn.: *Cynanchum Jacquemontium* Decne., Ann. Scienc. Nat. Ser. 2, 9: 334 (1838) et in Jacquem., Voy. Bot. 106, tab. 112 (1844). *Endotropis Jacquemontis* Decne. in DC., Prodr. 8: 547 (1844).
Icon.: Tab. 8, fig. 2.

Typus: "Inter Ramouh et Choupinna", Jacquemont, P.

Suffrutescens, pluricaule, 20—30(—40) cm altum; caules herbacei, ± flaccidi, imprimis inferne ramosi, ramis erectis, elongatis, in parte superiore tenuissimi, ± volubiles; tota planta sparse puberula, ± complete glabrescens. Folia (20—) 40—60 × 7—15(—20) mm, basi cordata, ibique latissima, apicem versus sensim longe attenuata, in sicco tenuiter membranacea opace viridia, subtus pallidiora, longe petiolata, petiolo folii latitudinem circiter aequante. Cymae longissime tenuiter pedunculatae, pedunculo usque ad 7 cm longo. Pedicelli 4—10 mm longi, tenues, inaequales. Calycis primum vix 2 mm longi laciniae lanceolatae acutae. Corolla expansa 6—8 mm diametro, laciniis triangulari-oblongis, obtusiusculis, pubescentibus et ciliolatis. Corona staminea laciniis acuminatis subauriculatis, introrsum lingula acutiuscula erecta aucta. Folliculi non visi.

Afghanistan: E: Nuristan: Kantivo, 2300 m, Edelb. 727!
Pakistan: Swat: Bahrain, 1650 m, R. R. Stewart 27792!

Distr. gen.: Afghanistan, montes Himalaya occidentales, Kashmir.

8. *Sarcostemma*

Sarcostemma R. Br., Mem. Wern. Soc. 1: 50 (1811).

Frutex ramis ± scandentibus articulatis carnosis, ramulis pendulis. Flores umbellati, umbellis sessilibus parvis; corolla rotata, profunde divisa. Corona duplex staminalis, exterior annularis vel cupularis, saepe pentagonalis, truncata vel breviter lobata, interior e lobis quinque erectis carnosis compressis vel carinatis consistens, basi corona exteriore cincta. Columna staminalis e basi corollae orta; pollinia evoluta. Folliculi laeves. Semina comosa.

1. ***S. Stocksii*** Hook. f., Fl. Brit. Ind. 4: 27 (1883).

Typus: "Scind", Stocks.

Frutex ramis usque ad 6 mm crassis, carnosis, articulatis, glabris. Umbellae terminales, pauciflorae. Folliculi 5—7,5 cm longi, recti, tenues, late divaricati, saepe horizontaliter patentes.

Pakistan: Karachi: Drigh Road, Jafri — Sind, Stocks.

Distr. gen.: Sind.

9. *Pentatropis* √

Pentatropis Wight & Arn. in Wight, Contrib. 52 (1834).

Herbae perennes volubiles. Folia opposita carnosa. Calyx quinquepartitus. Inflorescentia umbellato-cymosa. Corolla profunde quinquepartita, laciniis longe attenuatis patulis demum reflexis. Corona staminea duplex, exterior ad denticulos 5 lobis interioribus oppositos interdum ± evanescentes reducta; interior e lobis 5 gynostegio verticaliter adnatis superne liberis basi calcaratis subhorizontaliter patentibus consistens. Antherae membrana terminatae. Pollinia ovoidea pendula. Stigma planum apiculatum. Folliculi ovato-oblongi, laeves. Semina longe comosa.

1 a. Corollae lobi in caudas longas lineares excurrentes ..... 1. *P. spiralis* (Forssk.) Decne.
b. Corollae lobi lanceolato-deltoidei, nec caudati ..... 2. *P. microphylla* (Roxb.) Wight & Arn.

1. ***P. spiralis*** (Forssk.) Decne., Ann. Scienc. Nat. Ser. 2, 9: 327, tab. 11 (1838).

Syn.: *Asclepias spiralis* Forssk., Fl. Aegypt.-Arab. 49 (1775). *P. cynanchoides* R. Br. in Salt., Abyss. App. 64 (1814).

Typus: "Arabia felix: Ad viam inter Djaliae et Meneisa".

Ramosissima, ramis tenuibus intricatis, ramulis juvenilibus appresse pilosis exceptis glabra. Folia 20—40 × 7—10 mm, oblonga vel anguste elliptica, basi rotundata, apice mucronulata, carnosula, canescenti-viridia, nervatura inconspicua, breviter petiolata. Cymae pauciflorae axillares. Pedicelli capillares flore longiores. Calyx brevissimus, laciniis breviter subulatis recurvis. Corolla c. 12 mm diametro, virescens, laciniis longissime attenuatis; gynostegium breviter stipitatum; coronae lobi acuminati. Folliculi 5—7,5 × 1 cm, in rostrum attenuati, glabri.

Persia: S: Lar.: Isin, Koelz 14218! Makran: Tang-e Sorkh, Shar. 758-E! Nikshahr, Shar. 759-E! Biaban: Bemuni, Behb. 748-E!

Pakistan: Kurram: Inter Thal et Badishkhel, Aitch. 608. — N. Wazir.: Spinwam, Blatt. & Fz. — Quetta: Sibi, 100 m, Lace s. n.! — Kalat: 20—25 km E Jhal Jhao versus Awaran, 400 m, Rech. 27672! — Bela: Hab Chauki versus Sonmiani, Rech. 28589! — Makran: Kuldan, 800 m, Hotson M 232. Chambor. 600—730 m, Hotson M 232-A. Makran, Palmer. Karachi: Cape Monze, Rech. 27532! Malir, Jafri 2452. Karachi, Volk K-174!

Distr. gen.: Afghanistan, Pakistan, India, Arabia, Africa tropica.

2. ***P. microphylla*** (Roxb.) Wight & Arn. in Wight, Contrib. 52 (1834) [1]).

Typus: Loco non indicato, Roxburgh.

Caules ramique tenuissimi. Folia 13—26 × 10—20 mm, late oblonga vel ovato-elliptica, obtusa, mucronata, basi rotundata vel cordata; petioli breves. Cymae laterales pauciflorae, breviter pedunculatae. Pedicelli filiformes, 10—15 mm longi. Calyx profunde divisus, laciniis lanceolatis acutis. Corolla 10—14 mm diametro, lobis 5 mm longis lanceolato-deltoideis, acutis; coronae lobi triangulares, gynostegium subaequantes. Folliculi 40—65 mm longi, sensim longe attenuati, glabri.

Pakistan: N.-Wazir.: In regionibus inferioribus, Stewart.

Distr. gen.: Pakistan, India, Ceylon.

10. *Leptadenia*

Leptadenia R. Br., Mem. Wern. Soc. 1: 34 (1811).

Frutex crebre ramosus subaphyllus. Cymae laterales. Calyx brevis 5-partitus. Corolla parva rotata 5-partita, tubo brevissimo, laciniis tomentosis marginibus revolutis. Corona duplex, corollina e lobis 5 carnosis apice barbatis, staminea ex annulo undulato carnoso basin columnae staminalis cingente consistens. Antherae apici styli incumbentes, appendicibus terminalibus nullis. Pollinia erecta apice pellucida. Folliculi laeves, saepe abortu solitarii. Semina comosa.

1. ***L. pyrotechnica*** (Forssk.) Decne., Ann. Scienc. Nat. Ser. 2, 9: 262 (1838).

Syn.: *Cynanchum pyrotechnicum* Forssk., Fl. Aegypt.-Arab. 53 (1775). *Leptadenia Spartium* Wight, Contrib. 48 (1834).

Icon.: Engler & Drude, Veget. Erde 9, 1: tab. 31 (1910).

Typus: "Arabia".

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[1]) Richtigstellung der Nomenklatur siehe S. 21.

Frutex scoparius ramulisque longe virgatis strictis teretibus juvenilibus puberulis. Folia valde caduca, ± linearia, 25—50 × 3 mm, sessilia. Cymae breviter pedunculatae, pedunculis post florendum incrassatis recurvatis. Corolla flavescens. Folliculi 8—11 cm × 6 mm, fusiformes laeves rostrati penduli.

Persia: W: Lur.: Posht Kuh, Nab. 125. Shah Bazan, 400—500 m, Koeie 290. — S: Fars.: Kuh-e Khormuj, Nab. 126. Lar.: Ad jugum Gohreh inter Hajjiabad et Bandar Abbas, 700 m, Rech. 3463! Ad Sinum Persicum, Auch. 4930! Makran: Iranshahr, Manuch. 6620-E!
Pakistan: Quetta: Sibi, Lace 4099! — N. Wazir.: Boya, Blatt. & Fz. Miram Shah, Blatt. & Fz. Spinwam Fort, Blatt. & Fz. — Kalat: Inter Wad et Bela, Rech. 27419! Kalgali Kaur, 1780 m, Hotson M 351. — Bela: Hinidan, H.-B. 18466. Inter Sonmiani et Uthal, Rech. 27539!, Lamond 260! Makran, Palmer. — Sind: 20 km SW Thano Bula Khan, Rech. 28637!, Lamond 804! — Karachi, Volk K 176!, Clifton, Jafri 1410!

Distr. gen.: Persia, Pakistan, India, Arabia, Aegyptus, Africa tropica.

Rech. 3463 und Auch. 4930 fallen durch einen weißlichen Wachsüberzug der Zweige und Früchte auf.

L. pyrotechnica unterscheidet sich in sterilem Zustand von der habituell ähnlichen *Periploca aphylla* Decne. durch dünnere, glatte, meist lebhafter gelblichgrüne Zweige.

11. *Caralluma*

Caralluma R. Br., Mem. Wern. Soc. 1: 25 (1811).

Herbae perennes subaphyllae caulibus succulentis, ramulis tetragonis angulis dentatis facie *Stapeliae*. Flores fasciculati. Corolla rotata vel late campanulata; corona staminalis duplex, exterior cupularis vel annularis, basi dorso loborum coronae interioris adnata vel ei partitionibus angustis connexa, 5-loba, lobis bicuspidatis; lobi coronae interioribus dorso antherarum incumbens; columna staminalis brevis. Antherae exappendiculatae. Pollinia erecta supra basin affixa. Stigma muticum. Folliculi anguste fusiformes, lineari-teretes vel trigoni, laeves. Semina comosa.

1. ***C. edulis*** (Edgew.) Benth., Gen. Plant. 2: 782 (1876).

Syn.: *Boucerosia edulis* Edgew., Journ. Linn. Soc. Bot. 6: 205, tab. 1 (1862). *B. Stocksiana* Boiss., Fl. Or. 4: 63 (1875). ?*B. Aucheriana* Decne. in DC., Prodr. 8: 649 (1844).
Typus: Stocks 533, K.

Perennis, 7—15(—40) cm alta, pluricaulis, erecta vel ascendens, cinereo-virens, plerumque ramosa, ramis subteretibus vel obtuse tetragonis; folia 6—12 mm longa, linearia vel ovoideo-lanceolata, carnosa, valde caduca. Flores 1—4-ni conferti, c. 6 mm longi; corolla usque ad medium fissa, intus glabra, purpurea, laciniis lanceolatis acutiusculis glabris.

Persia: S: Makran: Miandar in declivibus borealibus Kuh-e Bam Posht, Hotson.
Afghanistan: E: Nangarhar: Jalalabad, 650 m, Gilli 3063! — Nuristan: In valle fluvii Kunar inter Chigha Sarai et Barikot, 800 m, Gilli 3064!
Pakistan: Malakand: Dargai, 400 m, Rech. 19619-b! — Kohat: In jugo Kohat, 700—900 m, Rech. 30145! — Kurram: Inter Thal et Kurram usque ad 1300 m, Aitch. 492. — N. Wazir.: Inter Chota Darweshta et Miram Shah, 900—1050 m, Blatt. & Fz. — S. Wazir.: Inter Jandola et Wana, Fz. — Dera Ismail Khan: Palosin, Stewart. — Quetta: Qila Saifullah, H.-B. 19154, Loralai, H.-B. 19621, Gaz. 28. Musa Khel, Duki, Barkhan, Bari Hills, Gaz. 364. In faucibus Torkhan supra Harnai, 900 m, Rech. 29459!, 29494!

Shahrig, H.-B. 23085. Fort Sandeman, Zhob Gaz. 324. Bolan, Gaz. 121. Kohlu, Sibi Gaz. 327. — Kalat: Manguli, 1850 m, Hotson M 30-A, 30-B. Gajar, 1100 m, Hotson M 231. — Bela: Las Bela, H.-B. 19891. — Makran: Kulanch, H.-B. 18630. In collibus SE Panjgur, 900 m, Hotson M 30. — Karachi, sec. Cooke.

Distr. gen.: Persia, Afghanistan, Pakistan, India, Arabia.

12. *Marsdenia*

Marsdenia R. Br., Mem. Wern. Soc. 1: 29 (1811).
Lit.: K. Browicz, Genus Cionura Grisebach — distribution, history, and application, Arboretum Kornickie 12: 5—32 (1967).

Herba suffrutescens. Cymae axillares et terminales. Calyx quinquepartitus. Corolla quinquepartita laciniis patulis. Corona staminea e squamulis 5 liberis lineari-oblongis composita. Antherae membrana terminatae, rima dehiscentes. Stigma longe rostratum, bifidum, gynostegium longe superans. Pollinia ovata, erecta, minima. Folliculi laeves.

1. ***M. erecta*** (L.) R. Br., Mem. Wern. Soc. 1: 31 (1811).

Syn.: *Cynanchum erectum* L., Spec. Plant. 213 (1753). *Cionura erecta* (L.) Griseb., Spicil. Fl. Rumel. 2: 69 (1844).
Icon.: Browicz, l c.: 9, fig. 2; 11, fig. 3.
Typus: Syria.

Perennis, suffrutescens, pluricaulis, glabra. Caulis 40—60 cm altus, erectus, superne interdum subvolubilis, simplex, foliatus. Folia late cordata, usque ad 4×5 cm, apice acuminata, longe petiolata. Cymae pedunculatae, multiflorae, axillares et terminales. Calyx 3 mm longus, laciniis anguste ovatis pallide marginatis. Corolla alba, glabra, laciniis linearibus obtusis, c. 8×2 mm. Folliculi c. 7×2 cm, oblongi, apicem versus sensim attenuati.

Iraq: Kurd.: Mosul: In valle Shaykhan, 1000 m, Rawi 24872. Zinta Chula, 700 m, Chapman 26133. Arbil: In valle Berd Agha Gin, 115 m, Rawi 28712. Diana, 700 m, Guest 15871. Gali Ali Beg, Rawi 24252, Haines s. n.! In faucibus Bekma, 500 m, Gillett 8257. In faucibus prope Rawandiz, 600—800 m, Rech. 11262!, Thesiger 835!, Guest 499, 2876, 13609. In jugo Sardarrian inter Arbil et Rawandiz, 1000 m, Nab. 138. Mergasur, Haines s. n. Hajji Omran, 1500—1800 m, Chapman 11934, Rawi 26832.
Persia: W: Lur.: Dow Rud, Koelz 18162! Inter Khorramabad et Andimeshk, Bent & Wr. 507—301! Shah Bazan, Koeie 901. Sheshom, 800—1000 m, Jacobs 6796! Safid Dasht, Sab. 304!, 12038-E! Bakht.: Chashmehghirin, Koelz 15283! Gatvand, Mart.-Escal. Esf.: Esfahan, Auch. 4929, Deicke, Khuz.: Supra Behbehan, 1650 m, Hausskn. 60 km NE Dezful, 500 m, Koeie 901. Prope Dezful, Loftus. — S: Fars.: Kotal-e Dokhtar prope Kazerun, Stapf, Bobek 39! Daryacheh-ye Famur, 1100 m, Merton 3802. Inter Bushehr et Shiraz, 1800 m, Bornm. 3892. 18 km E Kazerun versus Bushehr, 100—700 m, Grant 15118! Shapur, Belanger.
Afghanistan: SW: Jija: Inter Jija et Khush, 900 m, Koeie 3901!

Distr. gen.: Regio Mediterranea orientalis, Asia austro-occidentalis. — Tab. geogr. Browicz, l. c. 17, fig. 4.

13. *Pergularia*

Pergularia L., Mantissa 1: 53 (1767).
Syn.: *Daemia* R. Br., Mem. Wern. Soc. 1: 50 (1809).
Lit.: N. E. Brown, The genus Pergularia, Kew Bulletin 1907: 323 (1907).

Frutices vel suffrutices superne vel omnino volubiles. Folia plerumque opposita, cordata. Cymae axillares subcorymbosae. Pedicelli filiformes inaequilongi. Corolla breviter infundibuliformis, tubo brevi, lobis late ovatis patulis. Corona staminea duplex, exterior brevis annuliformis sinuato-10-lobata, interior 5-lobata, lobis inferne liberis calcaratis, superne in acumen subulatum inflexum attenuatis. Pollinia compressa attenuata, pendula. Stigma muticum. Folliculi reflexi, plerumque spinis mollibus obsiti. Semina comosa.

1a. Rami juniores tantum ± scandentes. Tota planta pilis appressis canescens. Folia 1,5—3 cm longa et lata ..... 1. *P. tomentosa* L.
b. Rami omnes alte scandentes. Planta viridis ± parce pilosa. Folia plurima majora 2
2a. Folia lobis basalibus incurvis, sese ± tegentibus. Cymae longe pedunculatae ..... 2. *P. Daemia* (FORSSK.) BLATT. & McCANN
b. Folia lobis basalibus brevibus rotundatis, sese numquam tegentibus. Cymae breviter pedunculatae ..... 3. *P. pallida* WIGHT & ARN.

1. ***P. tomentosa*** L., Mantissa 1: 53 (1767).

Syn.: *Daemia tomentosa* (L.) POMEL, Mat. Fl. Atl. 82 (1860). *D. cordata* (FORSSK.) R. BR., Mem. Wern. Soc. 1: 50 (1809). *Asclepias cordata* FORSSK., Fl. Aegypt.-Arab. 49 (1775). *Daemia incana* DECNE., Ann. Scienc. Nat. Ser. 2, 9: 336 (1838).
Icon.: LAMARCK, Illustr. 1: tab. 176 (1797).
Typus: Arabia, FORSSKAL.

Suffrutex vel frutex, omnino pilis brevibus appressis canescens. Folia 1,5 ad 3 cm longa et lata, cordata, sinu basali aperto, apice breviter acuminata, longe petiolata. Cymae pluriflorae, pedunculo ± 3 cm longo florifero tenui, fructifero incrassato suffultae. Pedicelli filiformes, flore pluries longiores. Corolla 5—6 mm diametro, albido-flava purpurascens. Corona duplex. Folliculi 5×1,5 cm, reflexi, paralleli, e basi crassa in rostrum curvatum attenuati, molliter spinosi, pilis brevissimis canescentes. Semina c. 6×3 mm, margine inferiore inciso-crenata, coma c. 2 cm longa.

Persia: W: Khuz.: Prope Behbehan, HAUSSKN. — S: Fars.: Inter Kumaraj et Dalaki, HAUSSKN.! Hawize ad radices M. Khormuj, NAB. 147. Inter Dalaki et Kazerun, 800 m, KOEIE 30. Kuh-e Jebal Barez, Sabzvaran, 900 m, RECH. 3727! Lar.: Ad Sinum Persicum, AUCH. 4928! Ins. Hormoz, BORNM. 503! Parabedin inter Bandar Abbas et Kerman, MIRD. Lar, 1000 m, GAUBA & SAB. Inter Bandar Abbas et Sar Khun, BEHB. 576-E! Kerm.: 19 km SW Nosratabad Sipi RECH. 27185!, LAMOND 106! Bal.: Inter Khash et Iranshahr, 1500—1600 m, RECH. 4017! Makran: Tang-e Sorkh, SHAR. 578-E! — E: Sistan: Safidabeh, GAUBA & SAB. 60 km S Safidabeh inter Zabol et Nehbandan, 1000 m, RECH. 4134!

Afghanistan: SE: Kandahar: Pirzada, 900 m, KOEIE 2057! Kandahar, VOLK K-175!, KOELZ 13227! 80 km W Kandahar versus Girishk, 1100 m, RECH. 34832!

Pakistan: Kalat: Bhani SSW Kalat, 1330 m, HOTSON 208. Makran: Kulanch, H.-B. 18629. In declivibus borealibus jugi Hodal S Panjgur, 700—830 m, HOTSON M 223. S Parpuki Khaur SW Panjgur, 1130 m, HOTSON M 198. Panjgur, 900 m, POPOV 166. Jiwani, 30 m, POPOV 64! S Chambor, 600—730 m, HOTSON M 263. In jugo Baril inter Pirandar et Nundara, 730 m, HOTSON 266. 10—30 km SW Turbat versus Gwadar, 100—200 m, RECH. 27789!, LAMOND 415! Makran, PALMER. — Baluchistan, STOCKS s. n.! — Karachi, JAFRI.

Distr. gen.: Persia australis, Afghanistan, Pakistan, Arabia, Africa borealis.

2. ***P. Daemia*** (Forssk.) Blatt. & McCann, Journ. Bomb. Nat. Hist. Soc. 36: 528 (1933).

Syn.: *Asclepias Daemia* Forssk., Fl. Aegypt.-Arab. 51 (1775). *Cynanchum cordifolium* Retz., Obs. Bot. 2: 15 (1779—1781). *Daemia cordifolia* (Retz.) K. Schum., Abh. phys. Kl. Akad. Wiss. Berlin 17 (1894) et in Engler & Prantl, Natürl. Pflanzenfam. IV, 2: 258, fig. 74 (1895). *C. extensum* Jacq., Misc. Austr. Bot. 2: 353 (1781). *Pergularia extensa* (R. Br.) N. E. Brown in Dyer, Fl. Cap. 4, 1: 758 (1908). *Daemia extensa* (Jacq.) R. Br., Mem. Wern. Soc. 1: 50 (1811).
Icon.: Enger & Drude, Veget. d. Erde 9, 1: 191 (1910).
Typus: „Ad Zebid vocata Dhraeba".

Suffrutex valde scandens viridis, sparse hispidulus et puberulus. Folia (2—) 2,5—10 × 2—8 cm, late ovata, basi profunde cordata, lobis basalibus incurvis sese fere tangentibus, apice acuminata. Petioli 20—35 mm longi. Cymae longe pedunculatae, pedunculis 5—15 cm longis. Pedicelli filiformes. Corolla 10—15 mm diametro, flavescenti-viridis, plerumque brunnescens vel purpurascens. Corona duplex. Folliculi 5—8 × 1,5 cm, reflexi, paralleli, apicem versus attenuati, molliter spinosi. Semina c. 7 mm longa, ovata, pubescentia.

Pakistan: Peshawar: Machai, 24 km NE Mardan, Burtt 1516! — Kurram: Inter Thal et Alizai, Aitch. 511 — Bela: Las Bela, H.-B. 18745. — Karachi: Cap Monze W Karachi, Rech. 27530!, Lamond 245! Karachi, Jafri.

Distr. gen.: Pakistan, India, Burma, Malaya.

3. ***P. pallida*** Wight & Arn. in Wight, Contrib. 52 (1834).

Icon.: Wight, Icon. Plant. Ind. Or. 2: tab. 585 (1840—43).
Typus: India.

Frutex alte scandens, viridis, ramis pallidis valde flexibilibus, pubescens vel ± glabratus. Folia 6—9 × 4—6,5 cm, ovato-cordata, apice ± longe acuminata, lobis basalibus brevibus rotundatis; petioli (1—) 3—3,5 cm longi. Cymae axillares breviter pedunculatae. Pedicelli 4—8 mm longi, flaccidi, puberuli. Corolla 12—15 mm longa, pallide flava, usque infra medium in lobos lineares obtusas divisa. Coronae lobi lineares, longe appendiculati. Antherae longe membranaceo-acuminatae. Folliculi 6,5—10 cm longi, 2,5 cm crassi, subturgidi, in apicem obtusum attenuati, glabri. Semina c. 8 (—11) × 5 (—7) mm, manifeste marginata, basi rotundata, apice truncata; coma 2,5—4 cm longa.

Pakistan: Quetta: Wam Tangi, 1150 m, Lace 3965! — Kalat: Rar Kaur SW Kalat, 850—1330 m, Hotson 292 A. — Bela: N Las Bela, Hotson 397.

Distr. gen.: Pakistan, India.

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funebre (Boiss. & Ky.) Pobedimova .. 11
pumilum (Decne.) Pobedimova 12
scandens (Sommier & Levier) Pobedimova 11
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Daemia Forssk. 20
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subsp. **acutum** ... 8
subsp. **sibiricum** (Willd.) Rech. f. .. 9
var. *longifolium* Ledeb. ... 9
Arnottianum Wight ... 12
cabulicum Bornm. ... 13
cardiostephanum Rech. f. ... 14
cordifolium Retz. ... 20
erectum L. ... 18
extensum Jacq. ... 20
funebre (Boiss. & Ky.) Kusn. ... 10
glaucum Wall. ... 13
humile sensu Aitch. ... 14
Jacquemontium Decne. ... 14
longifolium Decne. ... 9
petrense Hemsl. & Lace ... 14
pumilum (Decne.) Bornm ... 12
pyrotechnicum Forssk. ... 16
scandens (Sommier & Levier) Kusn. . 11
sibiricum Willd. ... 9
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tomentosa (L.) Pomel ... 19
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Jacquemontis Decne. ... 14
Glossonema Decne. ... 5
Haussknechtii Bornm. ... 6
varians (Stocks) Benth. ... 5
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indicus (L.) R. Br. ... 5
Leptadenia R. Br. ... 16
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Alpini Decne. ... 6
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spiralis (Forssk.) Decne. ... 16
Pergularia L. ... 18
Daemia (Forssk.) Blatt. & McCann . . 20
extensa (R. Br.) N. E. Brown ... 20
pallida Wight & Arn. ... 20
tomentosa L. ... 19
Periploca L. ... 2
aphylla Decne. ... 2
subsp. **aphylla** ... 3
subsp. **laxiflora** (Bornm.) Browicz 4
var. *laxiflora* Bornm. ex Drar ... 4
esculenta L. fil. ... 6
graeca L. ... 2
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indica L. ... 5
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glaucum (Wall. in Wight) Rech. f. . . 13
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medium Decne. p. p. ... 11
petrense (Hemsl. & Lace) Rech. f. . . 14
pumilum Decne. ... 12
scandens Sommier & Levier ... 11

Corrigendum

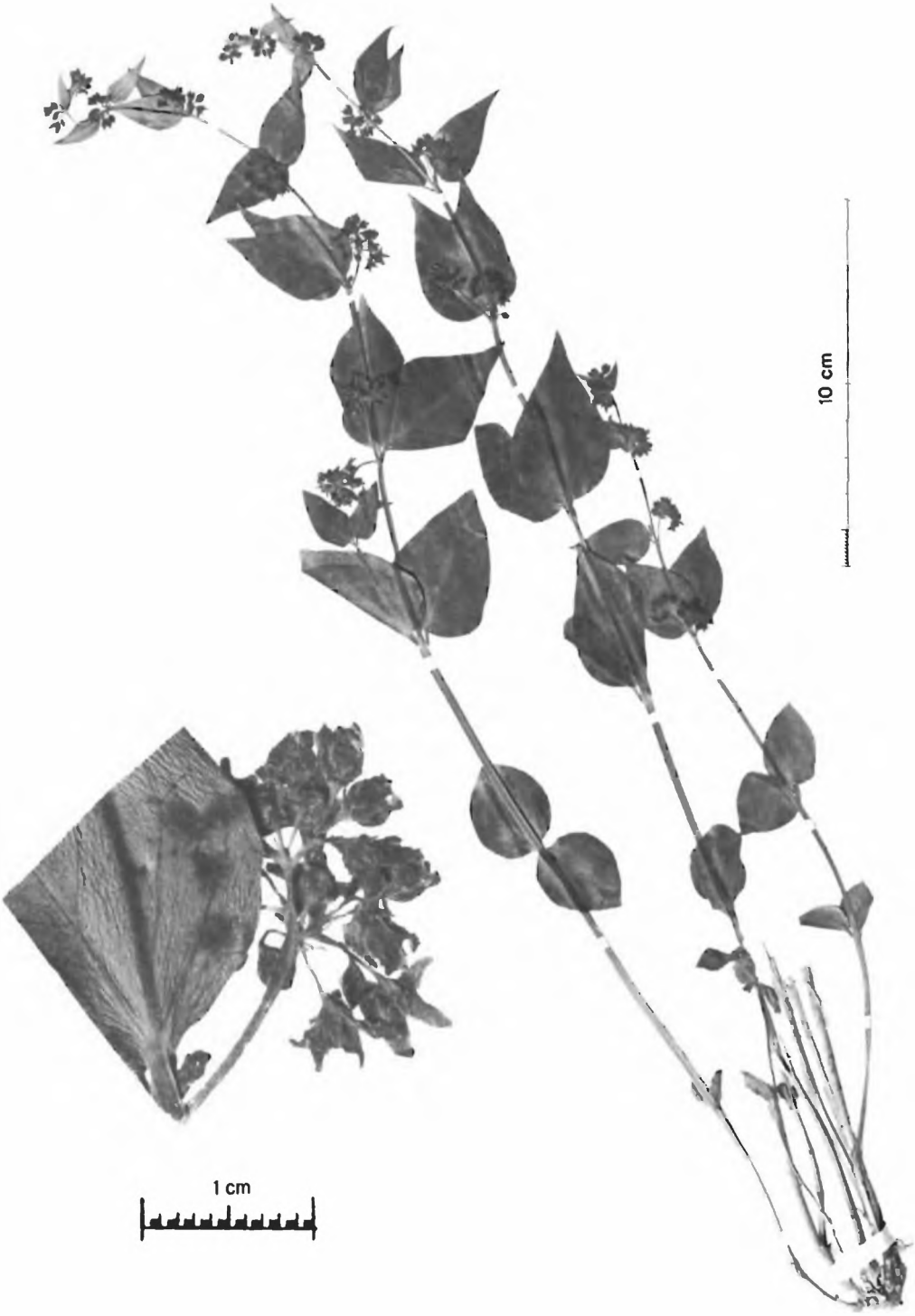
Pentatropis microphylla (ROTH) WALL., Cat. No. 8213 (1828) fide HOOKER, Fl. Brit. Ind. 4: 20 (1883).

Der Name *Asclepias microphylla* erscheint zuerst bei ROXBURGH, Hort. Bengal. 85 (1814), ist aber dort nicht gültig veröffentlicht, sondern erst bei ROTH, Nov. Sp. Pl. Ind. Or. 177 (1821), ferner bei ROXBURGH, Fl. Ind 2: 35 (1832). Es steht allerdings nicht unbedingt fest, daß ROTH und ROXBURGH dieselbe Art im Auge gehabt haben, da ROTH von ROXBURGH nicht zitiert wird. Die älteste Übertragung des Artnamens zu *Pentatropis* ist nach HOOKER, l. c. durch WALLICH erfolgt und nicht erst durch WIGHT & ARNOTT in WIGHT, Contrib. 52 (1834), wie zumeist zitiert wird. Bei Annahme des ROTHschen Namens hätte „India orientalis com. HEYNE" als Typus zu gelten.

Vincetoxicum funebre Boiss. & Ky. — Ky. 359

Tab. 2

Vincetoxicum scandens SOMMIER & LEVIER — SHAR. 365



Vincetoxicum pumilum DECNE. — RECH. 4650

Tab. 4

Vincetoxicum pumilum DECNE. — RECH. 1570

Vincetoxicum Arnottianum (Wight) Wight — Rech. 29803

Tab. 6

Vincetoxicum glaucum (WALL.) RECH. f. — RECH. 17141

Vincetoxicum cardiostephanum (Rech. f.) Rech. f. — Rech. 35614

Tab. 8

Fig. 1: *Vincetoxicum petrense* (Hemsl. & Lace) Rech. f. — Lace 3825
Fig. 2: *V. Jacquemontianum* (Decne) Rech. f. — R. R. Stewart 27792

Vitaceae

auctore L. T. VASSILCZENKO, Leningrad

Lfg. Cont. No. 74/30. 1. 1970

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

Vitaceae

auctore I. T. VASSILCZENKO, Leningrad

Vitaceae A. L. DE JUSSIEU, Gen. Plant. 267 (1789). „*Vites*".
Syn.: *Ampelideae* H. B. K., Nov. Gen. et Spec. 5: 222 (1821). *Ampelidaceae* LOWE, Man. Fl. of Madeira 80 (1868).

Lit.: E. BOISSIER, Flora Orientalis 1 (1867). I. E. PLANCHON in DE CANDOLLE, Monographiae Phanerogamarum 5 (1887). A. M. NEGRUL, Ampelographiia URSS. 1 (1946). D. I. SOSNOVSKY, Vitaceae in Flora URSS. 14 (1949). K. V. VASSILCZENKO, Flora URSS 14: 695—697 (1949). K. V. BLINOVSKY in Flora Turcomaniae 5: 89 (1950). H. F. NEUBAUER, Vierteljahrschrift der Höheren Bundes-Lehr- und Versuchsanstalt für Wein-, Obst- und Gartenbau in Klosterneuburg bei Wien (1952). S. KITAMURA, Plants of West Pakistan and Afghanistan (1964). K. SÜSSENGUTH, Vitaceae in ENGLER & PRANTL, Die natürlichen Pflanzenfamilien, ed. 2, 20 (1953).

Frutices saepe scandentes. Folia simplicia palmato-lobata vel (rarius) composita. Stipulae plerumque caducae. Inflorescentia racemosa vel paniculata, foliis plerumque opposita. Pedicelli basi bracteati. Flores radiati, hermaphroditici vel polygami, 4—5-meri, vernatione valvata, petala florendi tempore patula vel apice connata. Calyx parvus cyathiformis, 3—7-dentatus. Stamina petalis isomera iisque superposita, basi disco hypogyno inserta. Ovarium superum, 2—6-loculare, loculis biovulatis. Stylus brevis. Fructus bacca seminibus 1—4.

1 a. Petala in calyptram cohaerentia, caduca. Inflorescentia ± racemosa vel paniculata. Baccae 7—12 mm in diam. vel majores, edules ..... 1. *Vitis* L.
b. Petala non cohaerentia, stellatim patentia. Inflorescentia corymboso-paniculata. Baccae minores, non edules ..... 2. *Ampelopsis* MICHX.

1. *Vitis*

Vitis L., Spec. Plant. 202 (1753). Gen. Plant. ed. 5: 95 (1754).

Frutices scandentes, cirrhis foliis oppositis. Folia palmato-lobata. Petala apice connata, corolla mitriformis, ineunte anthesi tota decidua. Discus profunde lobatus. Stylus brevis stigmate bilobo. Semina ± pyriformia, basi acuminata.

1 a. Plantae cultae (vel subspontaneae) ..... 1. *V. vinifera* cult.
b. Plantae spontaneae 2
2 a. Flores dioici ..... 4. *V. sylvestris* C. C. GMELIN
b. Flores hermaphroditi, rarius hermophroditi et feminei 3
3 a. Baccae elongatae vel oblongo-ellipticae ..... 2. *V. nuristanica* VASSILCZ.
b. Baccae globosae vel globoso-ovatae vel breviter et late ellipticae .....
..... 3. *V. hissarica* VASSILCZ.

1. ***V. vinifera*** cult. — Cultigenum polyphyleticum est incl. *V. vinifera* L., Spec. Plant. 202 (1753) sensu stricto.

Lit.: J. ANDROSOVSKY in GAYER, Die systematische Gliederung von Vitis vinifera L., Mitteilungen der deutschen dendrologischen Gesellschaft 35: 284—287 (1925).

In regione „Florae Iranicae" colitur (plantarum cultarum specimena hoc loco non indicantur):

Afghanistan: E: Jaji: Ahmad Khel, 2200 m, in dumetis ad rivum Kurram, subspont., Rech. 32198!
Pakistan: Chitral: Inter Chitral et Mastuj, 1800 m, subspont., Stainton 2527!

2. ***V. nuristanica*** Vassilcz., Nov. Syst. Pl. Vasc. 1966: 183 (1966).

Icon.: Tab. 1.
Typus: Neub. 950, 958, W!

Scandens, usque ad 10—20 m longa. Folia 3—5-lobata, irregulariter dentata, basi cordata, 8—9 (—12) ×9—10 (—15) cm, supra glabra, subtus secus nervos pilis arachnoideis floccosis obsita. Flores hermaphroditi. Racemi elongati, fructiferi usque ad 20—25 cm longi. Baccae oblongo-ovatae, 8—10×5—7 mm. Semina 4,5—5×3—3,5 mm, basi abrupte in rostrum 1—2 mm longum attenuata.

Afghanistan: E: Nuristan: In valle fluvii Pech, Wama, 1380 m, Scheibe 90! In regione Ashkun prope Kulatum, 1450—1800 m. Kerst. 1224! Inter Ningalam 1300 m, et Darim 1900 m. Neub. 950!, 958! Prope Gusaluk, 1100—1150 m, Edelb. 1242!, Kerst. 737!
Pakistan: Swat: Inter Kalam et Utror in dumetis secus rivum scandens, 2100 m, Rech. 30797!

Distr. gen.: Endem.

3. ***V. hissarica*** Vassilcz. in Sbornik referatov n.-issled rabot, vypoln. in 1945 (Volume of refer. sc. works carried out in 1945), Sovjetsk. Bot. 6: 340 (1947). Vassilcz. Fl. URSS. 14: 697 (1949). Vassilcz., Species Vitis ad culturas novae, ed. Acad. Scienc. URSS. (1955).

— — subsp. ***hissarica***.

Typus: Jugum hissaricum in angustiis Kondora, LE!

Scandens, usque ad 15—20 m longa. Folia (5—) 8—12 (—15) cm longa et lata, subcordata, 3—5-lobata, basi late sinuata, superne glabra, subtus ± arachnoidea vel subglabra. Flores hermaphroditi vel feminei. Racemi 10—15 cm longi (vel longiores). Baccae globosae vel subglobosae, 10—12 mm in diametro, nigrae, virides vel roseo-purpureae, edules. Semina obovata, 5—6×3—4 mm, basi gradatim in rostrum 1—1,25 mm longum attenuata.

Afghanistan: SE: Tirin: In collibus inter lacum artificiale Arghandab Reservoir et Tirin, 1400—1700 m, Rech. 35050! — NE: Badakhshan: In valle fluvii Pjandzh, ubique sponte crescit usque ad 2000—2300 m, fide Vassilcz.

Distr. gen.: Pamir Alaj, Afghanistan.

Die Bestimmung von Rech. 35050 ist unsicher, da keine Früchte vorliegen.

— — subsp. ***Rechingeri*** Vassilcz., subsp. nov.

Icon.: Tab. 2.
Typus subspeciei: Rech. 11893, W!

A *V. hissarica* subsp. *hissarica* ut supra descripta seminibus elongatis oblongo-ellipticis, basi abrupte in rostrum angustatis differt.

Iraq: Kurd.: Sul.: M. Avroman ad confines Persiae prope Tawilla, 1300 m, Rech. 10212! — Arbil: Algurd Dagh ad confines Persiae, 36°40′ N, 44°50′ E, in valle supra pagum Nowanda, 1200—1300 m, 10.—14. VII. 1957, Rech. 11893! Pushtashan, 1000—

1200 m, RECH. 11025! Mosul: In faucibus 5 km S Zakho, in dumetis ad rivulum scandens, RECH. 12140!

Distr. gen.: Endem.

4. ***V. sylvestris*** C. C. GMELIN, Fl. Bad. 1: 543 (1805); PLANCH. in A. & C. DC., Monogr. Phan. 1: 356 (1887); A. NEGRUL, Ampelografia URSS. 1: 68 (1946).

Syn.: *V. vinifera anebophylla* KOLEN., Bull. Soc. Nat. Mosc. 296 (1846). *V. vinifera trichophylla* KOLEN., l. c. 287. *V. hyrcanica* VASSILCZ., Sovjetsk. Bot. 15, 6: 341 (1947) p. p., quoad plantam cum foliis subtus albo-pilosis usque albo-tomentosis: SOSN., Fl. URSS. 14: 697 (1949): GROSSH., Fl. Kawk. ed. 1, 3: 54 (1932); ed. 2, 6: 131 (1962); PROLIPKO, Fl. Azerbaijan 6: 206 (1955).

Typus: Herb. GMELIN, B.

Scandens usque ad 10—15 m longa. Folia 3—5-lobata vel integra irregulariter dentata, late ovata vel subrotundata, supra glabra, subtus ± pilosa, rarissime glabra. Flores dioici. Racemi elongati, laxiusculi, baccis globosis nigris (rarius viridibus), 6—8 (—9) mm in diam. Semina obovata, breviter rostrata.

Talish: Astara, HOHEN.! Talish, KUNTZE 1887! Distr. Astara, BOBROV & TZVELEV 190! Persia: N: Gorg.: Bandar-i Gaz, MICHELSON 104!, Gorgan, 650 m, KOELZ 16594!, 2300 m, NIKOLSKY! In montibus S Gorgan supra „Baba-gulme", MICHELSON 217! Ad ripam sinistram fl. Qareh Su, MICHELSON 201! Katul, 1100 m, GAUBA & SAB. 865! Maz.: In valle fluvii Chalus, Hasanabad, SAB. 449! 64 km S Chalus, 1150 m, FURSE 2523! Persia borealis maritima, BUHSE! Galand Rud, SAB. 451! In valle fl. Haraz, inter Mamgol et Karehsang, WDB. 581! — W: Azerb.: M. Qareh Dagh, BUHSE! Prope Hasan Beyglu, MIRD. in GAUBA 863! Lur.: Safid Dasht, SAB. 453!, 454! Bisheh, 1200—1400 m, RECH. 5679! Dow Rud, KOELZ 15598!, 18135!

Turcomania: Kara Kala: In valle fl. Sumbar, BERESIN! In angustiis Gjuen, BERESIN, VATOLKINA! Prope Kara Kala, VATOLKINA! Ad fl. Keltenczinar, ANDROSSOV!

Distr. gen. speciei: Europa, Africa borealis (Algeria), Asia occidentalis usque ad Persiam et Turcomaniam.

— — subsp. ***anebophylla*** KOLEN., Bull. Sci. Nat. Mosc. 19, 22: 286 (1846).

Typus subspeciei: Ad Araratum, KOLENATI 1691. LE!

Folia subtus pilis longis appressis arachnoideis tecta demum glabrescentia.

Persia: N: Gorg.: Bandar-i Gaz, RECH. 5524! Gorgan, GAUBA & SAB. 864! Maz.: Chalandar, SAB. 450! Dasht Nazir, SAB. 452! Gil.: Navrud, in silvis, ESFAND. 6462-E!

Distr. gen. subspeciei: In tota area speciei.

— — subsp. ***trichophylla*** KOLEN., Bull. Sci. Nat. Mosc. 19, 22: 287 (1846).

Typus subspeciei: In tota area Transcaucasia, KOLENATI 1987, LE!

Folia subtus pilis cellularibus tectis.

Persia: N: Maz.: Distr. Kojur: Inter Kinch et Dasht Nazir, 800—1300 m, RECH. 6662!

Distr. gen. subspeciei: In tota area speciei.

2. *Ampelopsis*

Ampelopsis MICHX., Fl. Bor. Amer. 1: 159 (1803).

Lit.: I. T. VASSILCZENKO, De Ampelopside vitifolia (BOISS.) PLANCH. in Notulae Systematicae ex Herb. Inst. Bot. Acad. Science URSS. 16: 238 (1954).

Frutices interdum cirrhiferi. Folia simplicia ± lobata rarius palmatifida.

Inflorescentiae foliis oppositae, cymoso-compositae. Flores polygamo-monoici. Bacca seminibus 2—4. Semina ovata, laevia.

1a. Folia basi cordata triangulari-sinuata, 5—7 costis palmatis primariis .... 1. *A. vitifolia* (Boiss.) Planch.
b. Folia basi cuneata vel recte resecta, rarius paulo emarginata, 3 costis primariis..... 2. *A. aegirophylla* (Bge.) Planch.

1. ***A. vitifolia*** (Boiss.) Planch. in DC., Monogr. Phan. 5: 453 (1887).

Syn.: *Cissus vitifolia* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 6: 31 (1845). *Vitis persica* Boiss., Fl. Or. 1: 955 (1867).
Icon.: Tab. 3.
Typus: Kotschy 728, G, W!

Frutex scandens vel prostratus ecirrhosus foliis late deltoideis basi cordatis, integris vel ± angulatis vel 3-lobatis. Flores in paniculis cymosis, sepalis inconspicuis, petalis 5 prostratis. Baccae nigrae, c. 4 mm in diam., apice stylo longo persistente.

Persia: N: Maz.: Now Shahr, Sab. 203! — W: Lur.: Tang-i Sarastan, Hausskn. Bakht.: Taleh, 3000 m, Koelz 15198! — S: Fars.: Kuh-e Dinar, Ky. 728!
Afghanistan: N: Mazar-i Sharif: In faucibus fluvii Balkh supra Akupruk, 700—800 m, Rech. 16319!, Hdg. & Wdb. 3942! 25 km SE Mazar-i Sharif, 700 m, Rech. 34159! — SE: Kandahar, Volk 1345! — E: Kabul: Tang-i Gharu, 1400—1800 m, Scheibe 64!, Gilli 1770!, 1771!, Hdg. & Wdb. 4274!, Rech. 16970! Kabul, Volk 1697!, Gilli 1772! Paghman, Neub. 729! Nuristan: In valle fluvii Pech inter Gusalak et Kurder, Neub. 781! — NE: Badakhshan: In valle Kokcha inter Faizabad et Baharak, Fischer in Podlech! Tang-i Pol inter Taliqan et Kishm, Lindb. 583! — C: Bamian: Bamian, Koeie 2902! Doab: Darreh-i Shikar, 16 km S Doab, 1600 m, Rech. 16677!, Hdg. & Wdb. 4132! Deh Kundi: 3—30 km NE Shahrestan, 2200 m, Rech. 36766! Ghorat: In faucibus infra Parjuman, 1850 m, Rech. 19043!
Pakistan: Chitral: Lutko, 2150 m, Bowes Lyon 813! Shoghot, 2150 m, Stainton 3255! In valle Yarkhun inter Reshun et Koghozi, 1650—1800 m, Kerst. 2009!

Distr. gen.: Persia, Afghanistan, Pakistan.

Rech. 36766 entspricht der „forma mixta" mit dreiteiligen unteren Blättern: *A. vitifolia* var. *chondisensis* Vass. & L. Vassil., Not. Syst. Leningrad 16: 240 (1954). — Typus: „In systemate fl. Sangardak in valle fl. Chondiza (West-Hissar), anno 1951", L. I. Vassiljeva.

2. ***A. aegirophylla*** (Bge.) Planch. in DC., Monogr. Phan. 5: 454 (1887).

Syn.: *Cissus aegirophylla* Bge., Arb. Naturf. Ver. Riga 7: 55 (1848); Mém. Acad. Scienc. Petersbg. 7: 231 (1851). *Vitis aegirophylla* Boiss., Fl. Or. 1: 956 (1867).
Icon.: Tab. 4.
Typus: „In rupestribus montis Karatau prope Samarkand", A. Lehmann, LE!

Frutex scandens vel prostratus ecirrhosus. Folia ovato-triangularia, basi cuneata vel truncata, rarius paulo emarginata, integra vel irregulariter dentata vel ± 3-lobata. Flores in paniculas cymosas dispositi, sepalis inconspicuis, petalis 5, prostratis. Baccae nigrae c. 4 mm in diam., apice stylo longe persistente.

Afghanistan: E: Kabul „an Hausmauern verwildert, an Quellen und Bergabhängen wild", Neub. 3155! — NE: Munjan: Robat prope Parwara, 2000 m, Edelb. 2241! Badakhshan: Hazratsaid, 2650 m, Koelz 12844! Akupruk, 1650 m, Koelz 13960!

Rabat in valle Kokcha, 2200 m, FREY in PODLECH F 459! — C: Doab, VOLK 2705! — Afghanistan, SCHEIBE 174!

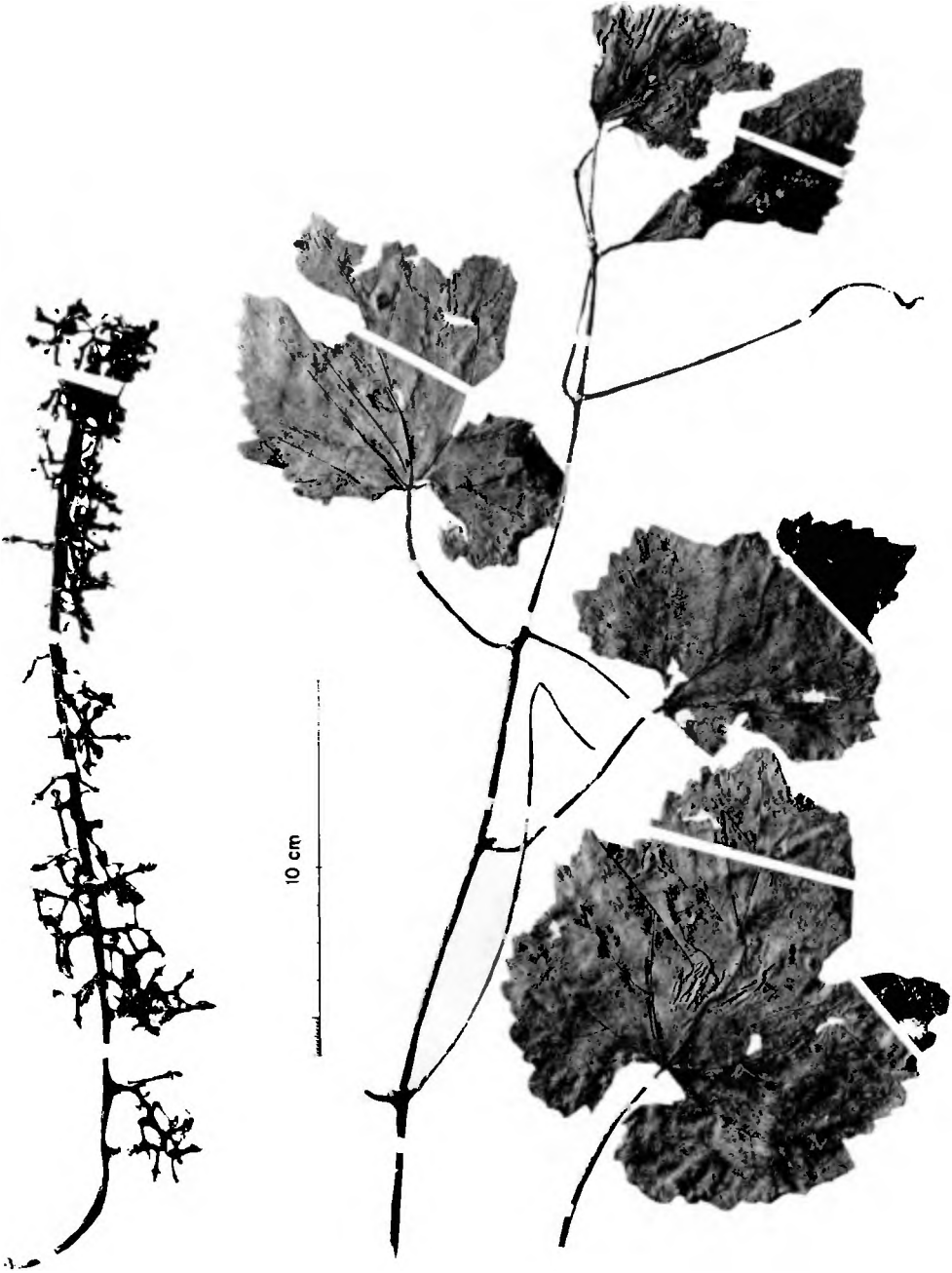
Distr. gen.: Afghanistan, Pamir-Alaj.

Hybrida

A. aegirophylla (BGE.) PLANCH. × ***vitifolia*** (BOISS.) PLANCH.

Afghanistan: C: Doab: 11 km ENE Doab versus Doshi, 1380 m, RECH. 37017! Darreh-i Shikar, 26 km S Doab, 2000 m, RECH. 36999!

Ampelopsis Michx. 3
aegirophylla (Bge.) Planch. 4
vitifolia (Boiss.) Planch. 4
var. **chondisensis** Vass. & L. Vassil. 4
Cissus
aegirophylla Bge. 4
vitifolia Boiss. 4
Vitis L. 1
aegirophylla Boiss. 4
hissarica Vassilcz. 2
subsp. **hissarica** 2
subsp. **Rechingeri** Vassilcz. 2
hyrcanica Vassilcz. p. p. 3
nuristanica Vassilcz. 2
persica Boiss. 4
sylvestris C. C. Gmelin 3
subsp. **anebophylla** Kolen. 3
subsp. **trichophylla** Kolen. 3
vinifera L. 1
vinifera cult. 1
vinifera anebophylla Kolen. 3
vinifera trichophylla Kolen. 3



Vitis nuristanica VASSILCZ. — NEUB. 950, 958

Tab. 2

V. hissarica VASSILCZ. subsp. *Rechingeri* VASSILCZ. — RECH. 11893

Ampelopsis vitifolia (Boiss.) Planch. — Rech. 19043

Tab. 4

Ampelopsis aegirophylla (Bge.) Planch. — Edelb. 2241

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
67	Amaryllidaceae	27	134	128	114	162
74	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
73	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
68	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
72	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
69	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
70	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
70	Poaceae	19	140	135	127	170

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
	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
63	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
71	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
74	Vitaceae	91	91	32	41	66
	Zannichelliaceae	14	131	117	125a	152
	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48

Juncaceae
auctore S. SNOGERUP, Lund

Lfg. Cont. No. 75 / 1. 4. 19

FLORA IRANICA

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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AKADEMISCHE DRUCK- u. VERLAGSANSTALT
GRAZ-AUSTRIA

Juncaceae

auctore SVEN SNOGERUP, Lund

Juncaceae „*Junci*" A. L. DE JUSSIEU, Gen. Plant. 43 (1789), p. p., nom. conserv.

Lit.: F. BUCHENAU, Monographia Juncacearum, Engler's Botanische Jahrbücher, 12: 1—498 (1890). F. BUCHENAU, Juncaceae in ENGLER, Das Pflanzenreich IV. 36: 1—284 (1906). F. VIERHAPPER, Juncaceae in ENGLER & PRANTL, Die natürlichen Pflanzenfamilien ed. 2, 15a: 192—224 (1930). V. KRECZETOWICZ & N. GONTSCHAROV, Juncaceae in Fl. URSS 3: 504—576 et 623—631 (1935). Y. SATAKE, Systematic and Anatomical Studies on Some Japanese Plants, II. Juncaceae, Journal of the Faculty of Science Imperial University of Tokyo, section III. Botany 4, 2: 131—224 (1933). G. SAMUELSSON, Juncaceae in HANDEL-MAZZETTI, Symbolae Sinicae 7: 1230—1238 (1936).

Plantae perennes rhizomatosae vel raro annuae (nostrae). Folia linearia, plana vel teretia. Ramificatio sympodialis. Bracteola adversa singula semper evoluta, saepe etiam bracteolae plures accessoriae distichae. Flores monoclini vel dioici. Perianthium dicyclicum tepalis alternantibus, persistens, herbaceum vel glumaceum, raro coloratum, aestivatione imbricata. Stamina sex, ad basin tepalorum inserta vel reductione interiorum minus numerosa, filamentis liberis antheris basifixis erectis, introrsis. Ovarium superum, e carpellis tribus compositum, tri- vel multiovulatum. Ovula anatropa. Stylus singulus, saepe brevis; stigmata tria, tepalis exterioribus opposita. Fructus capsula loculicida. Embryo parvus, basi endospermii inclusus; formatio endospermii helobialis.

1a. Plantae glabrae. Capsula polysperma ..... 1. *Juncus* L.
b. Plantae pubescentes. Capsula 3-sperma ..... 2. *Luzula* DC.

1. *Juncus*

Juncus L., Spec. Plant. 325 (1753). Gen. Plant. ed. 5: 152 (1754).
Typus generis: *Juncus acutus* L., lectotypus coll. a BRITTON (1910).

Plantae herbaceae perennes rhizomatosae vel annuae, semper glabrae. Inflorescentia sympodialis, plerumque multiflora, inflorescentiis partialibus ultimis drepania saepe ad glomerulos capitatos contracta formantibus. Bracteolae in speciebus nonnullis deficientes, in speciebus aliis una adversa biapiculata cum duabus vel pluribus simplicibus, in speciebus aliis bracteola adversa tantum evoluta. Tepala 6, biseriata, serie quaque e tepalis tenuibus consistente. Stamina 6 vel pauciora, cum antheris basifixis, tepalis opposita iisque basifixa. Capsula trilocularis, 3-septicida vel unilocularis, placentis tribus lateralibus vel raro (in specie singula americana) placenta axili. Ovula numerosa; testa plerumque prominenter sculpta. Habitu structuraque valde variabiles.

Distr. generis: Per totum orbem terrarum, in regionibus tropicis autem rarior.

1a. Folia et bracteae pungentes (Subgen. *Juncus*) 2
b. Folia et bracteae basales non pungentes 6

2a. Tepala interiora auriculis latis prominentibus provisa 3
b. Tepala interiora auriculis nullis vel non prominentibus 5
3a. Capsula 4—6 mm longa, apice late conico. ..... 3. *J. acutus* L.
b. Capsula 2,5—4 mm longa, apice pyramidali vel conico 4
4a. Flores numerosi, inflorescentiis amplis, capsula apice pyramidali .... 4. *J. littoralis* C. A. Mey.
b. Flores pauci, inflorescentiis capitatis. Capsula apice obtusa vel conica.... ..... 5. *J. Heldreichianus* Marsson ex Parl. subsp. *orientalis* Snog.
5a. Antherae filamentis 2,5—5-plo longiores. Capsula angusta, tepala valde excedens ..... 2. *J. rigidus* Desf.
b. Antherae filamentis c. duplo longiores. Capsula obtusa, tepala non vel paulo excedens ..... 1. *J. maritimus* Lam.
6a. Flores bracteolis involucrantibus provisi 7
b. Flores bracteolis involucrantibus carentes 18
7a. Folia teretia, unitubulosa 8
b. Folia plana vel canaliculata, pluritubulosa..... 11
8a. Folia caulina evoluta. Brachyblasti monophylli e rhizomate orientes nulli ..... 6. *J. subulatus* Forssk.
b. Folia caulina praeter bracteas non evoluta. Brachyblasti monophylli e rhizomate orientes evoluti (Subgen. *Genuini*) 9
9a. Folia et caules laeves. Capsula ± retusa ..... 8. *J. effusus* L.
b. Folia et caules valleculati. Capsula obtusa vel attenuata 10
10a. Medulla interrupta. Capsula acuta vel rotundato-acuminata.. 7. *J. inflexus* L.
b. Medulla continua. Capsula obtusa ..... 9. *J. conglomeratus* L.
11a. Plantae perennes, rhizomate bene evoluto. Auriculae in foliis omnibus evolutae (Subgen. *Pseudotenageia*) 12
b. Plantae annuae sine rhizomate. Auriculae in bracteis singulis tantum evolutae (Subgen. *Poiophylli*) 13
12a. Antherae filamentis 1—2-plo longiores. Capsula tepala valde excedens. ..... 10. *J. compressus* Jacq.
b. Antherae filamentis 3—7-plo longiores. Capsula tepala non vel paulo excedens ..... 11. *J. Gerardi* Lois.
13a. Capsula sphaeroidea ..... 16. *J. sphaerocarpus* Nees
b. Capsula ovoidalis vel ellipsoidalis..... 14
14a. Semina valde reticulata. Tepala interiora nervo mediano excluso scariosa ..... 17. *J. Rechingeri* Snog.
b. Semina laevia vel tenuiter striata. Tepala interiora centro herbacea..... 15
15a. Capsula ovoidalis. Tepala interiora apiculata vel acuta 16
b. Capsula ellipsoidalis vel prismatica. Tepala interiora obtusa vel acuta..... 17
16a. Capsula 3—5 mm longa. Antherae 4/10 usque ad totam longitudinem filamentorum aequantes. Plantae magnitudine variabiles ..... 12. *J. bufonius* L.
b. Capsula 2—3 mm longa. Antherae quartam usque tertiam partem longitudinis filamentorum aequantes. Plantae humiles.. 13. *J. minutulus* Albert & Jahandiez
17a. Plantae plerumque 3—15 cm altae. Folia 1—5 cm longa. Flores minores. Tepala exteriora 3,5—6 mm longa, quam interiora 0,5—1 mm longiora. Semina 0,35—0,5 mm ..... 15. *J. turkestanicus* V. Krecz. & Gontsch.
b. Plantae plerumque 10—20 cm altae. Folia 2—10 cm longa. Flores majores. Tepala exteriora 5—8,5 mm longa, quam interiora 0,5—3 mm longiora. Semina 0,3—0,4 mm ..... 14. *J. hybridus* Brot.

18a. Folia teretia, septata. Inflorescentia e capitulis pluribus composita. Antherae filamentis longiores (Subgen. *Septati*) 19
b. Aut folia plana vel canaliculata, pluritubulosa, aut inflorescentia e capitulo singulo consistens et antherae filamentis pluries breviores (Subgen. *Alpini*). 23
19a. Folia pluritubulosa. Brachyblasti monophylli e rhizomate orientes 20
b. Folia unitubulosa, omnia caulina 21
20a. Tepala acuta usque acuminata ..... 18. *J. punctorius* L. fil.
b. Tepala obtusa ..... 19. *J. subnodulosus* SCHRANK
21a. Tepala ad summum 2,7 mm longa, apiculata vel acuminata ..... 21. *J. acutiflorus* ERHH. ex HOFFM.
b. Tepala 3 mm longa vel longiora, obtusa usque apiculata 22
22a. Tepala interiora apiculata, quam exteriora plerumque longiora. Rhizoma plerumque non bene evolutum ..... 22. *J. Fontanesii* GAY
b. Tepala interiora obtusa usque acuta, quam exteriora aequilonga vel breviora. Rhizoma plerumque validum ..... 20. *J. articulatus* L.
23a. Inflorescentia e capitulis pluribus composita. Folia plerumque conduplicata 24
b. Inflorescentia monocephala. Folia teretia usque canaliculata 25
24a. Antherae filamentis 0,5—1,5-plo longiora. Tepala 5—6,5 mm ..... 24. *J. himalensis* KLOTZSCH
b. Antherae filamentis 3—4-plo longiora. Tepala 7—8 mm longa ..... 25. *J. afghanicus* SNOG.
25a. Tepala brunnea. Capitula 2—4-flora . . 23. *J. triglumis* L. subsp. *wakhaniensis* SNOG.
b. Tepala alba, straminea vel purpurascentia. Capitula plerumque 5—15-flora 26
26a. Capsula sphaeroidalis. Stylus 1,5—2,5 mm longus. Bractea infima plerumque longa, foliacea ..... 26. *J. benghalensis* KUNTH
b. Capsula ovoidalis vel ellipsoidalis. Stylus 1—1,5 mm longus. Bractea infima plerumque breviter tantum laminata 27
27a. Antherae 1,3—2 mm longae. Capsula attenuata. Pedicelli floriferi ad sinum 2 mm longi ..... 27. *J. membranaceus* ROYLE
b. Antherae 2—3 mm longae. Capsula arcuata. Pedicelli floriferi nonnuli quam 2 mm longiora ..... 28. *J. concinnus* D. DON

Subgen. ***Juncus***

Syn.: Subgen. *Thalassici* BUCHENAU, Abh. Nat. Ver. Bremen 4: 406 (1875). Subgen. *Thalassii* (BUCHENAU) BUCHENAU in ENGLER, Pflanzenr. 4, 36: 100 (1906). Sect. *Thalassii* (BUCHENAU) VIERHAPPER, in ENGLER & PRANTL, Natürl. Pflanzenfam. ed. 2, 15a: 216 (1930). *Juncastrum* FOURR., Ann. Soc. Linn. Lyon N. S. 17: 172 (1869), pro gen. Sect. *Juncastrum* (FOURR.) POST & KUNTZE, Lex. Gen. Phan. 303 (1903). Subgen. *Juncastrum* (FOURR.) V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 543 (1935). Sect. *Pungentes* COUTINHO, Bol. Soc. Brot. 8: 96 (1890). Sect. *Acuti* ROUY, Fl. Fr. 229 (1912). Sect. *Maritimi* ROUY, l. c.: 230.

Plantae perennes, elatae, rigidae. Folia bracteis exceptis basalia, teretia, non septata, pungentia. Medulla e cellulis parenchymaticis rotundatis composita. Stomata depressa. Flores in glomerulos capitatos congesti; bracteola prima biapiculata interdum evoluta; bracteolae involuerantes autem deficientes. Semina testa persistente appendices formante provisa. — x = 24; polyploidae ignotae.

Distr. gen. subgen.: In toto orbi terrarum, imprimis in regionibus calide temperatis et subtropicis.

1. ***J. maritimus*** LAM., Encycl. Meth. Bot. 3: 264 (1789).
Syn.: *J. acutus* L., var. β L., Spec. Plant. 325 (1753). *J. Broteri* STEUD., Syn. Pl. Glum. 2: 322 (1854). *J. ponticus* STEV., Bull. Soc. Nat. Mosc. 3: 94 (1857).
Icon.: Tab. 1, fig. 2.
Typus: „Angleterre, France etc. aux lieux maritimes et marécageux", P!.

Perennis, caulibus seriatim e rhizomate repente orientibus, interdum rhizomatis frequentius furcatis laxe caespitosis. Surculi intravaginales nulli. Caules 50—100 cm alti, plerumque 1,5—2 mm crassi, vaginis basalibus aphyllis 2—5, foliisque basalibus 2—4. Folia teretia, non septata, pungentia. Caules foliaque fasciculis sclerenchymaticis subepidermalibus striati; medulla e cellulis rotundatis parenchymaticis composita; fasciculi vasculares per transsectum subaequaliter distributi; stomata depressa. Auriculae lacerantes. Inflorescentia multiflora, plerumque laxa, rarius in glomerulos singulos vel plures magnos conferta. Flores in capitula pauciflora congesti, bracteolis involucrantibus nullis. Bracteae binae inferiores inflorescentiae caulibus similes, pungentes, prima caulem evidenter prolongans, secunda plerumque brevis. Tepala inaequalia, late hyaline marginata, exteriora ovata, cymbiformia, acuta, breviter mucronata, interiora breviora, anguste elliptica, obtusa, marginibus apice aliquantum expansis. Stamina 6, rarius 3, 2/3 tepalorum circiter aequantia; antherae 0,8—1,2 mm longae, quam filamenta circiter duplo longiores. Stylus c. 1,5 mm longus; stigmata brevia, contorta. Capsula 2,5—3,5 mm longa, trigono-ovata, obtusa vel attenuata, mucronata, tepala aequans vel paulo longior, trilocularis. Semina 0,6—0,7 mm longa, ovoidea, c. 25-striata, cum testa 0,8—1,2 mm longa, testa appendices binas aliam longiorem aliam breviorem formantes. — 2 n = 48.

Persia: W: Azerb.: In ripis occidentalibus lacus Rezaiyeh, SAB. in GAUBA 1567! Ad lacum Rezaiyeh, prope Bandar Danalu, 1220 m, STARM. 71! 25 km W Rezaiyeh, JARDINE 645!

Distr. gen.: Europa occidentalis et centralis (Lacus Peisonis), Regio Mediterranea, Africa borealis, litora Ponti Euxini, Persia occidentalis.

There exist many incorrect reports from other areas.

2. ***J. rigidus*** DESF., Fl. Atlant. 1: 312 (1800).
Syn.: *J. procerus* BIANCA, Atti Acad. Gicenia ser. 2, 3: 65 (1844—1859), non E. MEY (1828). *J. caffer* BERTOL., Mem. Accad. Sci. Inst. Bologna ser. 3: 253 (1851). *J. maritimus* LAM. var. *arabicus* ASCHERSON & BUCHENAU in BOISS., Fl. Or. 5: 354 (1882). *J. deserti* CARUEL ex ASCHERSON & SCHWEINF., Illustr. Fl. Egypt. 2: 155 (1887), nom. nud. *J. Nevskii* V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 629—630 (1935). *J. arabicus* (ASCHERSON & BUCHENAU) ADAMSON, Rev. S. Afr. Juncus, Journ. Linn. Soc. Bot. 50: 10—11 (1935).
Icon.: Tab. 1, fig. 1.
Typus: Africa boreo-occidentalis, P!

Perennis, caulibus seriatim e rhizomate repente orientibus, saepe rhizomatibus frequentius furcatis laxe caespitosus. Surculi intravaginales nulli. Caules 75—150 cm alti rarius breviores, plerumque 2—5 mm crassi, vaginis basalibus plerumque 4—5, foliisque basalibus sequentibus 2—5. Folia teretia, non septata, pungentia. Caules foliaque fasciculis sclerenchymaticis subepidermalibus striati; medulla e cellulis parenchymaticis rotundatis composita; fasciculi vasculares per transsectum subaequaliter distributi; stomata depressa. Auriculae nullae. Inflorescentia multiflora,

laxa, 5—35 cm longa, plerumque angusta, rarius longitudini aequilata. Flores in capitula pauciflora congesti, bracteolis involucrantibus nullis. Bracteae binae inferiores inflorescentiae caulibus similes, prima erecta, 5—15 cm longa, quam inflorescentia brevior vel eam multo excedens, secunda brevis. Tepala aequalia vel exteriora paulo longiora, late hyaline marginata; exteriora anguste ovata, cymbiformia, acuta vel obtusa, interdum apice aliquantum latius scarioso-marginata, interdum mucrone parvo provisa; interiora oblonga, margine hyalino lateraliter prope apicem dilatato obtusa. Stamina 6, 2/3—3/4 tepalorum aequantia; antherae (1—), 1,5—2 (—2,5) mm longae, quam filamenta plerumque 3—5-plo longiores. Stylus 0,7—1,2 mm longus; stigmata 1—1,5 mm longa. Capsula 3,5—5 mm longa, anguste ovato-trigona, apice pyramidaliter attenuata, mucronata, tepala plerumque multo excedens, plerumque pallide brunnea, trilocularis, mucrone 0,2 mm longo. Semina 0,6—0,7 mm longa, obliqua, anguste ovoidea, cum testa 1,1—1,8 mm longa, testa appendices binas aequales vel inaequales formans. — 2n = 48.

Iraq: Kurd.: Kirkuk, HAUSSKN. 977!
Persia: **W**: Lur.: 12 km N Malavi, 800 m, GRANT 15929! Sheshom, 700—800 m, JACOBS 6802! — **S**: Fars.: In paludosis prope Shiraz, STAPF 1925! Ad lacum Maharlu prope Shiraz, STARM. 245!; 1600 m, BROWN 3521! 35 km SE Shiraz, 1500 m, GRANT 15038! 20 km W Shiraz, 1700 m, GRANT 15096! Ad ripas boreales lacus Neyriz prope Tashk, BOBEK 186! Lar.: Ab-e Garm prope Bandar Abbas, GAUBA & SAB. 1575! Kerm.: Ad marginem australem deserti Lut porpe Fahraj, RECH. 27168! Bal.: Inter Khash et Iranshahr, M. Karevandar, 1500—1600 m, RECH. 4016! — **E**: Khor.: Inter Shahrud et Neyshabur, BUNGE! — **C**: Qazv.: In collibus Halkedar ad Mardabad prope Karaj, 1200 m, RECH. 6821!, GAUBA 1578! Kashan: In salsis Shurab, HAUSSKN.!
Afghanistan: **SW**: Herat: Ribat-i Turk, AITCH.! — **SE**: Kandahar: Muzhdan, AITCH. 62! — Afghanistan, GRIFF. 5409!, Journ. 197!, Journ. 666!
Pakistan: Bal.: Baluchistan borealis, AITCH. 62! — Kalat: Jangal, 1500 m, POPOV 207! — Sind: Prope Sehwan, JAFRI 2706! Sind, PINWILL!, DALZELL 1! — Karachi: Khadeji, 46 km ENE Karachi, RECH. 28569!, LAMOND 766!

Distr. gen.: Africa borealis, australis et orientalis, Sicilia, Asia austro-occidentalis: Persia, Afghanistan, Pakistan.

3. ***J. acutus*** L., Spec. Plant. 325 (1753).
Syn.: *J. spinosus* FORSSK., Fl. Aegypt.-Arab. 75 (1775). *J. Karelini* STEUD., Syn. Pl. Glum. 297 (1855).
Icon.: Tab. 2, fig. 1 et 2.
Typus: „In Angliae, Galliae, Italiae maritimis paludosis".

Perennis, rhizomate furcato surculisque intravaginalibus numerosis dense caespitosus. Caules 50—150 cm alti, rigidi, plerumque 2—4 mm crassi, vaginis basalibus nonnullis foliisque basalibus 2—5. Folia teretia, non septata, pungentia. Caules foliaque fasciculis sclerenchymaticis subepidermalibus striati; medulla e cellulis parenchymaticis rotundatis composita; fasciculi vasculares per transsectum subaequaliter distributi; stomata depressa. Auriculae nullae. Inflorescentia multiflora, plerumque densa, sphaerica, raro laxa, elongata. Flores in capitula pauciflora congesti, bracteis involucrantibus nullis. Bracteae binae inferiores inflorescentiae cauli similes, pungentes, prima caulem evidenter prolongans. Tepala plerumque aequalia, oblonga, late hyaline marginata; exteriora obtusa vel acuta, breviter mucronata, subcymbiformia; interiora auriculis latis hyalinis provisa. Stamina 6, tepala aequantia vel paulo breviora; antherae quam filamenta pluries longiores. Stylus 0,5—0,8 mm longus; stigmata 1,5—2 mm longa. Capsula 4—6 mm longa, tepala multo excedens,

nitida, straminea usque atrobrunnea, sphaeroidea, apice late conica; mucro brevissimus. Capsula normaliter semina 80—120 continens. Semina 0,8—1,1 mm, cum testa 1,8—2,5 mm longa; testa appendices binas aequales vel subinaequales formans. — 2 n = 48.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1367! Chalandar, in arenosis, Sab. 135! Maz.: Sisangam, Žumer 90! Now Shahr, Sab. 111!, 13189!; In litore caspio, —30 m, Stutz 1192! Mazamabad, Iranshahr 12002-E! Gil.: Astara, Cowan & Darlington 1718! 64 km S Astara, 30 m, Furse 2509! Ad litus Caspium prope fines rossicas, —30 m, Grant 16418!

Distr. gen.: Europa occidentalis, Regio Mediterranea, Insulae Canarienses, Madeira, Litora Ponti Euxini et Maris Caspii.

There occur somewhat deviating forms also in South Africa, Eastern North America, warm temperate South America, Australia and New Zealand.

4. ***J. littoralis*** C. A. Mey., Verz. Pfl. Cauc. 34 (1831).
Syn.: *J. Tommasinii* Parl., Fl. Ital. 2: 315 (1852). *J. tyraicus* Pacz., Fl. Chers. 1: 381 (1914).
Icon.: Tab. 2, fig. 5 et 6.
Typus: Insula Sara, C. A. Meyer 138, LE! lectotypus; G!

Perennis, rhizomate ramoso et surculis crebris intravaginalibus dense caespitosus. Caules rigidi, erecti, 50—100 cm alti, infra inflorescentiam 2—4 mm crassi, vaginis basalibus nonnullis, foliisque basalibus 2—6. Folia teretia, non septata, pungentia. Auriculae nullae. Caulis foliaque fasciculis sclerenchymaticis subepidermalibus striati. Medulla e cellulis parenchymaticis rotundatis consistens; fasciculi vasculares per transsectum subaequaliter distributi. Stomata depressa. Inflorescentia multiflora, densa, vel pluriramosa, ramis modice elongatis, divergentibus. Flores 50—200, in capitula (1—) 2—3 (—5)-flora congesti; bracteolae involucrantes nullae. Bracteae basales inflorescentiae foliaceae, pungentes, vaginis amplis, prima caulem evidenter prolongans, 5—15 cm longa, quam inflorescentia plerumque brevior, secunda brevis. Bracteae superiores plerumque lamina pungente carentes; bracteae capitularum quam flores breviores. Tepala 2,5—3 mm longa, late hyaline marginata, exteriora ovata, subcymbiformia, obtusa, mucronata, interiora plerumque longiora, oblonga, auriculis scariosis latis prominentibus, plerumque breviter mucronata. Bases tepalorum exteriorum plerumque spongioso-incrassatae. Stamina 6; antherae 1,2—1,9 mm longae, quam filamenta pluries longiores. Stylus 0,8—1,3 mm longus; stigmata c. 1,5 mm longa, contorta. Capsula 2,5—3,5 (—4) mm longa, sphaeroidea usque trigono-ovata, apice pyramidali, mucronato, seminibus 25—60. Semina 0,8—1,1 mm cum testa 1,5—2 mm longa, atrobrunnea, nitentia; testa appendices 2 aequales vel subinaequales formans. — 2 n = 48.

Persia: N: Gil.: Bandar-e Pahlavi, Bornm. 8331! Persia, Buhse!

Distr. gen.: Litora Maris Mediterranei borealia et orientalia, Ponti Euxini et Maris Caspii.

5. ***J. Heldreichianus*** Marsson ex Parl., Fl. Ital. 2: 315 (1852).
Typus: Heldreich 1993, lectotypus FI!, G!

Perennis, dense caespitosus. Folia pungentia, auriculae nullae. Inflorescentia multiflora; flores in capitula separata magnitudine varia congesti. Bracteae nonnullae superiores plerumque laminatae, pungentes. Tepala exteriora apice late hyaline

marginata, interiora auriculis hyalinis prominentibus provisa. Capsula 3—4,5 mm longa, ovoidea, apice conica vel leviter angulata, breviter vel non mucronata.

Distr. gen. speciei: Graecia, Anatolia, Cyprus, Persia, Transcaucasia, Turkestania.

In area nostra tantum occurrit:

— — subsp. ***orientalis*** SNOG., subsp. nov.
Icon.: Tab. 2, fig. 3 et 4.
Typus subspeciei: RECHINGER 32735, holotypus W!

Perennis, rhizomate ramoso et surculis numerosis intravaginalibus dense caespitosus. Caules (30—) 50—60 (—70) cm alti, erecti, plerumque 1,5—2,5 mm crassi, vaginis basalibus nonnullis foliisque basalibus 4—5. Folia teretia, non septata, pungentia, caulibus similia. Auriculae deficientes. Caules foliaque fasciculis sclerenchymaticis subepidermalibus striati; medulla e cellulis rotundatis parenchymaticis composita; fasciculi vasculares per transsectum subaequaliter distributi. Stomata depressa. Inflorescentia plerumque 4—10 × 2—5 cm, e capitulis 8—30 discretis evidenter separatis composita. Capitula (3—) 4—5 (—8)-flora. Bracteae basales foliaceae, pungentes, prima erecta, 3—7 cm longa, inflorescentiam plerumque excedens, interdum brevior, secunda brevis. Bracteae infimae capituli flores aequantes vel excedentes; bracteae superiores lamina parva vel nulla, raro pungente provisa. Tepala 2,5—3,5 mm longa, aequalia vel subaequalia, oblonga, late scariose marginata; exteriora cymbiformia, marginibus apice lateraliter aliquantum expansis, obtusa, mucrone brevi 0,1—0,3 mm longo provisa; interiora auriculis latis prominentibus provisa, emarginata; bases tepalorum exteriorum spongioso-incrassatae. Stamina 6, 3/5—4/5 tepalorum attingentia; antherae 1,4—2 mm longae, filamentis 4—8-plo longiores, ineunte anthesi flavae, demum rubescentes. Stylus c. 1 mm longus; stigmata 1—1,5 mm longa, mox contorta. Capsula 2,8—3,5 mm longa, tepala aequans vel paulo excedens, sphaeroidea, apice obtusa vel breviter conica; mucro brevis, c. 0,2 mm longus. Capsula semina 40—65 continens. Semina 0,75—0,8 mm longa, striato-reticulata, oblique ovoidea, testa inclusa 1,2—2 mm longa; testa appendices 2 valde inaequales formans.

Persia: N: Persia borealis, coll. ign.! — W: Azerb.: Karachal, KNAPP! Ahmadabad, KNAPP! Prope Khvoy, COWAN & DARLINGTON 2169!, 1500 m, FURSE 2315! 94 km N Khvoy inter Shahabad et Maku, 1000 m, RECH. 32735! Seyyed Hajjin, SZOV. 260! In ripa occidentali lacus Rezaiyeh, 1300 m, JACOBS 6894! 19 km SE Maku, 1400 m, GRANT 16233! — Prov. Azerbaijan, locis humidis salsis, SZOV.!

Distr. gen. subspeciei: Anatolia orientalis et centralis, Persia, Transcaucasia, Turkestan.

The following specimens have been seen from outside the Flora Iranica area: Turkestan, in valle Sarawshan, Peyschambe, FEDTSCHENKO 1280! Caucasus, Carthalinia: Gori, BROTHERUS! and several collections from the interior of eastern Anatolia.

Differing from subsp. *Heldreichianus* mainly in its shorter and broader inflorescence, in its few and comparatively manyflowered heads, in the less pungent upper bracts and in the strongly thickened bases of outer tepals.

Subgen. ***Subulati*** BUCHENAU, Englers Bot. Jahrb. 7: 157 (1885)

Syn.: Sect. *Subulati* (BUCHENAU) ROUY, Fl. Fr. 245 (1912). Sect. *Forskalina* POST & KUNTZE, Lex. Gen. Phan. 303 (1904). Subgen. *Forskalina* V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 557 (1935).

Plantae perennes rigidae, rhizomate crasse repente. Folia caulina teretia, non septata, medulla e cellulis asterisciformibus composita. Stomata depressa. Flores singuli. Bracteolae involucrantes evolutae. — x = 21. — Subgen. monotypicum.

Distr. gen. subgen.: Vide sub specie unica.

6. ***J. subulatus*** FORSSK., Fl. Aegypt.-Arab. 75 (1775).
Syn.: *J. multiflorus* DESF., Fl. Atlant. 1: 313 (1798). *J. siculus* TINEO in GUSS., Fl. Sic. Syn. 2: 2 (1844).
Icon.: WILLIS & DAVIS, Watsonia 4: 212 (1960), (non optima).
Typus: FORSSKÅL, lectotypus C!

Perennis. Rhizoma crassum, repens, internodiis elongatis. Caules 30—120 cm alti, vaginis basalibus (2—3), foliisque caulinis 2—4. Folia teretia, non septata. Medulla e cellulis asterisciformibus composita; fasciculi vasculares in strato parenchymatico circumdante tantum evoluti. Stomata depressa. Inflorescentia laxa, multiflora; flores singuli, bracteolis involucrati. Tepala 2,5—3,5 mm longa, aequalia vel exteriora sublongiora, pallide viridia vel pallide brunnea, exteriora anguste ovata vel lanceolata, apiculata usque acuta, interiora latiora, obtusa apice late membranaceo-marginata. Stamina 6, dimidium circiter tepalorum attingentia; antherae 1—1,2 mm longae, quam filamenta 4—5-plo longiores. Stylus c. 1 mm longus; stigmata c. 1 mm longa. Capsula tepala aequans, trigono-ovoidea, obtusa, breviter mucronata, pallide usque atro-brunnea, nitens. Semina 0,6—0,7 mm, striato-reticulata, brevissime appendiculata. — 2 n = 42.

Persia: S: Fars.: Ad lacum Neyriz prope Tashk, BOBEK 185! Bushehr, STAPF 1917! — Persia, STAPF 1728!

Distr. gen.: Europa occidentalis, Regio Mediterranea, Asia austro-occidentalis usque ad regionem Caspicam. Sahara: Montes Hoggar. — Vide tabulam geographicam in WILLIS & DAVIS, l. c.

Subgen. ***Genuini*** BUCHENAU, Abh. Nat. Ver. Bremen 4: 406 (1875).

Syn.: Sect. *Genuini* (BUCHENAU) VIERHAPPER in ENGLER & PRANTL, Natürl. Pflanzenfam. ed. 2, 15a: 215 (1930). Sect. *Juncotypus* DUMORT., Fl. Belg. 142 (1827). Subgen. *Juncotypus* (DUMORT.) V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 546 (1935). Sect. *Lateriflori* FRIES ex ROUY, Fl. Fr. 223 (1912).
Typus subgen.: *J. glaucus* EHRH. (= *J. inflexus* L.)

Plantae perennes rhizomate valido. Folia caulina parva vel nulla; brachyblasti monophylli e rhizomate orientes, medulla asterisciformis. Inflorescentia pseudolateralis; bractea prima erecta, cauli similis. Flores singuli, bracteolis involucrantibus. — x = 20, 21, 22.

Distr. gen. subgen.: Per totum orbem terrarum.

7. ***J. inflexus*** L., Spec. Plant. 326 (1753).
Syn.: *J. glaucus* EHRH., Beitr. Naturk. 6: 83 (1791). *J. tenax* BANKS & SOLAND. in RUSSELL, Nat. Hist. Aleppo ed. 2, 2: 251 (1794) nom. illeg., non SOLAND. in FORSTER (1786). *J. longicornis* BASTARD, Journ. Bot. 3: 20 (1814). *J. paniculatus* HOPPE, Dec. Gram. n. 156 in ROEMER & SCHULTES, Syst. Veg. 7, 2: 183 (1830). *J. warakensis* NAB., Publ. Fac. Sci. Univ. Masaryk (Brno) 105: 42 (1929). *J. brachytepalus* TRAUTV. ex V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 547—548 et 630 (1935).

Icon.: CLAPHAM, TUTIN & WARBURG, Fl. Brit. Is., Ill. 4: 24 (1965).
Typus: Europa australis.

Perennis, dense caespitosus. Caules dense seriati, e rhizomate ramoso orientes. Rhizoma brachyblastos monophyllos quoque emittens. Caules 50—120 cm alti, praeter bracteas aphylli; vaginae basales plerumque castaneae, raro pallide vel atrobrunneae vel rubescentes. Folia teretia, non septata, caulibus similia. Caulis foliaque 10—20-costata, costis validis e stratis validis subepidermalibus cum fasciculis vascularibus maximis connectis formatis. Medulla e cellulis asterisciformibus formata, interrupta; fasciculi vasculares in strato parenchymatico circumdante tantum evoluti. Inflorescentia pseudolateralis, multiflora, plerumque laxa, rarius contracta vel fere capitata. Bractea infima longa, caulem evidenter prolongans. Flores singuli, bracteolis involucrati, c. 3 mm longi. Tepala anguste ovata, acuminata, aequalia vel interiora breviora. Stamina 6, dimidium circiter tepalorum aequantia; antherae 0,8—1 mm longae, filamenta aequantes vel eis sesquilongiores; stylus c. 0,5 mm longus, stigmata 0,8—1,5 mm longa. Capsula 3—4 mm longa, trigono-ovoidea vel trigono-ellipsoidea, acuta, mucronata, pallide brunnea vel atrocastanea. Semina c. 0,5 mm diam., oblique ovoidea, reticulata. — 2 n = 40.

Iraq: Kurd.: Kirkuk, Jarmo, HELBAEK!, HAINES 288! Inter Kirkuk et Sulaymaniyah, PATERSON 807! Arbil: M. Algurd Dagh, 1800—2100 m, GILLETT 9489!, GUEST 2819!, RAWI 13798! N Hajji Omran, RAWI 24969! N Shaqlawa, 950 m, ANDERS 1467! Mosul: 35 km N Mosul, BARKLEY & ABBAS AL AINI 8999! Ad pontem prope Mindan, 270 m, CHAPMAN 26220!, 26241! Jabal Bakhair S Zakho, FIELD & LAZAR 807! Sirsang, 1150 m, HAINES!, BARKLEY & ABBAS AL AINI 9070! Sul.: Qara Dagh, 1500 m, HAINES 1072! Jafaran, 800—950 m, GILLETT 7864! Penjwin, 1500 m, GUEST 13000! In jugo Malakawa, 1400 m, RECH. 10414! Pira Magrun, 1500 m, RAWI 12123! Sulaymaniyah, 1000 m, HAINES 1095!

Talish: Swant, Tatuni, HOHEN.,

Persia: **N**: Gorgan: Mirmahaleh, 60 m, SCHMID 6033! Shahkuh, KOELZ 16468! Ziarat, BUNGE! Maz.: In valle fluvii Chalus, Pol-e Zanguleh, 2200—2600 m, MANUCH. 9! Abanjarmahali, KOELZ 16196! In declivibus borealibus jugi Kandavan, 2500 m, WDB. 2157! Kalar Dasht, 1660 m, Imp. College Exped. E-15! — **W**: Azerb.: Merdise, KNAPP! Kuh-e Sahand, KNAPP! Kuh-i Bilqis, KNAPP! Prope Khvoy, SZOV.! In jugo Goja Bel 20 km W Ahara, JARDINE 599!, 600! Kuha-ye Sabalan, 1000 m, HARRINGTON 208!; in declivibus borealibus, JARDINE 576! Kurd.: Prope Saqqez, JARDINE 760! Ham.: Hamadan, 2300 m, ROGERS 503!; 1800 m, GAUBA! Arak: M. Rasvand, GAUBA! Darun, JARDINE 789-B! Arak, BORNM. & STR.! In faucibus Girdu, STR.! Esf.: In jugo Godar-i Khunsar, JARDINE 760! Bakht.: Galli Sur, 2300 m, KOELZ 18077! 24 km E Kuhrang, 2650 m, TIMMIS 74! Lur.: Oshtoran Kuh prope Qaleh Rostam, STR! Kuh-e Saverz, 2650 m, HAUSSKN.! Bisheh, 1100 m, KOEIE 658! Khuz.: Khorramshahr, KOEIE 1703! — **S**: Fars.: Hoseynabad, 40 km W Shiraz, 1700 m, GRANT 15857! Kalat, 2300 m, GRANT 17673! Kuh Bamu, 1830 m, ARCHIBALD 2917! Prope Sivand, STAPF 1931! Kuh Chah Siah prope Sivand, STAPF 1929! Rud-e Mand, STAPF 1930! Inter Ardakan et Tal-e Khosravi, 1980 m, ARCHIBALD 2887! Tal-i Khosravi, BEHB. 977-E! Kerm.: Kuh-e Hazaran, 3400 m, BORNM. 4783! — **E**: Khor.: Inter Shahrud et Neyshabur, BUNGE! Bezg, 1660 m, AITCH. 662! Inter Mashhad et Chanaran, 1001 m, RECH. 4691! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, RECH. 4945! — **C**: Tehr.: 30 km NE Tehran, STARM. 213! Supra Qach Sar, 2440 m, ARCHIBALD 2373! Shimran, 1200 m, PRAVITZ 165! Darband, 1800—2200 m, ŽUMER 742! M. Tuchal: Pas Qaleh, 1500—2000 m, RECH. 1146! M. Tuchal, TERMÉ 13137-E! Qazv.: 32 km NE Karaj, 2000 m, FURSE 2601! Purkan, 1700 m, ŽUMER 922! Khur, GAUBA 1577! Kashan: Qamsar, MANUCH.! Shahr.-Bust.: M. Shahvar prope Nokarman, 2000 m, RECH. 5914!

Turcomania: Kizyl-Arvat: Kara Kala: Ad rivulum prope Nechre, Sint. 1826! Ad rivulum prope Nurgele chan, Sint. 1826-b! Ashkhabad: Suluklü, Sint. 1009!, 1009-b! Garmab, Radde 539! Khodzhakala, Radde 899!
Afghanistan: N: Mazar-i Sharif: Terak, 3000 m, Koelz 13893! — NW: Maimana: In jugo Burchao, 3000 m, Koelz 14120! Naranj, 1050 m, Hdg. & Wdb. 3263! Bala Murghab: Mirak, 900—1100 m, Jakeš! Herat: Chashmeh Obeh, 1800 m, Rech. 19219! Obeh, 1600 m, Koeie 4288! Sauzak, 2200 m, Koeie 2196! — SE: Kandahar: Qala Bist, 800 m, Furse 5566! — E: Kabul: Paghman, 2300—2800 m, Rech. 17199!, Gilli 229! Inter Kabul et Band-e Kargha, 1900 m, Rech. 31453!, Lamond 2132! Kabul, Hdg. & Wdb. 3263!, Gilli 228!, Akhtar 377! Wardak, Volk 831! Hauz-i Mahiha, 2600 m, Koeie 2433! Guldarrah, Podlech 11624! In declivibus jugi Salang, Fohlen!; 1850 m, Lamond 2057! Laghman: Daulat Shah, 2300 m, Koelz 11660! Darrah Rastyon: Alishang, 2700 m, Wdb. & Ekberg 9718! Ghazni: Sang-i Masha, 2500 m, Rech. 17438! In jugo Sardalu inter Qarabagh et Sang-i Masha, 2600 m, Rech. 17372! Khost: Yakubi, 1200 m, Rech. 35567! Nuristan: Supra Wama, 1400 m, Kerst. 835! Wama, Edelb. 399! Chetras, 2000 m, Edelb. 1210! Kulam, 2150 m, Kerst. 1051-b!, 1054! Nishai, 1300 m, Edelb. 830! — NE: Kataghan: Distr. Baghlan, 500 m, Furse 6021! Badakhshan: Daraim, 2800 m, Koelz 13037! Yaworzan, 30 km S Kishm, 1400 m, Hdg. & Wdb. 9317! Jurm: Iskan, 1540 m, Edelb. 2104! — C: Ghorband: In jugo Shibar, 2500—2750 m, Rech. 36918! Doab: Lorinj, 2650 m, Koelz 13713! In valle Kamard ad fl. Surkhab, 1600—2000 m, Gilli 227!, Koelz 13580!, 13606! — Afghanistan, Griff. 5411!
Pakistan: Chitral: Mastuj, 2500 m, Stainton 2480! Shoghot, 2000 m, Stainton 2750! Shogor, 1900 m, Schmid 2406! In valle Lutko, 2300 m, Stainton 3253! Broz, 2500 m, Harriss 16727! — Swat: E Kalam, 2650 m, Rodin 5690! Kalam, 2300 m, Stewart & Rahman 25098-a! Prope Bahrain, 1500—1650 m, Stewart 24530!, Stewart & Rahman 25407! — Kurram: In valle Kurram, Aitch. 370!, 678! Distr. fl. Hariab, 2000 m, Aitch.! Parachinar, 1800 m, Afendi 224! Inter Amal Kot et Sadda, 1400 m, Rech. 30978! — S. Wazir.: Kaniguram, Stewart, Blatt. & Fz. Wana, Duthie 15668. — Quetta: Fort Sandeman, Harsukh 20660! Urak, 2150 m, Crookshank 390! Ziarat, 2650 m, Akbar 2160!, Lace! Quetta, Duthie 8729! — Makran: Ad fl. Gwarkoh SE Panjgur, c. 900 m, Hotson 25.

Distr. gen.: Europa, Africa, Asia, in Novam Zealandiam introductus.

8. ***J. effusus*** L., Spec. Plant. 326 (1753).
Icon.: Clapham, Tutin & Warburg, Fl. Brit. Is., Ill. 4: 24 (1965).
Typus: „In Europae uliginosis".

Perennis, dense caespitosus. Caules 50—150 cm alti e rhizomate ramoso dense seriati, praeter bracteas aphylli. Rhizoma praeterea brachyblastos monophyllos folio longo proferens. Vaginae basales colore vario, plerumque pallide brunneae, opacae, summae laminam parvam proferentes. Folia teretia, non septata, caulibus similia. Caules foliaque laeves vel inconspicue striati, fasciculis sclerenchymaticis subepidermalibus in sectione transversali fasciculis vascularibus majoribus non superpositis. Medulla e cellulis asterisciformibus composita, continua. Fasciculi vasculares in strato parenchymatico circumdante tantum evoluti. Inflorescentia multiflora, plerumque laxa, raro contracta. Bractea infima longa, caulem evidenter prolongans; vagina bracteae angusta, ad basin inflorescentiae plerumque evidenter constricta. Flores 1,5—2,5 mm longi, singuli, bracteolis involucrantibus praediti. Tepala ovata usque anguste ovata, apiculata, exteriora longiora. Stamina plerumque 3, raro 4, 5 vel 6, circiter 2/3 tepalorum longitudinis attingentia; antherae filamenta aequantes. Stylus brevissimus; stigmata c. 1 mm longa. Capsula ovoidea usque sphaerica, ± conspicue retusa, quam tepala plerumque paulo brevior, raro eam aequans vel ea paulo longior. Semina c. 0,5 mm longa, ovoidea, reticulata. — 2 n = 42.

Iraq: Kurd.: Kirkuk: Darband-i Bazian, HAUSSKN.!
Persia: N: Maz.: S Amol, 152 m, ARCHIBALD 2285! Mazanderan, ESFAND. M-15! Gil.: Lahijan, LINDS. 974! Navrud, 1000—1200 m, ESFAND. 6471-E! S Hashtpar, 1250 m, STEINER 49!
Afghanistan: E: Nuristan: Kulam, 2150 m, KERST. 1051-a!

Distr. gen.: Europa, Africa australis, centralis et boreo-occidentalis, Madagascar, Asia austro-occidentalis, australis et austro-orientalis, Nova Zealandia, America borealis et australis.

9. ***J. conglomeratus*** L., Spec. Plant. 326 (1753).
Syn.: *J. Leersii* MARSSON, Fl. Neu-Vorpommern und Rügen 451 (1869).
Icon.: CLAPHAM, TUTIN & WARB., Fl. Brit. Is., Ill. 4: 24 (1965).
Typus: „In Europae borealis uliginosis", L, lectotypus, vide Bot. Not. 1970: 2.

Perennis, dense caespitosus. Caules 40—100 cm alti, e rhizomate ramoso orientes, dense seriati, bracteis exclusis aphylli. Rhizoma praeterea brachyblastos monophyllos folio longo proferens. Vaginae basales colore vario, plerumque atrobrunneae, summa laminam brevem proferens. Folia teretia, non septata, caulibus similia. Caules foliaque conspicue 12—30-costata, fasciculis subepidermalibus sclerenchymaticis majoribus in sectione transversali fasciculis vascularibus validissimis superpositis. Cellulae epidermales in costis dilatatae, cuticula crassa provisae. Medulla e cellulis asterisciformibus composita, continua; fasciculi vasculares in strato parenchymatico circumdante tantum evoluti. Inflorescentia pseudolateralis, multiflora, plerumque compacta, capituliformis, raro laxa vel e glomerulis pluribus composita. Bractea infima longa, caulem evidenter prolongans; vagina bracteae ampla. Flores 2—3 mm longi, singuli, bracteolis involucrantibus provisi. Tepala lanceolata, apiculata, exteriora plerumque paulo longiora. Stamina 3, raro 4, 5 vel 6, c. 2/3 tepalorum longitudinis aequantia; antherae quam filamenta paulo longiores. Stylus brevis, plerumque c. 0,1 mm longus; stigmata 0,6—1 mm longa. Capsula ovoidea usque sphaeroidea, obtusa, mucronata, quam tepala paulo brevior. Semina c. 0,5 mm longa, ovoidea, reticulata. — 2 n = 42.

Iraq: Kurd.: Kirkuk: Darband-i Bazian, HAUSSKN.!

Distr. gen.: Europa, Africa boreo-occidentalis, Asia austro-occidentalis, America boreo-occidentalis.

Subgen. ***Pseudotenageia*** V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 527 (1935).

Syn.: Subgen. *Poiophylli* BUCHENAU, Monogr. Junc. 169 (1890) et in ENGLER, Pflanzenr. IV. 36: 100 (1906) p. p. non (1875). Sect. *Pseudostygii* ROUY, Fl. Fr. 13: 231 (1912). Sect. *Compressi* BOISS. ex ROUY, l.c.: 247 (1912). Sect. *Squarrosi* FRIES ex ROUY, l.c.: 246 (1912). Sect. *Tenues* ROUY, l.c.: 246 (1912). Sect. *Trifidi* ROUY, l.c. 232 (1912). Sect. *Tenageia* DUMORT., Fl. Belg. 142 (1827) p. p.
Typus subgen.: *J. compressus* JACQ.

Plantae perennes usque modice elatae. Folia plana vel raro subteretia, cellulis epidermalibus dorsalibus dilatatis et fasciculis sclerenchymaticis marginalibus provisa. Flores singuli vel in glomerulos laxos capituliformes congesti, bracteolati. Bracteolae summae 2 vel raro 3 basin floris cuiusque involucrantes. — x = 15, 21, 22.

Distr. gen. subgen.: Per omnes regiones temperatas, Africa australi exclusa.

10. ***J. compressus*** Jacq., Enum. Stirp. Vindob. 60 (1762).
Syn.: *J. bulbosus* L., Spec. Plant. ed. 2: 466 (1762), non ed. 1 (1753).
Icon.: V. Krecz. & Gontsch. in Komar., Fl. URSS. 3: 505 (1935).
Typus: Ignotus.

Perennis, rhizomate repente vel laxe caespitoso. Caules 10—40 cm alti, plerumque aliquantum compressi, vaginis basalibus 0—3, laminis nullis, foliis subbasalibus 1—4 et foliis caulinis superioribus 1—2. Folia plana vel late canaliculata 5—25 cm longa, 0,75—2 mm lata, ± glaucescenti-viridia. Auriculae breves, latae. Inflorescentia laxa vel raro modice contracta; flores singuli, bracteolis involucrantibus provisi, 2,5—3 mm longi. Bractea infima inflorescentiae longa, inflorescentiam plerumque evidenter excedens. Tepala aequalia, ovata, obtusa, exteriora cymbiformia, apice saepe leviter cucullata. Stamina 6, 1/2—2/3 tepalorum aequantia; antherae 0,5—1 mm longae, filamenta aequantes vel eis usque ad duplo longiores. Stylus 0,2—0,4 mm longus; stigma 1—1,5 mm longum. Capsula sphaerica usque obovoidea, rotundata vel subtrigona, tepala excedens, vel saepe eis usque ad duplo longior, mucronata. Semina 0,35—0,5 mm, ovoidea et subobliqua, prominenter c. 12-striata, striis transversalibus indistinctis. — 2 n = 44.

Persia: W: Azerb.: Ad fl. Shahr Chay prope Rezaiyeh, Knapp!
Afghanistan: E: Nuristan: In valle fluvii Bashgul inter vallem Bargema et Dewana Baba, 2500 m, Rasoul 32!, Breckle A-3432!
Pakistan: Chitral: Inter 35° 55′ N, 71° 18′ E et 36° 6′ N, 71° 48′ E, Bowes Lyon 806!

Distr. gen.: Europa et Asia temperata, America boreo-orientalis.

11. ***J. Gerardi*** Loisel., Journ. Bot. 2: 284 (1809).
Syn.: *J. bulbosus* L., Spec. Plant. ed. 2: 466 (1762), non L. (1753). *J. bottnicus* Wahlenb., Fl. Lapp. 12 (1812).
Icon.: V. Krecz. & Gontsch., Fl. URSS. 3: 505 (1935).
Typus speciei: Provence, Gerard.

Perennis, caespitosus vel caules e rhizomate sat longe articulato singuli. Caules 3—50 cm alti, vaginis basalibus nonnullis, foliis subbasalibus 3—6 et foliis caulinis 0—2. Folia plana usque subteretia. Inflorescentia forma variabilis; flores singuli vel in glomerulos subcapitatos congesti. Tepala aequalia vel exteriora sublongiora, obtusa sed exteriora interdum mucrone dorsali usque submarginali provisa. Antherae 1—2,2 mm longae, quam filamenta 2—6-plo longiores. Capsula quam tepala paulo brevior usque paulo longior, semper lata sed forma variabilis. Semina 0,4—0,75 mm longa, striata, striis transversalibus tenuibus.

Persia: W: Azerb.: Chahriq, Knapp! — C: Tehr.: In valle Ushan N Tehran, 2000 m, Wdb. 1822!
Afghanistan: NW: Herat: Sauzak, 2500 m, Koeie 2203! Inter Herat et Obeh, 1200 m, Koeie 3747! — E: Kabul: in paludosis, Koelz 11453! — C: Bamian: Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16788!

Distr. gen. speciei: Europa, Africa boreo-occidentalis, Asia occidentalis et centralis, America boreo-orientalis; in regiones alias introductus.

The specimens Chahriq, Knapp, Rech. 16788, Koeie 2203 and 3747 are intermediate between subsp. *libanoticus* and subsp. *persicus*. Deviating local forms are Wdb. 1822, an extreme dwarf form, 4—9 cm, tepals c. 1,5 mm, anthers c. 1 mm, most like subsp. *libanoticus*. Koelz 11453 is 40 cm high, most like subsp. *libanoticus* but lightcoloured, stems and leaves thin, basal sheaths reddish.

J. Gerardi forms a widespread form series with several local races, which have been treated as species by several authors. The existence of intermediate and hardly determinable specimens and populations has led me to treat them as subspecies. In our area the following three subspecies are represented:

— — subsp. ***libanoticus*** (THIÉBAUT) SNOG., comb. nov.
Syn.: *J. libanoticus* THIÉBAUT, Bull. Soc. Bot. Fr. 95: 20 (1948).
Typus (syntypi) subspeciei: Libanon, Bekoa; marais d'Amik; de Beskinta à Khan Sannin.

Perennis, rhizomate crasso repente, internodiis plerumque 1—3 cm longis. Caulis (10—) 25—50 cm alti, rigide erecti, vaginis basalibus plerumque 3, bene evolutis amplis, foliis subbasalibus 3—6, foliis caulinis nullis vel 1 (—2) parvis. Surculi intravaginales foliacei in vaginis basalibus interdum evoluti. Auriculae breves, plerumque 0,1 mm longae, latae, in medio faciei dorsalis folii subcontiguae. Folia 2—25 cm longa, 0,5—2 mm lata, plana, marginibus ± convolutis, inflorescentias aequantia vel eis plerumque breviora. Inflorescentia 3—10 cm longa, rarius brevior, 10—70-flora; flores plerumque omnes solitarii, rarius nonnulli in glomerulos parvos congesti. Bracteae infimae foliaceae, auriculis acutis, longitudine valde variabiles; bracteae superiores sensim minores, variabiles, acuminatae usque obtusae vel emarginatae. Bracteola infima adversa tenuis, scariosa, ea floris singuli lata, 1—1,5 mm longa, ea ramorum inferiorum tubularis, multo longior; bracteolae involucrantes late ovatae, amplexicaules obtusae vel acutae, 1,7—2,2 mm longae. Tepala 2,5—4,5 mm longa, exteriora sublongiora, cymbiformia, ovata usque anguste ovata, mucrone dorsali, raro vero apicali usque ad 0,3 mm longo provisa, centro et basi viridia, margine et apice castanea, anguste scariose marginata; interiora ovata usque oblonga, exterioribus colore similia sed margine scariosa apice latiore et in auriculas minutas expansa. Stamina 6, 5/10—9/10 tepalorum aequantia; antherae 1,2—2 mm longae, quam filamenta 3—6-plo longiores. Stylus 0,8—1,2 mm longus. Capsula tepala aequans vel paulo excedens, 2,5—4 mm longa, breviter trigono-ellipsoidalis vel trigono-sphaeroidalis, obtusa usque subretusa, mucrone 0,2—0,5 mm longo. Semina 0,6—0,75 mm longa, oblique ovoidalia, manifeste longitudinaliter c. 16-striata.

Iraq: Kurd.: Arbil: Algurd Dagh, 2000—2300 m, AGNEW s.n.!

Persia: N: Gorg.: Bandar-e Shah, GAUBA 1605! Maz.: In declivibus borealibus jugi Kandavan, 2500 m, WDB. 2178! — W: Azerb.: Kuhha-ye Sabalan prope Megur, JARDINE 577-b! Khvoy, KNAPP!, 1500 m, FURSE 2313! 24 km SE Mahabad, 1650 m, FURSE 2184! Azerbaijan, AUCH. 5473! Karachal, KNAPP! Lur.: Kharon, 1300 m, KOEIE 1705! Dow Rud, 1830—2650 m, KOELZ 15540!, 18333! Ham.: Aq Bolagh-e Aqdaq, RIOUX & GOLV. 44! — E: Khor.: M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, RECH. 5160! — C: Damgh.-Semn.: Kuh-i Nizwa: Kherseh, 2700 m, WDB. 1252! Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 2500 m, RECH. 5949!

Afghanistan: NW: Bala Murghab: Qala Nau, 900 m, KOEIE 3962! Manghan, 700 m, JAKEŠ! Badghiz: Kambao Burj, AITCH. 523! Sang Kotal, 1300 m, AITCH, 557! — NE: Kataghan: In parte superiore vallis Andarab supra Sarab, 2400 m, PODLECH 11155! — C: Bamian: Band-i Amir ad lacum Band-i Zolfikar, 2900 m, RECH. 18441! — Danaghoi, 800 m, MEINERTZHAGEN! Afghanistan, GRIFF. 381!, 382!, 1005!, 1044!, 5408!

Distr. gen. subspeciei: Anatolia interior, Syria, Libanon, Kurdistan, Persia borealis et Afghanistan.

The eastern limit of the distributional area is imperfectly known.

— — subsp. ***persicus*** (Boiss.) Snog, comb. nov.
Syn.: *J. persicus* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 101 (1846).
Typus subspeciei: Kotschy 683, CGE!, E!, BM!, G!

Perennis, rhizomate crasso, repente, internodiis usque ad 2 cm longis. Caules 3—15 (—25) cm longi, tenues sed stricte erecti, vaginis basalibus 2—3 bene evolutis, foliis subbasalibus 4—5, folio caulino superiore 0—1 brevissimo. Folia 2—10 (—15) cm, quam caulis maturus multo breviora, 0,4—1,2 mm lata, plana, margine convoluta vel folia minutissima subteretia. Surculi intravaginales in vaginis basalibus interdum evoluti. Auriculae breves, plerumque 0,3—0,4 mm longae, latae, rotundatae, in facie dorsali folii subcontiguae. Inflorescentia contracta, plerumque 0,5—2 cm longa, e florum glomerulis discretis composita, 3—16 (—30)-flora. Bracteae infimae foliaceae, saepe auriculis acutis provisae, quam inflorescentia plerumque breviores; bracteae superiores sensim minores et magis scariosae, latae, amplexicaules, acuminatae usque obtusae. Bracteola infima adversa tenuis, scariosa, biapiculata, tubularis vel ea floris brevipedicellati ovato-amplexicaules, 1—1,5 mm longa. Bracteolae involucrantes late ovatae, amplexicaules, 1,2—1,8 mm longae, obtusae vel acutiusculae. Tepala 2,5—3,5 mm longa, aequalia vel exteriora sublongiora; exteriora cymbiformia, ovata usque oblongo-lanceolata, cucullato-apiculata, mucrone dorsali usque ad 0,1 mm longo, centro et basi viridia, margine et apice pallide usque atro-brunnea, margine scariosa angusta vel apice leviter expansa; tepala interiora colore similia, oblonga, latius scarioso-marginata et apice in auriculas aliquantam protrudentes expansa. Stamina 6, 6/10—9/10 tepalorum longitudinis attingentia; antherae 1,2—2,2 mm longae, filamentis 3—5 (—7)-plo longiores. Stylus 0,5—0,8 mm longus. Capsula 2,3—3 mm longa, quam tepala subbrevior usque sublongior, pallide usque atro-brunnea, late trigono-ellipsoidalis usque subsphaerica, apice arcuata usque subobtusa vel subretusa et mucrone 0,2—0,4 mm longo provisa. Semina 0,4—0,6 mm longa, oblique ovoidalia, c. 16-striata.

Persia: **W**: Azerb.: Kuh-e Sahend, Shah Zardi, Buhse (?) — **S**: Fars.: Kuh-e Bul, 3300 m, Stapf 1922! Shiraz, 1425 m, Pravitz 370! Kuh-e Dinar, Ky. 612! In planitie Kakun M Kuh-e Dinar, Ky. 683! Prope fontem Chashmeh Pias, Ky. 914! — **E**: Khor.: Inter Mashhad et Torbat-e Heydariyeh, Rech. 1549! — **C**: Qom: Rahjerd, 1700 m, Koeie 1706!
Afghanistan: **E**: Kabul: 20 km E Kabul versus Lataband, 1800 m, Hdg. & Wdb. 3041! Kabul, Neub. 125-a!, 187!, 768!, Gilli 222!, 223!, 224!, s.n.!, Rech. 16006! In jugo Unai, 3120 m, Gilli 226!, Neub. 555! Farakulum, 2800 m, Koeie 2572! Ghazni: Ad marginem orientalem altoplanitiei Dasht-i Nawar, 3000 m, Rech. 37303! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17923-b! Jaji: Inter Dre Kalla et Shinkai, 2900 m, Lamond 2514! Prope Bian Khel, Aitch. 603! Inter Qasim Khel et Dobandi, 3300 m, Rech. 32360! Urgun: 35 km NW Urgun versus Surmat, 2200—2400 m, Rech. 35927! Urgun, 2200—2300 m, Rech. 35891! — **C**: Bamian: Inter jugum Unai et jugum Hajigak, 2950 m, Hdg. & Wdb. 4587! Shar-e Shak, 2320 m, Gilli 225! Band-i Amir, ad lacum Band-i Panir, 2800 m, Rech. 18351! Panjao: 20 km N Panjao, 2500 m, Koeie 3351! Deh Kundi, 2700 m, Edelb. 1903! Doab: Safed Sang, 3300 m, Koelz 14014!

Distr. gen. subspeciei: Endem.

— — subsp. ***soranthus*** (Schrenk) Snog., comb. nov.
Syn.: *J. soranthus* Schrenk, Bull. Acad. Sci. Petersbg. 2: 193 (1843).
Icon.: V. Krecz. & Gontsch., Fl. URSS. 3: 505 (1935).
Typus subspeciei: „Soongaria, in desertis ad fl. Ters Akhan", Schrenk, MANCH!

Perennis, laxe caespitosus vel rhizomate repente, plerumque breviarticulato interdum stolonifero. Caules 25—50 cm alti, validi, erecti, plerumque crassi, vaginis 2—4

magnis basalibus, foliis plerumque 3—4 subbasalibus, folio caulino nullo, vel singulo brevi. Folia 5—25 cm longa, plerumque inflorescentiam attingentia, 1—2 mm lata, plana, marginibus ± convolutis. Auriculae breves, plerumque 0,3—0,7 mm longae, latae, obtusae, in latere dorsali folii sese aliquantum tegentes. Inflorescentia 3—13 cm longa, (15—) 30—60 (—120)-flora, floribus plurimis in capitula 2—5-flora congestis. Bracteae infimae foliaceae, prima inflorescentiam saepe superans, auriculis acutis, bracteae superiores sensim minores, partim vel omnino scariosae, acuminatae usque obtusae. Bracteola prima florifera, latissime amplexicaulis, 0,5×0,5 mm, eae ramificationum inferiorum longiores, tubulares. Bracteolae involucrantes ovatae, amplexicaules acutae usque subobtusae vel emarginatae, partim scariosae, 1,2—1,8 mm longae. Tepala 2,8—3,5 mm longa, plerumque aequalia, oblonga usque ovata vel late lanceolata, obtusa, basi et dorso viridia usque pallide brunnea, apice et lateraliter atrobrunnea usque castanea; margo scariosa tepalorum interiorum apice lata, nec autem vel paulo tantum expansa, argentea; tepala exteriora subcymbiformia, cucullata et dorso interdum minute mucronata. Stamina 6, 3/4—5/6 longitudinis tepalorum attingentia; antherae 1,5—2,2 mm longae, quam filamenta 2,5—4,5-plo longiores. Capsula 3—3,5 mm longa, tepala aequans vel paulo excedens, late ellipsoidalis, subtrigona, obtusa, rostro 0,2—0,4 mm longo provisa. Semina 0,55—0,65 mm longa, oblique ovoidalia usque subellipsoidalia, c. 16-striata.

Afghanistan: **NW:** Maimana: Naranj, 1050 m, HDG. & WDB. 3656!

Distr. gen. subspeciei: In regionibus interioribus a regione Wolgensi inferiore usque ad Asiam centrali-borealem.

The distributional area is imperfectly known.

Subgen. ***Poiophylli*** BUCHENAU, Abh. Nat. Ver. Bremen 4: 406 (1875).

Syn.: Sect. *Poiophylli* (BUCHENAU) VIERHAPPER in ENGLER & PRANTL, Nat. Pflanzenfam. ed. 2, 15a: 215 (1930). Sect. *Paeophylli* ROUY, Fl. Fr. 251 (1912). Sect. *Tenageia* DUMORT., Fl. Belg. 142 (1827) p.p. Subgen. *Tenageia* (DUMORT.) V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 515 (1935).
Typus subgen.: *J. bufonius* L.

Plantae annuae sine rhizomate. Folia plana cellulis epidermidis dorsalibus dilatatis et fasciculis sclerenchymatis marginalibus. Flores singuli vel nonnulli laxe glomerati, bracteolati, bracteolis summis binis, basem floris involucrantibus. Semina semper sine testa persistente. — x = 15, 17, 18.

Distr. gen. subgen.: Per totum orbem terrarum.

The highly critical *J. bufonius* group is here represented by species 12—15. It contains diploid forms, which I have found to have a constant chromosome number of 2n = 34 as far as hitherto studied. To them belong *J. hybridus* and most probably also *J. turkestanicus*, according to stomata measurements and other morphological evidence. The delimitation between *J. hybridus* and *J. turkestanicus* is not clear, the forms from the South Caspian and parts of Iran may be regarded as intermediate, though here divided to the two species. These might perhaps be ± interfertile subspecies instead, but as long as no evidence from cytology or crossing is available, I prefer not to make any new combinations. As selfpollination is frequent in all forms of the complex, many of the rather characteristic local forms, e.g. within *J. turkestanicus*, may represent pure lines originating from ± obligate autogamy. *J. minutulus* is approximately tetraploid. Constant hybrid derivatives observed in one greek population indicate occurence of apomictic propagation on this level. The approximately hexaploid forms here kept as *J. bufonius* show an aneuploid series of chromosome numbers centering between 100 and 110. The difficulty in chromo-

some counts resulting from extremely small chromosomes have led to the publication of numerous miscounts even by recent authors. The complex is not yet sufficiently known, so that the taxonomic treatment must be regarded as somewhat arbitrary.

12. ***J. bufonius*** L., Spec. Plant. 328 (1753).
Typus: „In Europae inundatis."

Annuus, caespitosus, specimina macra rare caulem singulum proferentes. Caules 5—50 cm alti, plerumque tenues, erecti vel ascendentes, foliis 1—5 infra inflorescentiam, infima laminas parvas proferentes; bracteae infimae quoque elongatae, foliaceae. Folia 1—12 cm longa, 0,5—2 mm lata, plana, marginibus saepe leviter convolutis. Auriculae nullae. Stomata plerumque 35—50 μ, rare siccitate extrema 32 μ. Inflorescentia plerumque dimidium vel magis caulis longitudinis occupans, rare brevior, plerumque laxa, floribus singulis, rarius flores nonnulli capitato-congesti; flores pauci usque ad 100. Bracteae superiores sensim minores, supremae saepe ovatae et $\pm$ scariosae. Bracteola prima adversa scariosa, tubularis, manifeste biapiculata, longitudine valde variabilis. Bracteolae involucrantes 2, rare 3, 1,5—2,5 mm longae, ovatae, scariosae, acutae. Tepala inaequalia, anguste ovata, exteriora longiora (4,5—) 6—8 mm longa, apiculata vel acuminata, herbacea, plerumque anguste scarioso-marginata, interiora 4—6,5 mm longa, apiculata vel in floribus superioribus rare acuta, plerumque scariosa, centro late herbacea, in uno eodemque specimine saepe valde variabilia. Stamina 6, 1/3—1/2 longitudinis tepalorum attingentia; antherae 0,5—1 mm vel rarius longiores, 4/10 usque totam longitudinem filamentorum attingentes. Stylus c. 0,5 mm longus; stigmata 1—1,5 mm longa, divergentia vel mox contorta. Flores plerumque aperti, rarius cleistogami; antherae saepe stigmati affixae, a filamentis solutae. Capsula quam tepala brevior, (3—) 3,5—5 mm, ovoidalis usque subellipsoidalis, arcuata usque obtusa, usque ad 2/3—5/7 longitudinis spontanee dehiscens, colore viridi usque castaneo; stylus plerumque ut rostrum 0,1—0,25 mm longum persistens. Semina 0,4—0,55 mm, ellipsoidalia, interdum subobliqua, laevia vel tenuissime striata. — 2 n = 100—110, variabilis.

Iraq: Kurd.: Kirkuk: 30 km S Darbandikhan, Barkley 7372! Jarmo, Helbaek 607!, 1232!, Haines 267! — Mosul: Inter Dihok et Amadiyah supra Sirsang, 1200 m, Rech. 11924! In jugo inter Dagh al Raziem et Sharanish prope Zakho, 900 m, Rech. 10810! — Sul.: Inter Sulaymaniyah et Dokan, 700 m, Rech. 10096!, Rawi 21768! Prope Penjwin, 1400 m, Rech. 12225!

Talish: Distr. Lenkoran, Bobrov & Tzevlev!

Persia: N: Maz.: Now Shahr, Assefi 13134-E! In declivibus borealibus jugi Kandavan, 2600—3000 m, Rech. 6858 p. p.! Gil.: Astaneh?, Abai 12136-E! Lahijan, Linds. 861! — W: Azerb.: Chariq, Knapp, Ham.: Yalfan, Pichler! Hamadan, Pichler! Kermansh.: Qasr Shirin, Shar. 5546-E! Bakht.: Belu, Koelz 15219! Lur.: Shah Bazan, 500 m, Koeie 1701! — S: Fars.: Bushehr, Koeie 139! Kotal Kumaraj, Stapf 1934! In cacumine M. Kuh-e Dinar, Ky. s. n.! Kuh Charmakan, Stapf 1935! — C: Tehr.: Prope Darband, Ky. 279 p. p.!

Turcomania: Ashkhabad: Suluklü, Sint. 524-b p. p.!

Afghanistan: SE: Kandahar: Siah Sang, Griff.! — E: Kabul: Paghman, 2480 m, Gilli 220!, Neub. 767! Kabul, 1780 m, Gilli 218! Farakulum, 2700 m, Koeie 3353 p. p.! Nuristan: Gusalak, 1000 m, Edelb. 146!, 196! In valle fluvii Bashgul inter Dario Pushol et jugum Pushol, 3600 m, Breckle A-3574!, Rasoul 174!; prope Garm Chashmeh, 3000—3250 m, Breckle A-2559!, A-3140! Gardez: 10—20 km SE Gardez, 2400—2700 m, Rech. 32078 p. p.! Ghazni: Sar-i Ab, 52 km W Ghazni, 2700 m, Rech. 37174! — Afghanistan, Griff. 5407 p. p.!

Pakistan: Swat: Inter Khawazakhiela et Shangla, 1300—1900 m, Rech. 30552!

Distr. gen.: Per totum orbem dispersus, partim introductus.

13. ***J. minutulus*** ALBERT & JAHANDIEZ, Cat. Pl. Vasc. Dep. Var 501 (1908).
Syn.: *J. minutulus* V. KRECZ. & GONTSCH., Fl. URSS. 3, add. 625—626 (1935), nom. illeg. *J. Congdoni* WATSON, Proc. Amer. Acad. 22: 480—481 (1887)?, typum non vidi.
Typus: „France: Var, Bormes et île de Porquerolles" (non vidi).

Annuus, caespitosus vel rare caulem singulum proferens, specimina macra saepe subacaulia, florum glomerulos subsessiles formantia. Caulis 0,5—5 cm (in speciminis cultis quoque usque ad 15 cm) altus, tenuissimus, aphyllus vel infra inflorescentiam foliis paucis minutis obsitus; bracteae inferiores quoque foliaceae. Folia brevia 0,5—2 cm longa, minus quam 1 mm lata, plana usque semiteretia. Auriculae in foliis non floralibus deficientes, in bracteis nonnullis evolutae. Stomata 30—35 μ. Inflorescentia ultra dimidium caulis longitudinis occupans, plerumque non vel breviter ramosa, 2—15 (—20)-flora; flores singuli vel in glomerulos paucifloros congesti. Bracteae superiores sensim minores, magis scariosae, supremae quoque breviter laminatae vel apiculatae. Bracteola prima adversa biapiculata, tubularis, 2—3 mm longa, in floribus supremis brevior et latior. Bracteolae involucrantes plerumque binae, 1,5—2,5 mm longae, ovatae, amplexicaules, acutae vel supremae rare obtusae. Tepala anguste ovata, late scarioso-marginata, centro herbacea, inaequalia; exteriora 4—6,5 mm longa, plerumque quam interiora multo longiora, apiculata usque acuminata; interiora 3—4,5 mm longa apiculata. Stamina plerumque 3, rare 6, 1/3—1/2 longitudinis tepalorum interiorum attingentia; antherae 0,2—0,6 mm longae, 1/4—1/3 longitudinis filamentorum attingentes. Stylus 0,1—0,4 mm; stigmata c. 1 mm longa, deflexa. Flores plerumque cleistogamica; antherae stigmatibus plerumque affixae et a filamento capsula increscente soluta. Flores dimeri interdum evoluti. Capsula 2,5—3 mm longa, quam tepala brevior, ovoidalis, obtusa, spontanee usque ad 2/3 longitudinis dehiscens. Stylus ut mucro 0,1—0,2 mm longus remanens. Semina 0,35—0,4 (—0,5) mm longa, ovoidalia usque ellipsoidalia, laevia vel tenuissime striata. — 2 n = c. 72.

Persia: N: Gil.: Lahijan, LINDS. 836!, GAUBA 1604! Inter Rasht et Lahijan, RECH. 35!

Distr. gen.: Per totum orbem terrarum dispersus.

The distributional area is imperfectly known.

14. ***J. hybridus*** BROT., Fl. Lusit. 1: 513 (1804).
Syn.: *J. mutabilis* SAVI, Fl. Pis. 1: 364 (1798) non LAM. (1789). *J. insulanus* VIV., Fl. Cors. 5 (1824). *J. ambiguus* GUSS., Fl. Sic. Prodr. 1: 435 (1827), non auct. mult. seq.
Typus: Circa Conimbricam; Beira.

Annuus, caespitosus, plerumque multicaulis. Caules (5—) 10—20 (—30) cm alti, erecti, validi, folia plerumque 1—4 longa infra inflorescentiam proferentes; bracteae infimae quoque longae, foliaceae. Folia 2—7 (—10) cm longa, plerumque 0,5—1 mm lata, plana, marginibus ± convolutis. Auriculae in foliis non floralibus deficientes, in bracteis nonnullis tantum evolutae. Stomata 25—35 (—40) μ. Inflorescentia plerumque 1/3—1/2 tantum caulis longitudinis occupans, 7—50-flora, floribus in glomerulos 1—10 plerumque capitatos congestis, rarius omnibus singulis. Bracteae superiores sensim minores, supremae ovatae, scariosae, acutae. Bracteola prima adversa biapiculata, scariosa, tubularis, longitudine variabilis, in floribus superioribus brevis, subovata. Bracteolae involucrantes plerumque 2, 1,5—2,5 mm longae, scariosae, ovatae, acutae vel obtusae. Tepala late scarioso-marginata, centro her-

bacea, inaequalia; exteriora 5—8,5 mm longa, quam interiora 0,5—3 mm longiora, anguste ovata apiculata; interiora 3,5—6 mm longa, anguste ovata usque lanceolata, obtusa vel plerumque acutiuscula. Stamina 6, 1/3—1/2 longitudinis tepalorum interiorum attingentia; antherae 0,4—0,8 mm longae, 2/3—4/5 longitudinis filamentorum attingentia. Stylus 0,2—0,5 mm longus; stigmata 0,5—1 mm longa. Flores plerumque normales, aperti, non cleistogami. Capsula 3,5—4,5 mm longa, quam tepala interiora paulo brevior, rotundato-prismatica usque ellipsoidalis, obtusa, saepe ad basin styli paulo elevata, usque ad dimidium longitudinis spontanee dehiscens. Basis styli plerumque omnino delabens. Semina 0,3—0,4 mm longa, late ovoidalia usque ellipsoidalia, laevia. — 2 n = 34.

Iraq: Kurd.: Kirkuk: Qara Anjir 27 km E Kirkuk, 600—710 m, Rech. 12522! Rawi 21594! Darbandikhan, Barkley 9271!, 9276!
Talish: Lenkoran, Fischer!
Persia: N: Gorg.: Gonbad-e Kavus, Shar. 2588-E!, Bandar-i Gaz, Shar. 455! — W: Lur.: Changuleh, Behb.! Khuz.: 50 km NE Haft Gel, Bent & Wr. 503—603! — S: Fars.: Prope Bushehr, Stapf 1938! Bal.: Inter Zahedan et Khash, 1300—1600 m, Rech. 4260! — C: Qazv.: 25 km N Karaj, 1700 m, Remaudière 84. — Persia, Belanger s. n.!
Turcomania: Ashkhabad, Sint. 524!
Afghanistan: SW: Dilaram, 1100 m, Koeie 3352!

Distr. gen.: Regio Mediterranea, Asia australis, Africa australis, et verosimiliter alibi.

The distributional area of this species is still imperfectly known.

15. ***J. turkestanicus*** V. Krecz. & Gontsch., Fl. URSS. 3, add.: 625 (1935).
Typus: „Kasakstaniae pars heptopotamica, reg. Alma-ata, distr. Bien-Aksu, in planitie Istyk, 3.—21. 7. 1928", Smirnov 503, holotypus, LE!

Annuus, caespitosus, plerumque multicaulis. Caules 3—15 (—25) cm alti, plerumque tenues, erecti vel leviter ascendentes, foliis 2—4 subbasalibus plerumque parvis infra inflorescentiam; bracteae inferiores quoque foliaceae. Surculi intravaginales crebre evoluti, etiam in axillis foliorum caulinorum. Folia 1—5 cm longa, 0,2—0,5 (—1) mm lata, plana, marginibus convolutis, vel folia minima semiteretia. Auriculae in foliis infra inflorescentiam nullae, in bracteis nonnullis autem evolutae. Stomata (24—) 30—38 μ. Inflorescentia (1/4—) 1/3—2/3 caulis longitudinis occupans; flores singuli vel superiores plerumque dense glomerati; flores 5—25. Bracteae superiores decrescentes, supremae ovatae, scariosae, acutae. Bracteola prima adversa tubularis, scariosa, eae florum supremorum minores, subovatae. Bracteolae involucrantes plerumque 2, 1,5—2,5 mm longae, late ovatae, amplexicaules, acutae. Tepala inaequalia, scariose marginata, centro herbacea, exteriora 3,5—6 mm longa, quam interiora usque ad 1 mm longiora, anguste ovata apiculata, tepala interiora 3—5 mm longa, anguste ovata usque oblongo-lanceolata, area centrali angusta, plerumque acutiuscula, rarius obtusa vel manifeste acuta. Stamina 6, 1/3—2/3 longitudinis tepalorum interiorum attingentia; antherae 0,4—0,8 mm longae, 3/4—4/5 longitudinis filamentorum attingentia. Stylus 0,2—0,5 mm longus, stigmata 0,5—1 mm, plerumque deflexa et mox contorta. Floratio cleistogama, in plantis vivis autem nondum observata; antherae stigmatibus non affixae. Capsula 3—4,5 mm longa, tepala interiora aequans vel eis usque ad 1 mm brevior, raro quam ea paulo longior, ellipsoidalis obtusa, usque ad c. dimidiam longitudinem spontanee dehiscens; styli basis plerumque decidua. Semina 0,35—0,45 (—0,5) mm longa, ellipsoidea, laevia vel tenuiter striata.

Persia: N: Maz.: In declivibus borealibus jugi Kandavan, 2600—3000 m, RECH. 6858 p. p.! — W: Azerb.: Ad fl. Shahr Chay prope Rezaiyeh, KNAPP! Ham.: Yalfan, PICHLER! Prope Hamadan, PICHLER! Lur.: Najiu, 1700 m, KOEIE 566! Dow Rud, KOELZ 18370 p. p.! — S: Fars.: Dasht-e Arzhan inter Ahmadi et Borazjan, STAPF 1936! Inter Deh-e Girdu et Yazd-e Khvast, STAPF 1933! Bushehr, KOELZ 14828!, STAPF 1932! — E: Khor.: M. Hazar Masjed, 2000 m, RECH. 5104! — C: Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 2300 m, RECH. 5902!
Turcomania: Ashkhabad: Suluklü, SINT. 524-b p. p.! Prope Ashkhabad, LITW. 2142!
Afghanistan: E: Kabul: Paghman, 2480 m, GILLI 220 p. p.! Supra Begtut, 2900 m, GILLI 221 p. p.! Prope Kabul, GILLI 218 p. p.!, 219! Farakulum, 2700 m, KOEIE 3353! Panjshir: Shanez, 2550 m, HDG. & WDB. 5342! Gardez: In planitie prope Gardez, 2600 m, LALANDE R 534-E 6! 10—20 km SE Gardez versus Khost, 2400—2700 m, RECH. 32078 p. p.!, LAMOND 2424! Urgun: 50 km NW Urgun versus Surmat, 2200—2400 m, RECH. 35955! — NE: Wakhan: Sar Skhaur, 2700 m, ROEMER 294! Badakhshan: 8 km S Ishkamish, 1180 m, PODLECH 10729! — C: Bamian: Shar-e Shak prope Bamian, 2260 m, GILLI 219-b! Band-i Amir, ad lacum Band-i Zolfikar, 2900 m, RECH. 18466! Doab: Kamard, 200 m, KOELZ 13588! In jugo Sabz, 3300 m, KOELZ 13815! Behzud: In jugo Unai, NEUB. 4366! Inter Behzud et jugum Unai, 2800 m, HDG. & WDB. 5033! — Afghanistan, GRIFF. 774! 1000!, 5407 p. p.!
Pakistan: Chitral: Laspur Gol, SE Mastuj, 3600 m, STAINTON 3099! In parte superiore vallis Brumboret prope Bromotul, 2000 m, KERST. 2084!

Distr. gen.: Ab Anatolia orientali orientem versus usque ad Mongoliam.

The distributional area is still imperfectly known.

16. ***J. sphaerocarpus*** NEES in FUNCK, Flora 1: 31, 521 (1818).
Typus: Röhn, HELLER.

Annuus, caespitosus, pauci- usque multicaulis. Caules 5—30 cm alti, erecti vel subflaccidi, tenues, foliis 0—2 infra inflorescentiam. Bracteae inferiores elongatae, foliaceae. Folia 1—5 cm longa, 0,5—1,5 mm lata, plana vel leviter convoluta. Inflorescentia laxa, ampla, plerumque multiflora, dimidiam vel totam longitudinem caulis occupans. Flores singuli, laxe cymosi, 2,5—4,5 mm longi, bracteolis involucrantibus. Tepala exteriora anguste ovata, apiculata, interiora breviora, lanceolata, acuta vel apiculata. Stamina 6, 1/3—1/2 longitudinis tepalorum attingentia; antherae 0,1—0,4 mm longae, 1/3—1/2 longitudinis filamentorum occupantes. Styli 0,1—0,2 mm longi; stigmata 0,4—0,8 mm longa, deflexa, mox contorta. Pollinatio plerumque cleistogamica. Capsula quam tepala exteriora breviora, trigono-sphaerica, obtusa, brevissime mucronata. Semina 0,3—0,45 mm ovoidea vel ellipsoidea, laevia vel minutissime et inconspicue striata. — 2 n = 36.

Iraq: Kurd.: Mosul: Ad confines Persiae inter Dihok et Amadiyah supra Sirsang, 1200 m, RECH. 11926!
Persia: N: Gil.: Ispili, LINDS. 1359! — W: Lur.: Bisheh, 1200 m, KOEIE 1702! — S: Fars.: Kuh Delu, KY. 501 et 502 p. p.! Chashmeh Girdu prope Kuh Bamu, 2650 m, STAPF 1919 p. p.!
Afghanistan: E: Panjshir: Mukeni, 2600 m, HDG. & WDB. 5269!

Distr. gen.: Europa centralis, Regio Mediterranea orientem versus usque ad Afghanistan, America.

Everywhere a rare species.

17. ***J. Rechingeri*** SNOG., sp. nov.
Icon.: Tab. 3.
Typus: RECHINGER 37174-B, LD!, holotypus W!

Annuus, caulibus singulis vel caespitosis usque ad 20. Caules 1—6 cm (in speciminibus cultis usque ad 10 cm) longi, erecti, tenues, 0,2—0,3 mm crassi, foliis basalibus 1—3 vel vaginis aphyllis, foliis caulinis praeter bracteas nullis. Folia 2—4 cm longa, 0,3—0,7 mm lata, plana vel subteretia, cellulis epidermidis dorsalibus dilatatis et stratis sclerenchymatis marginalibus. Inflorescentia pauciflora, laxa, plerumque e drepanio singulo 1—6-floro consistens. Flores singuli, bracteolati. Bracteae inferiores foliaceae, summae minutissimae, scariosae, late ovatae. Bracteolae adversae tenues, scariosae, tubulares, obtusae vel breviter biapiculatae, 2—3 mm longae. Bracteolae involucrantes, 2, scariosae, late ovatae, amplexicaules, acutae vel obtusae, 0,8—2 mm longae, usque ad 0,5 mm inter se remotae; pedicellus florifer supra bracteolam summam 0,1—0,3 mm longus. Tepala exteriora 2,5—5 mm longa, lanceolata, anguste ovata vel in floribus diminutis ovata, apiculata, centro herbaceo tertiam partem latitudinis occupante, ceterum scariosa. Tepala interiora breviora, 1,7—4 mm longa, anguste ovata usque ovata, acuta vel obtusa, praeter costam medianam brunneam scariosa, in floribus juvenilibus raro viridia. Stamina 6, 3/10—4/10 longitudinis tepalorum attingentia; antherae 0,35—0,55 mm longae, 4/10—6/10 longitudinis filamentorum attingentia. Stylus 0,2—0,3 mm longus; stigmata 0,4—0,6 mm longa, ineunte anthesi rubescentia, deflexa. Pollinatio interdum quidem cleistogamica. Capsula quam tepala exteriora brevior, proportione cum interioribus variabilia 1,8—3 mm longa, ellipsoidea et interdum subtrigona, obtusa, mucrone nullo vel brevissimo. Semina 0,45—0,55 mm longa, 0,25—0,3 mm lata, oblique ovoidea, apicibus duobus atris sculptura prominente e costis 11—14 tenuiter angulato-flexuosis et e costis plerumque 30—40 tenuioribus transversalibus consistente, pallide brunnea, costis atrioribus. 2 n = 30 (e typo).

Persia: **W:** Lur.: Dow Rud, KOELZ 18370 p. p.! — **S:** Fars.: In humidis regionis superioribus Kuh Delu, 3800 m, KY. 501!, 502!, s. n.! Kuh Charmakan, STAPF 1918! Kuh Bamu prope Chashmeh Girdu, 2650 m, STAPF 1919 p. p.! — **C:** Tehr.: M. Elburz prope Darband, KY. 279 p. p.!
Afghanistan: **E:** Kabul: Paghman supra Begtut, 2900 m, GILLI 221 p. p.! Gardez: 10—20 km SE Gardez versus Khost, 2400—2700 m, RECH. 32078-b! Ghazni: Sar-i Ab, 52 km W Ghazni, substr. calc., 17. VII. 1967, RECH. 37174-B!

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

The name is formed in honour of the type collector. The name *J. tenellus* ascribed to some sheets by BOISSIER could not be used because it would be a homonym of *J. tenellus* GEUNS (1788).

The characteristic seed form of this species is very different from that of other representatives of this subgenus. It is more like that of subgenus *Juncinella*, which *J. Rechingeri* also approaches in the absence of cauline leaves. The presence of a full set of bracteols and the leaf shape indicate, however, a closer affinity to the previously known species of subgen. *Poiophylli*. The seed sculpture would indicate a relationship to *J. sphaerocarpus* NEES and to the West Mediterranean *J. foliosus* DESF., capsule form and habit are, on the other hand, more reminding of the members of the *J. bufonius* complex.

Outside the Flora Iranica area only the following collections: Anatolia: Prov. Bitlis: Pelli, 2200 m, DAVIS & POLUNIN 22398 p. p.! Prov. Sivas: Gürün-Pinarbasi, 35 km a Gürün, 1700 m, STAINTON & HENDERSON 5703 p. p.! Kurdistan occidentalis: Taurus Cataonicus. Inter urbem Malatja et vicum Kjachta Tschat, 1900 m, HAND.-MZT. 2502! — Ajagus („bei *Arenaria serpyllifolia* N. 131"), SCHRENK!

Subgen. ***Septati*** BUCHENAU, Abh. Nat. Ver. Bremen 4: 406 (1875).

Syn.: Sect. *Septati* (BUCHENAU) VIERHAPPER in ENGLER, Nat. Pflanzenfam. ed. 2, 15a: 217 (1930). Sect. *Ozophyllum* DUMORT., Fl. Belg. 142 (1827). Subgen. *Ozophyllum* (DUMORT.) V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 534 (1935). *Phylloschoenus* FOURR., Ann. Soc. Linn. Lyon, N. S. 17: 171 (1869), pro gen. Sect. *Caespitosi* COUTINHO, l. c.: 104 (1890) p. p. Sect. *Nodulosi* COUTINHO, Bol. Soc. Brot. 8: 107 (1890) Sect. *Obtusiflori* ROUY, Fl. Fr. 233—234 (1912). Sect. *Pygmaei* ROUY, l. c.: 249. Sect. *Supini* ROUY, l. c.: 243. Sect. *Articulati* FRIES ex ROUY, l. c.: 234—235. Sect. *Subnodulosi* WEIMARCK, Svensk Bot. Tidskr. 20: 153 (1946).
Typus subgen.: *J. oxycarpus* E. MEY., lectotypus.

Perennes rhizomatosi vel rarius annui. Folia teretia, in speciebus nonnullis dorso applanata vel sulcata, uni- vel pluritubulosa septata. Septatio foliorum pluritubulosorum aut septis in tubis separatis imperfecta aut septis omnino coordinatis perfecta. Flores dense capitato-congesti. Bracteolae adversae in ramis nonnullis inflorescentiae evolutae; flores singuli bracteolis involucrantibus autem carentes. — X = 20 (polyploidia frequens).

Distr. gen. subgen.: Per totum orbem terrarum.

18. ***J. punctorius*** L. fil., Suppl. 208 (1781).
Syn.: *J. exaltatus* DECNE., Ann. Scienc. Nat., Sér. 2, 2: 16 (1834). *J. Schimperi* HOCHST. in RICHARD, Tent. Fl. Abyss. 2: 338 (1850).
Typus: Caput bonae spei.

Perennis, rhizomate repente, internodiis 0,5—2 cm longis. Caulis rigidus, 40—110 (—210) cm altus, vaginis basalibus 3, vagina summa laminam minutam proferente et folio caulino singulo plerumque 20—40 cm longo e parte superiore caulis oriente. Rhizoma brachyblastos vaginis 3—4 et folium singulum 50—100 cm proferentes emittens. Folia teretia pluritubulosa, cavitate centrali magna, perfecte vel imperfecte septata. Inflorescentia e capitulis 10—80 composita, ramis patentibus, capitulis hemisphaericis vel sphaericis 8—30-floris. Tepala ovata, aequalia, 2—2,5 mm longa, acuta usque apiculata, exteriora cymbiformia. Stamina 6, 1/2—3/4 tepalorum longitudinis aequantia; antherae 0,5—0,7 mm longae, quam filamenta c. sesquilongiora, stylus c. 1 mm, stigmata 1—1,5 mm longa. Capsula tepala aequans vel paulo superans, c. 2,5 mm longa, sphaeroidea vel ovoidea, lateribus carpelli leviter depressis, rostro 0,5 mm longo, trilocularis, atrobrunnea, nitida. Semina 0,45 mm longa, ovoidea, subobliqua, bi-apiculata, 20—25-striata.

Persia: S: Fars.: 20 km W Shiraz, 1700 m, GRANT 15099! — Persia, BUNGE!
Pakistan: Quetta: Urak, FURON V 14!; 2300, CROOKSHANK 71!; 2150 m, CROOKSHANK 391! M. Zargun, 2650 m, KHARTHAK 572! Kahan, 2300 m, CROOKSHANK 570! — Kalat: Harboi, 2300—2650 m, STEWART 782! Kalat, 2300 m, JAFRI & AKBAR 1889! — Sind, STOCKS 1093!

Distr. gen.: Africa borealis, australis et orientalis, Persia australis, Pakistan occidentalis, Arabia.

19. ***J. subnodulosus*** SCHRANK, Baier. Fl. 1: 616 (1789).
Syn.: *J. sylvaticus* REICHARD, Fl. Moeno-francof. 2: 181 (1778), non HUDSON (1762). *J. nodosus* WEBER, Primit. Fl. Hols. 28 (1780), non L. (1762). *J. obtusiflorus* EHRH. ex HOFFM., Deutschl. Fl. 125 (1791).

Icon.: HEGI, Ill. Fl. Mitteleur. ed. 2,2: 210 (1939).
Typus: Ignotus.

Perennis. Rhizoma crassum, internodiis c. 1 cm longis. Caules 40—130 cm alti, 2—4 mm crassi, teretes vel subcompressi, vaginis basalibus 3—4 et foliis caulinis 1—2. Rhizoma brachyblastos vaginis basalibus 3—4 et folium singulum longum proferentes emittens. Folia 20—100 cm longa, teretia, caulina basi dorsaliter profunde furcata, pluritubulosa, cavitate centrali ampla, perfecte manifeste septata. Auriculae obtusae. Inflorescentia e capitulis usque ad 100 composita; capitula 5—10-flora, hemisphaerica; inflorescentiae rami patentes, Flores bracteolis carentes, 2—2,5 mm longi. Tepala aequalia, elliptica, obtusa, viridia usque pallide brunnea. Stamina 6, tepala subaequantia; antherae quam filamenta circiter duplo longiores. Stylus 0,7—1 mm, stigmata c. 1 mm, erecta. Capsula tepala paulo excedens, trigono-ovoidea, attenuata, mucronata, trilocularis. Semina 0,5—0,6 mm longa, pyriformia.

Iraq: Kurd.: Sul.: Shahrazur, in uliginosis, HAUSSKN.!

Distr. gen.: Europa, Africa boreo-occidentalis, Anatolia boreo-occidentalis, Kurdistan.

20. ***J. articulatus*** L., Spec. Plant. 327 (1753).
Syn.: *J. lampocarpus* EHRH. ex HOFFM., Deutschl. Fl. 125 (1791).
Icon.: CLAPHAM, TUTIN & WARBURG, Fl. Brit. Is., Ill. 4: 26 (1965).
Typus: In Europae aquosis.

Perennis, caespitosus vel raro rhizomate longinodo provisus. Caules 5—60 cm alti, erecti vel ascendentes, vaginis basalibus nonnullis foliisque caulinis 3—6. Folia teretia, unitubulosa, perfecte septata, saepe lateraliter subcompressa. Inflorescentia plerumque ampla, capitulis (1—) 5—20 (—80). Capitula (4—) 5—15 (—30)-flora; flores 3—6 mm longi, pallide vel atrobrunnei. Tepala aequalia vel exteriora paulo longiora, ovata vel raro late lanceolata, exteriora subcymbiformia, omnia acuta vel interiora obtusa, plerumque mucronata. Stamina longitudine variabilia; antherae filamenta aequantes vel paulo longiores. Stylus c. 0,5 mm longus, stigmata c. 1,5 mm longa. Capsula trigono-ovoidea vel raro ellipsoidea, acuta vel interdum obtusa, mucronata, tepala excedens. Semina 0,3—0,5 mm longa, ovoidea, reticulata. Species eximie variabilis. — 2 n = 80.

Iraq: Kurd.: Arbil: N Shaqlawa, 950 m, ANDERS 1484! Hajji Omran, 1700 m, CHAPMAN 12285 A! Ser-i Hassan Beg, 2000 m, GUEST 3021! Algurd Dagh, 2100 m, GILLETT 9510! Kirkuk: Tainal inter Tasluja et Darband-i Bazian, 850 m, RAWI & GILLETT 11903! Sul.: M. Avroman prope Tawilla, 1400 m, RECH. 10289!, RAWI 21983! S Sulaymaniyah prope bifurcationem Halabja-Penjwin, GILLETT 11733! 8 km S Dukan, BARKLEY, SHARIF & HADDAD! Mosul: Jabal Khantur NE Zakho, 1360 m, RAWI 23356! In faucibus Zinta, 700 m, CHAPMAN 26125! Sirsang, HAINES 485-A!
Persia: N: Gorg.: Mirmahaleh, 60 m, SCHMID 6029! Maz.: In valle fluvii Chalus, Pol-e Zanguleh, 2200—2600 m, RECH. 6366-d! Hazar Jerib, SHAR. 530! Istgah-e Tirtash, SHAR. 524! Now Shahr, SAB. 114! In decl. bor. jugi Kandavan, 2500 m, WDB. 2192! Kuh-i Nizwa inter Orim et Taru, 2000 m, WDB. 1137! In valle Haraz prope Panjab, 1000 m, WDB. 1662! Gil.: Lahijan, LINDS. 958! — W: Azerb.: Kuhha-ye Sabalan, 1650 m, HARRINGTON 209! Senjanab, KNAPP! Merdise, KNAPP! Rezaiyeh ad fl. Shahr Chay ripas, KNAPP! 8 km S Shahpur, REMAUDIÈRE 86! Kurd.: 20—25 km E Sanandaj, 2000—2300 m, FURSE 3346!, REMAUDIÈRE 83! In jugo inter Rezaiyeh et Shahpur, 1980 m, ARCHIBALD 3202! Ham.: Hamadan, PICHLER! Ad radices boreales M. Takht-i Suleiman, 1000 m, FURSE 2850! Haydere, SAB. 1602! 5 km N Borujerd, 1500 m, WALTON 127! Bakht.: Belu, KOELZ 15229! Distr. Bakhtiari, HAUSSKN.! Galli Sur, 2300 m, KOELZ

18071! 12 km E Kuh Rang, 1650 m, TIMMIS 80! Arak, Darun, JARDINE 792! Prope Arak, STR.! Khuz.: 50 km NE Haft Gel, BENT & WR. Khorramshahr, NOE! Lur.: Bisheh, 1100 m, KOEIE 1704! — **S**: Kerm.: M. Jebal Barez: Inter Bam et Jiroft, RECH. 7376! Fars.: Rud-e Korr prope Rezaabad, STAPF 1937! Kuh-e Dinar, KY. 695-a! Prope Tal-e Khosravi, 2130 m, ARCHIBALD 2842!, BEHB. 976-E! Dasht-e Arzhan, STAPF! — **E**: Khor.: M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, RECH. 4944! Inter Neyshabur et Mashhad, BUNGE! Prope Bezg, AITCH. 663! — **C**: Tehr.: Gach Sar, FURSE 2621! Polur, 1900 m, GILLI! Qazv.: Karaj, coll. ign.! Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 2300—2500 m, RECH. 5859!, 5948!

Turcomania: Ashkhabad: Suluklü, SINT. 887!, 1051! Mergen Ulja, SINT. 972! Prope Bagir, SINT. 591!, LITW. 2139!

Afghanistan: **NW**: Maimana: In jugo Burchao, 3000 m, KOELZ 14119! Naranj, 1050 m, HDG.& WDB. 3666! Mirak, 900—1100 m, JAKEŠ! Herat: M. Paropamisus, Chashmeh Obeh, 1800 m, RECH. 19250! — **SW**: Herat, 1000 m, KOEIE 3951!, BUNGE! Docha i Ibrahim Khan, AITCH. 777! — **SE**: Kandahar: Kajakai, 1000 m, KOEIE 2154! Arghandab, VOLK 1362! — **E**: Kabul: Paghman, 2300—2800 m, RECH. 17200!, KOELZ 12103! Prope Kabul, 1740—1880 m, GILLI 232!, 233!, 234!, 235! NEUB. 766! Ad fl. Kabul, GRIFF.! Prope Sarobi, WOLF 1219! Farakulum, 2800 m, KOEIE 2573! Hauz-i Mahiha, 2600 m, KOEIE 2407! Gulbahar, REINER 742-A! 1700 m, GILLI 231! Jaji: Inter Dre Kalla et Qasim Khel, RECH. 32294! Khost: Yakubi, 1200 m, RECH. 35579! In valle fluvii Matun, 10—15 km NW Khost, 1400 m, RECH. 35770! Ghazni: W jugi Sardalu, inter Qarabagh et Sang-i Masha, 2600 m, RECH. 17352! In jugo Sardalu, 2300—2500 m, RECH. 17339! Ad lacum Sabzab, 2800 m RECH. 17923-a!, 17924! Gardez: Prope Gardez, 2800 m, LALANDE R 534-E 4! Nuristan: Gusalak, 1000 m, EDELB. 1939!, 1532! Wama, 1300 m, EDELB. 1238! Kushtos, NEUB. 3371!; 2000 m, NEUB. 3243! In valle Linar, 400 m, THESIGER 1533! In valle Ramgul prope Gadwol, 1970 m, KERST. 1122! In valle Paṛun inter Shtive et Pashki, 2300 m, KERST. 1381! Prope Pashki, 2300 m, EDELB. 1183! Prope Kurder, 1600—1700 m, NEUB. 762!, 768! Nuristan orientalis, EDELB. 1120!, 1150! — **NE**: Kataghan: In declivibus borealibus jugi Salang 1100—2200 m, RECH. 31648!, 31686!, LAMOND 2249!, 2277!, FOHLEN! Kunduz, 400 m, RECH. 16052! 15 km E Kunduz, 500 m, PODLECH 11342! Inter Doshi et Doab, 800—1300 m, RECH. 16559! Pul-e Khumri, NEUB. 240! Badakhshan: In valle Warduj, 30 km W Faizabad, 1000 m, FURSE 6450! Inter Mashhad et Faizabad, 1000 m, FURSE 6116! — **C**: Bamian: Band-i Amir, RECH. 18316!, GILLI 236!, NEUB. 432!, 458!, REINER 770! Band-i Panir, 2800 m, RECH. 18343! In declivibus borealibus jugi Shahtu, 2800—3000 m, RECH. 36330! Panjao: Kuh-e Josha NW Panjao, 2900 m, RECH. 18751! Doab: Kamard, 2000 m, KOELZ 13573!, 13599! Saighan, GRIFF. 5410! Doab, 1650 m, KOELZ 13532! W Doab, 1620 m, GILLI 230! Ghorband: In jugo Shibar, 2500—2750 m, RECH. 36919! Ghorat: In jugo Kotal Nayak inter Sar-i Naorak et Taiwara, 2660 m, RECH. 18962! Lal-i Sar Jangal, 2500 m, KOEIE 3350! — Afghanistan, GRIFF. 5461!, 650 m, AITCH. s. n.!

Pakistan: Chitral: In valle fl. Yarkhun inter Chapalli et Brep, 2500 m, STAMM & WÖHRL 277! Prope Mastuj, 2040 m, KERST. 2049! Inter Mastuj et Baroghil, 3000 m, STAINTON 2954! Bundai, 1330 m, HARRISS 16726! Shoghot, 2000 m, STAINTON 2747! In parte superiore vallis Brumboret prope Bromotul, 2000 m, KERST. 2084-a! — Swat: Utror, 2500 m, RECH. 19535! Prope Mingora, 900 m, RECH. 30677!, LAMOND 1742! Inter Khawazakhiela et Shangla, 1300—1900 m, RECH. 30614! Prope Madyan, 1650 m, RODIN 5527! Bahrain, 1650 m, STEWART 25479! — Peshawar: Kund ad confluentes fluvios Kabul et Indus, RECH. 30387!, LAMOND 1629! — Kurram: Alizai, KHAN 26! — Quetta: Ziarat, 2650 m, LACE 3810 p. p.! Quetta, 1800 m, CROOKSHANK 568!, LACE 3810 p. p.! Kahan, 2300 m, CROOKSHANK 518! — Kalat, 2300 m, AKHAR 1895!

Distr. gen.: Europa, Asia, America borealis temperata, Africa borealis et australis, Australia australis, Nova Zealandia.

Perhaps introduced in parts of its area.

21. ***J. acutiflorus*** Ehrh. ex Hoffm., Deutschl. Fl. 125 (1791).
Syn.: *J. rugosus* Steud., Syn. Pl. Glum. 2: 298 (1855). *J. silvaticus* auct. mult. non Hudson (1762).
Icon.: Clapham, Tutin & Warburg, Fl. Brit. Is., Ill. 4: 26 (1965).
Typus: Ehrhart, Calam. no. 66, BM!

Perennis, rhizomate crasso repente sparse ramoso, internodiis plerumque 1—1,5 cm longis. Caules 30—110 cm alti, basi compressi, superne teretes, vaginis basalibus 2—3 aphyllis, raro folio uno suprabasali, foliis caulinis (2—) 3 (—4). Folia teretia, 5—50 cm longa, perfecte septata, auriculis brevibus, firmis obtusis. Inflorescentia e capitulis (12—) 50—80 (—250) composita; capitula (3—) 5—8 (—20)-flora; flores sine bracteolis involucrantibus. Tepala 2—2,7 mm longa, ovata vel anguste ovata, apice apiculata vel cuspidata, saepe recurvata, interiora longiora, exteriora cymbiformia. Stamina 6, 1/2—2/3 tepalorum aequantia; antherae 0,8—1 mm longae, quam filamenta sesqui- usque duplo longiora. Stylus 0,5—1 mm longus; stigmata 1—1,5 mm longa. Capsula tepala excedens, plerumque 2—2,5 mm longa, trigono-ovoidea usque anguste pyramidalis, in rostrum longum attenuata, brunnea vel castanea. Semina 0,5 mm longa, ovoidea usque ellipsoidea, c. 25-striata. — 2 n = 40.

Iraq: Kurd.: Sul.: Shahrazur, in uliginosis, Haussk.!

Distr. gen.: Europa occidentalis, centralis et australis, in Asia austro-occidentali orientem versus usque ad Kurdistan dispersus; Newfoundland; in Novam Zealandiam introductus.

22. ***J. Fontanesii*** Gay in Laharpe, Monogr. vrai Jonc., Mém. Soc. Hist. Nat. Paris 3: 130—131 (1827).
Icon.: Buchenau in Engler, Pflanzenr. IV, 36: 191 (1906).
Typus speciei: „Barbarie", Herb. Desfontaines.

Perennis, rhizomate nullo vel male evoluto. Caules singuli vel plures, e surculis intravaginalibus, raro e rhizomatibus brevibus orientes. Surculi supraterranei prolongati evoluti, imprimis in subsp. *Fontanesii* frequentes. Folia manifeste et saepe copiose septata. Tepala acuta usque acuminata, interiora plerumque conspicue longiora. Antherae 0,8—1,5 mm, quam filamenta 1,5—3-plo longiores. Capsula semper ± acute trigona, aut, ut plerumque in subsp. *Fontanesii*, ovoidalis et tepala leviter excedens, aut elongata, magis pyramidata, semper manifeste rostrata, rostro 0,4—2 mm longo.

Young material not determined to subsp.:
Persia: N: Maz.: Inter Amol et Zardman, 500—1800 m, Schmid 5258!
Afghanistan: NW: Bala Murghab: Ghormac, 700 m, Jakeš!

Seed sterile specimens:
Persia: S: Fars.: Ad fl. Safid Rud prope Shapur, Stapf 1920! (conf. subsp. *pyramidatus*).
Pakistan: Quetta: Quetta, 1800 m, Crookshank 159! (conf. subsp. *Kotschyi*).

Both these collections are quite seed sterile, but their entire morphology indicates that they represent pure *J. Fontanesii*. Their true nature cannot be understood with security from herbarium material.

J. Fontanesii, in the wide sense here used, includes a wide series of local as well as more widespread forms, which may be grouped in some geographical subspecies. In our area only the following two subspecies occur:

— — subsp. ***pyramidatus*** (LAHARPE) SNOG., comb. nov.
Syn.: *J. pyramidatus* LAHARPE, Monogr. vrai Jonc., Mém. Soc. Hist. Nat. Paris 3: 128 (1827). *J. Fontanesii* GAY var. *pyramidatus* (LAHARPE) BUCHENAU, Englers Bot. Jahrb. 1: 140 (1880).
Typus (syntypi) subspeciei: Syrie, LABILLARDIÈRE; Egypte, SAVIGNY.

Perennis rhizomatibus abbreviatis saepe non bene evolutis. Radices et stolones verosimiliter extravaginales e nodis caulis et stolones intravaginales saepe evoluti. Stolones supraterranei interdum evoluti. Caules 15—40 cm alti, erecti vel ascendentes, vaginis 1—3 basalibus et una suprabasali et foliis 3—5 caulinis. Folia 5—15 cm longa, 1,5—2,5 mm lata, prope basin canaliculata, sursum ± teretia, unitubulosa, perfecte et saepe manifeste septata. Auriculae 1,5—3 mm longae, obtusae. Inflorescentia e capitulis 3—20, plerumque 15—30-floris hemisphaericis vel sphaericis composita. Bracteae inferiores inflorescentiae foliaceae, eae florum scariosae, late ovatae, costa mediana tenuiter prolongata. Bracteolae florum singulorum deficientes. Pedicelli floriferi 0,3—1 mm longi. Tepala 3—4 mm longa, viridia, fascia dorsali rubescente marginibusque scariosis angustis, anguste ovata, apiculata, exteriora cymbiformia, carinata, interiora prope basin saepe leviter carinata. Stamina 6, 1/3—1/2 tepalorum longitudinis attingentia; antherae 0,8—1,2 mm longae, quam filamenta sesqui- usque ad duplo longiores. Stylus 0,5—1 mm longus; stigmata c. 1,5 mm longa, divergentia. Capsula 4,5—5 mm longa, tepala ± manifeste excedens, anguste pyramidalis vel rarius trigono-ovoidea, in parte apicali acutangula, sursum valde attenuata, apice saepe in rostrum 0,5—1 (—1,5) mm longam abrupte contracta. Semina 0,4—0,5 mm longa, pyriformia, striis 20—25 prominentibus longitudinalibus leviter angulato-flexuosus striisque transversalibus tenuioribus.

Iraq: Kurd.: Kirkuk, Jarmo, HELBAEK 1025!, 1751!, 1757!, HAINES 201! Mosul: Ad pontem prope Mindan, 270 m, CHAPMAN 26217!, 26219! Zawita, 750 m, CHAPMAN 26285! Sul.: Dukan ad viam versus Sulaymaniyah, HAINES! Arbil: N Shaqlawa, 950 m, ANDERS 1464!

Distr. gen. subspeciei: Africa borealis et Regio Mediterranea, orientem versus usque ad Iraq.

— — subsp. ***Kotschyi*** (BOISS.) SNOG., comb. nov.
Syn.: *J. Kotschyi* BOISS., Diagn. Pl. Or. Nov. Ser. 1, 7: 101 (1846). *J. pyramidatus* LAHARPE var. *Kotschyi* (BOISS.) BOISS., Fl. Or. 5: 359 (1882). *J. Fontanesii* GAY var. *Kotschyi* (BOISS.) BUCHENAU, Monogr. Juncac. 329 (1890).
Typus subspeciei: KOTSCHY 466, G!, BM!, K!, CGE; lectotypus herb. BOISSIER, G!

Subspeciei *pyramidato* similis sed caules plerumque 10—25 cm alti, tepala latiora, ovata, marginibus scariosis saepe latioribus, capsula trigono-ovoidea vel latius pyramidata, ± arcuata, rostro 0,4—0,8 mm tantum longo.

Iraq: Kurd.: Kirkuk: Darband-i Bazian, HAUSSKN. 976! — Diyala: Jabal Hamrin, SUTHERLAND 397!
Persia: W: Kurd.: S Sanandaj, 1890 m, ARCHIBALD 3110! Prope Saqqez, JARDINE 748! — Bakht.: Kuh-e Kukular, HAUSSKN. — S: Fars.: Prope Shiraz, STAPF 1921!, 1928! Kuh-e Sabz Pushan, KY. 446! Kerm.: Kerman, 1800—2000 m, PARSA 365! — E: Khor.: M. Hazar Masjed, inter Ardak et Talqur, 1200—1600 m, RECH. 4910!
Afghanistan: SW: Herat: Prope Ribat, 1500 m, CHAMBERLAIN 8! — E: Khost: Yakubi, 1200 m, RECH. 35566!
Pakistan: Quetta: Prope Mastung, JAFRI & AKBAR 1763! Hanna, 2000 m, NASIN 28415! Fort Sandeman. HARSUKH 20661! — Kalat: Harboi, 2300—2650 m, STEWART 762!, 783!

Distr. gen. subspeciei: In regionibus altioribus a Kurdistan usque ad Baluchistan; plantae similes in regionibus magis occidentalibus usque ad Libanon.

Subgen. ***Alpini*** BUCHENAU, Flora 35: 88 (1877).

Syn.: Sect. *Alpini* (BUCHENAU) VIERHAPPER in ENGLER & PRANTL, Natürl. Pflanzenfam. ed. 2, 15a: 218 (1930). Sect. *Stygiopsis* GAND. ex POST & KUNTZE, Lex. Gen. Phan. 303 (1904). Sect. *Stygii* FRIES ex ROUY, Fl. Fr. 232 (1912). Subgen. *Stygiopsis* (POST & KUNTZE) V. KRECZ. & GONTSCH. in KOMAR., Fl. URSS. 3: 320 (1935).
Typus subgen.: *J. triglumis* L.

Plantae perennes rhizomatosae, humiles vel mediocres. Folia forma variabilia, plana usque subteretia, pluri- vel rarius unitubulosa, non vel ± manifeste septata. Flores dense capitato-congesti; bracteolae deficientes. Tepala in speciebus intense colorata, castanea, alba, purpurascentia vel flavescentia. Antherae in speciebus plurimis exserta, filamentis longis tenuibus. Semina testa persistente.

Distr. gen. sectionis: Regiones arcticae, alpinae et frigide temperatae hemisphaerae borealis; species plurimae in Asia centrali.

The cytology is insufficiently understood.

23. ***J. triglumis*** L., Spec. Plant. 328 (1753).
Syn.: *J. albescens* (LANGE) FERNALD, Rhodora 26: 203 (1924).
Typus (syntypi) speciei: „Alpibus Lapponicis, Tauro Rastadiensi."

Perennis, laxe caespitosus vel caules singuli, e rhizomate surculos subterraneos prolongatos emittens. Caules 3—20 cm alti, foliis basalibus pluribus. Folia teretia vel prope basin applanata usque canaliculata, bitubulosa vel in partibus crassioribus pluritubulosa, non septata. Inflorescentia e capitulo singulo (1—) 3—4 (—5)-floro consistens; flores aequa altitudine vel infimi infra ceteros inserti. Antherae 0,6—1,2 mm longae, quam filamenta triplo usque quintuplo breviores. Stylus brevis; stigmata patentia. Capsula 4,5—6 mm longa, quam tepala sesquilongior, obtusa. Semina 0,7—1 mm, testa inclusa 2—3 mm longa.

Distr. gen. speciei: Arctico-circumpolaris, in Europa, Asia et America boreali monticolus.

J. triglumis is represented in Europa an N. Asia by subsp. *triglumis*, in N. America and NE. Asia by subsp. *albescens* (LANGE) HULTÉN. The latter is connected with the subsp. *wakhaniensis* described below by a series of central asiatic localities. The forms from C. to NE. Asia and Caucasus need further investigation.

In area nostra tantum occurrit:

— — subsp. ***wakhaniensis*** SNOG., subsp. nov.
Typus subspeciei: ROEMER 156, holotypus M!
Icon.: Tab. 4, fig. 2.

Perennis, caulibus singulis vel caespitibus parvis e rhizomate surculos subterraneos prolongatos quoque emittens. Caules 5—20 cm alti, tenues sed rigide erecti, foliis basalibus pluribus; folium summum saepe altius, in caulibus validis usque ad medium caulem insertum, lamina minutissima. Folia 1—10 cm longa, plerumque 0,3—1 mm lata, basi canaliculata, apice teretia, non septata, bitubulosa vel basi usque ad quinquetubulosa, apice compacta, obtusa. Auriculae 0,7—1,3 mm latae, obtusae, in medio dorsali foliorum laminae subcontiguae. Inflorescentia capitulum

singulum 2—4-florum; flores infimi a ceteris remoti, pedicelli eorum 1—1,5 mm longi. Bracteae flores non excedentes, atrobrunneae, partim scariosae, obtusae vel infima capitulorum magnorum acutae usque brevissime laminatae. Tepala 4,5—5,5 mm, anguste ovata, acuta usque obtusa, aequalia vel exteriora longiora, pallide usque atro-brunnea, exteriora saepe inter se inaequalia, cymbiformia. Stamina 6, tepala exteriora aequantia vel paulo breviora; antherae 0,6—0,75 mm, 1/5—1/4 filamentorum aequantia. Stylus 0,5 mm longus; stigmata 0,7—1 mm longa, patentia. Capsula 5—6 mm longa, ellipsoidea, apice subtrigono-arcuato, rostro 0,5 mm longo, triloculari. Semina 50—60, 0,75 mm longa, 0,25 mm lata, ellipsoidea vel subobliqua, c. 30-striata, testa inclusa 2—2,5 mm; testa appendices 2 aequales vel inaequales formans.

Pakistan: NE: Wakhan: In valle Badjens, 4300 m, ROEMER 374! In valle Quazi Deh, 3100 m, „Sumpfige Stellen in felsigem Hang mit *Carices, Juncus, Primula, Orchis, Calamagrostis* u. a., VII. 1964", ROEMER 156!

Distr. gen. subspeciei: Endem.

Differing from subsp. *triglumis* in small seeds, small anthers, large capsule and the tendency of developing a separate fourth flower in the heads, from subsp. *albescens* by a much larger capsule, smaller seeds and darker colour. — The general distribution is still imperfectly known. It can also be expected in the Himalayan region.

24. ***J. himalensis*** KLOTZSCH in KLOTZSCH & GARCKE, Bot. Ergebnisse Reise Prinz Waldemar von Preußen 60 (1862).
Icon.: tab. 4, fig. 1; KLOTZSCH, l.c.: tab. 97.
Typus: Himalaya, HOFFMEISTER.

Perennis, caespites parvas laxas e caulibus et e surculis sterilibus e rhizoma orientes formans, praeterea surculi subterranei elongati evoluti. Caules 40—45 cm alti, 1—1,5 mm crassi, stricte erecti, vaginis basalibus 1—2, foliis subbasalibus 2—4 et foliis caulinis altius insertis; nodi caulini manifesti. Folia 5—25 cm, basi canaliculato-conduplicata, apice subteretia, pluritubulosa, non septata vel vario modo septata, in statu normali subduplicato 0,5—1 mm lata. Auriculae brevissimae sed latae. Inflorescentia e capitulis 2—9 composita; capitula 4—8-flora. Bractea floris infimi saepe foliacea, inflorescentiam aequans vel manifeste superans. Bracteae florum summos flores aequantes vel breviores, basales capituli acutae vel apiculatae, superiores acutae vel rarius obtusae et latiores. Pedicelli floris singuli 0,5—1,5 mm longi. Tepala proportione valde variabilia, 5,2—6,5 mm longa, exteriora subcymbiformia, ovata usque anguste ovata, acuta vel anguste obtusa, atrobrunnea, saepe dorso minute mucronata; interiora ovata usque oblonga, pallidius brunnea, parte superiore scariosa, obtusa vel rarius acuta. Stamina 6, 8/10—9/10 tepalorum longitudinis attingentia; antherae 1,5—3 mm longae, quam filamenta dimidio breviores usque ad sesquilongiores, connectivo brevi acuto prolongatae. Stylus 1—2,5 mm longus; stigmata 3—4 mm longa. Capsula tepala excedens, trigono-ovoidalis, 6—9 mm longa, mucrone 1—1,5 mm longo. Semina 0,6—0,65 mm longa, 0,2—0,25 mm lata, testa inclusa 2,5—4,5 mm longa; testa appendices duas angustas aequales, candidas formans. Semina c. 20-striata.

Afghanistan: E: Panjshir: Darreh Rastagal, 3600 m, HDG. & WDB. 5253! Nuristan: Pashki, 2300—2500 m, EDELB. 742!, 906-b! Netshingel, 4000 m, EDELB. 2013! In declivibus occidentalibus jugi Semenek, 3400 m, KERST. 1506! In valle Kantivo prope Brubruts, 2460 m, KERST. 943! In valle Ramgul prope Pushol, 2300 m, KERST. 1104-a! In valle fluvii Bashgul inter Dewana Baba et Garm Chashmeh, 3000—3250 m, BRECKLE A-2963!,

A-3141!, A-3449! Dario Pushol, 3500 m, Breckle A-3587!, Rasoul 187: In valle Suyengal, 4350 m, Breckle A-3073! — NE: Wakhan: In valle Qazi Deh, 3100 m, Roemer 158! Munjan: Darrah-i Parshui, 3700 m, Frey F-211! Ptili, 2700 m, Edelb. 2100! Badakhshan: Distr. Khumbuk, SW Robat, Hdg. & Wdb. 9429!
Pakistan: Chitral: Tirich Mir: Inter Och Anzog et Camp 2 prope South Barum Glacier, 3800 m, Wdb. s. n.! Och Anzog, 3600 m, Wdb. s. n.! Ziarat, 3000 m, Harriss 16723! In jugo Lowarai, 3300 m, Harriss 16722! Gujar, 2800 m, Harriss 16724! Golen, 4500 m, Bowes Lyon 128! Lutko, 3000 m, Bowes Lyon 787! NE Drosh, 4300 m, Stainton 3131! Ad glaciem Pechus, 3750 m, Stamm & Wöhrl 30! — Swat: Batani supra Ushu, 3000 m, Stewart & Rahman 25317! Bishigram, 3000 m, Stewart & Rahman 24948!, 3300 m, Stewart & Rahman 25025-a!

Distr. gen.: Regio Himalayica ab Afghanistan orientale usque ad Sikkim.

25. ***J. afghanicus*** Snog., sp. nov.
Icon.: tab. 4, fig. 3.
Typus: Koeie 2667, holotypus W!

Perennis; rhizoma validum, ramosum, internodiis longis, caulibus singulis, saepe surculis foliiferis sterilibus laxe adnatis. Caules 25—70 cm alti, rigide erecti, 1,5—2,5 mm crassi, vaginis basalibus 1—3 amplis, aphyllis vel breviter foliaceis, foliis caulinis 3—5, 5—15 cm longis. Surculi steriles foliiferi foliis usque ad 7, usque ad 40 cm longis. Squamae rhizomatis in fila valida cinerascentia fissae, eae basis caulis saepe prominentes. Folia basi canaliculato-conduplicata, apice teretia, pluritubulosa, non septata vel folia nonnulla leviter imperfecte septata, in statu normali plicato 1,5—2,5 mm lata. Auriculae breves, latae. Inflorescentia e capitulis 3—10 composita; capitulum (4—) 7—9 (—11)-florum. Bracteae ramorum inflorescentiae laminis bene evolutis provisae; lamina bracteae infimae inflorescentiam aequans vel plerumque superans. Bracteae florum infimorum capituli apiculatae, anguste ovatae, eae florum superiorum ovatae, acutae, apicem florum numquam attingentes. Flores pedicellis 1—2 mm longis suffulti. Tepala 7—8 mm longa, castanea, longitudine subaequalia, exteriora anguste ovata, cymbiformia, acutiuscula, non vel anguste scariose marginata, interdum centro prope basin viridia, interiora oblonga, obtusa, prope apicem late scariose marginata. Stamina 6, 3/4—4/5 longitudinis tepalorum attingentia; antherae 3—4 mm longae, quam filamenta triplo usque quadruplo longiores. Stylus c. 2 mm longus; stigmata 3,5—4 mm longa. Capsula rostro incluso 8—10 mm longa, tepala paulo excedens, ovoidalis, in rostum 1—1,5 mm longum attenuata, trilocularis. Semina 0,8—0,85 mm longa, 0,25—0,3 mm lata, testa inclusa 3—4 mm longa, testa appendices 2 subaequales albas formans. Semina ellipsoidalia usque anguste ovoidalia, pallide brunnea, apicibus pallidioribus, tenuiter 20-striata.

Afghanistan: E: Paghman: In M. Paghman supra Begtut, 2900 m, Gilli 237! Panjshir: In declivibus occidentalibus jugi Anjuman, 3500 m, Hdg. & Wdb. 5506! — NE: Kataghan: In declivibus borealibus jugi Salang, Fohlen; 3600 m, Ekberg 9557! — C: Bamian: Kuh-i Baba, 3200 m, 26. VII. 1948 Koeie 2667! — Afghanistan, Griff. 5405 = Journ. 1078!

Distr. gen.: Endem.

26. ***J. benghalensis*** Kunth, Enum. Pl. 3: 360 (1841).
Syn.: *J. sphenostemon* Buchenau, Englers Bot. Jahrb. 6: 223 (1885).
Icon.: Buchenau, Juncaceae in Engler, Pflanzenr. IV, 36: 230 (1906).
Typus: Wallich 3480a (erronee „Bengalia inferior").

Perennis, caespites parvas e caulibus et e surculis sterilibus e rhizoma orientes formans; praeterea surculi elongati subterranei evoluti. Caules 8—25 cm longi, 0,3—1 mm crassi, erecti, in parte superiore saepe aliquantum curvati, vaginis basalibus 1—2, foliis basalibus 1—2, caulinis 0—2. Surculi intravaginales saepe evoluti. Squamae rhizomatis et vaginae basales infimae saepe in fila valida fissae. Folia 0—10 cm longa, ea surculorum sterilium usque ad 15 cm longa, 0,2—1 mm crassa, semiteretia usque applanata, canaliculato-conduplicata, apice applanata, bitubulosa vel folia majora basi usque ad quinquetubulosa, non septata. Auriculae 0,5—1,5 mm longae, latae, obtusae, sese in dorso foliorum attingentes. Inflorescentia capitulum singulum 3—10-florum formans. Bractea infima plerumque foliacea et auriculata, flores valde excedens, usque ad 5 cm longa. Bracteae superiores scariosae, ovatae, interdum etiam secunda breviter foliacea. Pedicelli floriferi 0,5—1,5 mm longi. Tepala 4—6,5 mm longa, anguste ovata, obtusa vel exteriora quoque interdum acutiuscula, alba usque straminea vel rarius leviter purpurascentia. Stamina 6; antherae 2,5—3,5 mm longae, in filamentis 4—6,5 mm longis exsertae. Stylus 1,5—2,5 mm longus; stigmata 0,5—1 mm longa, mox contorta. Capsula 4,5—5 mm longa, late obovoidea, in rostrum 1,5—2,5 mm longum abrupte contracta, nitida, pallide vel atrobrunnea, unilocularis. Semina c. 0,75 mm longa, testa inclusa c. 1,5 mm longa.

Pakistan: Swat: Supra Bishigram, STEWART & RAHMAN 24940!

Distr. gen.: In regionibus himalayensibus a Swat usque ad Yunnan.

27. ***J. membranaceus*** ROYLE in DON, Trans. Linn. Soc. 18,3: 320—321 (1840).
Syn.: *J. Hoffmeisteri* KLOTZSCH in KLOTZSCH & GARCKE, Bot. Ergebnisse Reise Prinz Waldemar von Preußen 60 (1862).
Icon.: KLOTZSCH & GARCKE, l. c.: tab. 98.
Typus: „In Emodi montibus ad Punjee", ROYLE.

Perennis, caules singuli vel caespites parvas etiam surculos parvos steriles continentes formantes; rhizoma praeterea surculos elongatos subterraneos emittens. Caules 10—30 (—40) cm alti, 0,5—1,5 mm crassi, stricte erecti, vaginis basalibus 0—1, foliis basalibus 1—4, foliis caulinis 2—3; folia omnia quam caulis multo breviora. Folia 2—15, ea surculorum sterilium usque ad 25 cm longa, 0,5—1,5 mm lata, basi canaliculata, apice ± teretia; septa extus plerumque non visibilia. Auriculae 1,1—1,5 mm latae, obtusae, in media superficie foliorum contiguae. Inflorescentia e capitulo 6—15 (—30)-floro composita. Bracteae plerumque omnino scariosae, ± late ovatae, infimae plerumque minute foliaceae et ± brunneae vel rubescenti-brunneae, venis prominentibus, omnes quam flores plerumque breviores. Pedicelli floriferi 1—2 mm longi. Tepala 3,7—5 mm longa, longitudine aequalia, straminea usque albida, interdum partim brunnescentia, anguste ovata usque oblonga, exteriora subcymbiformia, obtusa usque acuta, raro dorso minute mucronata, inferiora plerumque ± late obtusa. Stamina 6; antherae 1,3—2 mm longae, in filamentis 3—5 mm longis exsertae. Stylus 0,5—1,3 mm longus; stigmata 1,5—2 mm longa, divergentia. Capsula tepala excedens, 5—6,5 mm longa, ovoidalis usque ellipsoidalis, in rostrum 0,5—1,5 mm longum ± acute contracta, brunnea vel castanea, nitida. Semina 0,6—0,65 mm longa, 0,2—0,3 mm lata, ellipsoidalia, apiculo uno majore altero minore, pallide brunnea, testa candida nitida inclusa 2,5—3 mm longa; testa appendices 2 aequales formans.

Afghanistan: E: Panjshir: Shalzur, 3700 m, HDG. & WDB. 5410! Nuristan: In valle Kantivo prope Brubruts, 2460 m, KERST. 944! Kantivo, 2200 m, EDELB. 666! Pashki,

2300 m, EDELB. 906-a! In valle Rangul, 4600 m, THESIGER 1464!; 2660 m, THESIGER 1432! In valle fluvii Bashgul: Dario Pushol, 3600 m, BRECKLE A-3577!, A-3577-a!, RASOUL 177! Inter Dewana Baba et Garm Chashmeh, 3000 m, BRECKLE A-3448!, RASOUL 48! Prope vallem Bargema, 2100 m, BRECKLE A-2873! In valle Suyengal, 4000 m, BRECKLE A-3098! — NE: Badakhshan: In parte superiore vallis Anjuman prope pag. Anjuman, 3100 m, PODLECH 12377!
Pakistan: Chitral: Madaklasht NE Drosh, 4000 m, STAINTON 3116!; 3000—3330 m, BROWN 479! Gangalwat Gol SW Chitral, 3000 m, STAINTON 2710! Barum Gol, Zapotili, 3500 m, WDB. s. n.! Gujar, 2800 m, HARRISS 16721! — Swat: Prope Kalam, RODIN 5614! Batani supra Ushu, 3000 m, STEWART & RAHMAN 25316!

Distr. gen.: In regionibus Himalayensibus occidentalibus a Parvan usque ad Kashmir.

HDG. & WDB. 5410 is included with some hesitation because of the markedly sphaeric form of its ovary. Plants from Panjshir should be further studied in a more mature state.

28. ***J. concinnus*** D. DON, Prodr. Fl. Nepal. 44 (1825) nec (1840), nec BUCHENAU (1890 et 1906).
Syn.: *J. allioides* FRANCH., Nouv. Arch. Mus. Hist. Nat. Paris 10: 99 (1887). *J. macranthus* BUCHENAU, Monogr. Juncac. 398—399 (1890).
Icon.: BUCHENAU, Juncaceae in ENGLER, Pflanzenr. IV, 36: 229 (1906).
Typus: Nepal, WALLICH.

Perennis; rhizoma breviramosum, caespites parvos caulium, surculos foliosos et surculos subterraneos elongatos proferens. Caulis 10—35 cm altus, 0,8—1,5 mm crassus, erectus, vaginis basalibus 0—3, foliis basalibus 1—6 et caulinis 1—3, omnibus quam caules multo brevioribus. Folia 2—12 cm longa, 0,5—1,5 mm crassa, basi canaliculata, apice subteretia aut conspicue, aut inconspicue septata, septis internis autem semper evolutis. Auriculae 1—1,5 mm latae, scariosae, interdum rubescentes, in media superficie foliorum contiguae. Inflorescentia e capitulo unico 4—15-floro consistens. Bracteae infimae latae, saepe laminis brevibus provisae, prominenter nervosae, plerumque rubescenti-brunneae, superiores omnino scariosae, ovatae, quam flores breviores. Pedicelli floriferi 1,5—3 mm longi. Tepala scariosa, straminea vel alba, plerumque prominenter nervosa. Tepala exteriora manifeste spiraliter disposita, 5—6,5 mm longa, anguste ovata, subcymbiformia, obtusa vel acutiuscula, rarius dorso minute mucronata. Tepala interiora exteriora aequantia vel paulo superantia, anguste ovata, obtusa vel acutiuscula. Stamina 6; antherae 2—3 mm longae, in filamentis 4—6 mm longis exsertae. Stylus 1—1,5 mm longus; stigmata 1,5—2,5 mm longa, divergentia. Capsula perianthium excedens, 6—7 mm longa, ovoidalis vel ellipsoidalis, subtrigona, arcuata, unilocularis, rostro distincto 1—1,5 mm longo provisa. Semina 0,6—0,7 × c. 0,2 mm, testa alba inclusa 2,5—3 mm longa; testa appendices 2 aequales vel subaequales formans.

Pakistan: Chitral: Laspur, 3000 m, BOWES LYON 30! — Swat: Kalam, 2300 m, STEWART & RAHMAN 25098-b!

Distr. gen.: Sina, Regio Himalayana a Swat usque ad Sikkim.

The presence or absence of externally visible septa cannot be used as a distinguishing character in this group. In STEWART & RAHMAN 25098-b the septa are prominent in most leaves, in BOWES LYON 30 they are not visible without dissection or preparation. In material from Kashmir the degree of septation is also variable, whereas in Chinese and East Himalayan material they are stated to be always externally visible, e. g. BUCHENAU (1906), SAMUELSSON (1936). In fact internal septa are always present, though

not always affecting the external form of the leaf. From the closely allied *J. membranaceus* ROYLE this species is separated by its capsule form, the size of the anthers and usually in texture and size of the bracts.

Hybrida

J. articulatus L. × ***Fontanesii*** GAY subsp. ***Kotschyi*** (BOISS.) SNOG.

Habitu et inflorescentia inter parentes intermedius. Tepala interiora quam exteriora longiora, in specimine STEWART 617 acute acuminata, in specimine FURSE 3347 obtusa. Semina non evoluta, in specimine FURSE 3347 serius collecto capitula iterum iterumque florigera.

Persia: W: Kurd.: Sanandaj, 2000 m, FURSE 3347!
Pakistan: Quetta: Urak, 2000 m, STEWART 617!

Species incomplete nota

J. arianus V. KRECZ., Bull. Jard. Bot. URSS. 30: 99 (1931). No material has been seen. It may be a northern extreme form of *J. Fontanesii*. Only locality given: In valle Kushka prope „Tschilduschtar" sec. Fl. URSS. 3: 540 (1935).

2. *Luzula*

Luzula DC. in LAM. & DC., Fl. Fr. 1: 198 et 3: 158 (1805), nom. conserv.
Syn.: *Juncoides* SEGUIER, Pl. Veron. 3: 88 (1754).
Typus generis: *L. campestris* (L.) DC., typ. conserv.

Folia plana, in speciebus plurimis basi quidem pilosa. Auriculae nullae. Vagina foliorum basalium et caulinorum clausa. Flores bracteolati, protogyni. Capsula unilocularis; ovula 3, in fundo ovarii affixa.

1a. Flores singuli ..... 1. *L. Forsteri* (SMITH) DC.
b. Flores dense capitati vel subspicato-glomerati 2
2a. Flores in capitulum singulum spiciformem congesta .... 3. *L. spicata* (L.) DC.
b. Flores in capitula plura pedunculata congesta... 2. *L. multiflora* (RETZ.) LEJ.

1. ***L. Forsteri*** (SMITH), DC. in LAM. & DC., Syn. Pl. Fl. Gall. 150 (1806).
Syn.: *Juncus Forsteri* SMITH, Fl. Br. 3: 1395 (1804).
Icon.: CLAPHAM, TUTIN & WARBURG, Fl. Brit. Is., Ill. 3: 28 (1965).
Typus: „Between Hoghill and Collier, Essex", FORSTER.

Perennis, dense caespitosa. Caules 15—30 (—40) cm alti, vaginis 2—3 plerumque rubescentibus, basalibus non vel breviter laminatis, foliis basalibus 1—3 et caulinis plerumque 2,2—5 cm longis. Surculi steriles foliis pluribus usque ad 25 cm longis provisi. Folia plana, 1,5—5 mm lata, margine pilosa et apice acutissima quidem minute serrulata. Inflorescentia ampla, 5—35-flora, floribus singulis. Bracteae infimae foliaceae, superiores sensim minores et magis scariosae. Florum bracteolae adversae tubulares, bicuspidatae, 2—3 mm longae; bracteolae involucrantes 2,5—4 mm longae, tenuiter mucronatae, plerumque aliquantum laceratae. Tepala 3,5—4,5 mm longa, aequalia vel interiora sublongiora, rarius breviora, brunnea vel castanea et partim scariosa, costa mediana mucronem tenuem formante, leviter lacerata, exteriora ovata, interiora ovata vel anguste ovata. Stamina 6, 4/10—6/10 tepalorum longitudinis attingentia; antherae 0,9—1,2 mm longae, filamenta aequantes

vel eis usque ad duplo longiores. Stylus 1,5—2 mm longus; stigmata 2,5—4 mm longa. Capsula 3,5—5 mm longa, tepala aequans vel eis paulo longior, ovoidea vel sphaerica, apice conica et rostro c. 0,5 mm longo provisa, plerumque virescens. Semina caruncula exclusa 1,4—1,8 mm longa, ovoidalia usque sphaeroidalia, laevia. Caruncula 0,8—1,4 mm longa, 5/10—9/10 longitudinis seminis attingens, conica, obliqua, obtusa, nunquam uncinata [ut in *L. pilosa* (L.) Willd.].

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1473! Inter Gorgan et Ziarat, 200 m, Gauba & Sab. 1603! Maz.: Supra Suledeh, 1000 m, coll. ign.! Keirudkenar, 200 m, Tregubov! 32 km S Amol, 700 m, Furse 5074! In valle Haraz: Karehsang, 100 m, Wdb. 154! Lajim, 1330 m, Mooney 6625!

Distr. gen.: Insulae Canariensis, Europa, Regio Mediterranea, Asia austro-occidentalis usque ad Persiam.

The differences from *L. pilosa* (L.) Willd. in caruncula size and leaf breadth given e. g. by Buchenau (1890, 1906) are not generally valid for the material from Anatolia and Persia. *L. Forsteri* is, however, sufficiently well separated by its capsule form and by its caruncula, which is never hookformed like in *L. pilosa*.

2. ***L. multiflora*** (Retz.) Lej., Fl. Spa 1: 169 (1811).
Syn.: *Juncus multiflorus* Ehrh. ex Retz., Fl. Scand. Prodr. ed. 2: 469 (1795).
Icon.: Hess & al., Flora der Schweiz 521 (1967).
Typus: Calam., Gram. & Trip. Exs. no. 127, Ehrhardt.

Perennis, caespitosa. Caules 25—50 cm alti, erecti, vaginis basalibus nonnullis, foliis caulinis 1—3, 2—7 cm longis. Surculi steriles foliati, foliis usque ad 15 cm longis. Folia plana, 2—4 mm lata, nervis paucis prominentibus, apice tenui obtuso. Folia et vaginae margine dense pilosae et minute serrulatae. Inflorescentia e capitulis 4—12 composita; capitula (3—) 10—15 (—20)-flora; pedicelli floriferi brevissimi. Bracteae inferiores foliaceae; bracteae florum ut bracteolae omnes omnino scariosae, usque ad 3 mm longae. Bracteola adversa florum usque ad 1,5 mm longa, perlata, remote biapiculata; bracteolae involucrantes ad summum 2 mm longae, late ovatae, costa mediana tenuiter prolongata. Tepala 2,5—3 mm longa, aequalia vel exteriora sublongiora, scariosa, centro pallide vel atrobrunnea, exteriora ovata, apiculata, subcymbiformia, interiora lanceolata, acuta vel mucronata, saepe aliquantum lacerata. Stamina 6, 5/10—6/10 longitudinis tepalorum attingentia; antherae 0,7—1,2 mm longae, filamenta aequantes vel eis usque ad duplo longiores. Capsula 2,5—3 mm longa, quam tepala brevior vel ea raro aequans, obovoidea, truncata, brevissime rostrata, pallide usque atrobrunnea. Semina caruncula exclusa 1—1,2 mm longa, sphaeroidalis vel latissime ellipsoidalis, tenuiter reticulata. Caruncula 0,4—0,6 mm longa, late conica, obtusa, obliqua.

Persia: N: Maz.: Chalus, Sab. 198! Kuh-i Nizwa: Prope Orim, 2000 m, Wdb. 1109! Gil.: Lahijan, Linds. 772!

Distr. gen.: Europa temperata, Asia, America boreo-orientalis.

3. ***L. spicata*** (L.) DC. in Lam. & DC., Fl. Fr. 3: 161 (1805).
Syn.: *Juncus spicatus* L., Spec. Plant. 330 (1753).
Icon.: Hess & al., Flora der Schweiz 521 (1967).
Typus: „Lapponiae Alpibus".

Perennis, caespitosa. Caules 5—35 cm alti, tenues, erecti, apice nutantes, florendi tempore residuis nonnullis foliorum basalium, foliis basalibus compluribus usque ad

7 cm longis et foliis caulinis 2—3, plerumque multo minoribus. Surculi steriles foliis pluribus multo minoribus obsiti. Inflorescentia glomerulum singulum spiciforme nutans florum glomerulorumque brevi pedunculatorum formans. Bracteae aut nonnullae inferiores foliaceae aut omnes ut superiores scariosae, venis vel fasciis medianis pallide vel atro-brunneis, margine pilosae vel laceratae, costa mediana tenuiter prolongata, omnes floribus longiores vel nonnullae superiorum breviores. Tepala 2,5—3,5 mm longa, scariosa, brunnescentia, areis centralibus atrioribus, costa mediana tenuiter prolongata; exteriora paulo longiora, ovata, subcymbiformia; interiora lanceolata usque anguste ovata. Stamina 6, 0,25—0,35 partes tepalorum longitudinis attingentia; antherae 0,5—0,6 mm longae, quam filamenta 0,8—1,5-plo longiores. Stylus 0,3—0,4 mm longus; stigmata 1,3—1,7 mm longa. Capsula 1,8—2 mm longa, quam tepala brevior, trigono-sphaeroidalis, brevissime rostrata. Semina caruncula exclusa 0,9—1 mm longa, ellipsoidalia; caruncula parva, 0,1—0,2 mm longa, rotundata.

Persia: **W:** Azerb.: In declivibus borealibus Kuhha-ye Sabalan, 3800 m, HARRINGTON 219!
Afghanistan: **E:** Nuristan: In valle fluvii Suyengal tributarii fl. Bashgul, 4400 m, BRECKLE A-3048! — **NE:** Wakhan: Kotal-e Wazit, 4700 m, BRECKLE A-1326!
Pakistan: Chitral: Tirich Mir: Barum Gol infra Zapotili, 3700 m, WDB. s. n.! Prope South Barum Glacier, 4500 m, WDB. s. n.!

Distr. gen.: Regiones arcticae Europae, Asiae et Americae, in regionibus australioribus monticola.

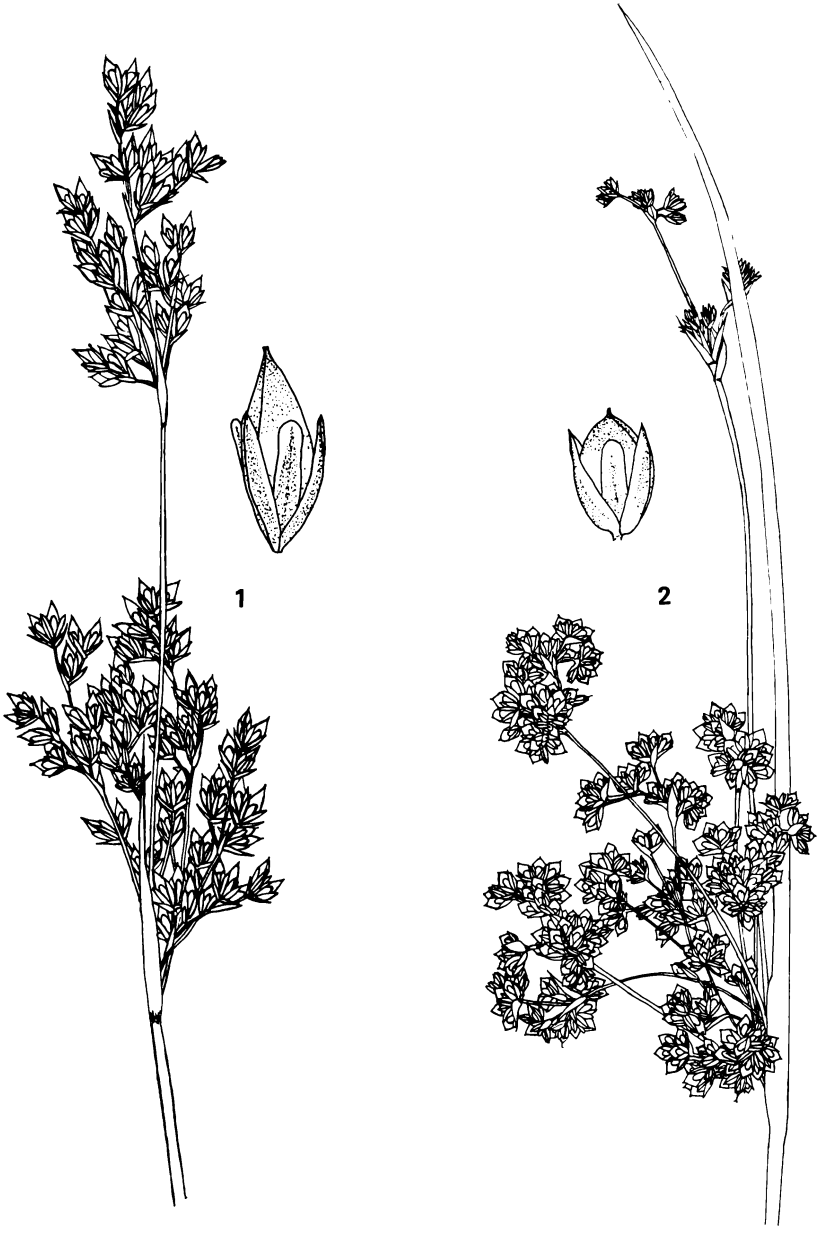
The above description is entirely prepared from material of the Flora Iranica area, Transcaucasia and Kashmir. The entire complex of forms is still imperfectly known.

Juncastrum FOURR. 3
Juncoides SEGUIER 31
Juncus L. 1
Subgen. **Alpini** BUCHENAU 26
Subgen. *Forskalina* V. KRECZ. & GONTSCH. 7
Subgen. **Genuini** BUCHENAU 8
Subgen. *Juncastrum* (FOURR.) V. KRECZ. & GONTSCH. 3
Subgen. **Juncinella** V. KRECZ. & GONTSCH. 20
Subgen. *Juncotypus* (DUMORT.) V. KRECZ. & GONTSCH. 8
Subgen. **Juncus** 3
Subgen. *Ozophyllum* (DUMORT.) V. KRECZ. & GONTSCH. 21
Subgen. **Poiophylli** BUCHENAU ..11, 15
Subgen. **Pseudotenageia** V. KRECZ. & GONTSCH. 11
Subgen. **Septati** BUCHENAU 21
Subgen. *Stygiopsis* (POST & KUNTZE) V. KRECZ. & GONTSCH. 26
Subgen. **Subulati** BUCHENAU 7
Subgen. *Tenageia* (DUMORT.) V. KRECZ. & GONTSCH. 15
Subgen. *Thalassici* BUCHENAU 3
Subgen. *Thalassii* (BUCHENAU) BUCHENAU 3
Sect. *Acuti* ROUY 3
Sect. *Alpini* (BUCHENAU) VIERHAPPER 26
Sect. *Articulati* FRIES ex ROUY 21
Sect. *Caespitosi* COUTINHO 21
Sect. *Compressi* BOISS. ex ROUY ... 11
Sect. *Forskalina* POST & KUNTZE ... 7
Sect. *Genuini* (BUCHENAU) VIERHAPPER 8
Sect. *Juncastrum* (FOURR.) POST & KUNTZE 3
Sect. *Juncotypus* DUMORT. 8
Sect. *Lateriflori* FRIES ex ROUY 8
Sect. *Maritimi* ROUY 3
Sect. *Nodulosi* COUTINHO 21
Sect. *Obtusiflori* ROUY 21
Sect. *Ozophyllum* DUMORT. 21
Sect. *Paeophylli* ROUY 15
Sect. *Poiophylli* (BUCHENAU) VIERHAPPER 15
Sect. *Pseudostygii* ROUY 11
Sect. *Pungentes* COUTINHO 3
Sect. *Pygmaei* ROUY 21
Sect. *Septati* (BUCHENAU) VIERHAPPER 21
Sect. *Squarrosi* FRIES ex ROUY 11

Juncus L. *(cont.)*
Sect. *Stygii* FRIES ex ROUY 26
Sect. *Stygiopsis* GAND. ex POST & KUNTZE 26
Sect. *Subnodulosi* WEIMARCK 21
Sect. *Subulati* (BUCHENAU) ROUY... 7
Sect. *Supini* ROUY 21
Sect. *Tenageia* DUMORT. 11, 15
Sect. *Tenues* ROUY 11
Sect. *Thalassii* (BUCHENAU) VIERHAPPER 3
Sect. *Trifidi* ROUY 11
acutiflorus EHRH. ex HOFFM. 24
acutus L. 5
var. *β* L. 4
afghanicus SNOG. 28
albescens (LANGE) FERNALD 26
allioides FRANCH. 30
ambiguus GUSS. 17
arabicus (ASCHERSON & BUCHENAU) ADAMSON 4
arianus V. KRECZ. 31
articulatus L. 22
articulatus L. × **J. Fontanesii** GAY subsp. **Kotschyi** (BOISS.) SNOG... 31
benghalensis KUNTH 28
bottnicus WAHLENB. 12
brachytepalus TRAUTV. ex V. KRECZ. & GONTSCH. 8
Broteri STEUD. 4
bufonius L. 16
bulbosus L. 12
caffer BERTOL. 4
compressus JACQ. 12
concinnus D. DON 30
Congdoni WATSON 17
conglomeratus L. 11
deserti CARUEL ex ASCHERSON & SCHWEINF. 4
effusus L. 10
exaltatus DECNE. 21
foliosus DESF. 20
Fontanesii GAY 24
subsp. **Kotschyi** (BOISS.) SNOG... 25
subsp. **pyramidatus** (LAHARPE) SNOG. 25
var. *Kotschyi* (BOISS.) BUCHENAU 25
var. *pyramidatus* (LAHARPE) BUCHENAU 25
Forsteri SMITH 31
Gerardi LOISEL. 12
subsp. **libanoticus** (THIÉBAUT) SNOG. 13

Juncus L. *(cont.)*
subsp. **persicus** (Boiss.) Snog. . . 14
subsp. **soranthus** (Schrenk) Snog. 14
glaucus Ehrh. 8
Heldreichianus Marsson ex Parl. . 6
subsp. **Heldreichianus** 7
subsp. **orientalis** Snog. 7
himalensis Klotzsch 27
Hoffmeisteri Klotzsch 29
hybridus Brot. 17
inflexus L. 8
insulanus Viv. 17
Karelini Steud. 5
Kotschyi Boiss. 25
lampocarpus Ehrh. ex Hoffm. . . . 22
Leersii Marsson 11
libanoticus Thiébaut 13
littoralis C. A. Mey. 6
longicornis Bastard 8
macranthus Buchenau 30
maritimus Lam. 4
var. *arabicus* Ascherson & Buchenau 4
membranaceus Royle 29
minutulus Albert & Jahandiez . . 17
minutulus V. Krecz. & Gontsch. . . . 17
multiflorus Desf. 8
multiflorus Ehrh. ex Retz. 32
mutabilis Savi 17
Nevskii V. Krecz. & Gontsch. 4
nodosus Weber 21
obtusiflorus Ehrh. ex Hoffm. 21
oxycarpus E. Mey. 21
paniculatus Hoppe 8
persicus Boiss. 14
ponticus Stev. 4

Juncus L. *(cont.)*
procerus Bianca 4
punctorius L. fil. 21
pyramidatus Laharpe 25
var. *Kotschyi* (Boiss.) Boiss. 25
Rechingeri Snog. 19
rigidus Desf. 4
rugosus Steud. 24
Schimperi Hochst. 21
siculus Tineo 8
silvaticus auct. mult. 24
soranthus Schrenk 14
sphaerocarpus Nees 19
sphenostemon Buchenau 28
spicatus L. 32
spinosus Forssk. 5
subnodulosus Schrank 21
subulatus Forssk. 8
sylvaticus Reichard 21
tenax Banks & Soland. 8
tenellus Geuns 20
Tommasinii Parl. 6
triglumis L. 26
subsp. **albescens** (Lange) Hultén 26
subsp. **triglumis** 26
subsp. **wakhaniensis** Snog. 26
turkestanicus V. Krecz. & Gontsch. 18
tyraicus Pacz. 6
warakensis Nab. 8
Luzula DC. in Lam. & DC. 31
campestris (L.) DC. 31
Forsteri (Smith) DC. 31
multiflora (Retz.) Lej. 32
pilosa (L.) Willd. 32
spicata (L.) DC. 32
Phylloschoenus Fourr. 21



Inflorescentiae et fructus cum perianthio **1**: *Juncus rigidus* DESF. — JACOBS 6802.
2: *J. maritimus* LAM. — JARDINE 645

Inflorescentiae et fructus cum perianthio × 5. **1—2:** *Juncus acutus* L., inflorescentia — FURSE 2509, flos — Graecia, Naxos, SNOGERUP s. n. **3—4:** *J. Heldreichianus* MARSSON ex PARL. subsp. *orientalis* SNOGERUP — RECH. 32735. **5—6:** *J. littoralis* C. A. MEY. — MEYER 138

Juncus Rechingeri SNOGERUP. **1:** habitus × 1. **2:** chromosomata somatica ex apicibus radicum × c. 1000. **3:** semen × 50. **4:** capsula × 10. **5:** flos cum capsula immatura × 10 — Specimina duo parva: KOELZ 18370 p. p.; specimina reliqua e seminibus typi culta

Tab. 4

Species subgeneris *Alpini* **1**: *Juncus himalensis* KLOTZSCH — EDELBERG 2100. **2**: *J. triglumis* L. subsp. *wakhaniensis* SNOGERUP — ROEMER 156. **3**: *J. afghanicus* SNOGERUP — KOEIE 2667

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
78	Alismataceae	16	127	115	124	146
76	Alliaceae	26	133	128	116	155
	Amaranthaceae	45	23	93	92	112
67	Amaryllidaceae	27	134	128	114	162
74	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
73	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
79	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
68	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
	Commelinaceae	24	138	132	117	154
	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
72	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
77	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
89	Eriocaulaceae	23a	138b	–	125a	154a
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
77	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
69	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
70	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
80	Hydrocharitaceae	18	129	114	111	146
49	Hypericaceae	95	55	19	27	54

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2.ed.
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
75	Juncaceae	25	136	133	118	168
82	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
86	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	147	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
73	Periplocaceae	126	118	74	76	83
19	Philadelphaceae	64	57	52	47	16
35	Phytolaccaceae	47	24	90	94	110
15	Plantaginaceae	139	114	80	90	122
21	Platanaceae	66	34	110	106	22
	Plumbaginaceae	119	95	88	68	121
70	Poaceae	19	140	135	127	170
	Podophyllaceae	54	40	3	13	93
	Polygalaceae	77	80	12	21	41

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
56	Polygonaceae	43	21	94	95	108
	Pontederiaceae	24a	133a	–	116a	155a
	Portulacaceae	49	28	14	24	107
83	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
84	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
82	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
88	Sphenocleaceae	145	125	62a	66	130
87	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
63	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
71	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
74	Vitaceae	91	91	32	41	66
85	Zannichelliaceae	14	131	117	125a	152
81	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48

Alliaceae
auctore P. WENDELBO, Gothenburg

Lfg. Cont. No. 76 / 1. 4.

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

Alliaceae

auctore PER WENDELBO, Gothenburg[1])

Alliaceae J. G. AGARDH, Theoria systematis plantarum 32 (1858).
Syn.: *Liliaceae* subfam. *Allioideae* ENGLER in ENGLER & PRANTL, Nat. Pflanzenfam. 2, 5: 18 (1887) p. p. *Amaryllidaceae* tribus *Allieae* HUTCH., Fam. Fl. Pl. 2: 130 (1934).

Lit.: K. KRAUSE in ENGLER & PRANTL, Natürliche Pflanzenfamilien 15a: 317—329 (1930). J. HUTCHINSON, Families Flowering Plants 2, ed. 2: 642 (1959). D. B. O. SAVILE, Nature 196: 792 (1962). R. HEGNAUER, Chemotaxonomie der Pflanzen 2: 315—325 (1963). P. WENDELBO, Lily Year Book 30: 68—95 (1967). AIRY-SHAW in J. C. WILLIS, Dictionary of the Flowering Plants and Ferns ed. 7: 41 (1966).

Herbae bulbosae vel rhizomatosae. Caulis scaposus. Folia radicalia vagina scapum aut breviter aut longius involucrante provisa. Inflorescentia composita, umbelliformis, spatha in valvas duas vel plures fissa vel integre decidua involucrata. Perigonium e tepalis ± connatis vel liberis compositum. Stamina 6, rarius 3; antherae dorsifixae. Ovarium superum, triloculare. Fructus capsula loculicida.

The family *Alliaceae* was proposed by AGARDH (1858) and has recently been taken up by AIRY SHAW (1966). HUTCHINSON (1935; 1959) treated *Allium* with related genera as belonging to *Amaryllidaceae* due to the cymose, umbel-like inflorescence surrounded by ± scarious spathes. Considering evidence from chemistry (HEGNAUER 1963), parasitology (SAVILE 1962) as well as from other fields there can be no doubt that a genus like *Allium* is more related to members of *Liliaceae* than of *Amaryllidaceae*. There is, however, reason to believe that *Liliaceae* are a rather heterogeneous family that should be split into smaller ones. At present this seems premature, and it is for practical reasons only that the family *Alliaceae* has been taken up here. It was found better to publish the treatment of the rather important genus *Allium* now, than to await the revision of all the other Liliaceous genera.

1a. Tepala 3—7-nervia (interiora interdum 1-nervia) .. 1. *Nectaroscordum* LINDL.
b. Tepala 1-nervia ..... 2. *Allium* L.

1. *Nectaroscordum*

Nectaroscordum LINDL., Bot. Reg. 9: tab. 1913 (1836).
Syn.: *Allium* sect. *Nectaroscordum* (LINDL.) GREN. & GODR., Fl. France 3: 212 (1855).

Lit.: A. A. GROSSHEIM, Fl. Kawk. ed. 2, 2: 267 (1940).

Differt a genere *Allio* arcte affini tepalis 3—7-nerviis plerumque disco duro valde incrassato insertis.

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[1]) Hoc opus viro illustrissimo ANDREO VVEDENSKIO, Scrutatori *Alliorum* Florae URSS. optime merito dedicatum.

1a. Tepala 12—15 mm longa. Folia e vaginis foliorum supraterraneis bene evolutamorta ..... 1. *N. tripedale* (Trautv.) Grossh.
b. Tepala 4—5 mm longa. Folia sine vaginis foliorum supraterraneis .... 2. *N. Koelzii* Wendelbo

Sect. *Nectaroscordum*

Folia vaginis supraterraneis provisa. Flores magni, disco bene evoluto. Tepala interiora distincte unguiculata.

1. ***N. tripedale*** (Trautv.) Grossh., Fl. Kawk. ed 2, 2: 110 (1940).
Syn.: *Allium tripedale* Trautv., Acta Horti Petrop. 2: 485 (1873). *A. roseum* L. subsp. *persicum* Bornm., Beih. Bot. Centrbl. 28, 2: 513 (1911). *Nectaroscordum persicum* Bornm., Beih. Bot. Centrbl. 33, 2: 210 (1915).
Icon.: Tab. 1, fig. 2. — Grossh., l. c.: tab. 19, fig. 1.
Typus: „In Armenia, ad thermas Isti-su", Radde, LE!

Bulbus c. 1,5 cm diametro, globosus, tunicis exterioribus membranaceis. Scapus 50—105 cm altus, usque ad 1/4—1/3 foliorum vaginis tectus. Folia 1—2 cm lata, glabra. Spatha univalvis, 3,5 cm longa, caduca. Umbella fasciculata, potius multiflora, densiuscula; pedicelli inaequales, 1,5—4 cm longi. Perigonium campanulatum; tepala 12—15 mm longa, albida, dorso et nervis rubescentibus, apiculata, exteriora panduriformi-oblonga, 5-nervia, interiora lamina elliptica, basi rotundata vel cordata, late unguiculato-attenuata, trinervia. Filamenta tertiam circiter partem longitudinis tepalorum attingentia, e basi dilatata filiformia, tepalis breviter adnata, interiora quam exteriora aliquantum longiora; antherae c. 2 mm longae. Stylus c. 2 mm longus. Capsula c. 6 mm longa, valvis late ovatis crassis, tepalis persistentibus basi incrassatis cincta.

Iraq: Kurd.: Arbil: Zeita et Kani Mazu Shirin prope Shirwan Mazin, Haines & al.! M. Botin, Haines & al.!
Persia: W: Lur.: Kuh-e Pariz, 2100 m, Koelz 15884! Kermansh.: Karand in Kuh-e Nevoh, Str. 8!, 602! „Nalkou", Auch. 2870! Arak: Soltanabad prope Khomeyn, Str.! Bakht.: Damevar, Koelz 15186! Gahar, 2100 m, Koelz 17860! 18043-a! — S: Fars.: Prope Dasht-e Arzhan, Stapf 1049! 1986!

Distr. gen.: Iraq, Persia, Transcaucasia.

Sect. *Pseudoprason* Wendelbo, sect. nov.

Folia sine vaginis supraterraneis. Flores parvi disco potius indistincto. Tepala interiora non distincte unguiculata. — Typus sectionis: *N. Koelzii* Wendelbo.

2. ***N. Koelzii*** Wendelbo, Acta Horti Gotob. 28: 53 (1966).
Icon.: Tab. 1, fig. 1. — Wendelbo, l. c.: fig. 15.
Typus: Koelz 15913, W!

Bulbus 2,5—3 cm diametro, late ovoideus, tunicis exterioribus ignotis. Scapus usque ad 60 cm altus, validus, teres, tenuiter costatus, basi vaginis foliorum brevibus aggregatis clausis probabiliter partem subterraneam scapi tantum tegentibus tunicatus. Folia 5, basalia, dimidio scapo breviora, usque ad 3 cm lata, anguste elliptica usque lineari-elliptica, apice rotundata apiculo cucullato, margine irregulariter minute papillosa vel sublaevia. Spatha c. 2 cm longa, usque ad basin in valvas 2—3 late elliptico-ovatas apiculatas ± reflexas persistentes fissa. Umbella

c. 6,5 cm diametro, hemisphaerica, multiflora, raro etiam bulbillos nonnullos proferens; pedicelli inaequales usque ad 3 cm longi, basi et infra florem incrassati. Perigonium late campanulato-urceolatum, album, viridi-nervosum; tepala 4—5 mm longa, late elliptica, valde concava, apice rotundata; tepala exteriora 3—7-nervia, interiora 1—3-nervia. Filamenta tepala circiter aequantia, per 1 mm circiter connata, interiora triangularia, quam exteriora lineari-triangularia duplo latiora; antherae c. 2,5 mm longae. Ovarium subglobosum, tricoccum, verruculosum. Stylus 1,5—2,5 mm longus; stigma punctiforme. Capsula seminaque ignota.

Persia: W: Lur.: Kalvar, 1500 m, KOELZ 15913! Kharon, 1200 m, KOEIE 1668! M. Oshtoran Kuh, STR.! Prope Qaleh Rostam in M. Oshtoran Kuh, STR.! Arak: Golpayegan, Hendeh, 2200—2800 m, IRANSHAHR 8033-E! Bakht.: Gahar, 2400 m, KOELZ 18010! — S: Fars.: Kuh Bil prope Dasht-e Arzhan, STAPF 1972!

Distr. gen.: Endem.

It is mainly because of the several-nerved outer tepals that *Nectaroscordum Koelzii* has been placed in this genus. In vegetative characters it is rather different from the other species of this small genus. Studies on living material are necessary to find further clues to its true relationship.

2. *Allium*

Allium L., Spec. Plant. 294 (1753), Gen. Plant. ed. 5: 143 (1754).

Lit.: G. DON, A monograph of the genus Allium, Mem. Wernerian Nat. Hist. Soc. 6: 1—102 (1827). E. REGEL, Alliorum adhuc cognitorum monographia, Acta Horti Petrop. 3: 1—266 (1875); Allium in Reise in Turkestan 3, Bot. Theil 1: 29—104 (1876). E. BOISSIER, Allium in Flora orientalis 5: 229—285 (1882). E. REGEL, Allii species in Asia media a Turcomania desertisque aralensibus et caspicis usque ad Mongoliam crescentes, Acta Horti Petrop. 10: 279—362 (1887). A. A. GROSSHEIM, Flora Kawkasa 1: 199—217 (1928). A. I. VVEDENSKY, Allium in Flora Turkmenii 1, 2: 270—296 (1932). A. I. VVEDENSKY, Allium in Flora URSS. 4: 112—280 (1935); translated into English by H. K. AIRY SHAW as: The genus Allium in the USSR, Herbertia 11: 65—218 (1946). A. A. GROSSHEIM, Flora Kawkasa ed. 2, 2: 111—141, 268—273 (1940). N. FEINBRUN, Allium sectio Porrum of Palestine and the neighbouring countries, Palest. Journal Bot., Jerusalem Series 3: 1—21 (1943). V. de JANKA, Key to the Alliums of Europe — translated by W.T. STEARN —, Herbertia 11: 219—225 (1946). W. T. STEARN, Notes on the genus Allium in the old world, Herbertia 11: 11—34 (1946). N. FEINBRUN, Further studies on Allium of Palestine and the neighbouring countries, Palestine Journal Bot. Jerusalem Series 4: 144—157 (1948). P. WENDELBO, Allium in Symbolae Afghanicae IV, Dan. Biol. Skr. 10, 3: 167—184 (1958); W. T. STEARN, Allium and Milula in the Central and Eastern Himalaya, Bull. Brit. Mus. (Nat. Hist.) Botany 2, 6: 161—191 (1960). A. I. VVEDENSKY, Allium in Fl. Tadjikskoi SSR. 2: 292—361 (1963). L. I. VAKHTINA, Chisla khromosom nekotorykh vidov luka, rasprostranennych na territorii SSSR., Botaniceskij Zjurnal Akad. Nauk SSSR. 49: 870—875 (1964). L. I. VAKHTINA, Sravniteljno-kariologicheskoe isslednovanie nekotorykh vidov luka sektsii Rhiziridium DON, l. c. 50: 387—394 (1965). L. I. VAKHTINA, Sravniteljno-kariologicheskie issledovanie roda Allium L., 24 pp., Acta Instituti botanici Academiae Scientiarum URSS. Leningrad (1965). K. PEDERSEN & P. WENDELBO, Chromosome numbers of some SW Asian Allium species, Blyttia 24: 307—313 (1966). P. MOUTERDE, Allium in Nouvelle flore du Liban et de la Syrie 1: 257—285 (1966). P. WENDELBO, New taxa and synonyms in Allium and Nectaroscordum of SW. Asia, Acta Horti Gotoburgensis 28: 15—55 (1966). P. WENDELBO, The genus Allium, The Lily Year Book 30: 86—95 (1967). H. P. TRAUB, The subgenera, sections and subsections of Allium L., Plant Life 24: 147—163 (1968). P. WENDELBO, New subgenera, sections and species of Allium, Botaniska Notiser 122: 25—37 (1969). L. I. VAKHTINA, Sravniteljno-kariologicheskoe

issledovanie nekotorykh vidov luka sektsii Molium DON (A comparative karyological investigation of some species of Allium L. (Liliaceae) belonging to the section Molium DON), Botaniceskij Zjurnal Akad. Nauk SSSR. 54: 143—150 (1969).

Bulbus solitarius vel plures aggregati rhizomati affixi. Caulis scaposus. Folia radicalia vagina caulem aut breviter aut longius involucrante provisa; lamina filiformis, linearis vel elliptica, cylindrica vel semicylindrica, saepe fistulosa. Flores inflorescentiam umbelliformem ex inflorescentiis partialibus pluribus compositam formantes; inflorescentia spatha aut unilateraliter in valvas duas vel plures fissa aut integra decidua involucrata; pedicelli basi saepe bracteolati. Perigonium stellatum usque anguste campanulatum vel ovoideo-urceolatum, in area nostra album, viride, flavum, brunneum, rubrum, purpureum vel violaceum; tepala ± aequalia, libera vel ± connata, uninervia. Stamina 6; filamenta inter se libera vel ± longe connata, tepalis basi ± longe adnata, saepe cuspidibus vel dentibus lateralibus provisa; antherae plerumque ellipsoideo-oblonga, dorsifixa. Ovarium triloculare, loculis plerumque biovulatis interdum multiovulatis, foveolis nectariferis basalibus provisum vel destitutum; stigma plerumque integrum, capitatum vel punctiforme, rarius ± trilobum. Fructus capsula loculicida. Semina plerumque compressa et irregulariter angulata, nigra.

The number of *Allium* species within the „Flora iranica"-area is likely to be considerably increased in the future. Several more Caucasian species may be found in NW. Persia and additional Central Asiatic species may occur in NE Afghanistan. Several sheets of undetermined plants seen during work with the genus, may represent species new to science.

Hybrids must be very rare within *Allium*, and are not, to my knowledge, known with certainty in wild material. Hybrids between closely related species would undoubtedly be very difficult to disclose on pressed specimens. When coming across mixed populations in the field one should therefore always look out for possible hybrids.

When collecting plants of *Allium* one should take great care to sample as complete material as possible. The bulb should be dug out very carefully to preserve the dry outer bulb tunics (tunicae exteriores) as well as bulbils which give important characters. Naming would be easier if notes or sketches were made of cross sections of fresh leaves above base and above middle. When possible one should also collect young plants with the spathe intact. There is much variation in the form of the spathe and in the way it is splitting up or falling off. If the spathe characters of all species were known, certain taxonomic problems might be solved, e. g. at sectional or subsectional level within the present sect. *Allium*. Another important sectional character that only can be studied on living material, is the number of storage leaves of the bulb. The characteristic smell that we connect with onion, leek and garlic, is not found in all species of *Allium*. There is certainly a lot of variation in the chemical constituents within the genus. Provisionally it would be of interest to know which species smell of onion and which do not have this smell (should be checked on fresh leaves). Most probably one could in this way get valuable hints for tracing supraspecific taxa.

Complete material being available the naming of *Allium* is usually not difficult. One should, however, note that the present keys and drawings are based on pressed, not living specimens. Bits of the dried leaves should be boiled in water to check the form of a transect and whether the leaves are fistulose or not. A cylindrical, fistulose leaf will naturally look flat when pressed. A careful preparation of the perigon is essential for correct naming. This is best done when the pressed flower has been boiled in water. The tepals usually are ± cucullate at apex when fresh. When the apex of such a tepal is flattened out, it bursts and gets a totally different shape. Thus a fresh tepal may look acute when fresh, but obtuse or emarginate when pressed. Important characters are found in the shape of the filaments, in the way they are connate inter se, as well

as in the distance for which they are adnate (attached) to the tepals. A certain confusion arises from the fact that plants collected before flowering may grow considerably in the plant press and may develop flowers and even fruits. Such flowers are rarely characteristic neither in shape of tepals nor of filaments.

Plants with bulbils and no flowers in the umbel will be impossible to name by help of the keys as flower characters are essential for a reliable determination. Such plants may belong to any of the following species:

1a. Leaves all basal, flat, broad or rather broad ..... *Nectaroscordum Koelzii* WENDELBO; 91. *Allium paradoxum* (M. B.) G. DON; 126. *A. chelotum* WENDELBO.
b. Leaves with leaf sheaths covering scape well above ground; lamina usually rather narrow 2
2a. Leaf lamina flat, not fistulose ..... 72. *A. longicuspis* REGEL.
b. Leaf lamina cylindrical, fistulose, often canaliculate above ..... 23. *A. caesium* SCHRENK; 44. *A. umbilicatum* BOISS.; 71. *A. subvineale* WENDELBO.

Clavis ad subgenera et sectiones determinandas.

Only those subgenera and sections are mentioned which are monotypic or for which species keys are presented.

1a. Bulbi solitarii vel aggregati, cylindrici, oblongo-ovoidei vel ovoidei, rhizomati ± bene evoluto adnati. Scapus interdum manifeste inflatus .... Subgen. *Rhizirideum* (KOCH) WENDELBO p. 6
b. Bulbus solitarius vel rarius bulbi bini vel plures tunica communi tecti, globosus usque ± late ovoideus vel ovoideus, rhizomati non adnatus..... 2
2a. Folia vaginis clausis scaporum partem supraterraneam ± involucrantibus; lamina foliorum cylindrica vel semicylindrica, fistulosa, rarius plana, si plana filamenta interiora denticulata vel cuspidibus lateralibus provisa et perigonium parvum, 3—5 (—8) mm longum 3
b. Folia plerumque basalia, plana vel canaliculata, vaginis subterraneis ± bene evolutis vel raro vaginis partem supraterraneam scapi breviter involucrantibus filamenta tum integra et tepala magna, 8—12 mm longa..... 5
3a. Filamenta interiora 3 (—5—7)-cuspidata; cuspis antherifera plerumque quam cuspides ± filiformes laterales brevior (in *A. turkestanico* dentibus lateralibus obtusis sed folia tum plana); filamenta exteriora integra vel rarissime 3-cuspidata ..... Sect. *Allium* p. 43
b. Filamenta interiora et exteriora integra vel interiora denticulata usque dentata dentibus lateralibus cuspidem antheriferam non excedentibus. Folia nunquam plana 4
4a. Valvae spathae elongatae, umbellam plerumque valde excedentes, persistentes. Ovarium foveolis nectariferis carens vel foveolae minutae indistinctae ..... Sect. *Codonoprasum* (RCHB.) ENDL. p. 59
b. Valvae spathae non elongatae, plerumque quam umbella multo breviores, persistentes vel spatha integra mox decidua. Ovarium foveolis nectariferis magnis provisum ..... Sect. *Scorodon* C. KOCH p. 20
5a. (2) Foliorum vaginae supraterraneae ± evolutae, pilosae. Bulbi tunicae exteriores crassae, sculptae, in specie nostra foveolato-reticulatae..... ..... Sect. *Molium* G. DON ex KOCH p. 65
b. Foliorum vaginae soli superficiem attingentes vel omnino subterraneae saepe brevissimae vel deficientes 6

6a. Scapus triqueter. Flores ± nutantes, 8—12 mm longi, albi. Species unica ..... Sect. *Briseis* (Salisb.) Stearn p. 66
b. Scapus teres. Flores non nutantes 7
7a. Folia apice non cucullata. Bulbus bulbillos longe stipitatos proferens. Vernatio foliorum plana. Tepala 8—11 mm longa, lata, purpurea. Species unica ..... Sect. *Porphyroprason* Ekberg p. 67
b. Folia apice cucullata. Bulbus bulbillis nullis vel rarissime evolutis nec autem visibilibus. Vernatio foliorum convoluta. Tepala ± lata, immutata vel saepe angusta mox reflexa et contorta ..... Subgen. *Melanocrommyum* (Webb & Berth.) Wendelbo p. 67

Subgen. ***Rhizirideum*** (Koch) Wendelbo, Bot. Not. 122: 25 (1969).

Syn.: Sect. *Rhizirideum* G. Don ex Koch, Syn. Fl. Germ.: 714 (1837).

Bulbi rhizomati adnati, plerumque anguste cylindrico-conici usque oblongo-ellipsoidei vel ovoideo-conici, plerumque conferti. Scapus in parte supraterranea foliorum vaginis ± alte obtectus. Ovarium foveola nectarifera provisum. — Typus subgeneris: *A. senescens* L.

The subgenus *Rhizirideum* will probably comprise several sections in addition to those treated here. Even for the species of our area the sectional division used for this subgenus is provisional. Much work has still to be done to clear up the real relationships between the species and thus give a sound basis for the grouping.

1a. Bulbi bene evoluti, ± ovoidei. Scapus validus plerumque manifeste inflatus. Folia sub anthesi emarcida. Perigonium stellatum, virescenti-album 2
b. Bulbi ± cylindrici. Scapus nunquam inflatus. Folia sub anthesi vigentia. Perigonium late usque anguste campanulatum usque tubulare, coloratum vel album colorati-nervosum, raro album 4
2a. Scapus non manifeste inflatus. Folia 1—4 mm lata 18. *A. farctum* Wendelbo
b. Scapus manifeste inflatus. Folia ultra 4 mm lata 3
3a. Folia cylindrica, recta ..... 19. *A. Oschaninii* O. Fedtsch.
b. Folia applanata, canaliculata, ad basin scapi conferta, recurva ..... 20. *A. Vavilovii* M. Pop. & Vved.
4a. (1) Folia cylindrica, fistulosa, non longitudinaliter costata. Tepala 7—14 mm longa 5
b. Folia plana usque ± cylindrica, si cylindrica filiformia longitudinaliter costata (in sicco) et supra ± canaliculata, non fistulosa 6
5a. Perigonium roseo-purpureum usque purpureum. Stigma integrum ..... 17. *A. Schoenoprasum* L.
b. Perigonium flavum demum rubescens. Stigma trilobum ..... 16. *A. Fedtschenkoanum* Regel
6a. (4) Bulbi tunicae exteriores ± integrae 7
b. Bulbi tunicae exteriores reticulato-fibrosae 10
7a. Folia 2—15 mm lata, plana 8
b. Folia c. 1 mm lata vel angustiora, canaliculata 9
8a. Bulbi tunicae exteriores opacae, brunneae. Folia plerumque falcata, 3,5—15 mm lata. Tepala interiora elliptica usque ad 8,5 mm longa ..... 11. *A. carolinianum* DC.
b. Bulbi tunicae exteriores subnitentes, brunneae. Folia erecta, 2—5 mm lata. Tepala interiora anguste elliptica, 4—5,5 mm longa 12. *A. hymenorrhizum* Ledeb.

9a. (7) Tepala 4—5 mm longa, pallide rosea usque rosea nervis atrioribus. Folia 0,25—0,5 (—1) mm lata ..... 13. *A. filifolium* REGEL
b. Tepala 6—8 mm longa, rubra. Folia c. 1 mm lata ..... 14. *A. Roylei* STEARN
10a. (6) Scapus compressus et unilateraliter anguste alatus. Tepala alba..... ..... 15. *A. humile* KUNTH
b. Scapus teres, ad summum costatus. Tepala colorata vel alba colorato-nervosa 11
11a. Perigonium 3—4 mm longum. Folia semicylindrica, longitudinaliter costata 12
b. Perigonium (4—) 5—12 mm longum. Folia plana usque canaliculata..... 13
12a. Filamenta quam perigonium tubuloso-campanulatum aliquantum breviora. Umbella laxa ..... 3. *A. baluchistanicum* WENDELBO
b. Filamenta quam perigonium campanulatum aliquantum longiora. Umbella densa ..... 4. *A. nuristanicum* KITAMURA
13a. (11) Filamenta quam tepala distincte longiora, alternatim utrinque dente provisa 14
b. Filamenta quam tepala aequilonga vel breviora, dente non provisa..... 15
14a. Folia 1,2—2,5 mm lata. Scapus 10—20 cm altus..2. *A. brachyodon* BOISS.
b. Folia (2—) 5—7 mm lata. Scapus (25—) 35—70 cm altus..... ..... 1. *A. afghanicum* WENDELBO
15a. (13) Perigonium 7—14 mm longum, campanulatum, rubrum usque roseo-violaceum vel purpureum 16
b. Perigonium (4—) 5—6 mm longum, late campanulatum, flavum (in sicco album nervis brunneis) vel brunneo-flavescens 19
16a. Filamenta quam tepala aequilonga vel paulo breviora. Stylus exsertus.... ..... 9. *A. dolichostylum* VVED.
b. Filamenta 1/2 vel 2/3 tepalorum aequantia. Stylus inclusus..... 17
17a. Antherae apiculatae. Ovarium apice coronatum, corona basin styli includens ..... 10. *A. tenuicaule* REGEL
b. Antherae muticae. Ovarium non coronatum 18
18a. Antherae violaceae. Folia plana ..... 7. *A. xiphopetalum* AITCH. & BAKER
b. Antherae flavae. Folia ± canaliculata .....8. *A. Barszczewskii* LIPSKY
19a. (15) Foliorum vagina et lamina glabrae vel scabridae. Tepala extus laevia vel sublaevia, in vivo clare flava, in sicco albescentia..... ..... 5. *A. scabriscapum* BOISS. & KY.
b. Foliorum vagina et lamina pubescens. Tepala extus papilloso-puberula, brunnescenti-flava ..... 6. *A. pogonotepalum* WENDELBO

Sect. *Rhizirideum*

Folia plana vel canaliculata raro filiformia, semicylindrica. Pedicelli plerumque bracteolati. Perigonium campanulatum, saepe satis parvum.

1. ***A. afghanicum*** WENDELBO, Acta Horti Gotob. 28: 16 (1966).
Icon.: Tab. 2, fig. 1; tab. 11, fig. 1. —WENDELBO, l. c.: fig. 1.
Typus: HEDGE & WENDELBO 5379, BG!

Bulbi 1—2, subcylindrici; tunicae exteriores fractae vel ± reticulato-fibrosae. Scapus (25—) 35—70 cm longus, in tertia parte inferiore vaginis foliorum remote costulatis, glabris obtectus. Folia 4—5, scapo breviora, (2—) 5—7 mm lata, linearia, plana, margine minute scabrida. Spatha 10—12 mm longa, cauda ad 8 mm longa inclusa, in valvas duas persistentes reflexas fissa. Umbella sphaerica, multiflora,

4—5 cm diametro; pedicelli ad 20 mm longi, bracteolati. Perigonium campanulatum, roseo-lilacinum; tepala subaequalia, concava, apice cucullata; exteriora 4,5—5 mm longa, elliptico-ovata; interiora 5—5,5 mm longa, elliptico-oblonga. Filamenta 6,5—8,5 mm longa, per 0,8 mm connata et tepalis adnata; exteriora integra, lineari-subulata; interiora exterioribus plus quam duplo latiora utrinque basi cuspide 1,5—3 mm longa provisa; antherae c. 1 mm longae, flavae. Capsula c. 4,5 mm longa, valvis late ovatis vel late elliptico-ovatis emarginatis, perigonio persistente inclusa.

Afghanistan: E: Kabul: Panjshir: Chimar, 2800 m, Hdg. & Wdb. 5379! — NE: Badakhshan: Ad lacum Shiva, Lindb. 883! Supra Yawarzan, c. 30 km S Kishm, 1800 m, Hdg. & Wdb. W-9341!

Distr. gen.: Endem.

A. afghanicum is undoubtedly closely related to *A. lineare* L. and might better be treated as a subspecies of that species. Geographically the two are widely separated.

2. ***A. brachyodon*** Boiss., Diagn. Pl. Or. Nov. Ser. 1,7: 117 (1846).
Icon.: Tab. 2, fig. 2.
Typus: Kotschy 756, G!

Bulbi 5—10 cm longi, 1—1,5 cm diametro, cylindrici, bini usque terni rhizomati ascendenti adnati; tunicae griseo-brunneae, coriaceae, partim in fibras grossas reticulatas dissolutae. Scapus 10—20 cm altus, basi vaginis foliorum approximatis laevibus inclusus. Folia 3—4, 1,2—2,5 mm lata, plana, margine scabrida. Spatha umbellam ± aequans, breviter caudato-acuminata, bivalvis. Umbella sphaerica usque hemisphaerica, pauciflora, densa; pedicelli ± aequales, perigonio aequilongi vel breviores, basi bracteolis paucis majusculis provisi. Perigonium campanulatum, album vel roseum (?) nervis purpureis; tepala c. 5 mm longa, subaequalia, elliptico-ovata, obtusa, ± cucullata. Filamenta tepalis aliquantum longiora, per 0,7 mm connata et tepalis adnata, interdum sinibus inter filamenta denticulis minutis provisis, exteriora e basi triangulari subulata, interiora basi duplo latiora et in tertia circiter parte inferiore utrinque cuspide provisa; antherae vix 1 mm longae, flavae. Stylus exsertus; stigma capitatum. Ovarium verruculosum. Capsula valvis 3,5 mm diametro, suborbicularibus apice emarginatis.

Persia: S: Fars.: Kuh Abbas Ali, Stapf 1990! Kuh-e Dinar ad fontem Chashmeh Pias = fontem *Allii*), Ky. 756!
Turcomania: M. Kopet Dagh: Tjapan, Gontscharov & Jarmolenko.

Distr. gen.: Endem.

According to Flora Turkmenii 1, 2: 275, fig. 103 (1930) and Fl. URSS. 4: 153 (1935) *A. brachyodon* occurs in the Kopet Dagh mountains. I have seen no material from there, but judging from descriptions and figure there are certain differences in the form of the tepals and filaments between the Kopet Dagh plant and Kotschy 756.

3. ***A. baluchistanicum*** Wendelbo, Nytt Mag. Bot. 10: 82 (1963).
Icon.: Tab. 2, fig. 3; tab. 11, fig. 2. — Wendelbo, l. c.: fig. 1.
Typus: Lace, E!

Bulbus cylindricus, tunicis exterioribus cano-rufescentibus in fibras reticulatas dissolutis. Scapus 20—44 cm altus, costatus, in tertia parte inferiore vaginis inter se remotis, glabris obsitus. Folia 2—3, filiformia, 5—14 cm longa, 0,5 mm lata, semicylindrica, fistulosa, costata, costis papilloso-scabridis. Spatha acuminata,

brevior quam umbella, persistens. Umbella fasciculata, laxa, 8—12-flora; pedicelli usque ad 12 mm longi, bracteolati. Perigonium tubulosum, probabiliter album, nervis rubellis; tepala 3,5—4 mm longa, elliptico-oblonga, subaequilonga. Filamenta quam tepala paulo breviora, per c. 1/4 connata et perigonio adnata; exteriora anguste triangularia, interiora basi duplo latiora quam exteriora, ovato-triangularia, interdum unilateraliter denticulo provisa. Ovarium verruculosum. Stylus inclusus. Capsula c. 4,5 mm longa, valvis obcordatis.

Pakistan: Quetta: Ziarat, 2550 m, LACE s. n.!

Distr. gen.: Endem.

4. ***A. nuristanicum*** KITAMURA, Acta Phytotax. Geobot. 17: 142 (1958).
Icon.: Tab. 2, fig. 4. — KITAMURA, Fl. Afgh.: fig. 46 (1960).
Typus: KITAMURA, KYO.

Bulbi 2,5—5 cm longi, basi 0,6—1 cm diametro, cylindrici, rhizomati brevi oblique adnati, tunicis brunneis reticulato-fibrosis ± dense tecti. Scapus (8—) 20—40 (—45) cm longus, usque ad 1/3—1/2 foliorum vaginis distantibus sublaevibus vel ad nervos papilloso-scabridis inclusus. Folia 3, summum usque ad 5 cm longum, inferiora longiora, (0,5—) 1,5—5 mm lata, subcylindrica vel, si lata, plana et aliquantum succulenta, longitudinaliter costata, ad costas minute ± distincte papilloso-scabrida vel laevia. Spatha 6,5—10 mm longa, caudato-acuminata, bivalvis. Umbella hemisphaerica, densa, multiflora; pedicelli 6—15 mm longi, basi bracteolis c. 2 mm longis conspicuis suffulti. Perigonium campanulatum, sordide album extus secus nervum fascia virescenti-brunnea provisum. Tepala 3—4 mm longa, elliptico-oblonga, apice rotundata ± indistincte crenulata usque integra, apiculata. Filamenta breviter exserta, e basi latiore lineari-subulata, alternatim plerumque utrinque denticulo ± distincto provisa, per 0,5 mm connata et tepalis adnata; antherae vix 1 mm longae, purpureo-violaceae. Stylus exsertus. Ovarium verruculosum. Capsula 3 mm longa, 3—3,5 mm diametro.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, 3300 m, RECH. 37094!, 37487! Paghman: supra Begtut, 3300—3500 m, GILLI 192! Siah Sang, WDB. & EKB. W-9828! Panjshir: Chimar, 2800 m, HDG. & WDB. 5373! In valle Panjshir, 2750 m, HDG. & WDB. 5521! Nangarhar: Musa Khan E Khane, 2500 m, EKBERG W-9227! Nur.: Inter Kushimaikot et Pashki, KITAM. s. n. Inter Pashki et Kushitaki, KITAM. s. n. In valle Parun prope Pashki, 2300 m, KERST. 1349! Ghazni: Okak NE Dasht-e Nawar, 3000 m, RECH. 17702! In jugo inter Sariab et Dasht-i Nawar, 3100 m, RECH. 37242! Sariab, 52 km W Ghazni, 2700 m, RECH. 37162! M. Saperlebuli ad marginem austro-orientalem Dasht-i Nawar, 3200—4200 m, W. RECH. 37316! — C: Bamian: In montibus Kuh-i Baba, 3780—4320 m, GILLI 193!, 194! In jugo Hajigak, 2700—3300 m, FURSE 8509!, 8560!, Panjao: In montibus W Kotal-e Nalgis W Panjao, 3000 m, HDG. & WDB. W-8764! Ghorband: In declivibus orientalibus jugi Shibar, WDB. & EKB. W-9744!

Distr. gen.: Endem.

5. ***A. scabriscapum*** BOISS. & KY. in BOISS., Diagn. Pl. Or. Nov. Ser. 1, 13: 31 (1854).
Icon.: Tab. 2, fig. 5.
Typus: KOTSCHY 262, G!

Bulbi elongati, numerosi rhizomati obliquo adnati, tunicis brunneis reticulato-fibrosis dense tecti. Scapus 12—50 cm altus, erectus, strictus, tenuiter costatus, glaber vel ± papilloso-scaber, usque ad 1/4—1/3 vaginis foliorum distantibus

glabris usque ± papilloso-scabridis inclusus. Folia 4—6, lamina 2—4 mm lata, quam scapus brevior, plana, glabra vel scabrida. Spatha bivalvis, valvis usque ad 13 mm longis, apiculatis, persistentibus. Umbella multiflora, hemisphaerica, fragilis; pedicelli (1—) 1,5—2,5 cm longi, aequales, tenues, in sicco atri, basi bracteolati. Perigonium late campanulatum, flavum nervis viridibus (plerumque in sicco album basi et nervo mediano atro-brunneo); tepala (4—) 6 mm longa, elliptica, obtusa. Filamenta tepalis aequilonga vel paulo breviora, e basi triangulari subulata, interiora quam exteriora duplo latiora. Stylus c. 5 mm longus, filiformis; stigma capitatum. Capsula perigonio persistente brevior.

Iraq: Kurd.: Sul.: Prope Penjwin, 1500 m, Rech. 10473! M. Kajan prope Penjwin, 1590 m, Rawi 22746! Malakawa prope Penjwin, 1320 m, Rawi 22479! — Mollah Khort, 1700 m, Rawi 29582!
Persia: N: Gorg.: Aliabad, Gauba 8025-E! Maz.: In valle fluvii Talar E Gaduk prope Kahud Chashmeh, 2300 m, Behb. & Aell. 1778! Gil.: In valle fluvii Safid Rud prope Rudbar et Kaluraz, Bornm. 8312! — W: Azerb.: In jugo prope Mianeh, Furse & Synge 302! Prope Shapur, 1600 m, Egger 43! Kurd.: Sanandaj, 1200—1400 m, Jacobs 6685! 18 km N Sanandaj, Wdb. 1858! Kermansh.: Kuh-i Tarikha, Str.! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 39! Arak: Kuh Safid, Str.! M. Alvand prope Golpayegan, Str.! Latetar, Str. 63! M. Rasvand, Str.! Mowdar, Str. 212! Inter Arak et Qom, Str. 29! Kuh Shahsinde, Str.! Arak, Str.! Bakht.: In montibus Bakhtiaris, Bode. Gahar, 2100 m, Koelz 17862! Damaver, 3600 m, Koelz 15181! Taleh, 3050 m, Koelz 15202! Lur.: Chamchid, 1500 m, Koelz 15853! Ti, 2100 m, Koelz 15938! Kharon, 1200 m, Koeie 733! Kuh-e Saverz, Haussk. — S: Fars.: Kuh Banu, Stapf 1979! Baba Kuhi, Stapf 1980! Kuh Karabagh prope Shiraz, Stapf 1978! Sabz Pushan, 2200 m, Wdb. 893! Prope Abadeh, coll. ign. 7092-E! Kerm.: M. Jebal Barez inter Bam et Jiroft, infra Deh Bakri, 1900 m, Rech. 3886! — E: Khor.: Inter Neyshabur et Shahrud, Bunge. Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4506-a! M. Kopet Dagh: 48 km E Bojnurd, 1200 m, Furse 7442! — C: Tehr.: Aigal Bagh Gal infra Ushan, Lindb. 151! Pas Qaleh, Ky. 262! Ferosad, Bornm. 8313! Qazv.: W Purkan, 1500—2000 m, Žumer 1147! Prope Qazvin, 1200 m, Pravitz 923! Kuh-e Nemar, 1600—2000 m, Rech. 706! Prope Vessieh, Rech. 427! In montibus prope Kalak, Rech. 217! 32 km NE Karaj, 1800 m, Furse 2585! Eshtehard, Kuh Tabareh, Termé 8101-E! In montibus supra Karaj, 2200 m, Gauba 1179! Kashan: Qohrud, Bunge. Damgh.-Semn.: Inter jugum Bashm et Sorkheh, 1600—2200 m, Rech. 1208! Shahr.-Bust.: Prope Shahrud, Bunge — Persia, Auch. 2213!
Turcomania: Suluklü, Sint. 894! Suluklü in campis ad M. Ackerberg, Sint. 892! Ashkhabad: Supra Nephton, Sint. 427! Gaudan, Litw. 2095!

Distr. gen.: Anatolia orientalis, Iraq, Persia, Turcomania, Transcaucasia.

6. ***A. pogonotepalum*** Wendelbo, Acta Horti Gotob. 28: 18 (1966).
Icon.: Tab. 2, fig. 6; tab. 12, fig. 1. — Wendelbo, l. c.: fig. 2.
Typus: Hedge & Wendelbo 4110, BG!

Bulbi numerosi conferti; tunicae exteriores canescenti-brunneae, crasse reticulato-fibrosae. Scapus 20—40 cm longus, strictus, papilloso-puberulus, in quarta parte inferiore vaginis foliorum pubescentibus vel rarius glabris obtectus. Folia 4, scapo multo breviora, 1,5—3,5 mm lata, anguste linearia, plana, pubescentia vel rarius glabra. Spatha c. 15 mm longa, puberula, subirregulariter in valvas 2 late ovatas fissa, persistens. Umbella 4—5,5 cm diametro, fasciculato-hemisphaerica, 20- usque multiflora, sublaxa usque densa; pedicelli aequales vel subaequales, 17—25 mm longi, tenues, atrati, sparse minute papilloso-puberuli, bracteolati. Perigonium late campanulatum, ochraceo-brunnescenti-flavescens, brunneo-nervosum; tepala inae-

qualia, obtusa, exteriora quoque dorso papilloso-puberula; exteriora c. 4,5 mm longa, elliptica; interiora c. 5 mm longa, elliptico-ovata, basi attenuata. Filamenta tepalis exterioribus sublongiora, e basi triangulari filiformia, interiora quam exteriora circiter duplo latiora, paulo supra basin connata et tepalis adnata; antherae c. 1,3 mm longae. Stylus c. 2,5 mm longus, filiformis stigmate capitato. Capsula ignota.

Afghanistan: **NE**: Kathagan: 32 km N Doshi, 750 m, FURSE 5988! In valle Salang, 2100 m, FURSE 6561! In valle Farkhar, 12 km S Farkhar, 1500—2400 m, FURSE 8172! Prope Doshi, 950 m, EKBERG, HDG. & WDB. W-8612! — **C**: Doab: In valle Ajar, W Doab, HDG. & WDB. 4110!, RECH. 16592!, 16594! Darrah-i Shikar, 2100 m, HDG. & WDB. 3367! Infra Doab, ROEMER s. n.! Ghorband: In declivibus orientalibus jugi Shibar, 2900 m, HDG. & WDB. W-9536! 10 km W Chordeh Ghorband prope Farinjal, 2000 m, FREITAG 1105!

Distr. gen.: Endem.

There is no doubt that *A. pogonotepalum* is rather closely related to *A. scabriscapum* BOISS. & KY. Other species of the same group occur in the central Asiatic part of URSS.

HDG. WDB. & EKB. W-8612 is a glabrous, obviously casual form of *A. pogonotepalum* occurring in the same area as the normal pubescent plants.

7. ***A. xiphopetalum*** AITCH. & BAKER, Trans. Linn. Soc. Ser. 2, 3: 118 (1888).
Icon.: Tab. 2, fig. 7a, b. — AITCH. & BAKER, l. c.: tab. 48.
Typus: AITCHISON 384, K!

Bulbi 1—3—9, approximati, tunicis exterioribus tenuiter reticulatis. Scapus (20—) 30—60 cm altus, basi usque ad tertiam partem foliorum vaginis laevibus inclusus. Folia 3—4, linearia, dimidium circiter scapum aequantia, (1—) 2—6 (—10) mm lata, plana, saepe falcata. Spatha breviter acuminata, 10—12 mm longa. Umbella fasciculata vel hemisphaerica, pauciflora, densa; pedicelli usque ad 20 mm longi, basi bracteolis paucis provisi. Perigonium campanulatum, purpureum, nervis atrioribus; tepala 9—12 mm longa, subaequalia, lanceolata vel anguste ovata attenuata, subacuta. Filamenta 2/3—3/4 tepalorum longitudinis aequantia, per 1/2 longitudinis filamentorum connata et tepalis adnata, exteriora triangulari-subulata, interiora triangularia, quam exteriora duplo latiora; antherae violaceae. Stylus non exsertus. Capsula dimidium perigonii aequans, subsphaerica.

Persia: **N**: Maz.: In declivibus borealibus jugi Kandavan, 2600—2900 m, WDB. 2128!, GILLI! Kuh-i Nizwa, 2900 m, WDB. 1237! — **W**: Ham.: Borujerd, in montosis, STR.! Arak: Khomeyn, STR.!, Kuh Shahsinde, STR.! M. Alvand prope Golpayegan, STR.! Inter Arak et Qom, STR. 28! M. Rasvand, STR.! Inter Arak et Kashan, STR.! Bakht.: Chehel Dokhtaran Kuh, 2800 m, WDB. 1746! Gahar, 2700 m, KOELZ 17911! Bakhtiari, SAWYER in WATT 13016! — **E**: Khor.: 24 km N Quchan, 2000—2300 m, FURSE 7485! Kuh-e Hazar Masjed: Inter Ardak et Talqur, 1200—1600 m, RECH. 4981! Gush, 1800 m, RECH. 5197! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, RECH. 4507! Prope Robat-i Safid, 1800—2000 m, RECH. 4436! In jugo Alam Ali, 2000 m, RECH. 4786-a!, -b! — **C**: Tehr.: Prope Shahrestanak, 2200 m, BORNM. 8311!, TERMÉ 8103-E! M. Tuchal, 2000—2500 m, ŽUMER 784!; 1800 m, EGGER 73! Gach Sar, 2100—2400 m, FURSE 2655!, coll. ign. 42! Qazv.: Kuh Dashteh, 2400 m, GAUBA 1178!
Turcomania: Suluklü, BORNM. 894!, ANDROSSOV. Gaudan, CZERNJAK., FEDTSCH. Kurt-su, DROBOV.
Afghanistan: **NW**: Herat: 52 km E Kisil Islam Qaleh, ad viam versus Herat, 750 m, RECH. 33280! Prope Herat, AITCH.! Inter Obeh et Khwajachisht, HDG., WDB. & EKB. W-7824! Badghiz: In declivibus borealibus jugi Sabzzak, 1500 m, HDG., WDB. & EKB. W-8096! — **SW**: Herat: Prope summum jugum Kotal-e Mir Ali, 1680 m, HDG., WDB. &

Ekb. W-7742! Farah: 15 km N Golestan, 2000 m, Hdg., Wdb. & Ekb. W-7318! — E: Jaji: In jugo Shuturgardan, 2900—3000 m, Hdg. & Wdb. W-9019!, Ekb. W-9181!

Distr. gen.: Persia, Turcomania, Afghanistan, Pamir-Alaj.

Material of *A. xiphopetalum* from Persia has, in general, much narrower leaves than that from Afghanistan. It has, however, not been possible to find other differences correlated with this.

8. ***A. Barszczewskii*** Lipsky, Acta Horti Petrop. 18: 114 (1900).
Icon.: Tab. 2, fig. 8.
Typus: Karategin: Sary Kuh-i-Kalon pass, LE!

Bulbi pauci approximati; tunicae exteriores reticulato-fibrosae, brunneae. Scapus 20—60 cm altus, in tertia parte inferiore foliorum vaginis laevibus vel scabris tectus. Folia 3—5, quam scapus breviora, 1—3 mm lata, linearia, ± canaliculata, margine scabrida. Spatha breviter acuminata, dimidiam circiter umbellam aequans. Umbella fasciculata usque fasciculato-hemisphaerica, plerumque multiflora, densa; pedicelli inaequales, usque ad 20 mm longi. Perigonium campanulatum, purpurascens; tepala 7—14 mm longa, subaequalia, lanceolata usque oblongo-lanceolata, acuminata. Filamenta 1/2—2/3 tepalorum longitudinis aequantia, per 1/3—1/2 longitudinis filamentorum connata et tepalis adnata, integra, exteriora triangulari-subulata, interiora triangularia, quam exteriora duplo usque triplo latiora; antherae flavae. Capsula 1/2—2/3 perigonii aequans.

Afghanistan: N: Mazar-i Sharif: SE Tashkurghan ad viam versus Samangan, 600 m, Hdg. & Wdb. 3977! — E: Kabul: 10 km NW Kabul versus Charikar, 2000—2100 m, Rech. 31134! In declivibus australibus jugi Salang, 80—110 km N Kabul, 2400 m, Lamond 2113! Panjshir: Darreh Rastagal, Hdg. & Wdb. 5216! Till Pain, Lindb. 999! — NE: Kataghan: In jugo Salang, 3000—3700 m, Furse 7885!, 8791!, Hdg. & Wdb. W-8569!, Hdg., Wdb. & Ekb. 9578! Karkar, 1000 m, Frumkin 174! Badakhshan: Shiva, Lindb. 712! Distr. Faizabad, 1500—2100 m, Furse 6257! — C: Ghorband: In declivibus orientalis jugi Shibar prope summum, Hdg. & Wdb. 3330!, 4240!
Pakistan: Chitral: Tirich Mir: Barum Gol supra Shokor Shal, 3600 m, Wdb. s. n.!

Distr. gen.: Hindukush, Pamir-Alaj, Tien Shan.

A. Barszczewskii is a very variable species and is perhaps not clearly understood. It is in need of a closer study based on living material from different parts of its area.

9. ***A. dolichostylum*** Vved., Bull. Univ. As. Centr. 19: 120 (1934).
Syn.: *A. pseudoxiphopetalum* Wendelbo, Dan. Biol. Skr. 10, 3: 181 (1958).
Icon.: Tab. 2, fig. 9; tab. 12, fig. 2. — Wendelbo, l. c.: 180, fig. 67; 185, fig. 71 c.
Typus: Sary Chilek, LE.

Bulbi 3—4 cm longi, 0,75 cm diametro, elongato- vel ovoideo-conici, 1—3 conferti, rhizomati brevi adnati; tunicae brunneae, reticulato-fibrosae. Scapus 20—50 (—70) cm altus, in quarta vel tertia parte inferiore foliorum vaginis laevibus vel rarius papillosis tectus. Folia 4—5, 1—3 (—4) mm lata, canaliculata, plerumque margine scabra. Spatha breviter acuminata, persistens, 1/2—2/3 umbellae attingens. Umbella hemisphaerica usque fasciculato-hemisphaerica, multiflora, densa; pedicelli quam tepala plerumque breviores vel ea aequantes, basi bracteolis paucis provisi. Perigonium anguste campanulatum, purpurascens, nervis atrioribus; tepala (7—) 8—11 mm longa, subaequalia, attenuata, acuta, lanceolata vel anguste ovata, exteriora quam interiora paulo breviora et latiora. Filamenta quam tepala subbreviora vel aequilonga vel sublongiora, per 1/5—1/6 connata et tepalis adnata, exteriora

triangulari-subulata, interiora anguste triangularia; antherae c. 1 mm longae, brunnescenti-violaceae. Stylus exsertus. Capsula dimidium perigonii persistentis aequans.

Afghanistan: **N**: Mazar-i Sharif: Tang-i Tashkurghan, EKB. W-9063! — **NW**: Maimana: Prope Kaolian E Belchiragh, 1200 m, HDG., WDB. & EKB. W-8386! Darreh Zang, 1400 m, LINDB. 453!, 539!, HDG. & WDB. 3714! Darreh Belchiragh, 1200 m, HDG. & WDB. 3777! Herat: Khwajachisht, 1800 m, KOEIE 4280!, 4282! — **SE**: Orozgan: Inter Tirin et Orozgan, RECH. 35166! 30 km SW Orozgan, 2150 m, FREITAG 902! — **E**: Kabul: Prope Kabul, 1700—2300 m, KERST. 97!, KERST. s. n.!, HDG. & WDB. 2882!, GILLI 195! Sebroderakan prope Shewaki in valle Logar, 2500 m, GILLI 196! Inter Shaikhabad et Gardez, 50 km SSW Kabul, 2700 m, FURSE 5710! Ghazni: Sariab, 52 km W Ghazni, 2700 m, RECH. 37212! In jugo inter Sariab et Dasht-i Nawar, 3100 m, RECH. 37244! Okak NE Dasht-i Nawar, 3000 m, RECH. 17701! Dahan-i Abdila 35 km E Sar-i Chashma, 2800 m, RECH. 17987! — **C**: Bamian: Band-i Amir, 2800—2900 m, RECH. 18283!, HDG. & WDB. 4780!, FURSE 8459!, VOLK 2744! Band-i Panir, 2800 m, RECH. 18406! Band-i Zolfikar, 2900 m, RECH. 18457! In declivibus borealibus jugi Shahtu, 2800—3000 m, RECH. 36375! In jugo Kotal-e Devali inter Yakulang et jugum Shahtu, 3100 m, HDG. & WDB. 4847! Inter Bulola et jugum Shibar, 2600—2800 m, RECH. 16821! Behzud: Ad pontem prope Khash Kul, 2470 m, HDG. & WDB. W-8662! Panjao: Inter Panjao et jugum Shahtu, 2800—3000 m, RECH. 36287! Prope Panjao, 2700 m, HDG. & WDB. 4937! Ghorband: In montibus W jugi Shibar, 2800 m, HDG. & WDB. 4222! Deh Kundi: In summo jugo Khonak, 3300 m, RECH. 36666! Deh Kundi, 2800 m, EDELB. 1921! Doab: In valle Hajir, 64 km W Doab, 2100 m, FURSE 8344! Afghanistan, GRIFF. 5830!, 349!

Pakistan: Quetta: SW Ziarat, 2200—2500 m, RECH. 29337! Inter Quetta et Ziarat in summo jugo, 2500 m, LAMOND 1186! Spin Karez prope Quetta, 1800—1900 m, RECH. 29268!, LAMOND 1139! In valle Hanna, 2000—2300 m, SCHMID 127! — Baluchistan, STOCKS 1120!

Distr. gen.: Afghanistan, Pakistan, Alaj, Tien-Shan.

DR. VVEDENSKY (in litt.) indicated to me that *A. pseudoxiphopetalum* might be a synonym of *A. dolichostylum*. I have had the possibility of comparing my material with a few sheets from Tien Shan, and it is difficult to point out any real distinction although the Afghan plants on an average seem to be somewhat smaller of stature and to have larger flowers. There is also a marked disjunction in the distribution.

10. ***A. tenuicaule*** REGEL, Acta Horti Petrop. 10: 348 (1887).
Icon.: Tab. 2, fig. 10. — REGEL, l. c.: tab. 4, fig. 4.
Typus: „In Bucharae occidentalis vallis sarawschanicae monte Passrut ad 7—8000′ alt., in montium declivibus lacus Iskander", A. REGEL, LE.

Bulbi 2—6 approximati, ovoideo-conici; tunicae exteriores brunneae reticulato-fibrosae. Scapus 10—20 (—30) cm altus, usque ad 1/4—1/3 foliorum vaginis laevibus vel scabridis inclusus. Folia 2—3, fere filiformia, convoluta, margine scabrida. Spatha breviter acuminata, quam umbella paulo brevior. Umbella fasciculata vel fere hemisphaerica, plerumque pauciflora, densa; pedicelli subaequales, 4—9 mm longi, ebracteolati. Perigonium campanulatum, atropurpurascens; tepala 7—9,5 mm longa, subacuta, exteriora anguste elliptico-oblonga, quam interiora lanceolata 1,5-plo latiora. Filamenta 1/2—2/3 longitudinis tepalorum aequantia, per 1/2 longitudinis filamentorum connata et perigonio adnata, exteriora triangularia subulata, interiora quam exteriora duplo latiora triangularia; antherae flavae, distincte mucronatae. Ovarium corona basin styli includens e dentibus cartilagineum composita coronati. Capsula 2/3 perigonii longitudinis aequans.

Afghanistan: E: Panjshir: Chimar, 2800 m, Hdg. & Wdb. 5372! Ghazni: M. Saperlebuli ad marginem austro-orientalem Dasht-i Nawar, 3200—4200 m, W. Rech. 37318!, Freitag 1511! In jugo inter Sariab et Dasht-i Nawar, 3100 m, Rech. 37243! — C: Bamian: Kargana-tu prope Band-i Amir, 3100 m, Hdg. & Wdb. 4738! Doab: In jugo Lorinj, 3050 m, Koelz 13775! In declivibus australibus jugi Shibar, 3400 m, Furse 6637! — In jugo Kaloo, Griff. 5816!
Pakistan: Chitral: Inter Shoghot et Lutko, 2000 m, Bowes Lyon 767!

Distr. gen.: Afghanistan, Pamir-Alaj.

11. ***A. carolinianum*** DC. in Redouté, Les Liliacées 2: tab. 101 (1804).
Syn.: *A. blandum* Wall., Pl. Asiat. Rar. 3: 38, tab. 260 (1832). *A. polyphyllum* Kar. & Kir., Bull. Soc. Nat. Mosc. 15: 509 (1842). *A. obtusifolium* Klotzsch in Klotzsch & Garcke, Bot. Ergebnisse Prinz Waldemar von Preussen: 51, tab. 95 (1862). *A. Thomsonii* Baker, Journ. Bot. 12: 294 (1874). *A. Aitchisonii* sensu Boiss., Fl. Or. 5: 248 (1882), non Regel (1879).
Icon.: Tab. 2, fig. 11. — Redouté, l. c. Fl. Tadjik. SSR. 2: tab. 57, fig. 1—2 (1963).
Typus: Specimen cultum originis incertae, G!

Bulbi 1,5—2,5 cm diametro, late cylindrico-conici, 1—2 approximati rhizomati verticali vel oblique ascendenti adnati; tunicae coriaceae, brunneae, ± integrae, opacae. Scapus robustus, 20—40 (—60) cm altus, ad 1/4—1/2 foliorum vaginis laevibus obtectus. Folia 5—7, 3,5—15 mm lata, scapo breviora, late linearia, plana, obtusa, plerumque falcato-recurvata, margine tenuissime papillosa. Spatha breviter acuminata, umbella brevior vel eam subaequans, bivalvis, saepe roseo-tincta. Umbella sphaerica vel hemisphaerica, densa, multiflora; pedicelli subaequales, tepalis aequilongi vel eis usque ad duplo longiores, ebracteolati. Perigonium urceolato-campanulatum, roseum, saturatius nervosum; tepala 5—8,5 mm longa, apice rotundata, in vivo verisimiliter cucullata, exteriora elliptica usque elliptico-obovata, interiora aliquantum longiora latius elliptica. Filamenta tepalis sesqui-longiora, paulo supra basin connata et tepalis adnata, e basi dilatata subulata, interiora quam exteriora duplo latiora; antherae 1,5 mm longae. Stylus longe exsertus. Capsula perigonio manifeste brevior.

Afghanistan: E: Nuristan: In vallem Pitwei inter jugum Pitwei et Kulam, 2200—2900 m, Kerst. 1085! — NE: Wakhan: In valle Sarchant S Qala Panja, 3500 m, Renz! In convalle Gol vallis Qazi Deh, 3800 m, Wojtusiak! Prope Noshaq, 3900 m, Roemer 218! Munjan: In jugo Munjan, 3660 m, Koelz 12707!, 12707-a!, Edelb. 1301! In parte superiore vallis Weran, 3500 m, Edelb. 1262! Prope jugum Dushbuko, Edelb. 1076! Darrah-i Parshui, 4000 m, Frey 299: (23)!

Pakistan: Chitral: Sora Lasht, 3800 m, Bowes Lyon 1081! In jugo Shah Jinali, 3400 m, Bowes Lyon 1015! Ad glaciem Chatiboi, 4140 m, Wöhrl! — Kurram: In montibus N Kaiwas, 3000 m, Aitch. 704!

Distr. gen.: Montes Himalaya ab Afghanistan orientalem usque ad Nepal, Pamir-Alaj, Tien Shan, Dsungaro-Zarbagatai, Dsungaro-Kashgar.

12. ***A. hymenorrhizum*** Ledeb., Fl. Alt. 2: 12 (1830).
Syn.: *A. macrorrhizum* Boiss., Diagn. Pl. Or. Nov. Ser. 1, 13: 32 (1854).
Icon.: Tab. 2, fig. 12. — Ledeb., Icon. Pl. Fl. Ross. 4: tab. 359 (1833).
Typus: „Hab. in pratis humidis ad fl. Koksun et Uba", LE.

Bulbi 1—2 cm crassi, cylindrici, singuli vel pauci, rhizomati caespitem densum formanti adnati; tunicae exteriores numerosae, coriaceae, brunneae, fissae. Scapus

30—60 (—90) cm altus, in tertia circiter parte inferiore foliorum vaginis distantibus laevibus inclusus. Folia 3—4 (—5), quam scapus aliquantum breviora, 2—5 mm lata, linearia, plana, plerumque erecta, laevia. Spatha breviter acuminata, quam umbella paulo brevior vel eam aequans, ± persistens. Umbella sphaerica usque hemisphaerica, multiflora, densa; pedicelli subaequales, 5—10 mm longi, ebracteolati. Perigonium campanulatum, purpurascens nervis medianis aliquantum inconspicuis; tepala 4—6 mm longa, obtusa vel subacuta, interiora apice saepe denticulata, exteriora lanceolata usque oblongo-lanceolata, quam interiora aliquantum breviora et angustiora. Filamenta quam tepala sesqui- usque ad duplo longiora, basi connata et tepalis adnata, subulata, integra, subaequalia, interiora saepe basi subquadrata. Styli valde exserti. Capsula 4—5 mm longa, perigonio persistente inclusa.

Persia: N: Maz.: In alpinis frigidis M. Damavand, 3500—3600 m, BORNM. 8310! In regionibus altissimis M. Damavand, 2800 m, KY. 610 (Typus *A. macrorrhizi* BOISS.)! Afghanistan: NE: Wakhan: Dario Kundur, RASOUL in BRECKLE A-1412! Kotal-e Wazit, 4500 m, BRECKLE A-1258! — C: Bamian: Band-i Amir, 2700—3000 m, FURSE 8460! In valle versus Jam, 2300 m, HEWER 1324!

Distr. gen.: Persia borealis, Afghanistan centralis, montes Asiae centralis, Ural.

13. ***A. filifolium*** REGEL, Acta Horti Petrop. 10: 352 (1887).
Icon.: Tab. 2, fig. 13. — REGEL, l. c.: tab. 6, fig. 3.
Typus: „Habitat in regione montium Alexandricorum in regione fluvii Talas ad rivum Bisch-Tasch 5000′ alt.“, FETISOW, LE.

Bulbi 0,5—1 cm crassi, elongato-conici, nonnulli rhizomati brevi adnati; tunicae exteriores brunneae, coriaceae, ± diffractae, apice laceratae. Scapus 10—20 cm altus, basi foliorum vaginis laevibus obtectus. Folia 2—3, scapum circiter aequantia, 0,25—0,5 (—1) mm lata, canaliculata, longitudinaliter costata, margine scabrida. Spatha umbellam circiter aequans, rostro basin ± aequante, ± persistens. Umbella hemisphaerica, pauciflora; pedicelli 2—7 mm longi, bracteolati. Perigonium campanulatum, ± pallide roseum purpureo-nervosum; tepala 4—5 mm longa, elliptico-oblonga, acuta. Filamenta manifeste exserta, subulata, integra, pallida vel interdum purpurea, basi connata et tepalis adnata; antherae 1,2 mm longae, purpureae. Stylus exsertus. Capsula c. 4 mm diametro, perigonio persistente inclusa.

Afghanistan: NE: Wakhan: Quazi Deh, 2950—3200 m, ROEMER 119-a!
Pakistan: Chitral: Tirich Mir, in parte superiore Barum Gol supra Shokor Shal, 3700 m, WDB. s. n.!

Distr. gen.: Montes Hindukush boreo-occidentales, Pamir-Alaj, Tien Shan.

14. ***A. Roylei*** STEARN, Herbertia 12: 75 (1947).
Syn.: *A. lilacinum* ROYLE ex REGEL, Acta Horti Petrop. 3,2: 89 (1875), non KLOTZSCH (1862). *A. rubens* BAKER, Journ. Bot. 12: 293 (1874), non SCHRAD. ex WILLD. (1809).
Icon.: Tab. 2, fig. 14.
Typus: „Habitat in Himalaya occidentali, 1—7000′ alt. Herbarium of the late East Indian company distributed by the Royal Gardens Kew 1869 n. 1100“, LE.

Bulbus solitarius rhizomati brevi adnatus; tunicae exteriores membranaceae, rubro-brunneae. Scapus 15—25 cm altus, in sicco distincte costulatus, basi foliorum vaginis obtectus. Folia 1—3, scapum superantia vel eo breviora, c. 1 mm lata, canaliculata. Spatha rostrata, rostro quam basi persistente breviore, bivalvis. Umbella 2,5—3 cm diametro, hemisphaerica; pedicelli aequales 6—12 mm longi, bracteolati. Perigonium campanulatum, rubrum; tepala 6—8 mm longa, acuta

usque subobtusa, interiora ovata et quam exteriora angustiora paulo longiora. Filamenta longe exserta, subulata, aliquantum supra basin connata et basi tepalorum adnata, interiora prope basin utrinque denticulo provisa; antherae vix 2 mm longae, flavae. Stylus filiformis, exsertus.

Afghanistan: E: Nuristan: Inter Kotal-e Agok et Waigel, NEUB. 888!
Pakistan: Chitral: Painogh prope Drosh, 3200 m, BOWES LYON 185!

Distr. gen.: Montes Hindukush orientales et Himalaya occidentales.

15. ***A. humile*** KUNTH, Enum. Plant. 4: 443 (1843).
Syn.: *A. Govanianum* WALL. ex BAKER, Journ. Bot.: 293 (1874).
Icon.: Tab. 2, fig. 15a, b; tab. 12, fig. 3. — BLATTER, Beautiful flowers of Kashmir 2, tab. 59, fig. 4 (1929).
Typus: India orientalis, JACQUEMONT 533, P.

Bulbi anguste cylindrici rhizomati adnati; tunicae exteriores reticulato-fibrosae, brunneae usque cinerascenti-brunneae. Scapus 5—25 cm altus, ut videtur unilateraliter compressus et anguste alatus, basi foliorum vaginis laevibus tectus. Folia (5—) 6, 1—2 infima brevissima, cetera scapum circiter aequantia, 1,5—6 mm lata, plana, margine laevia, apice obtusa. Spatha 1—1,7 cm longa, obtusa, bivalvis, persistens, pedicellos basi involucrans. Umbella late fasciculata usque hemisphaerica, multiflora, laxiuscula, floribus nutantibus; pedicelli subinaequales, usque ad 1,5 cm longi, acutanguli, ebracteolati. Perigonium late campanulatum, album; tepala 6—9 mm longa, subaequalia, elliptica usque elliptico-ovata, apice rotundata usque subacuta. Filamenta dimidium tepalorum aequantia, carnosa, connata et tepalis paulo supra basin adnata; antherae c. 1 mm longae. Stylus brevis, crassus.

Pakistan: Chitral: In jugo Lowarai, 3500 m, HARRISS 16693!

Distr. gen.: In montibus Himalaya occidentalibus.

Sect. *Schoenoprasum* DUMORTIER, Fl. Belg.: 140 (1827) p. p.

Folia cylindrica, fistulosa. Pedicelli ebracteolati. Perigonium ± anguste campanulatum, satis magnum. — Typus sectionis: *A. Schoenoprasum* L.

The similarity between the two species *A. schoenoprasum* and *A. Fedtschenkoanum* here placed in the same section may be a superficial one. Until the problem of the true relationship has been studied more closely it seems practical to group the fistular-leaved species together.

16. ***A. Fedtschenkoanum*** REGEL, Acta Horti Petrop. 3,2: 82 (1875).
Syn.: *A. Semenovii* sensu WENDELBO, Dan. Biol. Skr. 10,3: 183 (1958), non REGEL (1868).
Icon.: Tab. 3, fig. 16; tab. 25, fig. 1. — REGEL, Reise in Turkestan 3,1: tab. 7, fig. 4,5 (1876). WENDELBO, l. c.: 183, fig. 69. Fl. Tadjik. SSR. 2: tab. 57, fig. 3,4 (1963).
Typus: In valle Sarawschansk Turkestaniae, O. FEDTSCHENKO, isotypus K!

Bulbus solitarius vel bulbi plures conferti, cylindrici; tunicae exteriores brunnescentes fibrosae libriformes. Scapus 10—30 (—80) cm altus, ad 1/5—1/2 foliorum vaginis laevibus obsitus. Folia 1—3, cylindrica, fistulosa, infima plerumque brevia, longissima umbellam saepe excedentia, 2—8 (—15) mm lata. Spatha quam umbella subbrevior, purpurascens. Umbella ovoideo-sphaerica, densa; pedicelli inaequilongi, 4—20 mm longi. Perigonium campanulatum, flavum demum rubescens nervis saturatioribus; tepala 8—12 (—14) mm longa, aequalia vel exteriora sublongiora, anguste ovata usque elliptico-oblonga, saepe attenuata, integra vel ± denticulata.

Filamenta 1/3—1/2 tepalorum longitudinis attingentia, perigonio per dimidium longitudinis filamentorum circiter adnata, superne a perigonio libera in annulum connata; filamenta parte libera triangularia; exteriora multo latiora, interdum utrinque denticulo provisa. Stylus stigmate 3-lobato. Capsula dimidium perigonii attingens.

Afghanistan: E: Laghman: Alishang in parte superiore Darrah Rastyon, 3200 m, WDB. & EKB. W-9665! Panjshir: Darreh Rastagal supra Mukeni, 3800 m, HDG. & WDB. 5173! Nuristan: Shtive, 3500 m, EDELB. 1083! In jugo Mrami versus Shtive, 3000—4200 m, KERST. 1409! In jugo Mrami versus Papruk, 3000—4000 m, KERST. 1423! — NE: Munjan: Darrah-i Parshui, 4200 m, FREY 243—132! In jugo Munjan, 4100 m, KOELZ 12757! Wakhan: In jugo Pamir, 4200 m, ROEMER 355! Kataghan: In parte superiore vallis Andarab prope Darrah-i Til, 2800 m, PODLECH 11172!
Pakistan: Chitral: Yarkhun, 3700 m, BOWES LYON 1003! Ad glaciem Chatiboi usque ad 4140 m, WÖHRL! Ojor, 3700 m, BOWES LYON 862! — Swat: Inter Diwan Gol et Pichar, 3910 m, OGINO 114, HONDA 212. Inter Diwan Gol et Ghizar, 3900 m, OGINO 271, 3800 m, OGINO 241.

Distr. gen.: Hindukush boreo-orientalis, Himalaya boreo-occidentalis, Pamir-Alaj, Tien Shan.

The material from Afghanistan listed above obviously belongs to *A. Fedtschenkoanum* as treated by VVEDENSKY, Flora Tadjikskoi SSR. 2: 316 (1963). Undoubtedly it is closely related to the purple-flowered *A. atrosanguineum* SCHRENK, and it is not clear whether there are any distinguishing morphological characters correlated with the colour. Other species are involved in this complex: see STEARN, Bull. Brit. Mus. Bot. 2, 6: 184—186 (1960).

In Symbolae Afghanicae IV, I used the name *A. Semenowii* REGEL for the Afghan plant. That species, however, is distinguished by its flat leaves. In dried material it is often difficult to tell whether a leaf is flat or whether it is fistular and then compressed in the pressing. This can be checked by boiling a bit of the leaf.

17. ***A. Schoenoprasum*** L., Spec. Plant.: 301 (1753).
Syn.: *A. Buhseanum* REGEL, Acta Horti Petrop. 3,2: 81 (1875). *A. Schoenoprasum* L. var. *Buhseanum* (REGEL) BOISS., Fl. Or. 5: 250 (1882).
Icon.: Tab. 3, fig. 17.
Typus: „Habitat in alpestribus Sibiriae, Olandiae locis rupestribus."

Bulbi 0,5—1 cm crassi, anguste ovoidei, conferti, tunicae exteriores ± fibrosae libriformes. Scapus 10—40 cm altus (vel elatior), usque ad 4 mm crassus, tenuiter costatus, ad 1/3 circiter foliorum vaginis laevibus obtectus. Folia 1—2, scapum circiter aequantia, 1—5 mm lata, cylindrica, fistulosa. Inflorescentia usque ad 3,5 cm diam., sphaerico-ovoidea, densa, saepe capitata. Spatha umbellam aequans vel ea subbrevior, apiculata, purpurea, persistens; pedicelli inaequilongi, quam tepala aequilongi vel interiores in statu fructifero usque ad duplo longiores, ebracteolati. Perigonium cylindrico-campanulatum, roseo-purpureum vel purpureum, nitidum; tepala 7—10 (—14) mm longa, aequalia vel interiora quam exteriora paulo longiora, et angustiora, lanceolata usque anguste elliptico-oblonga, ± attenuata. Filamenta dimidium circiter tepalorum longitudinis aequantia, triangulari-subulata; interiora quam exteriora sesquilatiora, interdum utrinque denticulo provisa, per 1/3—1/4 longitudinis connata et tepalis adnata; antherae c. 0,75 mm longae. Stylus c. 2 mm longus, tenuis. Capsula dimidium tepalorum longitudinis attingens, perigonio persistente inclusa.

Iraq: Kurd.: Arbil: Algurd Dagh, 3000—3500 m, Rawi 24551!, 24922!, 24927!, Guest 1049!, Gillet 12360!, Haley 142!, Rech. 11446! Ser Kurawa, Gillett 9747!
Persia: W: Azerb.: Sarab et Kuhha-ye Sabalan, Termé 8107-E! Maragheh, Kuh Sahand, Shar. 7024-E! Kuh Sahand prope Shah Jordi, 2400 m, Buhse — C: Tehr.: Prope Darband, Ky. 427! M. Tuchal, 3200 m, Linds. 527! — In montibus Elburz prope Kuschkak, Buhse 1027-a!

Distr. gen.: Per regiones temperatas et arcticas late dispersum, in regionibus australioribus monticolum.

Sect. *Cepa* Prokhanov, Bull. Appl. Bot. Pl.-Breed. (Leningrad) 24: 180 (1930).

Bulbi rhizomati adnati, ± conferti, conici usque ovoidei, saepe bene evoluti. Scapus robustus, saepe inflatus. Folia fistulosa. Pedicelli bracteolati. Perigonium stellatum, album vel virescenti-album. Filamenta integra vel interiora basi breviter bidentata. — Typus sectionis: *A. Cepa* L.

18. ***A. faretum*** Wendelbo, Nytt Mag. Bot. 14: 101 (1968).
Icon.: Tab. 3, fig. 18. — Wendelbo, l. c.: fig. 1 a—f, fig. 2.
Typus: Rech. 30991, W!

Bulbus usque ad 2,5 cm crassus, ovoideo-cylindricus, tunicis exterioribus integris papyraceis fusco-brunneis. Scapus 70—100 cm altus, indistincte costatus, ± solidus, non inflatus, usque ad partem quintam inferiorem vaginis foliorum laevibus tectus. Folia 3—4, scapo multo breviora, 1,5—4 mm lata, cylindrica, fistulosa. Umbella multiflora sat densa; pedicelli inaequales, usque ad 3 cm longi. Tepala 4—4,5 mm longa, aliquantum inaequalia, exteriora cymbiformia, ovata usque ad ± anguste ovato-oblonga, interiora ± anguste elliptico-oblonga, obtusa, alba, nervo viridi percursa. Filamenta tepalis aequilonga vel subbreviora, basi in annulum c. 1,5 mm altum tepalis per c. 0,8 mm adnatum connata; partes liberae filamentorum subulatae, filamenta interiora utrinque denticulo obtuso provisa vel edentata; antherae c. 1,5 mm longae. Stylus c. 2,5 mm longus. Capsula valvis c. 5 mm latis late obcordatis.

Afghanistan: E: Nangarhar: 50 km NW Tor Khama versus Jalalabad, 600 m, Rech. 31011!
Pakistan: Kohat: Inter Hangu et Kohat, 1400 m, Rech. 30991!, Lamond 1901! — Quetta: In parte inferiore faucium Torkhan supra Harnai, 900 m, Rech. 29468! In jugo Torkhan, 1400—900 m, Lamond 1265! 15 km W Harnai, 900—1200 m, Lamond 1298!

Distr. gen.: Endem.

19. ***A. Oschaninii*** O. Fedtsch., Progress. Sadov. i Ogorod 3: 332 (1906).
Syn.: *A. decipiens* Fisch. var. *integrifolium* Parsa, Kew Bull. 1949: 33 (1950).
Icon.: Tab. 3, fig. 19; tab. 13; tab. 25, fig. 2. — O. Fedtsch., l. c.
Typus: Non indicatus.

Bulbi ± late ovoidei, 1—3-ni rhizomati adnati; tunicae exteriores rubescenti-brunneae, coriaceae, integrae. Scapus robustus, 45—100 cm altus, medulla laxa farctus cavus videtur, infra medium inflatus, basi vaginis foliorum ± distantibus laevibus tectus. Folia 4—6, tertiam partem scapi longitudinis attingentia, 4—15 mm lata, cylindrica, supra canaliculata, apicem versus attenuata, fistulosa, erecta, glaucescentia. Spatha umbellam circiter attingens, rostrata. Umbella sphaerica, densa, multiflora; pedicelli aequales, usque ad 30 mm longi. Perigonium stellatum, album nervis viridibus; tepala 4—5 mm longa, obtusa, exteriora cymbiformia, anguste elliptico-ovata, interiora obovata usque ad anguste elliptico-oblonga. Fila-

menta quam tepala aliquantum longiora, prope basin tepalis adnata, per c. 1 mm connata, exteriora subulata, interiora basi multo latiora et quam tepala latiora, e basi suborbiculata subulata, basi utrinque denticulo obtuso provisa; antherae c. 2 mm longae, flavae. Capsula c. 5 mm diametro.

Persia: E: Khor.: Inter Neyshabur et Mashhad, BUNGE 20! S Mashhad, in stepposis, PARSA 180! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, RECH. 4982! In silvis prope Bardu, KOELZ 16789!
Afghanistan: N: Mazar-i Sharif: SE Tashkurghan versus Samangan, 600 m, HDG. & WDB. 3968! Chashmeh-i Shafal, 900 m, HDG. & WDB. 3876!, RECH. 16184! Tang-e Shadyan, 15 km S Mazar-i Sharif, in rupibus inaccessibilibus, 850 m, WDB. obs. — NW: Maimana: Inter Maimana et Belchiragh, 1000 m, HDG. & WDB. 3680! Belchiragh, in rupibus inaccessibilibus, 1150 m, WDB. obs. Herat: Inter Obeh et Khwajachisht, 1500—1900 m, HDG., WDB. & EKB. W- 7806! — E: Kabul: In parte superiore faucium Tang-i Gharu, 1800 m, HDG. & WDB. 3054!; 1650 m, GILLI 177!, 178! — C: Doab: In valle Hajir 64 km W Doab, 2100 m, FURSE 8345!

Distr. gen.: Persia boreo-orientalis, Afghanistan, Pamir-Alaj, Tien Shan.

Most probably, *Allium Oschaninii* is the species from which the onion (*A. Cepa*) originated. But as the cultivated form often is polyploid and may be of hybrid origin, I have hesitated to use the name *A. Cepa* also for the wild plant. *A. Oschaninii* typically grows in crevices of cliffs and also on stony slopes, and there can be no doubt that it is of spontaneous occurence in Afghanistan.

A sheet (Teheran: Karaj valley, Assara, leg. TERMÉ 8102-E) is from far outside the previously known area of the species of sect. *Cepa*. It may be a cultivated specimen of *A. Cepa*. As the Karaj valley is rather well known botanically it would be rather surprising if such a remarkable plant should have been overlooked by previous collectors.

20. ***A. Vavilovii*** M. POP. & VVED., Bull. Univ. As. Centr. 19: 122 (1934).
Typus: Kopet Dagh: Germab.

A. Oschaninii affine. Scapus 70—130 cm altus. Folia 7—9, applanata, canaliculata, recurva, 7—15 mm lata. Filamenta tepala ± anguste oblongo-elliptica circiter aequantia vel paulo superantia.

Turcomania: Kopet Dagh: Firyuza, CZERNJAK. 253!, BOBROV & FEDTSCH. Ashkhabad: Suluklü ad Kulkulab, SINT. 1080!, 1145! Inter Garmab et Chuli, VVED. Nephton, ANDROSSOV.

Distr. gen.: Endem.

The main difference between *A. Oschaninii* and *A. Vavilovii* is apparently found in the leaves. On all sheets I have seen the leaves are wilted, and in any case the mentioned difference would probably be impossible to see in pressed material. Cultivated material said to come from the Mashhad-area has terete leaves like the Afghan material which I have studied in the field. I have therefore used the name *A. Vavilovii* only for material from the Soviet side of the Kopet Dagh mountains. Field studies on material from the Khorasan area is needed to solve the problem. The two might better be treated as subspecies of *A. Oschaninii*.

Subgen. ***Allium***

Bulbus solitarius, rhizomati non adnatus. Scapus in parte supraterranea foliorum vaginis ± alte obtectus. Folia aut cylindrica aut semicylindrica aut ± plana vel canaliculata. Perigonium campanulatum vel ovoideum. — Typus subgeneris (typus generis): *A. sativum* L.

The three sections *Scorodon*, *Allium* and *Codonoprasum* are rather closely related to each other, and I have found it convenient to express this relationship by placing them in a common subgenus.

Sect. *Scorodon* C. Koch, Linnaea 22: 239 (1849).

Syn.: Sect. *Crommyum* Webb & Berth. subsect. *Haplostemon* Boiss. § *Brachyspatha* Boiss., Fl. Or. 5: 252 (1882). Sect. *Haplostemon* (Boiss.) Halácsy, Consp. Fl. Graec. 3: 240 (1904) p. p.; Vved., Fl. URSS. 4: 199 (1935) p. p. — Typus sectionis: *A. rubellum* M. B.

Folia cylindrica usque semicylindrica, plerumque fistulosa, rarissime plana. Spatha bivalvis vel circumscissilis integra dehiscens, membranacea, nervis saepe coloratis sed tenuibus nec crassis. Filamenta plerumque inaequalia, interiora manifeste latiora et interdum 3-, raro 5-dentata. Ovarium foveolis nectariferis distinctis provisum.

1a. Bracteolae ad basin pedicellorum evoluti 2
b. Bracteolae ad basin pedicellorum non evoluti 19
2a. Filamenta exserta, quam tepala longiora 3
b. Filamenta inclusa, quam tepala breviora vel raro eis subaequilonga..... 6
3a. Tepala interiora apice emarginata; tepala exteriora dorso verruculosa.... ..... 35. *A. sabulosum* Stev.
b. Tepala interiora apice non emarginata; tepala exteriora dorso laevia..... 4
4a. Foliorum lamina prope basin manifeste inflata; vagina folii summi scapum per ± 2/3 longitudinis obtegens..... 28. *A. anacoleum* Hand.-Mzt.
b. Foliorum lamina prope basin non inflata; vagina folii summi scapum per 1/3—1/2 longitudinis obtegens 5
5a. Bulbi tunicae exteriores in fibras grosse reticulatas ± fissae, collo bene evoluto. Tepala anguste elliptico-oblonga .... 31. *A. lalesaricum* Freyn & Bornm.
b. Bulbi tunicae exteriores papyraceae, integrae. Tepala elliptico-oblonga usque elliptico-ovata ..... 27. *A. capitellatum* Boiss.
6a. (2) Filamenta interiora supra medium utrinque vel unilateraliter denticulo obtuso provisa; filamenta exteriora integra 7
b. Filamenta interiora et exteriora integra, non denticulata 12
7a. Folii summi vagina apice inflata vel gibbulosa 8
b. Foliorum vaginae nec inflatae nec gibbulosae 9
8a. Perigonium roseum nervis inconspicuis ..... 26. *A. schoenoprasoides* Regel
b. Perigonium purpurascenti-violaceum nervis saturatioribus conspicuis.... ..... 24. *A. caesioides* Wendelbo
9a. (7) Scapus ad 3/4 vel ultra folii summi vagina tectus 10
b. Scapus usque ad 1/2 folii summi vagina tectus 11
10a. Tepala c. 4 mm longa. Scapus ad 3/4 vel ultra foliorum vaginis tectus..... ..... 29. *A. arlgirdense* Blakelock
b. Tepala 5—6 mm longa. Scapus usque ad apicem foliorum vaginis tectus... ..... 30. *A. longivaginatum* Wendelbo
11a. (9) Scapus (15—) 25—65 cm altus. Perigonium violaceo-coeruleum vel raro album. Umbella saepe bulbillifera ..... 23. *A. caesium* Schrenk
b. Scapus 3—10 cm altus. Perigonium roseum usque purpureum. Umbella nunquam bulbillifera..... 25. *A. oreophiloides* Regel

12a. (6) Spathae basis basin pedicellorum in modo cupulae includens. Umbella anguste fasciculata, pauciflora 13
b. Plantae combinatione characterum diversa 14
13a. Bulbi tunicae exteriores regulariter reticulato-fibrosae..... ..... 21. *A. callidictyon* C. A. MEY. ex KUNTH
b. Bulbi tunicae exteriores papyraceae, ± integrae .... 22. *A. kirindicum* BORNM.
14a. (12) Tepala 10—13 mm longa. Antherae mucronatae..... ..... 36. *A. Rechingeri* WENDELBO
b. Tepala 4—8 mm longa. Antherae non mucronatae 15
15a. Bulbi tunicae exteriores regulariter reticulato-fibrosae..... 16
b. Bulbi tunicae ± integrae 17
16a. Perigonium roseum usque purpureum. Umbella laxa .... 33. *A. sindjarense* BOISS. & HAUSSKN. ex REGEL
b. Perigonium albido-lavandulaceum in sicco lilacinum. Umbella densa, fasciculata ..... 32. *A. registanicum* WENDELBO
17a. (15) Tepala c. 4 mm longa, probabiliter atropurpurea .... 29. *A. arlgirdense* BLAKELOCK
b. Tepala 5—8 mm longa, alba nervis coloratis 18
18a. Folia subopposita, scapo longiora. Perigonium 5—6 mm longum .... 34. *A. Bungei* BOISS.
b. Folia distantia, quam scapus breviora. Perigonium 6—8 mm longum..... ..... 37. *A. bracteolatum* WENDELBO
19a. (1) Foliorum vaginae inferiores quidem pubescentes 20
b. Foliorum vaginae glabrae interdum minute papilloso-scabridae. (Species normaliter pubescentes exceptione glabrescentes inclusae) 23
20a. Perigonium albidum nervis brunnescentibus usque purpurascentibus..... ..... 50. *A. Gillii* WENDELBO
b. Perigonium lilacinum usque pallide roseum vel purpurascens..... 21
21a. Tepala 3—4 mm longa ..... 51. *A. miserabile* WENDELBO
b. Tepala 5—8 mm longa 22
22a. Scapus 25—65 cm altus. Perigonium lilacino-roseum. (Status papilloso-pubescens huius speciei normaliter subglabrae vel glabrae) .... 44. *A. umbilicatum* BOISS.
b. Scapus quam 25 cm manifeste brevior. Perigonium atropurpureum .... 25. *A. oreophiloides* REGEL subsp. *salangense* WENDELBO
23a. (19) Filamenta exserta, quam tepala longiora 24
b. Filamenta inclusa, quam tepala breviora vel raro eis subaequilonga..... 26
24a. Bulbi tunicae distincte regulariter reticulato-fibrosae..... ..... 54. *A. ionandrum* WENDELBO
b. Bulbi tunicae ± integrae 25
25a. Bulbus solitarius. Filamenta interiora plerumque utrinque bicuspidata.... ..... 53. *A. micranthum* WENDELBO
b. Bulbi plures, aggregati. Filamenta interiora subintegra vel denticulo laterali obtuso provisa ..... 52. *A. circumflexum* WENDELBO
26a. (23) Bulbi tunicae exteriores distincte regulariter reticulato-fibrosae. Folia circinnata ..... 57. *A. Stocksianum* BOISS.
b. Bulbi tunicae exteriores ± integrae, interdum basi et apice incisae vel fibrosae sed nunquam omnino reticulato-fibrosae 27

27a. Bulbi numerosi, aggregati. Folia quidem juvenilia spiraliter contorta..... ..... 55. *A. spirophyllum* Wendelbo
b. Bulbi solitarii. Folia non spiraliter contorta..... 28
28a. Tepala lanceolata, acuminata, (6—) 7—10 mm longa. Scapus 3—5 (—12) cm longus ..... 56. *A. kopetdagense* Vved.
b. Plantae combinatione characterum diversa 29
29a. Tepala interiora quam exteriora latiora 30
b. Tepala interiora quam exteriora angustiora vel subaequilata..... 34
30a. Apex tepalorum interiorum latus, ± retusus..... 41. *A. chloroneurum* Boiss.
b. Apex tepalorum interiorum rotundatus vel acutus 31
31a. Folia scapo breviora. Scapus longiusculus 32
b. Folia scapum excedentia. Scapus breviusculus 33
32a. Tepala subacuta. Folia 2 (—3) ..... 46. *A. pamiricum* Wendelbo
b. Tepala obtusa. Folia 4—6 ..... 38. *A. fibrosum* Regel
33a. (31) Tepala 5—6 mm longa ..... 39. *A. Lamondiae* Wendelbo
b. Tepala c. 8 mm longa..... 40. *A. sabzakense* Wendelbo
34a. (29) Tepala interiora quam exteriora manifeste breviora .... 48. *A. Griffithianum* Boiss.
b. Tepala interiora quam exteriora aequilonga vel subaequilonga..... 35
35a. Pedicelli perigonio plerumque breviores, raro aliquantum longiores. Tepala margine ± minute papilloso ..... 49. *A. panjaoënse* Wendelbo
b. Pedicelli perigonio manifeste longiores. Tepala margine non papillosa..... 36
36a. Tepala subcoriacea, exteriora lilacina margine pallida fere alba, nervo atroviolaceo, interiora fere alba nervo virescenti-violaceo. Antherae 2 mm fere longae ..... 47. *A. choriotepalum* Wendelbo
b. Tepala non coriacea, exteriora et interiora concoloria pallide rosea usque rosea nervo purpurascente. Antherae c. 1 mm longae 37
37a. Bulbus bulbillis paucis usque numerosis praeditus. Umbella saepe bulbillifera. Tepala 6—9 mm longa ..... 44. *A. umbilicatum* Boiss.
b. Bulbus bulbillis nullis vel paucis. Plantae umbellis non bulbilliferis. Tepala 3—6 mm longa 38
38a. Antherae atro-violaceae ..... 45. *A. Jacquemontii* Kunth
b. Antherae flavae 39
39a. Tepala elliptica vel elliptico-oblonga, obtusa, purpurascenti-rubra. Filamenta 3/4—2/3 longitudinis tepalorum attingentia..... ..... 42. *A. synthamanthum* C. Koch
b. Tepala oblongo-lanceolata, acuta vel subacuta, pallide rosea. Filamenta 1/2—1/3 longitudinis tepalorum attingentia ..... 43. *A. rubellum* M. B.

21. ***A. callidictyon*** C. A. Mey. ex Kunth, Enum. Pl. 4: 413 (1843).
Syn.: *A. lacerum* Freyn, Österr. Bot. Zeitschr. 42: 373 (1892).
Icon.: Tab. 3, fig. 21; tab. 14, fig. 1.
Typus (isotypus): Szovits 484, LE! S!

Bulbus 1—2 cm diametro, oblongo-ovoideus; tunicae exteriores rubescenti-brunneae, reticulato-fibrosae. Scapi singuli vel bini, 10—28 cm alti, ± curvati, ad 1/3 usque fere 1/2 foliorum vaginis ± pubescentibus superioribus interdum glabris obsiti. Folia 3—4, quam scapus breviora, 0,5—0,75 mm lata, filiformia, canaliculata, scabra vel laevia, facie pubescentia vel glabra. Spatha dimidium circiter umbellae longitudinis aequans; rostrum basin spathae ± aequans; basis

spathae pedicellos cupulae modo cingens. Umbella anguste fasciculata, 4—9-flora, laxa; pedicelli valde inaequales, longissimi usque ad 35 mm longi, bracteolati. Perigonium anguste campanulatum, albidum purpurascenti-viridi-nervosum; tepala 6—7 mm longa, subaequalia, exteriora ovata vel elliptica, acuta vel subacuta, interiora ± anguste oblongo-elliptica, obtusa, integra vel in parte superiore margine ± lacerata. Filamenta ± 2/3 tepalorum longitudinis attingentia, per 1/4—1/3 connata et perigonio adnata, interiora triangularia, exteriora anguste triangularia; antherae flavae. Ovarium elongatum, apice lobatum, laeve. Stylus non exsertus. Capsula c. 4 mm longa.

Iraq: Kurd.: Mosul: Jabal Khantur prope Sharanish, 1480 m, RECH. 10868-b!
Persia: W: Azerb.: Prope Khvoy, Szov. Seyyed Hajjin, Szov. 484! Inter Shahpur et Rezaiyeh, JARDINE 654! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, RIOUX & GOLV. 37! E Hamadan, 1830 m, ARCHIBALD 2606!

Distr. gen.: Anatolia, Iraq boreo-orientalis, Persia occidentalis, Caucasia.

There are in the present material transitions from what should be typical *A. callidictyon* to *A. lacerum*. The geographical areas of the two species also more or less coincide. I have therefore come to the conclusion that *A. lacerum* is just a lacerate-tepaled form without taxonomical significance.

22. ***A. kirindicum*** BORNM., Beih. Bot. Centrbl. 33, 2: 209 (1915).
Icon.: Tab. 3, fig. 22.
Typus: STRAUSS, B! W! WU!

Bulbus 0,5—0,8 cm diametro; tunicae exteriores papyraceae, atrocinereae, in collum productae. Scapus 6—12 cm longus, ad 1/3 circiter foliorum vaginis laevibus tectus. Folia bina, 0,5—1 mm lata, plana, laevia. Spatha bivalvis; valvae 3—4 mm longae, basin pedicellorum includentes. Umbella fasciculata, 4—8-flora; pedicelli inaequilongi, usque ad 16 mm longi, bracteolati. Perigonium tubuloso-campanulatum, in sicco album, ± purpureo-suffusum et manifeste purpureo-nervosum; tepala c. 6 mm longa, anguste elliptico-oblonga, acuta, apice cucullata, exteriora quam interiora paulo latiora. Filamenta c. 3,5 mm longa, e basi triangulari subulata, interiora quam exteriora paulo latiora, per vix 1 mm connata et tepalis adnata; antherae 0,75 mm longae, ± indistincte mucronatae. Ovarium depresso-globosum, laeve. Stylus 1,5 mm longus. Capsula c. 2,5 mm longa, 3 mm lata.

Persia: W: Ham.: Kuh-e Garri: Nahavand, STR.!

Distr. gen.: Endem.

As *A. kirindicum* is known in Persia only from the western part and only from the type collection, I hesitate to accept the report of this species from Turcmenia, Fl. URSS. 4: 209 (1935).

23. ***A. caesium*** SCHRENK, Bull. Phys.-Math. Acad. Petersb. 2: 113 (1884).
Icon.: Tab. 3, fig. 23. — REGEL, Reise in Turkestan 3, 1: tab. 6, fig. 5—7 (1876).
Typus: Dschungaria, Karachanda, SCHRENK, LE.

Bulbus 1—1,5 cm diam., ovoideus; tunicae exteriores subcoriaceae, integrae, cinerascentes. Scapus (15—) 25—65 cm altus, per 1/4—2/5 longitudinis foliorum vaginis distantibus plerumque papilloso-scabridis tectus. Folia 2—4, 1—3 mm lata, semicylindrica, canaliculata, fistulosa, in statu sicco longitudinaliter costata plerumque papilloso-scabrida. Spatha c. 15 mm longa, apiculata, bivalvis, persistens. Umbella hemisphaerica vel sphaerica saepe bulbillifera, rarius e bulbillis tantum

composita, bulbillis usque ad 8 mm longis, viridi-purpureis; pedicelli 12—20 mm longi, basi late bracteolati. Perigonium campanulatum, violaceo-coeruleum atrius nervosum vel nervis brunnescenti-viridibus; tepala c. 5 mm longa, ovata, subobtusa, interiora quam exteriora subbreviora et subangustiora. Filamenta quam tepala aliquantum breviora, connata et tepalis per vix 1 mm adnata; filamenta exteriora basi triangularia; interiora paulo supra medium obtuse bidentata, basi elliptica, quam in exterioribus multo latiore. Stylus stamina non excedens; stigma capitatum. Capsula 2/3 perigonii persistentis attingens.

Afghanistan: E: Gardez, 2400 m, Koelz 11976! — NE: Kataghan: In declivibus borealibus jugi Salang, in juniperetis aridis, 2400 m, Wdb. & Ekb. W-9861!

Distr. gen.: Afghanistan orientalis, Sibiria occidentalis, Asia centralis, Dsungaro-Kashgar.

The material of Wdb. & Ekb. W-9861 has a dense head of bulbils only; Koelz 11976 has bulbils and in addition flowers that are white. The flowers of *A. caesium* are usually bluish, but may sometimes be white, Vvedensky, Fl. URSS. 4: 222 (1935).

24. ***A. caesioides*** Wendelbo, Bot. Not. 122: 29 (1969).
Icon.: Tab. 3, fig. 24. — Wendelbo, l. c.: 30, fig. 1 A.
Typus: Giles 210, K!

Bulbus 1—1,5 cm diametro, ovoideus; tunicae exteriores papyraceae, cinereae, nervis parallelis distantibus. Scapus unicus rarius bini, 11—22 (—35) cm longi, per 1/3—1/2 longitudinis foliorum vaginis distantibus scabrido-papillosis vel sublaevibus, paulo infra foliorum laminam inflatis obtecti. Folia 2 (—3), 0,75—1,8 mm lata, semicylindrica, fistulosa, secus nervos scabrida. Spatha acuminato-rostrata, basi c. 8 mm longa, rostro c. 6 mm longo, ± persistens. Umbella hemisphaerica usque subsphaerica, densa; pedicelli subaequales, usque ad 1,5 cm longi, bracteolis usque ad 6 mm longis instructi. Perigonium campanulatum, purpurascenti-violaceum, in vivo coerulescens nervis saturatioribus conspicuis; tepala 5—6,5 mm longa, subacuta, exteriora anguste elliptico-oblonga, interiora anguste ovata, quam exteriora aliquantum latiora. Filamenta c. 2/3 tepalorum longitudinis aequantia, per 1/6 longitudinis filamentorum connata et tepalis adnata; exteriora anguste triangularia; interiora basi late triangulari, ad c. 2/3 partis liberae utrinque denticulo ± distincto provisa; antherae 1 mm longae, mucronatae.

Afghanistan: NE: Badakhshan: locus illegibilis, 2700 m, Giles 210!

Distr. gen.: Hindukush boreo-orientalis, montes Himalaya boreo-occidentales.

25. ***A. oreophiloides*** Regel, Acta Horti Petrop. 3, 2: 114 (1875).

Bulbus tunicis exterioribus papyraceis cinereis obsitus. Scapus 3—10 cm altus, laevis vel scabridus, ad 1/4—1/2 foliorum vaginis aut laevibus aut ± scabridis aut pubescentibus obsitus. Folia 2, filiformia, scapum superantia, c. 0,75 mm lata, cylindrica, indistincte canaliculata, fistulosa, ± scabrida vel sublaevia. Spatha acuminata, c. 6 mm longa. Umbella subhemisphaerica, ± pauciflora, saepe potius densa; pedicelli subaequales, usque ad 13 mm longi, bracteolati vel ebracteolati. Perigonium late campanulatum, roseum usque purpurascens vel atropurpureum, nervis saturatioribus; tepala (4—) 5—7 mm longa, subacuta vel obtusa, interiora anguste elliptico-ovata, exteriora anguste elliptico-oblonga. Filamenta 1/2—2/3 tepalorum longitudinis attingentia, per 1/4 longitudinis filamentorum connata et tepalis adnata, exteriora triangulari-subulata, interiora ovata, infra apicem utrinque denticulo

provisa; antherae 0,6 mm longae, ± manifeste mucronatae. Capsula vix dimidium perigonii attingens.

Distr. gen. speciei: Afghanistan boreo-orientalis, montes Asiae centralis.

— — subsp. ***oreophiloides***
Icon.: Tab. 3, fig. 25; tab. 14, fig. 2. — REGEL, Reise in Turkestan 3, 1: tab. 11, fig. 4—6 (1876).
Typus: „Habitat Turkestaniae in provincia Kokania et in valle Sarawschansk", O. FEDTSCHENKO, LE.

Vaginae foliorum laeves vel scabridae. Pedicelli basi bracteolati.

Afghanistan: NE: Badakhshan: Ad lacum Shiva, LINDB. 713! Golestan, LINDB. 747!

Distr. gen. subspeciei: Afghanistan boreo-orientalis (Badakhshan), Pamir-Alaj, Tien Shan.

— — subsp. ***salangense*** WENDELBO, subsp. nov.
Typus subspeciei: RECHINGER 37501, W!

Vaginae foliorum pubescentes. Pedicelli basi ebracteolati.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, 3200—3300 m, 3. VIII. 1967, RECH. 37095!; 3300 m, RECH. 37501, FURSE 8699!

Distr. gen. subspeciei: Endem.

26. ***A. schoenoprasoides*** REGEL, Acta Horti Petrop. 5: 630 (1878).
Icon.: Tab. 3, fig. 26.
Typus: Prope Wernoje, FETISOW, LE!

Bulbus tunicis exterioribus nigrescentibus papyraceis enerviis obsitus. Scapus (10—) 15—40 cm altus, usque ad 1/3 vel ultra dimidium foliorum vaginis laevibus vel interdum parce papillosis tectus; vagina superior in parte superiore inflata. Folia (1—) 2, scapo plerumque breviora, anguste linearia, (0,5) 1—4 mm lata, compressa, plana, non fistulosa, laevia vel in nervis papillosa, laete viridia. Spatha umbellam subaequans, breviter acuminata, mox caduca. Umbella hemisphaerica usque sphaerica, ± multiflora, densa, interdum fere capitata; pedicelli 3—10 mm longi, basi bracteolati. Perigonium anguste campanulatum, purpureum, nitens; tepala 5—7 mm longa, anguste elliptico-ovata, exteriora quam interiora paulo latiora. Filamenta 1/2—2/3 tepalorum longitudinis attingentia, per 1/3 longitudinis filamentorum connata et tepalis adnata, interiora quam exteriora duplo latiora et per c. 2/3 longitudinis dilatata, plerumque utrinque denticulo provisa; antherae c. 0,7 mm longae, flavae. Capsula 4 mm longa.

Afghanistan: NE: Wakhan: In valle Khandud, 3500 m, ROEMER 259!; 3900—4000 m, RENZ!

Distr. gen.: Afghanistan boreo-orientalis, in montibus Asiae centralis.

27. ***A. capitellatum*** BOISS., Diagn. Pl. Or. Nov. Ser. 1, 7: 118 (1846).
Icon.: Tab. 3, fig. 27.
Typus: AUCHER-ELOY 5386, G!

Bulbus 1—2 cm diametro, tunicis exterioribus papyraceis, atrocinereis. Scapus 10—30 cm altus, costatus, usque ad dimidium circiter foliorum vaginis scabridis vel laevibus tectus. Folia (1—) 2—3, 0,5—1,5 mm lata, semitereti-filiformia, canaliculata. Spatha 0,5—1 cm longa, bivalvis, persistens. Umbella sphaerica, multiflora, densa; pedicelli usque ad 8 (—12) mm longi, bracteolati. Perigonium campanulatum,

viridi-album (in sicco erubescens) vel ± roseum nervis ± sordide violaceis; tepala c. 3,5 mm longa, elliptico-ovata vel elliptico-oblonga, obtusa. Filamenta c. 5,5 mm longa, violacea, basi connata et tepalis adnata, e basi anguste triangulari subulata, interiora basi interdum utrinque denticulo obtuso provisa; antherae 1—1,5 mm longae, flavae, demum purpurascenti-brunneae. Stylus c. 4 mm longus, filiformis. Capsula valvis c. 3,5 mm longis obcordatis.

Persia: N: Maz.: M. Alamut, Auch. 5386! Kuh-i Nizwa, in summo occidentale, 3200 m, Wdb. 1281! Distr. Kojur: M. Uloj, 3200—3400 m, Rech. 6480! In valle fluvii Chalus: Pol-e Zanguleh, Rech. 6363-a!, Manuch. 7031-E! — W: Lur.: Kuh Nur, Haussk.! Bakht.: Kuh-e Kukular et Sabzekuh, Haussk.! Zard Kuh supra vallem Kuhrang, 4140 m, Archibald 2987! Tang-i Sirdan inter vallis Kuhrang et Bazoft, 4110 m, Archibald 3034! — C: Tehr.: W Emamzadeh Hashem, 2900 m, Wdb. 1410! M. Damavand supra Reneh, 2950 m, Gilli s. n.! Inter pagum Damavand et lacum Tar, 2800 m, Gilli s. n.! Prope jugum Kandavan, 2900 m, Gilli s. n.!

Distr. gen.: Endem.

It is not quite clear whether the specimens from the Bakhtiari country are identical with those from the Elburz mountains. There seem to be certain differences in the colour of the perigone. Field notes for Wdb. 1281 and 1410 indicate a greenish white colour, whereas Archibald for his 2987 and 3034 stated the colour to be pink to carmine-pink.

28. ***A. anacoleum*** Hand.-Mzt., Ann. Nat. Hofmus. Wien 28: 17 (1914).
Icon.: Tab. 3, fig. 28. — Hand.-Mzt., l. c.: fig. 2.
Typus (lectotypus): „Türkei, Hasarbaba Dagh am Göldschik bei Kharput", Handel-Mazzetti 2609, WU!

Bulbus c. 2 cm longus, ovoideus; tunicae exteriores nigrescentes, fractae. Scapus 8—35 cm longus, tenuis, costatus, prope basin geniculatus, usque ad 5/6 foliorum vaginis costatis tectus. Folia 3—4, quam scapus multo breviora, superiora brevissima, c. 0,5 mm lata, filiformia, fistulosa, glabra, basi inflata. Spatha 5—8 mm longa, bivalvis, persistens. Umbella usque ad 25 mm diametro, hemisphaerica, multiflora; pedicelli usque ad 9 mm longi, aequales, bracteolati. Perigonium campanulatum, purpureum, basi flavum; tepala c. 3,5 mm longa, exteriora anguste elliptico-oblonga, interiora elliptico-oblonga, obtusa, in vivo probabiliter apice cucullata. Filamenta manifeste exserta, exteriora filiformia, interiora latiora et interdum utrinque infra medium denticulo obtuso provisa, basi connata et tepalis adnata; antherae flavae. Stylus c. 2,5 mm longus, filiformis. Capsula c. 6 mm diametro.

Iraq: Kurd.: Mosul: Ser Amadiyah, Haines W-2058! Arbil: In valle supra Ari, 2000 m, Gillett 9715!

Distr. gen.: Anatolia orientalis, Iraq borealis.

29. ***A. arlgirdense*** Blakelock, Kew Bull.: 209 (1953).
Icon.: Tab. 3, fig. 29.
Typus: Guest & Ludlow-Hewitt 2829, K!

Bulbus usque ad 1,5 cm diametro, late ovoideus; tunicae exteriores coriaceae, nigrescentes, diffractae. Scapus 3—18 cm longus, ± sulcatus, ad 3/4 vel ultra foliorum vaginis laevibus, papillosis vel puberulis tectus. Folia 2—3, 0,5—2,5 mm lata, semicylindrica, fistulosa, glabra vel ad nervos papillosa. Spatha 6—8 mm longa, bivalvis, persistens. Umbella usque ad 3 cm diametro, hemisphaerica; pedicelli usque ad 10 mm longi, aequilongi, bracteolati. Perigonium late campanulatum, probabiliter atropurpureum; tepala c. 4 mm longa, elliptico-oblonga, obtusa vel subacuta.

Filamenta aliquantum supra basin connata et tepalis adnata; interiora c. 3 mm longa, e basi ovato-triangulari filiformia, integra vel supra medium utrinque denticulo obtuso provisa; exteriora 2,5 mm longa, lineari-triangularia; antherae c. 3/4 mm longae, flavae vel purpureae. Stylus 1—2 mm longus; stigma capitatum. Capsula c. 4 mm lata, valvis obcordatis.

Iraq: Kurd.: Arbil: Algurd Dagh in declivibus occidentalibus summi montis, 3000—3800 m, RECH. 11872! Algurd Dagh, GILLETT 9604!; 3050 m, GUEST & LUDLOW-HEWITT 2829! M. Qandil, 2600—3300 m, RECH. 11801!, RAWI 18276!, 24085!, 24392!, 24430!, 24582!, 26764!, Inter Bardanas et M. Qandil, 2500 m, RAWI 24632!

Distr. gen.: Endem.

30. ***A. longivaginatum*** WENDELBO, Acta Horti Gotob. 28: 26 (1966).
Icon.: Tab. 3, fig. 30; tab. 14, fig. 3. — WENDELBO, l. c.: fig. 6a—c.
Typus: KOELZ 18533, W!

Bulbus 1—1,5 cm diametro, ovoideus, tunicis exterioribus griseo-brunneis, papyraceis, in collum usque ad 16 cm longum basin scapi involucrans elongatis. Scapus 16—46 cm altus, usque ad apicem fere vaginis foliorum remote costatis involucratus, costis hic illic minute papilloso-scabridis. Folia 3, e quibus 2 in dimidio inferiore caulis approximata, tertium infra umbellam situm eamque multo excedens, usque ad 3 mm latum, probabiliter cylindricum, fistulosum, supra canaliculatum. Spatha circiter 0,5 cm longa, crassiuscula, valvis 3, ovatis. Umbella hemisphaerica, c. 20—30-flora; pedicelli aequales, c. 1 cm longi, saepe curvati, bracteolis brevibus, latis, hyalinis. Perigonium cylindrico-campanulatum, roseo-purpureum, atrius nervosum; tepala 5—6 mm longa, anguste elliptico-oblonga, obtusa apice cucullata. Filamenta c. 4 mm longa, per 0,5 mm connata et tepalis adnata, exteriora lineari-triangularia, interiora e basi c. 1 mm lata quadrata abrupte attenuata, ibique plerumque utrinque denticulo obtuso provisa, cuspis basin dilatatam aequans vel excedens. Ovarium late ellipsoideum, apice aliquantum attenuatum, costis 6 brevibus verruculosis provisum.

Persia: W: Esf.: Bakhsun-Kuh inter Damaneh et Khunsar, 2895 m, ARCHIBALD 3073! Lur.: Dow Rud, 1800 m, KOELZ 18533! Bakht.: Zard Kuh supra Kuh Rang, 4140 m, ARCHIBALD 2989! Tang-i Sirdan inter valles Kuh Rang et Bazoft, 4110 m, ARCHIBALD 3039!

Distr. gen.: Endem.

31. ***A. lalesaricum*** FREYN & BORNM., Mém. Herb. Boissier 13: 31 (1900).
Icon.: Tab. 3, fig. 31.
Typus: BORNMÜLLER 4769, B!

Bulbus 8—12 mm diametro; tunicae exteriores cinerascenti-brunneae, in fibras grosse reticulatas ± fissae, collo bene evoluto. Scapus 5—17 cm altus, curvatus, ad 1/3—1/2 foliorum vaginis laevibus tectus. Folia 1—2, c. 0,5 mm lata, canaliculata, ad margines et costas papilloso-scabrida vel laevia. Spatha 3—6 mm longa, bivalvis, apiculata. Umbella hemisphaerica usque sphaerica, densiuscula; pedicelli c. 5 mm longi, bracteolati. Perigonium campanulatum, album virescenti-purpurascens; tepala c. 3,5 mm longa, anguste elliptico-oblonga, ± cymbiformia, obtusa, apiculata. Filamenta c. 4,5 mm longa, purpurea, paulo supra basin connata et tepalis adnata, exteriora filiformia, interiora filiformia basi lata utrinque dente provisa. Ovarium verruculosum. Stylus 3 mm longus.

Persia: S: Kerm.: Kuh-e Laleh Zar, 3600—4000 m, Bornm. 4768!, 4769!, Gabriel s. n.! Kuh-i Hazaran, 4000 m, Gabriel s. n.!

Distr. gen.: Endem.

The fact that the inner filaments have a tooth on each side near the base was overlooked in the original description.

32. ***A. registanicum*** Wendelbo, Bot. Not. 122: 34 (1969).
Icon.: Tab. 3, fig. 32a, b. — Wendelbo, l. c.: 30, fig. 1 E—F.
Typus: Furse 5576, K!

Bulbus c. 1 cm diametro, ovoideus; tunicae exteriores atro-brunneae, in fibras grosse reticulatas ± distinctas dissolutae. Scapi 1 (—2), 15—45 cm alti, curvati, in parte subterranea foliorum vaginis laevibus tecti. Folia 2—3, subopposita vel subverticillata, scapum subaequantia, (0,3—) 0,7—2 mm lata, in parte inferiore semicylindrica, subcanaliculata, in parte superiore plana, non fistulosa. Spatha c. 10 mm longa, in valvas plures fissa, mox caduca. Umbella fasciculata, densa; pedicelli fructiferi inaequales, usque ad 20 mm longi, bracteolati. Perigonium campanulatum, albido-lavandulaceum (e collectore), in sicco lilacinum nervis purpureo-violaceis; tepala 4,5—5,5 mm longa, elliptica vel elliptico-oblonga, obtusa, inaequalia, exteriora breviora, quam interiora latiora et magis elliptica, interiora basi subsaccata. Filamenta quam tepala subbreviora vel ea aequantia vel subsuperantia, e basi anguste triangulari subulata, prope basin connata et tepalis adnata; interiora quam exteriora sublatiora et sublongiora; antherae 1,2 mm longae, violaceae. Stylus exsertus, filiformis; stigma capitatum. Capsula valvis 4 mm longis, 5 mm latis, late obcordatis, sepalis persistentibus inclusa.

Afghanistan: SE: Kandahar: In marginibus deserti Registan, 4—5 km SE Safer, 700 m, Rech. 34606!, Freitag 702! 60 km W Kandahar E Khusk-i Nakhud, 900 m, Freitag 490!, Hdg., Wdb. & Ekb. W-7647! Inter Girishk et Kandahar, 800 m, Furse 5576!

Distr. gen.: Endem.

A. registanicum has so far only been found within a very restricted area near Kandahar in SE Afghanistan. It is a small, inconspicuous plant growing in sand under desertlike conditions. It may well have been overlooked.

33. ***A. sindjarense*** Boiss. & Hausskn. ex Regel, Acta Horti Petrop. 3, 2: 121 (1875).
Icon.: Tab. 3, fig. 33.
Typus: „Habitat in uliginosis salsis montis Sindjar Mesopotamiae", Hausskneht, G, JE.

Bulbus 1—2 cm longus, ovoideo-ellipsoideus, tunicis fulvis grosse reticulato-fibrosis. Scapus 8—25 cm longus, in parte inferiore foliorum vaginis costatis, glabris vel papillosis usque pubescentibus tectus. Folia 3, quam scapus breviora, usque ad 3 mm lata, filiformia, semiteretia, glabra vel secus nervos papilloso-scabrida usque tenuiter ciliata. Spatha quam umbella brevior, bivalvis, valvis binis, ovato-lanceolatis, longe caudatis, reflexis, persistentibus. Umbella laxa; pedicelli quam flores 5—6-plo longiores, inaequales, basi bracteolati. Perigonium campanulatum, roseum usque purpureum, nervo mediano saturatiore; tepala 5—8 mm longa, exteriora quam interiora aliquantum breviora, elliptico-ovata, subobtusa usque ad acuminata, apice in vivo cucullata. Filamenta 3/4 tepalorum longitudinis attingentia,

e basi lata sensim attenuata alternatim angustiora, prope basin connata. Stylus c. 3 mm longus. Capsula 3—4 mm longa, subglobosa, in perigonio persistente inclusa.

Iraq: Kut-al Imara: 16—30 km SE Badrah, RECH. 13959!, 14001!

Distr. gen.: Anatolia, Syria, Iraq.

34. ***A. Bungei*** BOISS., Fl. Or. 5: 267 (1882).
Icon.: Tab. 3, fig. 34.
Typus: BUNGE 10, LE!

Bulbus usque ad 1,5 cm diametro, tunicis exterioribus papyraceis paralleliter nervosis, cinereis vel cinerascenti-brunneis, partim basi, partim collo elongato fissis. Scapi 10—21 cm alti, curvati. Folia 2, subopposita, scapo longiora, 0,75—2 mm lata, fistulosa. Spatha c. 15 mm longa, reflexa, subpersistens. Umbella sphaerica usque hemisphaerica, multiflora, fragilis; pedicelli usque ad 13 mm longi, bracteolati. Perigonium 5—6 mm longum, campanulatum, album, sordide purpureo-nervosum; tepala elliptica, apice rotundata, cucullata. Filamenta c. 2/3 tepalorum longitudinis aequantia, basi connata et tepalis adnata, e basi lata subulato-attenuata, exteriora quam interiora angustiora. Stylus non exsertus. Capsula subglobosa, perigonio persistente inclusa.

Persia: **W**: Esfahan, AUCH. 5388! — **S**: Kerm.: M. Jebal Barez inter Bam et Jiroft in declivibus borealibus infra Deh Bakri, 1800 m, RECH. 3689! Inter Kerman et Yazd, BUNGE 10! — **C**: Qazv.: In ditione Karaj, in montibus Halkedar ad Mardabad, 1300 m, RECH. 1057!

Distr. gen.: Endem.

35. ***A. sabulosum*** STEV. ex BUNGE in GOEBEL, Reise Stepp. Russl. 2: 311 (1838), n. v.
Icon.: Tab. 3, fig. 35. — REGEL, Reise in Turkestan 3, 1: tab. 9, fig. 1—3 (1876).
Typus: E regione caspia.

Bulbus 1,5—2 cm diametro, oblongo-ovoideus; tunicae exteriores coriaceae, pallide brunneae, nervis immersis, distantibus, parallelis, saepe secus nervos fissae; bulbilli pallide brunnei, irregulariter tuberculato-foveolati. Scapus 20—60 cm altus, leviter inflatus, per 1/4 vaginis approximatis laevibus obtectus. Folia 3—4, quam scapus breviora, 1—2 (—3) mm lata, semicylindrica, canaliculata, fistulosa, laevia vel raro scabrida. Spatha umbellam subaequans, acuminata, caduca. Umbella hemisphaerica vel saepius sphaerica, multiflora, ± densa; pedicelli subaequales, perigonio 3—5-plo longiores, copiose bracteolati. Perigonium semiglobosum, virescens vel albidum, in statu fructifero viridi-nervosum, ± transverse rugosum; tepala c. 3 mm longa, elliptica vel late elliptica, exteriora dorso verruculosa, cymbiformia, obtusa, interiora laevia emarginata. Filamenta perigonio aliquantum longiora, basi connata et tepalis adnata, integra, subaequalia, lineari-subulata. Stylus exsertus. Capsula 3—4 mm longa, valvis suborbicularibus vix emarginatis.

Persia: Prope Shurab inter Esfahan et Teheran, BUNGE 13.
Turcomania: Ashkhabad inter Annaju et Gyaurs, SINT. 523!

Distr. gen.: Persia, Turcomania, a mare Caspio septentriones et orientem versus.

36. ***A. Rechingeri*** WENDELBO, Acta Horti Gotob. 28: 28 (1966).
Icon.: Tab. 4, fig. 36; tab. 14, fig. 4. — WENDELBO, l. c.: fig. 4 f—i.
Typus: HEDGE & WENDELBO 4207, BG!

Bulbus solitarius, ovoideus, 2—2,5 cm longus; tunicae in collum breve basin

caulis involucrans prolongatae, exteriores integrae papyraceae brunneo-cinereae vel cinerascentes, apice basique fissae; bulbilli 9—12 mm longi, ovoidei, bi-alati basi carinati, viridi-violascentes, laeves, nitidi. Scapus 6—9 cm longus, ad 2 mm crassus, flexuosus, in tertia parte inferiore vaginis duabus, glabris, costulatis. Folia duo scapum superantia usque ad 15 cm longa, 1,5—2,5 mm crassa, cylindrica, basin versus supra canaliculata, fistulosa, marginibus minute papillosis. Spatha quam inflorescentia brevior, bivalvis, persistens. Umbella multiflora, hemisphaerica, 3,5—5,5 cm diam.; pedicelli inaequilongi, ad 16 mm longi, bracteolis hyalinis 3—4 mm longis. Perigonium campanulatum basi leviter saccatum, album ± purpureo-suffusum nervis distinctis brunneo-purpureis; tepala lanceolata, subobtusa apice cucullata paulo recurvata, exteriora 12—13 mm longa, interiora 10—11 mm longa. Filamenta inaequalia, exteriora c. 1/3 tepalorum exteriorum longitudinis aequantia, interiora c. 1/2 tepalorum interiorum longitudinis aequantia, anguste triangularia, per 1,5—2 mm connata et tepalis paulo brevius adnata; antherae 1,5 mm longae, apice mucronatae, flavae. Ovarium late ovoideum, minute verruculosum. Stylus c. 1,2 mm longus stigmate capitato sublobato coronatus.

Afghanistan: C: Bamian: 31 km W Bamian, 3000 m, Freitag 1309! In declivibus occidentalibus jugi Shibar, 3000 m, Hdg. & Wdb. 4207!, Rech. 16822!

Distr. gen.: Endem.

37. ***A. bracteolatum*** Wendelbo, Bot. Not. 121: 269 (1968).
Icon.: Tab. 4, fig. 37. — Wendelbo, l. c.: fig. 1 A.
Typus: Hedge & Wendelbo 4548, BG!

Bulbus solitarius, ovoideus, 0,75—1,3 cm diametro; tunicae exteriores cinerascenti-brunneae, papyraceae, ± distincte nervosae, interiores purpureo-violaceae usque albae. Scapus solitarius, 12—30 cm altus, basi ± curvatus, usque ad 1/3—2/5 vaginis foliorum glabris tectus. Folia 2, distantia, quam scapus breviora, 0,5—2 mm diametro, filiformia, cylindrica, fistulosa, florendi tempore ± emarcida. Spatha c. 5 mm longa, 2-valvis, hyalina, purpureo-nervosa. Umbella fasciculata usque hemisphaerica, pauci- usque multiflora densa; pedicelli inaequales, 5—10 mm longi, crassiusculi, basi bracteolis bene evolutis usque ad 4 mm longis provisi. Perigonium campanulatum, umbilicatum, album, nervis virescenti-purpurascentibus usque purpureis; tepala 6—8 mm longa, elliptica, apice cucullata, exteriora quam interiora paulo breviora. Filamenta c. 3/4 tepalorum longitudinis attingentia, inaequalia, per c. 1,5 mm connata et tepalis adnata; exteriora linearia, quam interiora triangularia subbreviora; antherae 1,2—1,4 mm longae, flavae. Stylus brevis crassus; stigma subcapitatum. Capsula c. 3,5 mm diametro, subsphaerica.

Afghanistan: E: Kabul: Prope pagum Unai, 3000 m, Hdg. & Wdb. 4548! Jaji: In declivibus orientalibus Shuturgardan Kotal, 2930 m, Ekb. W-9154! Musa Khan, 2500 m, Ekb. W-9234! Khost: In declivibus austro-orientalibus jugi Sata Kandao inter Gardez et Khost, 2800—2200 m, Rech. 32124! Ghazni: Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17899! — C: Bamian: E Bulola, 2550 m, Rech. 36969! Darreh Kalou, 2500 m, Hdg. & Wdb. 4677! Bamian, 2500 m, Hdg. & Wdb. 4654! In jugo Hajigak, 2400—3400 m, Furse 8510! In declivibus orientalibus jugi Shibar, 2900 m, Hdg. & Wdb. W-9535! Behzud: Ad pontem trans fluvium Helmand Khash Kul, 2560 m, Hdg. & Wdb. W-8669! 20 km SW Behzud versus Sorkhabad, 2700 m, Hdg. & Wdb. W-8828! Siah Sang, 2900 m, Wdb. & Ekb. W-9829! Doab: In valle Darreh-i Shikar, inter Doab et Bulola, 1600—2000 m, Rech. 16720!, Hdg. & Wdb. 4159!

Distr. gen.: Endem.

38. ***A. fibrosum*** REGEL, Acta Horti Petrop. 10: 322 (1887).
Syn.: *A. leucosphaerum* AITCH. & BAKER, Trans. Linn. Soc. Ser. 2, 3: 117 (1888).
Icon.: Tab. 4, fig. 38. — REGEL, l. c.: tab. 7, fig. 2.
Typus: „In Turcomania a Tschikisljar ad orientem in deserto," G. RADDE, LE.

Bulbi tunicae exteriores brunneae, subcoriaceae, ± fibroso-reticulatae; bulbilli saepe numerosi, majusculi, reticulato-nervosi, flavescentes. Scapi singuli vel saepius bini, (15—) 25—60 cm alti, basi foliorum vaginis laevibus approximatis obsiti. Folia 4—6, quam scapus breviora, 0,5—2 mm lata, canaliculata, fistulosa, laevia vel rarius scabrida. Spatha longe rostrata, rostrum longum, quam basis spathae plerumque longior, mox decidua. Umbella hemisphaerica usque sphaerica vel fasciculata, densa, multiflora; pedicelli subaequales, 8—25 mm longi, ebracteolati. Perigonium late campanulatum umbilicatum, album vel ± intense roseum, valide purpureo- vel viridi-nervosum; tepala 4—5 (—6) mm longa, aequilonga, elliptica vel oblongo-elliptica, interiora saepe in parte superiore latissima, obtusa, minute apiculata, quam exteriora manifeste latiora. Filamenta 1/2—3/4 tepalorum longitudinis attingentia, per 1/4—1/3 longitudinis filamentorum connata et perigonio adnata, interiora ± late ovato-triangularia prope basin quam tepala latiora, quam filamenta exteriora anguste triangularia duplo latiora et paulo longiora. Capsula perigonio aliquantum brevior.

Persia: E: Khor.: 16 km SE Mashhad, 1800 m, FURSE 7571! Badghiz: Inter Tayyebat et Kisil Islam Qaleh, 700 m, RECH. 33229!
Turcomania sec. VVED., Fl. URSS. 4: 210 (1935).
Afghanistan: NW: Maimana: Inter Maimana et Belchiragh, 900 m, HDG. & WDB. 3674!; 1000 m, HDG. & WDB. 3792! Inter Daulatabad et Shibarghan W lacum salsum, 450 m, HDG., WDB. & EKB. W-8429! Prope Daulatabad, 500 m, HDG. & WDB. 3591! Bala Morghab: Prope Sakhari in declivibus australibus Koh-i Bazartu, 750 m, JAKEŠ s. n.! Inter Qala Nau et Morghab, KOEIE 4285! Inter Khushmargh et Qala Nau, 1100 m, HDG., WDB. & EKB. W-8146-b! Inter Bala Morghab et Ghormach, 500—700 m, HDG., WDB. & EKB. W-8225! Herat: Inter Obeh et Khwajachisht, 1430 m, HDG., WDB. & EKB. W-7769! Infra Chashmeh Obeh, 1600 m, HDG., WDB. & EKB. W-7895!, 7896! — SW: Herat: 16 km S Shindand, 900 m, FURSE 5482! Herat, AMSEL! 48 km S Herat, 1220 m, FURSE 7674!

Distr. gen.: Persia boreo-orientalis, Turcomania, Afghanistan occidentalis.

While *A. fibrosum* is white-flowered in the Herat-area it is purplish-flowered over large areas in the North-West of Afghanistan. Purple and white-flowered local populations occur as a mosaic and it is thus not possible to separate the colour-forms as geographical races.

39. ***A. Lamondiae*** WENDELBO, Nytt Mag. Bot. 14: 102 (1968).
Icon.: Tab. 4, fig. 39. — WENDELBO, l. c.: fig. 1 g—h, fig. 3.
Typus: LAMOND 1055, E!

Bulbus 1—1,5 cm diametro, ovoideus, tunicis brunnescenti-griseis, reticulato-nervosis saepiuscule ± fibrosis; bulbilli pauci, c. 10 mm longi, cymbiformes, pallide lutei, nervatura distincta, reticulata. Scapus solitarius (raro scapi bini), 12—30 (—36) cm longus, usque ad 2 mm diametro, flexuosus, usque ad 1/5—2/5 vaginis glabris tectus. Folia 2—3, 0,5—0,75 (—2) mm lata, subopposita vel subverticillata, lamina cylindrica, fistulosa, valde distincte costata, supra tenuiter canaliculata. Spatha 6—8 mm longa, breviter acuminato-caudata, caduca. Umbella hemisphaerica usque ad 3 (—3,5) cm diametro, multiflora, densiuscula; pedicelli subaequales sursum curvati, c. 10 mm longi, ebracteolati. Perigonium campanulatum; tepala 5—6 mm

longa, exteriora quam interiora angustiora, elliptica, subacuta (in vivo apice cucullata), alba rubro-nervosa. Filamenta 3—4 mm longa, interiora quam exteriora distincte longiora, per c. 0,8 mm connata et tepalis adnata, exteriora anguste triangularia, interiora e basi ovato-dilatata subulata; antherae 1—1,4 mm longae, flavae. Ovarium late ellipsoideum indistincte verruculosum. Stylus 1,5—2,5 mm longus, filiformis; stigma subcapitatum. Capsula valvis 4 mm longis, 6 mm latis, late obcordatis.

Afghanistan: **SW:** Herat: In declivibus borealibus jugi Mir Ali, 1580 m, Hdg., Wdb. & Ekb. W-7752! S Adraskan, 1430 m, Hdg., Wdb. & Ekb. W-7708! Farah: 15 km N Dilaram, 1400 m, Hdg. & Ekb. W-7249! In collibus SE Gulestan, 1800 m, Hdg. & Ekb. W-7268! 30 km W Dilaram, 1050 m, Hdg., Wdb. & Ekb. W-7666! In jugo inter Farah Rud et Shindand, 1160 m, Hdg., Wdb. & Ekb. W-7683! — **SE:** Kandahar: 80 km E Dilaram, 1040 m, Hdg., Wdb. & Ekb. W-7658! Inter Farah Rud et Dilaram, 27 km SE Farah Rud, 900 m, Rech. 33443! 40 km NE Kandahar versus Kalat-i Ghilzai, 1100 m, Rech. 35348!, 33565! Shahmaqsud, 50 km NW Kandahar, 2000 m, Hdg. & Ekb. W-7114! In collibus W Kandahar S pontem trans fl. Arghandab, 1200—1300 m, Hdg. & Ekb. W-7199-a! Tirin: 20—25 km S Tirin, 1800 m, Rech. 35116!
Pakistan: Quetta: Inter Qila Abdullah et Sheila Bagh, 1600—1900 m, Lamond 1055!, Rech. 28999! — Bannu: Tutaki 50 km N Bannu, 700 m, Rech. 30098! — Kalat: Prope Jangal inter Panjgur et Surab, 1350 m, Rech. 28297! — Makran: 20—30 km a Panjgur versus Hoshab, Lamond 568!, Rech. 28129! Inter Hoshab et Panjgur a planitie Balgathar septentriones versus, 850 m, Lamond 553! 20—60 km S Panjgur, 800—850 m, Rech. 28097!, 30106!

Distr. gen.: Endem.

A. Lamondiae is very characteristic and easy to distinguish in its typical state, but there are forms in the Herat-area that might as well belong to *A. fibrosum*. It would perhaps be better to treat it as a southern subspecies of the latter.

40. ***A. sabzakense*** Wendelbo, sp. nov.
Icon.: Tab. 4, fig. 40.
Typus: Hedge, Wendelbo & Ekberg W-8032, holotypus GB!

Bulbus c. 1 cm diam., ovoideus; tunicae exteriores coriaceae, crasse reticulato-nervosae, integrae, plerumque in collum breve productae, atrocinereae. Scapi 1 vel 2, 12—13 cm alti, ± curvati, per c. 1/3 longitudinis foliorum vaginis distantibus, glabris tecti. Folia 2—3 vel — si scapi 2 — usque ad 5, plerumque scapum excedentia, 0,8—1,7 mm lata, cylindrica, fistulosa. Spatha 10—12 mm diam., globularis, rostro 10—18 mm longo provisa, circumscissilis. Umbella hemisphaerica, multiflora, densa; pedicelli c. 10 mm longi et probabiliter longiores, ± aequilongi, ebracteolati. Perigonium campanulatum, album, nervis purpurascentibus; tepala c. 8 mm longa, exteriora c. 3 mm lata, elliptica, subacuta; interiora c. 4 mm lata, late elliptica, apice breviter acuminata, subacuta (in vivo cucullata), basi breviter saccata. Filamenta tepalis adnata et per c. 2 mm connata, triangulari-subulata, exteriora c. 4 mm longa, interiora c. 5 mm longa et quam exteriora circiter duplo latiora; antherae 1,7 mm longae, flavae.

Afghanistan: **NW:** Herat: In declivibus lapidosis australibus jugi Sabzak, 2000 m, 15. V. 1969, Hdg., Wdb. & Ekb. W-8032!

Distr. gen.: Endem.

The new species is habitually rather like *A. bracteolatum* Wendelbo but lacks the very characteristic bracteoles of that species. It is probably most closely related to

A. fibrosum REGEL and especially *A. Lamondiae* WENDELBO, but differs from both of these by the larger flowers with somewhat differently shaped tepals and filaments, and from the latter in having the leaves more separated.

41. ***A. chloroneurum*** BOISS., Fl. Or. 5: 247 (1882).
Icon.: Tab. 4, fig. 41.
Typus: BUNGE 14, G!

Bulbus c. 15 mm diametro, ovoideus; tunicae exteriores verisimiliter papyraceae, cinereae, in collum productae. Scapus singulus (vel bini?), 14—44 cm longus, indistincte costatus, ad 1/6—1/3 foliorum vaginis laevibus tectus. Folia 2 (—3), scapo verisimiliter longiora, 0,7—1,5 mm lata, filiformia, in parte inferiore canaliculata, fistulosa, costata; costae papillosae, papillae quadrangulae vel a latere visae longitudine latiores. Spatha caduca. Umbella sphaerica, densa, multiflora; pedicelli 5—13 mm longi, subinaequilongi, ebracteolati. Perigonium campanulatum, album, viridi-nervosum; tepala c. 4 mm longa, exteriora elliptico-oblonga apice rotundata, interiora late elliptico-obovata apice lata ± retusa. Filamenta c. 3 mm longa, basi connata et tepalis adnata, exteriora anguste triangularia, interiora latiora. Capsula 3 mm longa, 4,5 mm diametro, valvis late obcordatis.

Persia: S: Kerman: Inter Kerman et Yazd, BUNGE 14! M. Jebal Barez inter Bam et Jiroft, Deh Bakri, 2100 m, RECH. 3794!

Distr. gen.: Endem.

BOISSIER, l.c., placed *A. chloroneurum* in the section *Rhizirideum* obviously with some doubt as he had not actually seen the rhizome. Also the collection of RECHINGER is in a poor state and without a bulb. As other characters indicate sect. *Scorodon*, I have not hesitated to place it in that section. I am somewhat uncertain as to which species *A. chloroneurum* may be related.

42. ***A. synthamanthum*** C. KOCH, Linnaea 22: 238 (1849).
Icon.: Tab. 4, fig. 42. — GROSSH., Fl. Kawk. ed. 2, 2: tab. 16, fig. 2 (1940).
Typus: „In der armenischen Provinz Eriwan c. 2800′."

Bulbus ovoideus, c. 1 cm diametro; tunicae exteriores brunneae, coriaceae, ± fissae, nervatione manifeste reticulata; bulbilli pauci, flavescentes. Scapus singulus, rarius bini, 15—40 cm altus, usque ad 1/4 longitudinis foliorum vaginis approximatis laevibus obtectus. Folia 3—4, scapum non excedentia, 1—2 mm lata, semicylindrica, supra canaliculata, fistulosa, margine laevia vel scabrida. Spatha quam umbella aliquantum brevior, rostro quam basi spathae breviore, mox caduca. Umbella hemisphaerica vel subsphaerica, densa, multiflora; pedicelli subaequales perigonii longitudinem attingentes vel saepius eo 2—3-plo longiores, ebracteolati. Perigonium late campanulatum basi umbilicatum, purpurascenti-rubrum nervis saturatioribus; tepala 3—5 mm longa, elliptica vel elliptico-ovata, attenuata, obtusa, exteriora quam interiora aliquantum latiora et breviora. Filamenta 3/4—2/3 longitudinis tepalorum attingentia, per 1/4 longitudinis filamentorum connata et tepalis adnata, integra; exteriora anguste triangularia, interiora triangularia, quam exteriora sesquilatiora, basin tepalorum latitudine aequantia; antherae 3/4 mm longae, flavae. Stylus inclusus. Capsula perigonio brevior.

Talish: Sec. GROSSH., Fl. Kawk. 2: tab. geogr. 152 (1940).
Persia: W: Azerb.: Senjanab, KNAPP s.n.! 16 km N Khvoy, 1500 m, FURSE 2282! N Shahabad, 1370 m, ARCHIBALD 2243! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, RIOUX & GOLV. 36! — Arak, STR.!

Distr. gen.: Talish, Persia boreo-occidentalis, Transcaucasia.

43. ***A. rubellum*** M. B., Fl. Taur.-Cauc. 1: 264 (1808).
Syn.: *A. albanum* Grossh., Fl. Kawk. 1: 211 (1928). *A. rubellum* M. B. var. *stellatum* C. Koch, Linnaea 22: 238 (1849).
Icon.: Tab. 4, fig. 43.
Typus: „Occurrit in Iberia", D. Steven.

Bulbus 0,75—1,5 cm diametro, ovoideus; tunicae exteriores saepe in collum ± longum productae, coriaceae, brunneae, fissae, nervis prominentibus fere reticulatis; bulbilli pauci, minutiusculi, flavescentes usque brunnescentes, tenuiter nervosi. Scapi singuli vel bini, 10—30 cm alti, basi foliorum vaginis approximatis, laevibus obtecti. Folia 4—5 (—6), quam scapus plerumque breviora, 1—2 (—3) mm lata, semicylindrica, canaliculata, fistulosa, laevia vel margine scabriuscula. Spatha quam umbella brevior; rostrum basin spathae aequans, cito caducum, interdum roseo-suffusum. Umbella late fasciculata usque subsphaerica, densa, multiflora; pedicelli subaequales, 10—20 mm longi. Perigonium campanulatum, umbilicatum, pallide roseum, purpureo-nervosum; tepala (4—) 5—6 (—7) mm longa, oblongo-lanceolata, acuta vel subacuta, exteriora quam interiora sublatiora et subbreviora. Filamenta 1/2—1/3 tepalorum longitudinis aequantia, per 1/4 longitudinis filamentorum connata et tepalis adnata, exteriora anguste triangularia, interiora ovato-triangularia, quam exteriora 2—3-plo latiora, quam tepalorum bases latiora; antherae c. 0,75 mm longae, flavae. Capsula (1/2—) 2/3 perigonii longitudinis aequans.

Talish, sec. Grossh., Fl. Kawk. 2: tab. geogr. 151 (1940).
Persia: N: Gorg.: In silvis Golestan, 65—115 km E Gonbad-e Kavus, 900 m, Furse 7270!, Iranshahr 7074-E! Inter Shah Pasand et Shahrud, Iranshahr 8006-E! N Gorgan, 10 m, Grant 17351! Shahkuh, Koelz 16303! Dasht-e Gorgan, Shar. 57! In declivibus borealibus M. Shahvar prope Hajilang, 2400—2600 m, Rech. 6086-b! Gonbad-e Kavus, Shar. 5068-E!, 5015-E! Maz.: Inter Gach Sar et Chalus, Schmid 5737! Inter Chalus et Karaj, 2190 m, Archibald 2435! Supra Chalus, 900 m, Archibald 2325-a! In declivibus borealibus jugi Kandavan, 2600 m, Wdb. 2152! 40 km S Babol, 500 m, Stutz 1250! In valle Talar, Ruttner s.n.! Supra Ileka, 2300 m, Furse 2793! In valle fluvii Haraz: S Amol, 540 m, Archibald 2260! 50 km S Amol, 600 m, Furse 7062! E Emarat, 700 m, Wdb. 235! Supra Panjab, 1300 m, Wdb. 666! Prope Mahmudabad, Wdb. 607! Kelerd, 580 m, Rech. 33067! Kuh-i Nizwa: Prope Orim, 2250 m, Wdb. 1014! Gilan: Ispili, Linds. 1159! Prope Rudbar, Buhse! In valle fluvii Sefid Rud prope Rudbar, Bornm. 8308! — W: Azerb.: Dasht-e Moghan, Mirzayan 7003-E! — E: Khor.: M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, Rech. 4916! Kuh Sangi prope Mashhad, 1000 m, Rech. 4883! Inter Mashhad et Torbat-e Heydariyeh prope Robat-i Safid, 1700 m, Rech. 1553-d! M. Kopet Dagh: inter Quchan et Lotfabad, in jugo Allah Akbar, 1800 m, Rech. 1697! — C: Gach Sar, 2100 m, Furse 2605! Tehr.: Prope Tehran, Ky. 49!, Parsa 30! Varamin, Manuch. 7030-E! Qazv.: Inter Karaj et Gach Sar, 1200—2500 m, Schmid 5715!, 5716! 16 km N Karaj, 1300 m, Stutz 1091! Porkan, 1500 m, Žumer 962! Kuh Dashteh, Rech. 266! Vessieh, Rech. 410!
Turcomania: Ashkhabad: Kurd-Ssu, Litw. 2094! Prope Ashkhabad, Sint. 375!, Beresin & Androssov s.n.! Nephton, Sint. 375b!

Distr. gen.: Talish, Persia borealis, Turcomania, Caucasus.

A. rubellum is a somewhat polymorphic species. According to Vvedensky (see Herbertia 11: 161; 1946) the true species grows in the western part of E. Transcaucasia. In the eastern part of that area it is not always distinguishable from *A. albanum*. He was also not quite sure about some N. Persian material. Grossheim, Fl. Kawk. ed. 2, 2: 126, 271 (1940) dropped his own species *A. albanum*, stating that it was only a large-flowered variety (var. *stellatum* C. Koch) of *A. rubellum*. There is no doubt that the material from N. Persia mainly belongs to this large-flowered form. In the Kopet Dagh area there

are certain transitions to *A. umbilicatum*, from which large-flowered forms of *A. rubellum* can only be distinguished by their smooth leaf-sheaths. Thus there seems to be a clinal variation in flower size from Transcaucasia to Kopet Dagh; see also comments under *A. umbilicatum*.

A collection from Fars in SW. Persia (Kakan, KASHKOUHLI 8046-E) is remarkable. The two specimens are very like *A. rubellum*, the flower colour is only somewhat darker. But there are no bulbs and thus the material cannot be named with certainty. The locality is far outside the general area of *A. rubellum*.

44. ***A. umbilicatum*** BOISS., Diagn. Pl. Or. Nov. Ser. 2, 4: 113 (1859).
Syn.: *A. scabrellum* BOISS. & BUHSE, Mem. Soc. Nat. Mosc. 12: 215 (1860). *A. Aitchisonii* REGEL, Acta Horti Petrop. 6, 2: 520 (1880).
Icon.: Tab. 4, fig. 44. — WENDELBO, Dan. Biol. Skr. 10, 3: 176, fig. 64 a (1958).
Typus: STOCKS 1006, G!

Bulbus 1—2 cm diametro; tunicae exteriores in collum productae, coriaceae, reticulato-nervosae, basi apiceque ± laceratae; bulbilli parvi, flavi vel brunnei, reticulato-nervosi. Scapi 25—65 cm alti, usque ad tertiam partem foliorum vaginis laevibus vel papillosis vel papilloso-pubescentibus tecti. Folia 3—4, 2—3 mm lata, semicylindrica, fistulosa, canaliculata, secus nervos papillosa, rarius laevia. Spatha quam umbella brevior, rostrata, saepe rosea, mox caduca. Umbella fasciculata usque hemisphaerica, pauci- usque multiflora, bulbillis evolutis vel deficientibus, rarius e bulbillis tantum composita; pedicelli plerumque 1—2 cm longi, ebracteolati. Perigonium (5—) 6—8 mm longum, anguste campanulatum, umbilicatum, lilacino-roseum nervis saturatioribus; tepala ± aequalia, exteriora elliptico-ovata usque lanceolata, interiora lanceolata, subacuta usque acuta. Filamenta 1/3—2/3 tepalorum longitudinis attingentia, usque ad 1/4—1/3 longitudinis filamentorum connata et tepalis adnata, exteriora anguste ovata, interiora ovata. Capsula dimidium perigonium aequans.

Persia: **N**: Gorgan: In jugo inter Shah Pasand et Shahrud, 2000—2700 m, FURSE 7176! — **S**: Kerm.: M. Jebal Barez inter Bam et Jiroft, infra Deh Bakri, 1800 m, RECH. 3683! Kerman, BORNM. 4776!; 1900 m, BORNM. 4774! Kuh-e Jupar, 2000 m, BORNM. 4775! 100 km S Yazd, LAMOND 69! Bal.: Saravan, SALAVATIAN 7029-E! — **E**: Khor.: Showkatabad prope Birjand, 1400 m, RECH. 4150-d! Kopet Dagh: 24 km N Quchan, 2000—2300 m, FURSE 7472! Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, RECH. 4654! 62 km E Loveh versus Dasht, 1200 m, RECH. 33159! — **C**: Yazd: Prope Yazd, BUHSE 1281, 1281-b! Kashan: Inter Kashan et Qom, 16 km SW Qom, 1070 m, FURSE 1598!
Turcomania: Ashkhabad: Prope Gyaurs, SINT. 310!
Afghanistan: **SW**: Herat: Inter Shindand et Farah, 1200 m, FURSE 5517! Shindand, 1160 m, HDG., WDB. & EKB. W-7705! — **SE**: Kandahar: Tshilsina, 1000 m, KERST. 2245a!, Sangar, 50 km NE Orozgan, LINDB. 944! — **E**: Kabul: S Istalif, 1850 m, HDG. & WDB. 3279! Kabul, 1800 m, NEUB. 4430!, 4759!, GILLI 176! In valle Paghman, 3000 m, HDG. & WDB. 5051! In valle Logar, 2100 m, BRECKLE A-369! Ghazni: Inter Qarabagh et Sang-i Masha, 2400 m, RECH. 17431! Sang-i Masha, 2500 m, RECH. 17491! Jaji: Inter Khane et Kasim Khel E jugum Shuturgardan, 2500 m, EKB. W-9233! Kotkai, 2400 m, HDG. & WDB. W-9017! Khost: In jugo Sata Kandao inter Gardez et Khost, 2800—2200 m, RECH. 32124! Gardez: Gardez, 2400 m, KOELZ 11974! — **NE**: Kataghan: In declivibus borealibus jugi Salang, 2200 m, RECH. 31657! — **C**: Ghorat: Mollah Allah, 12 km SW Qala-i Ghor, 2300 m, RECH. 18982-b!
Pakistan: Quetta: Prope Sanjawi, 1500 m, LAMOND 1314!, 1314-a!, RECH. 29586! Ad viam a Quetta versus Sariab, 1700 m, LAMOND 900!, RECH. 28856!

Distr. gen.: Persia, Afghanistan, Pakistan occidentalis.

A. umbilicatum is closely related to *A. rubellum* and as mentioned under that species they are not always easy to distinguish from each other. There is within *A. umbilicatum* some variation which may — to a certain degree — be correlated with geographical distribution. In Afghanistan and Baluchistan (of Persia and Pakistan) a form with bulbilliferous umbel is the most frequent one, whereas such plants seemingly are rare in other areas of Persia. VVEDENSKY, Fl. URSS. 4: 214 (1935) does not mention the bulbilliferous state at all under *A. scabrellum*, which I here have treated as a synonym of *A. umbilicatum*. On the other hand the tendency to have densely scabrid-papillose to nearly pubescent leaf-sheaths is much more pronounced in material from C. Persia and Kopet Dagh than in that from Afghanistan and Baluchistan.

45. ***A. Jacquemontii*** KUNTH, Enum. Pl. 4: 399 (1843).
Icon.: Tab. 4, fig. 45.
Typus (isotypus): India orientalis, Mirpur in montibus Rajaosi, JACQUEMONT, 138, K!

Bulbus 0,8—1,3 cm crassus, ovoideus; tunicae exteriores nigrescenti-brunneae, reticulato-nervosae et ± reticulato-fibrosae; interiores crassae, flavescentes, nitidae, reticulato-nervosae. Scapi 1 (—2), 13—48 cm alti, ± flexuosi, in parte supraterranea foliorum vaginis brevibus, laevibus obtecti. Folia 2—3, quam scapus breviora vel eo subaequilonga, 0,8—2 mm lata, cylindrica, fistulosa, nervis indistincte angulariter papillosis. Spatha c. 8 mm longa, rostro c. 3 mm longo, mox caduca. Umbella fasciculata vel subsphaerica, multiflora; pedicelli subaequales, usque ad 15 mm longi, ebracteolati. Perigonium anguste campanulatum, basi umbilicatum, roseum, nervis saturatius coloratis, raro album nervis viridibus; tepala 4,3—5 mm longa, subobtusa; exteriora elliptico-ovata, quam interiora elliptico-oblonga latiora. Filamenta c. 3/5 tepalorum longitudinis aequantia, anguste triangularia, per 1/4 longitudinis connata et tepalis adnata; interiora quam exteriora duplo latiora et paulo longiora; antherae vix 1 mm longae, atroviolaceae, polline pallide flavo. Stylus inclusus, subclavatus; stigma capitatum. Capsula c. 3 mm longa, valvis latiuscule obcordatis.

Afghanistan: SE: Kandahar: W Kandahar, 1000 m, KERST. 2256! Baba Wali, 1250 m, VOLK K-212! Inter Kandahar et Girishk, ad fl. Hilmand, 1000 m, KERST. 262! N Girishk, in faucibus prope Garmao, KERST. 409-f! — E: Kabul: E Gulbahar prope Charikar, VOLK 217! In faucibus fluvii Kabul E Sarobi, 900—1000 m, RECH. 34466! 2 km E Sarobi, 1100 m, HDG. & WDB. W-7594! SE Sarobi, 1430 m, GILLI 180! Inter Sarobi et Kabul, 2—5 km W Sarobi, 1000—1300 m, RECH. 34422!, 34447! Inter Sarobi et jugum Lataband, RECH. 34457! Mama Khel, 2100 m, KOELZ 11525! Jalalabad, VOLK 2003! In valle Logar SW Kabul, VOLK 2581!

Distr. gen.: Afghanistan orientalis, Pakistan, India?

Two collections from north of the Hindukush: In valle Khinjan, 1600 m, HDG., WDB. & EKB. W-8592; in jugo Paigah Kotal (Mirza Atbili), inter Pul-i Khumri et Samangan, 1450 m, HDG., WDB. & EKB. W-8553, contain plants that look rather like *A. Jacquemontii* but differ in having yellowish flowers in the dried state and yellow anthers. In none of the specimens the flowers are fully developed and the form of tepals and filaments can therefore not be studied. The two collections may represent a distinct taxon.

46. ***A. pamiricum*** WENDELBO, Bot. Not. 122: 32 (1969).
Syn.: *A. Jacquemontii* sensu VVED., Fl. URSS. 4: 215 (1935); Fl. Tadj. SSR. 2: 322 (1963), non KUNTH (1843).
Icon.: Tab. 4, fig. 46. — Fl. Tadj. SSR. 2: tab. 58, fig. 1 (1963). WENDELBO, l. c.: 30, fig. 1 C.

Typus: Schugnan, in valle fl. Gunt prope aestia fl. Schachdara, 2. VI. 1934, RAJKOVA, holotypus BG!, isotypus TAK.

Bulbus ovoideus, 0,5—1 cm diametro; tunicae exteriores cinereae, subpapyraceae, nervis subreticulatis fere parallelis; bulbilli pauci, albi, non alati, tenuiter nervosi. Scapus (10—) 15—35 cm altus, ad 1/4—1/3 foliorum vaginis laevibus distantibus obsitus. Folia 2 (—3), quam scapus breviora, (0,5—) 1—2 mm lata, semicylindrica, canaliculata, fistulosa, laevia, rarius scabrida. Spatha ± caduca. Umbella hemisphaerica, densa, ± multiflora; pedicelli subaequales, tepalis aequilongi vel eis 1,5 (—2)-plo longiores, ebracteolati. Perigonium campanulatum, roseum nervis saturatioribus; tepala 4,5—5 (—6) mm longa, subaequalia, subacuta, exteriora elliptico-ovata, paulo attenuata, interiora elliptica, quam exteriora paulo breviora et latiora. Filamenta 1/2—2/3 longitudinis tepalorum attingentia, per 1/2—1/3 longitudinis filamentorum connata et perigonio adnata, integra; exteriora anguste triangularia; interiora late triangularia, quam exteriora duplo latiora et aliquantum longiora, quam basis tepalorum paulo latiora; antherae c. 3/4 mm longae, flavae. Stylus inclusus, filiformis; stigma capitatum.

Afghanistan: NE: Wakhan: Quazi Deh, 2950 m, ROEMER 119-b!

Distr. gen.: Afghanistan boreo-orientalis, montes Pamir.

47. ***A. choriotepalum*** WENDELBO, Bot. Not. 122: 31 (1969).
Icon.: Tab. 4, fig. 47. — WENDELBO, l. c.: 30, fig. 1 B.
Typus: RECHINGER 35864, W!

Bulbus 1—1,5 cm diametro, ovoideus; tunicae exteriores coriaceae, purpurascenti-brunneae, grosse reticulato-nervosae; bulbilli usque ad 1,5 cm longi, tunicis nitentibus pallide flavis, reticulato-nervosis. Scapus 24—38 cm altus, ± curvatus, in sicco ± violaceus, per 1/5—1/4 longitudinis foliorum vaginis laevibus tectus. Folia 2, florendi tempore emarcida, c. 2 mm lata, semicylindrica, fistulosa, laevia. Spatha caduca, basis tantum persistens. Umbella hemisphaerica, densa; pedicelli subaequales, usque ad 10 mm longi, ebracteolati. Perigonium ovoideum; tepala c. 6,5 mm longa, elliptica, acuta, subcoriacea, exteriora quam interiora sublatiora, exteriora dorso atrolilacino-nervosa marginem versus expallescentia, margine fere albo, interiora fere alba, nervo ± viridi-violaceo. Filamenta inaequalia, per c. 1 mm connata, exteriora 3 mm longa, triangulari-ovata, tepalis per c. 1 mm adnata; interiora c. 4 mm longa, ovato-caudata, quam exteriora latiora, tepalis per 1,5 mm adnata; antherae vix 2 mm longae, flavescenti-albae. Stylus inclusus, brevis, crassus.

Afghanistan: E: Urgun, 2200—2300 m, ad versuras, RECH. 35864!

Distr. gen.: Endem.

48. ***A. Griffithianum*** BOISS., Diagn. Pl. Or. Nov. Ser. 2, 4: 117 (1859).
Syn.: *A. tschulpias* REGEL, Acta Horti Petrop. 3, 2: 107 (1875). *A. rubellum* M. B. var. *grandiflorum* BOISS., Fl. Or. 5: 253 (1882). *A. anisotepalum* sensu WENDELBO, Dan. Biol. Skr. 10, 3: 169 (1958), non VVED. (1934).
Icon.: Tab. 4, fig. 48; tab. 14, fig. 5. — REGEL, Reise in Turkestan 3, 1: tab. 10, fig. 10—12 (1876).
Typus: GRIFFITH 552, G!

Bulbi tunicae exteriores subcoriaceae, reticulato-nervosae demum aliquantum dissolutae; bulbilli pauci, majusculi, flavescentes, reticulato-nervosi. Scapi 10—30 (—50) cm alti, basi vel ad 1/3 foliorum vaginis laevibus vel rarius subscabridis obtecti. Folia 2—3, scapo plerumque breviora, 1—2 mm lata, semicylindrica, canali-

culata, fistulosa, margine plerumque scabrida. Spatha quam umbella plerumque subbrevior, breviter rostrata, saepe purpurascens, mox caduca. Umbella hemisphaerica, densa, multiflora; pedicelli ± inaequales, 5—16 mm longi, ebracteolati. Perigonium campanulatum, umbilicatum, pallide carneum usque fere album vel purpurascens, nervis saturatioribus; tepala valde variabilia, lanceolata usque obovata, subobtusa vel obtusa, exteriora (5—) 7—9 mm longa, quam interiora manifeste longiora et latiora. Filamenta 1/3 longitudinis tepalorum exteriorum attingentia, per 1/2—2/3 longitudinis filamentorum connata et tepalis adnata; interiora quam exteriora anguste triangularia duplo latiora. Capsula dimidium perigonii longitudinis aequans.

Afghanistan: **N**: Mazar-i Sharif: 21 km SE Tashkurghan versus Haibak, 600 m, Rech. 34057! Tashkurghan, 500 m, Rech. 34085! Chashmeh-i Shafal SW Mazar-i Sharif, 500 m, Rech. 34111!, 34120! 20—25 km SE Mazar-i Sharif, 500—700 m, Rech. 34166! 23—35 km E Mazar-i Sharif, 400 m, Rech. 34205! Takht-i Rostam, 1200 m, Rech. 33994! Inter Chashmeh-i Shafal et Akupruk, 800—1000 m, Rech. 16246! Kuh Baz, Lindb. 468! — **NW**: Maimana: Prope Taghab-i Shirin, 500 m, Hdg. & Wdb. 3592! Darreh Abdullah prope Belchiragh, 1200 m, Hdg. & Wdb. 3697! 30 km W Maimana, 500 m, Hdg. & Wdb. 3630! Bala Morghab: M. Kuh-i Bazart prope Sakhari, 750 m, Jakeš! Chahar Shamba, 860 m, Hdg., Wdb. & Ekb. W-8230! Qaisar, 1200 m, Hdg., Wdb. & Ekb. W-8234! Herat: In declivibus borealibus jugi Sabzzak, 1850 m, Hdg., Wdb. & Ekb. W-8094! — **SE**: Kandahar: Inter Girishk et Kandahar, 800 m, Furse 5576! In montibus W Kandahar S pontem Arghandab, 1200—1300 m, Hdg. & Ekb. W-7199-b! 5 km SW Kalat-i Ghilzai, 1600 m, Freitag 379! Prope Kalat-i Ghilzai, Lindb. 322! Tirin: In collibus inter lacum articifiale „Arghandab Reservoir" et Tirin, 1400—1700 m, Rech. 35020! — **E**: Kabul: Istalif, 1900 m, Rech. 33587!, 33598! Supra Istalif, 2100 m, Furse 5747! Prope Kabul, Gilli 183!, 185!, Neub. 4423!, 703!, 1950/672!, Volk K-213! Khord Kabul, 2450 m, Hdg., Wdb. & Ekb. W-7530! Jabal us-Siraj, 1650 m, Gilli 184! In valle Panjshir: 2 km supra Gulbahar, 1700 m, Hdg. & Wdb. 2979! 30 km E Gulbahar, Breckle A-291! Prope Gulbahar, 1700 m, Gilli 181! Kuh Jaouz, Lindb. 800! In valle Logar, 55 km S Kabul, 2150 m, Freitag 960! Prope Shewaki, 2500 m, Gilli 182!, 186! In valle Logar, Volk 142-a!, Volk 1831! Inter Ghazni et Kabul, 2700 m, Furse 5650! Giri, 2100 m, Koelz 11495! Khost, 1180—1400 m, Hager in Rech. 37771!, 37757!, Freitag 300! Ghorband: In valle Ghorband, 2300 m, Furse 5784! Kuh Khwaja Gar, Lindb. 502!, 509! Jaji: Musa Khan, 2500 m, Ekb. W-9235! — **NE**: Kataghan: 20 km N Doshi, 800 m, Furse 5987! Doshi, 850 m, Meinertzhagen 415! In valle fluvii Kunduz inter Pul-i Khumri et Doshi, 700—800 m, Rech. 16524! E Pul-i Khumri versus Doshi, 760 m, Hdg. & Wdb. 4055! 30 km N Doab versus Pul-i Khumri, 1400 m, Hdg. & Wdb. 3458! 25—10 km S Pul-i Khumri, 700 m, Rech. 33684!, 33805! In jugo Salang, Jörgensen 64! W Farkhar, 1550 m, Podlech 10554! In valle Khinjan, 2260 m, Hdg., Wdb. & Ekb. W-8572! Badakhshan: Distr. Faizabad, 1500 m, Furse 6245! In parte superiore vallis Zebak, 2130 m, Furse 6340! 6341! Kuh-i Ishkamish, 2000 m, Podlech 10715!; 1350 m, Podlech 10642! Inter Zom Kotal et Rustak, Ekb. W-9110! SW Robat prope Khambuk, 2900 m, Hdg. & Wdb. W-9418! — **C**: Bamian: Band-i Amir, 2900 m, Hdg. & Wdb. 4793!
Pakistan: Kurram: Parachinar, 1800 m, Afendi 56! — Swat: Mingora, 900 m, Ali 26047!

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

A. Griffithianum is the most common species of its genus in Afghanistan. There is much variation in the material both in length of scape, and in size, shape and colour of tepals. A small-flowered form which is frequent in the Pul-i Khumri area of Kataghan, may represent a geographical race, e. g. Furse 5987, Rech. 16524, 33684 and Hdg. & Wdb. 3458, 4055.

49. ***A. panjaoënse*** WENDELBO, Bot. Not. 122: 33 (1969).
Icon.: Tab. 4, fig. 49. — WENDELBO, l. c.: 30, fig. 1 D.
Typus: HEDGE & WENDELBO 4962, BG!

Bulbus 1—1,5 cm diametro, ovoideus; tunicae exteriores pallide cinerascenti-brunneae, potius tenues, diffractae, nervis conferte reticulatis. Scapus 6—22 cm longus, curvatus, per 1/3—1/2 longitudinis foliorum vaginis laevibus vel minute scabrido-papillosis obtectus. Folia 2, scapum circiter aequantia, 0,3—1,5 mm lata, semicylindrica, superne canaliculata, fistulosa, secus nervos ± minute scabrido-papillosa. Spatha 6—10 mm longa, acuminata, bivalvis. Umbella hemisphaerica vel hemisphaerico-fasciculata, densa; pedicelli perigonio breviores, raro aliquantum longiores, ebracteolati. Perigonium campanulatum; tepala alba brunnescenti-purpureo- usque purpureo-nervosa, imprimis exteriora fascia colorata secus nervum provisa et in parte apicali colorata, obtusa, apice aliquantum reflexa, margine ± minute papillosa; tepala exteriora quam interiora aliquantum breviora, rarius aequilonga, 6—7,5 mm longa, elliptico-obovata, interiora 6—8 mm longa, anguste elliptico-oblonga, basi saccata. Filamenta inaequalia, per 2 mm connata; exteriora lineari-subulata, quam interiora manifeste breviora, tepalis per c. 2 mm adnata; interiora 4—5 mm longa, basi late triangulari-ovata, per 3—4 mm tepalis adnata; antherae c. 1 mm longae, flavae. Capsula valvis late ellipticis, 4—5 mm longa, 2,5—3 mm lata, apice emarginata.

Afghanistan: **E**: Ghazni: Jaghuri: Kotal-e Kechru NW Sang-i Masha, 2800 m, RECH. 17523! Nawar Kotal inter Okak et Behzud, 3150 m, RECH. 17831! — **C**: Bamian: In declivibus borealibus jugi Shahtu, 2800—3000 m, RECH. 36341! Panjao: In valle 12 km E Panjao, 2650—2800 m, RECH. 36164! W Panjao, Kotal-e Nalgis, 3100 m, HDG. & WDB. 4962!

Distr. gen.: Endem.

50. ***A. Gillii*** WENDELBO, Dan. Biol. Skr. 10, 3: 176 (1958).
Syn.: *A. scabrum* GILLI, Feddes Repert. 56: 146 (1954), non GILIB. (1792).
Icon.: Tab. 4, fig. 50; tab. 15, fig. 1. — WENDELBO, l. c.: fig. 63 a—d, 67 b—c. GILLI, l. c.: fig. 1.
Typus (lectotypus): GILLI 190, W!

Bulbus c. 1 cm diametro, ovoideus; tunicae exteriores nigrescenti-brunneae, reticulato-nervosae. Scapus 11—30 cm altus, tenuis, costatus, saepe scabridulus, ad dimidium circiter foliorum vaginis pubescentibus (superoribus interdum subglabris) obsitus. Folia 2 (—3), scapo saepe longiora, 0,5—2 mm diametro, fistulosa, costata, pubescentia vel subglabra. Spatha rostro incluso usque ad 7 mm longa. Umbella hemisphaerico-fasciculata, 3—6 cm diametro, laxa; pedicelli plerumque aequales, usque ad 2,5 (—3,2) cm longi, curvati, ebracteolati. Perigonium anguste campanulatum sordide album, violaceo- vel purpurascenti-nervosum (in vivo brunnescenti-nervosum); tepala 4,5—6 mm longa, anguste ovata usque elliptico-oblonga, exteriora quam interiora latiora. Filamenta 2/3—3/4 tepalorum longitudinis attingentia, per ± 1/2 longitudinis filamentorum connata et tepalis adnata, interiora quam exteriora duplo vel magis latiora, integra vel dentibus 1—2 prope medium partis liberae provisa; antherae 0,5—1 mm longae. Capsula c. 4 mm longa.

Afghanistan: **N**: Mazar-i Sharif: Ali Kuh 15 km S Mazar-i Sharif, 1600 m, HDG., WDB. & EKB. W-8515! — **E**: Kabul: In montibus NNW Khord Kabul, 2280 m, GILLI 191! Kabul, 1800—2100 m, RECH. 31158!, LAMOND 1992!, HDG. & WDB. 3119! GILLI 190! Paghman, 2600 m, HDG. & WDB. 4359!, RECH. 17109!, GILLI 189! Gulbagh, NEUB. 704! Gholrondi 2 km W Charikar, PODLECH 10877! Farza, S Istalif, 1800 m, HDG. &

Wdb. 3265! Panjshir: Jistha, 2750 m, Hdg. & Wdb. 5365! Gulbahar, 1700 m, Gilli 188! Logar: Pul-i Alam, Lindb. s. n.! Sebroderakan prope Shewaki, 2170 m, Gilli 187! Lataband, Botkhak, Neub. 696! Sarobi, Volk 1572!, 1925! Nijrao, Neub. 2443! Bagrami, 2800—3000 m, Neub. 1951/204! 8 km E Sarobi, Tangi Jamai, 800 m, Hdg., Wdb. & Ekb. W-7492! Laghman: Alishang supra Bangali, 1750 m, Ekb. & Wdb. W-9621! Khost/Urgun: In jugo Mirzakai Kotal, 2500 m, Rech. 35833!
Pakistan: Quetta: Fort Sandeman versus Wana inter Zhob et Sambaza, 1450 m, Lamond 1458! Urak, 2150 m, Lace 3741! — Zandra, 2100 m, Lace 3854!

Distr. gen.: Endem.

There is quite a lot of variation in the material. The inner filaments may be entire or toothed, the inflorescence may be relatively dense or in the most frequent and characteristic form, very lax with elongated curved pedicels. Lamond 1458 has glabrous leaf sheaths. I have, however, found no base for a splitting into more taxa.

51. ***A. miserabile*** Wendelbo, Nytt Mag. Bot. 14: 104 (1968).
Icon.: Tab. 4, fig. 51. — Wendelbo, l. c.: fig. 1 i—j, fig. 4.
Typus: Lamond 1549, E!

Bulbus ± 1 cm diametro, ovoideus, tunicis griseis dense paralleliter nervosis, in collum ± distincte elongatis. Scapus 15—45 cm altus, tenuis, in sicco costatus, usque ad 1/5—2/5 vaginis foliorum tectus, quarum infima pubescens summa plerumque glabra. Folia 2—3, lamina 0,5—1,3 mm diametro, probabiliter cylindrica filiformia, fistulosa, in sicco distincte costata. Spatha bivalvis; valvae 6—8 mm longae, ± breviter caudatae, ± persistentes, reflexae. Umbella hemisphaerica usque sphaerica, 2—4 cm diametro, multiflora, laxa usque densiuscula; pedicelli subaequales, 1—2 cm longi, tenues, ebracteolati. Perigonium campanulatum, purpureum vel album, atro-nervosum; tepala 3—4 mm longa, anguste elliptico-oblonga, latitudine paulo inaequalia, apice obtusa (in vivo probabiliter cucullata), nervus medianus basin versus incrassatus. Filamenta tepalis subaequilonga vel breviora, subaequalia vel interiora latiora, per c. 1 mm connata et tepalis adnata, e basi dilatata subulata. Stylus c. 1 mm longus; stigma capitatum. Capsula c. 4 mm lata, valvis late obcordatis.

Afghanistan: E: Khost: In montibus S Yakubi, 1400 m, Rech. 35712! Khost, 1200 m, Rech. 35497! Urgun: Gomal S Urgun versus Katawaz, 1850 m, Freitag 3339!
Pakistan: Chitral: Bundai, 1200 m, Harriss 16689!, 16690! Kurram: 20 km a Kohat versus Thal, 675 m, Rech. 30208!, Lamond 1549! 50 km SE Thal versus Hangu, Rech. 30879!

Distr. gen.: Endem.

52. ***A. circumflexum*** Wendelbo, Acta Horti Gotob. 28: 22 (1966).
Icon.: Tab. 4, fig. 52; tab. 15, fig. 2. — Wendelbo, l. c.: 4 a—e.
Typus: Hedge & Wendelbo 4803, BG!

Bulbi aggregati, usque ad 2 cm diametro, late ovoidei; tunicae exteriores coriaceae, cinerascenti-brunneae, ± fragiles, in collum usque ad 3 cm longum protractae; bulbilli cymbiformes apice protracti, pallide cinerascenti-flavescentes vel brunnescentes. Scapi singuli rarius bini, 10—26 cm alti, leviter flexuosi, in quinta parte inferiore foliorum vaginis ± approximatis glabris involucrati. Folia terna, scapo breviora, 0,5—1,5 mm lata, semi-cylindrica, fistulosa, margine scabrida, circinata rarius ± extensa. Spatha ± 7 mm longa, apiculata, in valvas 2 late ellipticas fissa, persistens. Umbella hemisphaerica, 1,5—2 cm, fructifera usque ad 2,5 cm diametro,

plerumque densa, multiflora; pedicelli 5—10 mm longi, aequales, ebracteolati. Perigonium campanulatum, lilacinum, violaceo-nervosum; tepala 3,5—4 mm longa, anguste elliptico-oblonga usque anguste elliptico-ovata, obtusa, nervo centrali prope basin demum incrassato. Filamenta violacea, tepalis paulo longiora, per ± 1 mm connata et perigonio per 3/4 mm adnata; interiora exterioribus circiter duplo latiora, omnia integra vel interiora utrinque dentibus minutis provisa; antherae 0,5 mm longae, obscure violaceae. Ovarium late ellipsoideum. Stylus 2,5—3 mm longus; stigma capitatum. Capsula valvis c. 5 mm latis, late obcordatis.

Afghanistan: C: Bamian: Band-i Amir, 2900 m, RECH. 18293!, HDG. & WDB. 4803! WDB. & EKB. W-9797! Kargana-tu ad viam versus Band-i Amir, 3100 m, HDG. & WDB. 4734! Bamian, 2500 m, HDG. & WDB. 4653! 6 km W Bamian, 2550 m, FREITAG 1250! 30 km W Bamian versus Band-i Amir, 2900 m, WDB. & EKB. W-9766! Kuh-i Hisar: Inter Sauzak Sumaj et Serdak versus jugum Sad Bark, 2600—2900 m, RECH. 36442!

Distr. gen.: Endem.

53. ***A. micranthum*** WENDELBO, Dan. Biol. Skr. 10, 3: 178 (1958).
Icon.: Tab. 4, fig. 53; tab. 15, fig. 3. — WENDELBO, l. c.: 177, fig. 65.
Typus: AITCHISON 228, K!

Bulbi tunicae exteriores papyraceae nervis parallelis, in parte superiore diffractae, cinerascentes. Scapus 23—40 cm altus, ad 1/4—1/2 foliorum vaginis remotis glabris vel minute papilloso-scabridis obsitus. Folia 2, 12—20 cm longa, 1,5—3 mm lata, anguste linearia, semicylindrica, supra canaliculata, fistulosa, glabra vel nervis minute scabrida. Spatha 7 mm longa, persistens. Umbella hemisphaerica, multiflora, densa; pedicelli 6—10 mm longi, ebracteolati. Perigonium late campanulatum, purpureum, nervis saturatioribus; tepala 3—3,5 mm longa, interiora lanceolata, obtusa, exteriora quam interiora aliquantum breviora et latiora. Filamenta exserta, perigonio basi adnata, supra adnationem in annulum angustum connata; interiora (3—) 5-cuspidata, cuspides laterales superiores dimidiam longitudinem cuspidis antheriferae attingentes, cuspides laterales inferiores multo breviores vel fere reductae; filamenta exteriora lineari-subulata; antherae c. 0,5 mm longae, atroviolaceae. Capsula depresso-globosa, c. 3 mm longa, 4 mm lata.

Afghanistan: E: Urgun: In jugo Mirzakai Kotal, 2500 m, RECH. 35807!
Pakistan: Kohat: Cherat, SE Peshawar, 700—960 m, RECH. 30236!, LAMOND 1575! — Kurram: In valle Hariab, 2400 m, COLLETT 25! In valle Kurram, AITCH. 228!

Distr. gen.: Endem.

In the original description this species was placed in the section *Porrum* (a synonym of sect. *Allium*). After having seen more material, I am, however, in no doubt that it is a true member of sect. *Scorodon* in spite of its more or less long-toothed inner filaments. The insertion of the lateral teeth is quite different in sect. *Allium*.

54. ***A. ionandrum*** WENDELBO, Bot. Not. 121: 270 (1968).
Icon.: Tab. 4, fig. 54. — WENDELBO, l. c.: fig. 2 C, D.
Typus: RECHINGER 35915, W!

Bulbus ovoideus, usque ad 2 cm diametro; tunica exterior crassa, dura, diffracta, atro-brunnea, tunicae interiores numerosae, brunnescentes usque griseae, reticulato-fibrosae. Scapus solitarius vel scapi bini, e bulbis separatis tunica communi tectis, 20—30 cm alti, 1—2,5 mm diametro, ± curvati, ± purpureo-suffusi, in quarta circiter parte inferiore vaginis foliorum approximatis glabris tecti. Folia 2, subop-

posita, scapum subaequantia vel eo manifeste breviora, 1—2 mm lata, semicylindrica, apice canaliculata, solida, glabra, margine laevia. Spatha 8—12 mm longa, 4-loba, distincte rostrata, albo-hyalina, purpureo-nervosa, demum reflexa. Umbella hemisphaerica, 2,5—5 cm diametro, multiflora, densa; pedicelli usque ad 2,5 cm longi, tenues, infra perigonium incrassati, ebracteolati. Perigonium campanulato-urceolatum in sicco album, tepalis apice purpurascentibus, nervis virescenti-purpureis; tepala inaequalia, nervo basin versus valde incrassato, exteriora c. 3,2 mm longa, anguste elliptica, apice rotundata, interiora c. 3,5 mm longa, anguste elliptico-oblonga, acuminata, obtusa. Filamenta inaequalia, filiformia, per c. 0,75 mm connata et tepalis adnata; exteriora vix 4 mm longa, basi utrinque denticulo provisa vel edenticulata; interiora quam exteriora sublongiora, utrinque prope basin dente majore provisa; antherae c. 1 mm longae, atroviolaceae. Stylus filiformis, exsertus. Capsula valvis 3 mm longis latiuscule obcordatis provisa.

Afghanistan: E: Urgun: 35 km NW Urgun versus Surmat, 2200—2400 m, Rech. 35915! Gardez: 25 km S Gardez ad viam versus Urgun, 2150 m, Freitag 3260!

Distr. gen.: Endem.

55. ***A. spirophyllum*** Wendelbo, Acta Horti Gotob. 28: 29 (1966).
Icon.: Tab. 4, fig. 55; tab. 15, fig. 4a, b. — Wendelbo, l. c.: fig. 7.
Typus: Hedge & Wendelbo 4102, BG!

Bulbi aggregati, ovoideo-elliptici, 1—1,5 cm longi, tunicis in collum longum basin caulis induens prolongatis, exterioribus cinerascentibus vel brunneis, reticulato-nervosis vel praesertim prope basin et apicem reticulato-fibrosis; bulbilli c. 12 mm longi, fusiformes, albo-flavi, reticulato-nervosi. Scapi 1—3, 5—12 cm longi, ad 2 mm crassi, flexuosi, denique saepe stricti, costati, vaginis in tertia parte inferiore approximatis. Folia 3—11, scapum superantia, usque ad 13 cm longa, cylindrica, fistulosa, laevia, juvenilia circinata, denique stricta vel flexuosa. Spatha c. 10 mm longa, bivalvis, valvis late ovatis, apiculatis, persistentibus. Umbella hemisphaerica vel subhemisphaerica, 2,5—3 cm diam., multiflora, fragilis; pedicelli c. 10 mm longi, tenues, angulati, ebracteolati. Perigonium campanulatum, albescens nervis viridi-brunnescentibus; tepala 6—6,5 mm longa, ovata, subacuta, apice cucullata. Filamenta vix dimidium perigonii attingentia, apice violascentia, per vix 1 mm connata et tepalis adnata; interiora exterioribus circiter duplo latiora; antherae c. 1 mm longae, flavae. Ovarium subsphaericum, minute verruculosum. Stylus 0,7 mm longus, crassus, stigmate subcapitato. Capsula 3 mm diam., subsphaerica.

Afghanistan: NE: Kataghan: Inter Doshi et Doab, 950 m, Hdg. & Wdb. 4077! 16 km W Doshi, 1200 m, Furse 5923! 10 km W Tashkurghan, 480 m, Freitag 5010! 1 km W Tashkurghan, 300 m, Ekb. W-9033! Karkar, Frumkin 170! — C: Bamian: Bulola, 2300 m, Hdg. & Wdb. 3292! Doab: In valle Ajar, W Doab, 1500 m, Hdg. & Wdb. 4102!, Rech. 16593!

Distr. gen.: Endem.

56. ***A. kopetdagense*** Vved., Flora Turkmen. 1, 2: 280 (1932), descr. ross.
Syn.: *A. khorasanicum* Wendelbo, Acta Horti Gotob. 28: 24 (1966).
Icon.: Tab. 4, fig. 56; tab. 15, fig. 5. — Wendelbo, l. c.: fig. 5.
Typus (paratypus): Vvedensky, GB!

Bulbus circiter 8 mm diametro, ovoideus; tunicae exteriores cinereae, papyraceae, nervis parallelis indistinctis, interiores purpurascentes. Scapi 1—2-ni, 3—5 (—12) cm

longi, parte supraterranea 1,5—2,5 cm longa, vix 1 mm diametro, costata, ± purpurascente; parte subterranea foliorum vaginis glabris obtecta. Folia 2—3, quam inflorescentia multo longiora, usque ad 1,5 mm diametro, cylindrica, paucicostata, laevia, ± flexuosa usque ad circinata. Spatha bivalvis, c. 10 mm longa, subpersistens. Umbella 4—9-flora, fasciculata usque subhemisphaerica; pedicelli usque ad 10 mm longi, curvati, purpurei, basi ebracteolati. Perigonium anguste campanulatum, purpureum; tepala (6—) 7—10 mm longa, lanceolata, acuminata, subsimilia. Filamenta per c. 1,5 mm connata et tepalis adnata; interiora ovato-triangularia parte libera 3—3,5 mm longa, exteriora anguste triangularia manifeste breviora; antherae c. 1,2 mm longae. Ovarium ovoideum. Stylus c. 1,5 mm longus; stigma capitatum. Capsula c. dimidium perigonii attingens, valvis late obcordatis.

Persia: E: Khor.: Montes Hazar Masjed inter Gash et Talqur, 1600 m, RECH. 5174 (Typus *A. khorasanici*)! 48 km E Bojnurd, 1200 m, FURSE 7450!
Turcomania: Kopet Dagh: Ad ripam dexteram fl. Sumbar prope urbem Kara Kala, VVED. s. n.!

Distr. gen.: Endem.

57. ***A. Stocksianum*** BOISS., Diagn. Pl. Or. Nov. Ser. 2, 4: 117 (1859).
Syn.: *A. himalayense* REGEL, Acta Horti Petrop. 3, 2: 118 (1875).
Icon.: Tab. 4, fig. 57; tab. 15, fig. 6. — WENDELBO, Dan. Biol. Skr. 10, 3: 176, fig. 64 c (1958).
Typus: STOCKS, G!

Bulbus tunicis numerosis brunneis reticulato-fibrosis tectus. Scapi singuli vel saepe bini, 4—10 cm alti, costati, usque ad medium circiter foliorum vaginis glabris, approximatis obsiti. Folia 3—4, quam scapus longiora, 0,5—1,2 mm lata, filiformia, cylindrica, canaliculata, fistulosa, circinata vel flexuosa. Spatha 6—8 mm longa, acuminata, caduca. Umbella hemisphaerica, laxiuscula; pedicelli 10—25 mm longi, curvati, purpureo-violacei, ebracteolati. Perigonium campanulatum, purpureum nervis saturatioribus; tepala 6—9 mm longa, acuminata, apice cucullata ± recurva, exteriora elliptico-ovata usque anguste elliptico-ovata, interiora ovata usque anguste ovata. Filamenta 1/2—2/3 tepalorum longitudinis attingentia, paulo supra basin connata et tepalis adnata, exteriora anguste triangularia, quam interiora ovato-triangularia breviora; antherae c. 1,5 mm longae. Capsula c. 3,5 mm longa, c. 5 mm lata.

Afghanistan: SW: Farah: 15 km N Dilaram versus Golestan, 1400 m, HDG. & EKB. W-7247! — SE: Kandahar: Panjvai SW Kandahar, LINDB. 375! Prope Kandahar, VOLK K 211!, K 358! HDG. & EKB. W-7186! 10—43 km N Kandahar versus lacum artificiale „Arghandab Reservoir", 1100—1200 m, RECH. 34889!, 34923!, 34949!, 35248! 40 km W Kandahar, 940 m, FREITAG 437! Kajakai, 1200—1300 m, HDG. & EKB. W-7212! S pontem Arghandab W Kandahar, 1200—1300 m, HDG. & EKB. W-7197! 80 km W Kandahar, versus Girishk, 1100 m, RECH. 34833! Inter Dilaram et Girishk, 750 m, FURSE 5552! Ispoli, 25 km NNE Spin Boldak, HDG. & EKB. W-7066! 42—20 km S Tirin versus Kandahar, 1800 m, RECH. 35051!, 35102! 20 km E Kandahar, 1040 m, HDG., WDB. & EKB. W-7620! Kalat-i Ghilzai: 5 km SW Kalat, 1550 m, HDG., WDB. & EKB. W-7614! — Afghanistan, GRIFF. 540!
Pakistan: Baluchistan „Doubund", STOCKS! Regi, 1500 m, LACE 3795!

Distr. gen.: Endem.

Sect. *Allium*

Syn.: Sect. *Alliotypus* DUMORT., Fl. Belg.: 140 (1827). Sect. *Porrum* G. DON ex KOCH, Syn. Fl. Germ.: 714 (1837). Sect. *Crommyum* WEBB & BERTH. subsect. *Porrum* BOISS., Fl. Or. 5: 229 (1882).

Folia cylindrica vel plana. Spatha bivalvis vel saepe longirostrata integre decidua. Perigonium campanulatum usque ovoideum. Filamenta inaequalia, exteriora integra vel raro tricuspidata, interiora latiora 3 (—5—7) cuspidata raro utrinque dentata; cuspis antherifera quam basis filamenti et quam cuspides laterales saepissime brevior. Ovarium foveolis nectariferis distinctis provisum.

1a. Filamenta interiora paulo supra basin tricuspidata . 60. *A. Hedgei* Wendelbo
b. Filamenta interiora circiter ad medium vel supra medium tricuspidata vel raro bidenticulata 2
2a. Folia scapum excedentia. Scapi usque ad 30 cm longi, flexuosi, saepe 2—3 ex eodem bulbo 3
b. Folia quam scapus breviora. Scapus usque ad 150 cm longus, solitarius ... 4
3a. Folium solitarium, non fistulosum. Tepala alba, nervis brunneo-purpurascentibus ..... 58. *A. Kotschyi* Boiss.
b. Folia 3—8, fistulosa. Tepala alba vel rosea, nervis roseo-purpureis .... 59. *A. Borszczowii* Regel
4a. (2) Folia cylindrica vel semicylindrica, supra ± distincte canaliculata, fistulosa 5
b. Folia plana vel saepe applanata canaliculata, numquam fistulosa 12
5a. Bulbi tunicae exteriores reticulato-fibrosae vel reticulato-nervosae 6
b. Bulbi tunicae exteriores coriaceae vel papyraceae, nervis parallelis, ± integrae, fractae vel interdum basi vel apice fibroso-dissolutae, indistincte reticulatae 9
6a. Perigonium purpureo-violaceum; tepala apice retusa .... 67. *A. hamrinense* Hand.-Mzt.
b. Perigonium viride vel albidum; tepala acuta vel obtusa, non retusa 7
7a. Tepala viridia anguste albo-marginata. Filamenta manifeste exserta .... 68. *A. viride* Grossh.
b. Tepala albida nervo viridi vel in sicco violascente. Filamenta quam tepala subbreviora vel ea aequantia vel subsuperantia 8
8a. Cuspis antherifera filamentorum interiorum cuspides laterales aequans vel eis aliquantum longior .....61. *A. turcomanicum* Regel
b. Cuspis antherifera filamentorum interiorum cuspidibus lateralibus multo brevior ..... 62. *A. filidens* Regel
9a. (5) Tepala 7—9 mm longa .....66. *A. Aucheri* Boiss.
b. Tepala 3—5 mm longa 10
10a. Umbella bulbillifera. Tepala c. 3 mm longa, lilacina vel alba. Filamenta longe exserta ..... 71. *A. subvineale* Wendelbo
b. Umbella non bulbillifera. Tepala 4—5 mm longa. Filamenta quam tepala paulo longiora 11
11a. Tepala interiora anguste elliptico-oblonga apice retusa. Pedicelli bracteolati, bracteolis plerumque longis filiformibus .....70. *A. affine* Ledeb.
b. Tepala interiora elliptico-ovata apice obtusa. Pedicelli ebracteolati .... 69. *A. phanerantherum* Boiss. & Hausskn.
12a. (4) Pedicelli dense pustulosi ..... 75. *A. notabile* Feinbr.
b. Pedicelli non pustulosi, ad summum prope apicem aliquantum papilloso-verruculosi 13
13a. Filamenta interiora e basi late obovata obtuse bidentata subulata .... 65. *A. turkestanicum* Regel
b. Filamenta interiora tricuspidata, cuspidibus lateralibus filiformibus 14

14a. Umbella bulbillifera. Perigonium 3—4 mm longum, tepalis roseis vel albis roseo-suffusis, nervis inconspicuis. Filamenta longe exserta ..... 72. *A. longicuspis* REGEL
b. Umbella non bulbillifera. Tepala longiora vel, si 3 mm tantum longa, filamenta breviter tantum exserta 15
15a. Tepala interiora anguste elliptico-oblonga, alba viridi-nervosa. Bulbus tunicis reticulato-fibrosis in collum longiusculum protractis obtectus 16
b. Plantae combinatione characterum diversa 17
16a. Scapus 50—70 cm altus. Tepala 5—6 mm longa. Folia margine scabrida .. .. 63. *A. dictyoscordum* VVED.
b. Scapus 16—30 cm altus. Tepala c. 4 mm longa. Folia margine et subtus pubescentia (raro glabrescentia) ..... 64. *A. longicollum* WENDELBO
17a. (15) Filamenta quam tepala breviora 18
b. Filamenta quam tepala longiora 21
18a. Perigonium purpurascens 19
b. Perigonium album vel fere album 20
19a. Tepala acuta, lanceolata, exteriora et interiora concoloria .... 73. *A. erubescens* C. KOCH
b. Tepala obtusa vel retusa, ± elliptica, exteriora purpurascentia, interiora pallidiora, saepe fere alba ..... 74. *A. rotundum* L.
20a. (18) Tunica bulbi juvenilis purpurascenti-violacea. Perigonium album, nervis indistinctis apicem versus aliquantum rubescentibus .... 76. *A. subnotabile* WENDELBO
b. Tunica bulbi juvenilis flavescens. Perigonium fere album, nervis validis sordide purpureis ..... 79. *A. talyschense* MISCZ.
21a. (17) Pedicelli basi bracteolis 6—10 mm longis laciniatis provisi. Vaginae foliorum plerumque papilloso-scabridae vel pubescentes 22
b. Pedicelli basi bracteolis ± inconspicuis provisi. Vaginae foliorum laeves .. 23
22a. Perigonium 3—3,5 mm longum ..... 77. *A. qaradaghense* FEINBR.
b. Perigonium 5—6 mm longum ..... 78. *A. trachycoleum* WENDELBO
23a. (21) Tepala interiora acuta vel subacuta. Filamenta interiora eciliata 24
b. Tepala interiora obtusa. Filamenta interiora ciliata 25
24a. Filamenta interiora quam tepala angustiora. Tepala dorso laevia .... 80. *A. laeve* WENDELBO & VON BOTHMER
b. Filamenta interiora quam tepala latiora. Tepala exteriora dorso papilloso-verruculosa ..... 82. *A. Ampeloprasum* L. subsp. *iranicum* WENDELBO
25a. (23) Perigonium atro-purpureo-violaceum, raro virescenti-album. Bulbi tunicae exteriores in fibras ± distincte reticulatas fissae .... 81. *A. atroviolaceum* BOISS.
b. Perigonium purpurascens raro album. Bulbi tunicae exteriores ± integrae, non in fibras fissae ..... 82. *A. Ampeloprasum* L. subsp. *Ampeloprasum*

58. ***A. Kotschyi*** BOISS., Diagn. Pl. Or. Nov. Ser. 1, 7: 117 (1846).
Icon.: Tab. 5, fig. 58.
Typus: KOTSCHY 777, G! W! O!

Bulbus 1—1,5 cm diametro, ovoideus; tunicae exteriores atro-cinereae, fractae, in parte inferiore in fibras crassas dissolutae. Scapus 7—12 cm altus, tuberculatus, ad medium usque vagina folii obsitus. Folium unicum, scapum superans, 1—2 mm latum, semicylindricum, non fistolosum. Spatha e valvis ovatis acuminatis quam

pedicellis brevioribus consistens. Umbella 5—20-flora; pedicelli c. 9 mm longi, aequilongi, crassiusculi, bracteolati. Perigonium campanulatum, album, nervis brunneo-purpurascentibus; tepala 5—6,5 mm longa, anguste oblongo-ovata, exteriora quam interiora paulo longiora, subacuta. Filamenta c. 1/2—2/3 tepalorum attingentia, per c. 0,5 mm connata et tepalis adnata, exteriora e basi triangulari-ovata subulata, interiora ovata, tricuspidata, cuspide antherifera 1/3 longitudinis cuspidum lateralium filiformium et c. 1/6 longitudinis baseos filamenti attingente; antherae 1,3 mm longae, flavae. Stylus c. 2,5 mm longus; stigma subcapitatum.

Persia: **S**: Fars.: In glareosis mobilibus Kuh-e Dinar, Ky. 777!

Distr. gen.: Endem.

59. ***A. Borszczowii*** Regel, Acta Horti Petrop. 3, 2: 74 (1875).
Syn.: *A. Boissieri* Regel, l. c. 75, excl. var. *deserti* Regel. *A. Lehmannianum* Merckl. var. *Bungei* Boiss., Fl. Or. 5: 235 (1882). *A. Stocksianum* Boiss. var. *persicum* Boiss., Fl. Or. 5: 267 (1882).
Icon.: Tab. 5, fig. 59 a, b. — Regel, Reise in Turkestan 3, 1: tab. 6, fig. 11—14 (1876). Wendelbo, Dan. Biol. Skr. 10, 3: 172, fig. 61 (1958).
Typus: „Habitat in deserto aralensi in regione fluvii Syr-Darja", Borszczow, LE!

Bulbus 1—1,5 cm diametro; tunicae exteriores grosse reticulato-fibrosae, nigrescenti-brunnescentes usque brunneae. Scapi 10—30 cm alti, plerumque 2—3 e bulbo communi orientes, flexuosi. Folia 3—8, quam scapus longiora, 1—2 mm lata, anguste linearia, fistulosa, glabra. Spatha acuminata, quam umbella multo brevior. Umbella sphaerica usque hemisphaerica, laxa; pedicelli inaequilongi, usque ad 3 cm longi, curvati, bracteolati. Perigonium campanulatum, album usque roseum, purpureo-nervosum; tepala 5—7 (—9) mm longa, elliptico-ovata usque ad anguste elliptico-oblonga, apice rotundata indistincte emarginata, in vivo cucullata. Filamenta tepalis paulo breviora usque 3/4 eorum longitudinis aequantia, basi connata et tepalis adnata, basi minute ciliata vel glabra; exteriora triangulari-subulata, interiora latiora tricuspidata, cuspide antherifera 1/4—1/3 longitudinis baseos et 1/3 longitudinis cuspidum lateralium attingente usque eis paulo longiore. Ovarium plerumque corona basin styli cingente praeditum. Stylus non exsertus. Capsula valvis fere circularibus, 4 mm longis, praedita.

Persia: **W**: Ad Shurab prope Esfahan, Bunge 12! — **S**: Bal.: In ditione Sarhad inter Khash et Iranshahr, Rech. 7507! Saravan, Salavatian 8063-E! — **E**: Khor.: E Kavir, Ozbagu, Ruttner 397! Kuh-e Safid prope Ozbagu, Ruttner 415! Inter Mayamey et Shahrud, Rech. 5329! Kavir-e Namak prope Ferdow, Ruttner 478! — **C**: Shahrud, Bunge.
Afghanistan: **N**: Mazar-i Sharif: 27 km E Mazar-i Sharif, Hewer 1124! — **SE**: Kandahar: Ad marginem Dasht-i Margo SW Qala Bist, 820 m, Rech. 34522! 20 km E Kandahar, 1040 m, Hdg., Wdb. & Ekb. W-7622! SW Kandahar et Girishk, ad fl. Helmand, 1000 m, Kerst. 262 p. p.! N Girishk, ad fl. Helmand, 1200 m, Kerst. 403! — **E**: Kabul: Pul-i Alam, 2100 m, Koelz 11838! Band-i Kargha, 2050 m, Rech. 31268!

Distr. gen.: Persia orientalis, Turcomania, Afghanistan, Kizyl Kum, Kara Kum, Aralo-Caspia, Amu-Darya, Syr-Darya.

60. ***A. Hedgei*** Wendelbo, Acta Horti Gotob. 28: 20 (1966).
Icon.: Tab. 5, fig. 60; tab. 16, fig. 1. — Wendelbo, l. c.: fig. 3.
Typus: Hedge & Wendelbo 3990, BG!

Bulbi 1,5—2 cm longi, ovoidei, aggregati; tunicae exteriores reticulato-fibrosae, atro-rufo-brunneae, in collum usque ad 2 cm longum basin scapi involucrans elongatae; bulbilli c. 10 mm longi, cymbiformes, gilvobrunnei, nervatura indistincta vel fere invisibili. Scapi singuli rarius bini, 9,5—25 cm longi, aliquantum flexuosi, in parte quinta usque ad tertiam inferiorem vaginis foliorum glabris tunicati. Folia 1—3, scapum circiter aequantia vel eo breviora, 0,3—0,6 mm lata, supra canaliculata, fistulosa, costata, marginibus minute papillosis. Spatha valvis duabus reflexis usque ad 1,2 cm longis, breviter caudatis, persistens. Umbella hemisphaerica, multiflora; pedicelli subaequales, 10—23 mm longi, apice incrassati, bracteolati. Perigonium urceolatum, umbilicatum, purpurascenti-violaceum, extus lilacino-pruinosum; tepala c. 4,5—5 mm longa, anguste elliptico-ovata usque ovata, concava, obtusa vel subacuta (in vivo acuta apice cucullata), exteriora quam interiora aliquantum breviora. Filamenta tepalis aliquanto breviora, per 0,4 mm connata, perigonio usque paulo supra basin adnata, exteriora subulata prope basin utrinque denticulo obtuso praedita, interiora circiter 0,8 mm supra basin tricuspidata, cuspidibus lateralibus subulatis, c. dimidium cuspidis antheriferae aliquantum validioris aequantia; antherae c. 1,5 mm longae, violaceae. Stylus c. 2 mm longus; stigma capitatum.

Afghanistan: N: Mazar-i Sharif: Takht-i Rostam prope Samangan, 1200 m, HDG. & WDB. 3990!, RECH. 16379! In declivibus borealibus montis W Tang-i Tashkurghan, 800 m, EKB. W-9093! — NE: Kataghan: In valle Andarab, 1100 m, RECH. 31782! Dahan-i Badjga, PODLECH 11303! Inter Doshi et Khinjan, 1120 m, HDG., WDB. & EKB. W-8599! Inter Taliqan et Kishm, HDG. & WDB. W-9509!

Distr. gen.: Endem.

61. ***A. turcomanicum*** REGEL, Acta Horti Petrop. 10: 305 (1887).
Icon.: Tab. 5, fig. 61. — REGEL, l. c.: tab. 1, fig. 4.
Typus: „In Turcomania ad fluvium Murgab inter Kalaburun et Abdul-lachan ad meridiem versus a Merw", A. REGEL, LE, isotypus K!, W!

Bulbi solitarii vel saepius bini usque terni aggregati; tunicae exteriores reticulatae, rufescenti-brunneae vel brunneae; bulbilli pauci, magni, elongati, flavi, laeves, nitidi. Scapus 30—100 cm altus, usque ad 1/3—1/2 foliorum vaginis laevibus tectus. Folia 4—5, scapo manifeste breviora, 2—6 mm lata, semi-cylindrica, fistulosa, laevia. Spatha mox caduca. Umbella sphaerica, multiflora, ± densa; pedicelli 12—30 mm longi, inaequilongi, bracteolati. Perigonium urceolato-campanulatum, album, nervis viridibus in sicco violascentibus; tepala 5—6 mm longa, laevia, apice cucullata, exteriora anguste ovata, cymbiformia, interiora elliptico- usque anguste oblonga. Filamenta quam tepala aliquantum longiora, purpurascenti-violacea, connata et tepalis prope basin adnata, basi ciliata, exteriora e basi latiore subulata, interiora quam tepalorum basis vix latiora, tricuspidata; cuspis mediana lateralibus longior vel aequilonga et quam basis oblonga aequilonga; antherae atroviolaceae. Capsulae valvae 3,5 mm longae, suborbiculares, transverse rugosae.

Turcomania: sec. VVED., Fl. URSS. 4: 234 (1935).
Afghanistan: NW: Herat: Kushk, LINDB. 626! — NE: Badakhshan: N Farkhar ad viam inter Taliqan et Kishm, HDG. & WDB. W-9256! Zom Kotal inter Khwaja Ghar et Rustak, EKB. W-9108! Supra Yaworzan, c. 30 km S Kishm, 1400 m, HDG. & WDB. W-9323!

Distr. gen.: Turcomania, Afghanistan, Tadjikistan.

62. ***A. filidens*** Regel, Acta Horti Petrop. 3, 2: 174 (1875).
Icon.: Tab. 5, fig. 62; tab. 16, fig. 2. — Regel, Reise in Turkestan 3, 1: tab. 15, fig. 11—13 (1876).
Typus: In montibus Mogol-Tau Turkestaniae, Sewerzow, LE!

Bulbi tunicae exteriores brunneae, reticulato-fibrosae, in collum basin scapi cingens elongatae; bulbilli pauci, majusculi, elongati, flavescentes vel brunnescentes, laeves. Scapi plerumque plures, 20—60 cm alti, costati, ad 1/5 foliorum vaginis laevibus approximatis obtecti. Folia 3—4, quam scapus breviora, 1—5 (—7) mm lata, semicylindrica, canaliculata, fistulosa, laevia vel raro ± scabrido-nervosa. Spatha caduca, rostro basin spathae aequante. Umbella sphaerica vel hemisphaerica, multiflora, densa; pedicelli subaequales, 10—25 mm longi, bracteolati. Perigonium urceolato-campanulatum, albidum, viridi-nervosum; tepala 4—5 mm longa, in vivo apice cucullata, laevia; exteriora carinata, anguste elliptico-ovata, subobtusa; interiora anguste elliptico-oblonga, obtusa. Filamenta tepala aequantia vel eis ± manifeste breviora, basi connata et tepalis adnata, basi ciliata, exteriora e basi anguste elliptico-ovata subulata, quam interiora breviora, interiora quam tepalorum basis sesquilatiora, tricuspidata, cuspide mediana circiter dimidium baseos ovato-ellipticae et 2/7—2/3 longitudinis cuspidum lateralium aequante. Capsulae valvae c. 4 mm longae, orbiculares, emarginatae.

Afghanistan: **N**: Mazar-i Sharif: In declivibus occidentalibus jugi Shibaghlu 34 km E Tashkurghan, 600 m, Rech. 34271! Tashkurghan, 500 m, Rech. 34062! Inter Mazar-i Sharif et Tashkurghan, 300 m, Ekb., Hdg. & Wdb. W-8535!, Ekb. W-9054! S Tang-i Tashkurghan, 570 m, Hdg., Wdb. & Ekb. W-8547! — **NW**: Maimana: Inter Nishar et Belchiragh, 1150 m, Hdg., Wdb. & Ekb. W-8337! — **E**: Kabul: Prope Kabul, 1880 m, Gilli 174!, 175! 10 km NW Kabul versus Charikar, 2000—2100 m, Rech. 31157!, Lamond 1984! In jugo Khord Kabul, 1900 m, Hdg., Wdb. & Ekb. W-7509! Prope Sarobi, 1050 m, Gilli 173! 15 km W Sarobi, 1200 m, Hdg. & Wdb. 4285! Nangarhar: Inter Chigha Sarai et Kandai, Rech. 32434! Tor Khama, ad confines Pakistaniae, 600 m, Rech. 31007! 5 km W Jalalabad, 750 m, Hdg., Wdb. & Ekb. W-7489! Nuristan: Pol-i Gawardesh, 830 m, Gilli 172! — **NE**: Munjan: Hazarat-i Sayet in valle Kokcha, 1900 m, Frey 299: 23! Kataghan: In valle Andarab, 1100 m, Rech. 31746!, 31786! 10 km S Aliabad, Hdg., Wdb. & Ekb. W-9245! Inter Doshi et Khinjan, 1120 m, Hdg., Wdb. & Ekb. W-8609! Pul-i Khumri, 750 m, Rech. 16496!, Hdg. & Wdb. 4142! Badakhshan: N Farkhar ad viam inter Taliqan et Kishm, Hdg. & Wdb. W-9514! 12 km S Farkhar, 1500—2400 m, Furse 8172! In parte superiore vallis Farkhar, 2100 m, Furse 8222! — **C**: Bamian: In valle Ajar W Doab, 1350—1500 m, Rech. 16611!, Hdg. & Wdb. 3426!, 4124!
Pakistan: Chitral: Broz, Harriss 16686! — Peshawar: Tor Khama ad confines Afghaniae, 700 m, Rech. 30355!, Lamond 1618! — Quetta: W Duki, 1150 m, Rech. 29601! E Sanjawi, 1400 m, Rech. 29589! Inter Duki et Gumbaz, 900 m, Lamond 1337!

Distr. gen.: Afghanistan, Pakistan, Asia centralis.

63. ***A. dictyoscordum*** Vved., Not. Syst. Herb. Horti Bot. Petrop. 5: 90 (1924).
Icon.: Tab. 5, fig. 63.
Typus: Transcaspia, in montibus Kopet-dag, Germab, Antonov, LE.

Bulbi tunicae exteriores brunneae reticulato-fibrosae scapum alte obtegentes. Scapus singulus (raro bini), 50—70 cm altus, basi foliorum vaginis laevibus approximatis obsitus. Folia 4—6, quam scapus manifeste breviora, 3 mm lata, linearia, canaliculata, non fistulosa, margine valde scabra. Spatha quam umbella brevior; rostrum basin spathae aequans. Umbella hemisphaerica usque sphaerica, densa, plerumque multiflora; pedicelli quam flores sesqui- usque ad triplo longiores, brac-

teolati. Perigonium ovoideo-campanulatum, albidum, viridi-nervosum; tepala 5—6 mm longa, apice obtusa, in vivo cucullata, exteriora cymbiformia, anguste elliptico-ovata, dorso scabrido-papillosa, interiora anguste elliptico-oblonga, dorso laevia. Filamenta aliquantum breviora quam tepala, connata et tepalis basi adnata, non ciliata, exteriora e basi ovato-elliptica subulata, interiora quam tepala et filamenta exteriora circiter duplo latiora, tricuspidata; cuspis mediana dimidiam longitudinem baseos filamenti aequans et dimidiam cuspidum lateralium aequans. Capsulae valvae suborbiculares, c. 1,5 mm diametro.

Turcomania: M. Kopet Dagh: Germab, VVED. 53! Kara Kala, POPOV., VVED. Firyuza, BOBROV & FEDTSCH.

Distr. gen.: Endem.

64. ***A. longicollum*** WENDELBO, Bot. Not. 121: 272 (1968).
Icon.: Tab. 5, fig. 64. — WENDELBO, l. c.: fig. 1 B, C.
Typus: RECHINGER 34761, W!

Bulbus unicus vel bini, interdum plures, 1,5—2 cm diam., ovoidei, tunicis crassis brunneis reticulato-fibrosis longicollibus inclusi. Scapus 16—30 cm longus, ± flexuosus, costatus, juventute secus costas tenuiter puberulus raro glabrescens, usque ad tertiam partem inferiorem foliorum vaginis ± pubescentibus raro glabrescentibus tectus. Folia 3, approximata, quam scapus breviora, 1—3 mm diametro, semicylindrica, non fistulosa, secus costas ± distincte pilosa, scabrida vel raro glabrescentia. Spatha c. 7 mm longa, valvis 2—3 acuminatis, hyalina, viridi-nervosa. Umbella hemisphaerica usque subsphaerica, multiflora, densa; pedicelli subaequales, usque ad 10 mm longi, basi bracteolati. Perigonium campanulatum, album, viridi-nervosum, umbilicatum; tepala c. 4 mm longa, apice obtusa in vivo cucullata; exteriora cymbiformia ± anguste elliptico-oblonga, dorso omnino vel secus nervos tantum scabrido-papillosa; interiora anguste elliptico-oblonga usque anguste obovata, dorso laevia. Filamenta 3—3,5 mm longa, usque paulo supra basin connata et tepalis adnata; exteriora e basi anguste ovato-triangulari subulata; interiora quam exteriora duplo latiora et quam tepala basi latiora, tricuspidata, cuspide mediana antherifera dimidium baseos latae et dimidium cuspidum lateralium filiformium longitudinis aequante. Stylus 1,5 mm longus; stigma capitatum. Capsula valvis 4,5 mm latis, vix 4 mm longis, emarginatis.

Afghanistan: SW: Farah: Inter Farah Rud et Dilaram, 27 km SE Farah Rud, 900 m, RECH. 33444! 54 km NW Dilaram, 1200 m, FREITAG 2511! Inter Farah et Jija, 900 m, KOEIE 4287! 30 km W Dilaram, 1050 m, HDG., WDB. & EKB. W-7665! In jugo inter Farah Rud et Shindand, 1160 m, HDG., WDB. & EKB. W-7682! — SE: Kandahar: 80—40 km W Kandahar versus Girishk, 1100 m, RECH. 34823!, FREITAG 438! 10—35 km NE Kandahar, 1100—1150 m, RECH. 35249!, FREITAG 932-c! 30 km E Dilaram versus Girishk, 1050 m, RECH. 33532! In monte 15 km SW Kandahar, 1100 m, FREITAG in RECH. 34837! 10 km W Girishk, 940 m, FREITAG 528! Ad lacum artificiale „Arghandab Reservoir", 1200 m, RECH. 34963! 34 km N Kandahar versus lacum artificiale „Arghandab Reservoir", 1100—1200 m, RECH. 34866! 20—25 km S Tirin versus Kandahar, 1800 m, RECH. 35117! Inter Kandahar et Kushk-i Nahod, 1000 m, KERST. 298! Kajakai, 1200—1300 m, HDG. & EKB. W-7211! W Kandahar S pontem trans fluvium Arghandab, 1200—1300 m, HDG. & EKB. W-7198! 44 km NE Qala Bist, 900 m, RECH. 34761! 48 km N Qala Bist, 900 m, FREITAG 778! Ispoli, 25 km NNE Spin Boldak, HDG. & EKB. W-7065!

Distr. gen.: Endem.

65. ***A. turkestanicum*** Regel, Acta Horti Petrop. 3, 2: 197 (1875).
Icon.: Tab. 5, fig. 65. — Regel, Reise in Turkestan 3, 1: tab. 15 fig. 6—8 (1876).
Typus: Turkestaniae in montibus Mogol-tau, Kuschakewicz, LE.

Bulbus 1,5—3 cm diametro, tunicis cinereis papyraceis exterioribus nervis inconspicuis. Scapus (40—) 50—100 cm altus, usque ad ± quartam partem foliorum vaginis laevibus vel raro scabridis tectus. Folia 4—6, quam scapus manifeste breviora, 2—10 mm lata, plana, margine papilloso-ciliata, mox marcescentia. Spatha persistens, umbellam aequans, rostrum basin spathae aequans. Umbella sphaerica, densa, multiflora; pedicelli subaequales, perigonio (2—) 3—4-plo longiores, bracteolati. Perigonium late campanulatum, roseum (in sicco saepe album) nervis saturatioribus inconspicuis; tepala c. 3 mm longa, obtusa; exteriora anguste ovato-elliptica, cymbiformia; interiora anguste elliptico-oblonga, basin versus angustata. Filamenta quam tepala paulo usque sesquilongiora, basi connata et perigonio adnata; exteriora e basi anguste triangulari subulata; interiora e basi late obovata obtuse bidentata subulata, quam exteriora duplo latiora. Capsula valvis 3,5 mm diam., orbicularibus.

Turcomania: Ashkhabad: Suluklü ad fines Persiae, Sint. 1014!

Distr. gen.: Asia centralis: Montes Turcomaniae, Aralo-Caspia, Balkhash, Tien Shan.

Vvedensky, Fl. URSS. 4: 229 (1935) placed *A. turkestanicum* at the end of sect. *Haplostemon* (in part a synonym of sect. *Scorodon*). The obtusely bidenticulate inner filaments of this species must in my opinion be considered as reduced and derived from the 3-cuspidate inner filaments found in the section *Allium*. The tall strict scape as well as the flat leaves are also reminiscent of species of sect. *Allium*. No species with truly flat leaves is known to me to occur in sect. *Scorodon*.

66. ***A. Aucheri*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 116 (1846).
Icon.: Tab. 5, fig. 66. — Fl. URSS. 4: tab. 14, fig. 3 (1935).
Typus: Armenia, Aucher-Eloy 2192, G! Ghilan Persiae, Aucher-Eloy 5385, G!

Bulbus c. 1 cm diametro, ovoideus; tunicae exteriores atrocinereae, subcoriaceae, fissae. Scapus 40—70 cm altus, ad 2/3 foliorum vaginis laevibus vel leviter scabridis tectus. Folia 2—4, scapo breviora, 1,5—3 mm lata, subcylindrica, canaliculata, fistulosa, laevia vel subscabrida. Spatha 1/2—2/3 umbellae attingens, acuminata, atroviolacea. Umbella sphaerica vel hemisphaerica, plerumque multiflora, densa, subcapitata; pedicelli inaequilongi, exteriores quam perigonium dimidio usque sesquilongiora, interiores perigonio aequilongi vel eo usque ad duplo longiores, ebracteolati. Perigonium tubuloso-campanulatum, atrate coeruleo-violascens (in sicco lilascens), nervis atro-purpureis; tepala 7—9 mm longa, subaequalia, oblongo-elliptica, apice in vivo cucullata, laevia vel interdum ad nervum papilloso-squamulosa. Filamenta dimidium tepalorum longitudinis attingentia, basi connata et tepalis adnata, basi ± ciliata; exteriora triangulari-subulata; interiora tepala basi aequantia, tricuspidata, cuspide antherifera 1/5—1/6 baseos et 1/2—1/3 longitudinis lateralium aequante; antherae vix 1 mm longae, atro-violaceae demum flavescentes. Stylus non exsertus. Capsula valvis c. 6 mm longis, ellipsoidea, apice leviter emarginata.

Persia: N: Gilan: In prov. Gilan, Auch. 5385! — W: Arak: M. Latetar, Str.

Distr. gen.: Anatolia orientalis, Persia boreo-occidentalis, Caucasus.

67. ***A. hamrinense*** Hand.-Mzt., Ann. Nat. Mus. Wien 28: 15 (1914).
Icon.: Tab. 5, fig. 67. — Hand.-Mzt., l. c.: fig. 1.
Typus: Iraq: „Jebal Makhul im Zuge des Jebel Hamrin südlich von Kalaat Schergat am Tigris, 250 m“, Handel-Mazzetti 1066, WU!

Bulbus 1—1,5 cm diametro, ovoideus; tunicae exteriores reticulato-fibrosae, in collum usque ad 4 cm longum productae, pallide brunneae. Scapus 34—70 cm longus, usque ad 1/5—1/3 foliorum vaginis tectus. Folia 2—3, quam scapus multo breviora, 1,5—2,5 mm lata, cylindrica, fistulosa. Umbella sphaerica, multiflora, densa, 2—4 cm diametro; pedicelli inaequales, 6—22 mm longi, basi bracteolati. Perigonium urceolatum; tepala 3,5—4 mm longa, apice cucullata, purpureo-violacea margine pallidiora, nervo mediano virescente; exteriora elliptico-oblonga, cymbiformia, in sicco retusa, dorso et margine squamuloso-verruculosa; interiora subrectangularia in sicco apice truncata, dorso carinata, sublaevia. Filamenta quam tepala paulo longiora, prope basin connata et tepalis adnata; exteriora simplicia, basi dilatata; interiora ad 2/3 longitudinis tricuspidata, cuspides laterales quam mediana antherifera aequilongae vel breviores.

Distr. gen.: Syria, Iraq.

A. hamrinense has been found rather frequently in desert areas of Iraq which do not belong to the Flora Iranica-area.

68. ***A. viride*** GROSSH., Fl. Kawk. 1: 201 (1928), descr. ross.
Icon.: Tab. 5, fig. 68.
Typus: Lenkoran.

Bulbus 2—2,5 cm diametro, tunicis numerosis brunneis reticulato-fibrosis, basin scapi alte involucrantibus; bulbi juveniles flavescentes; bulbilli pauci, magni, flavi, elongati, reticulato-nervosi. Scapus 60—150 cm altus, usque ad tertiam partem vaginis foliorum laevibus tectus. Folia 3—4, 3—11 mm lata, cylindrica, apicem versus attenuata, fistulosa. Spatha mox caduca. Umbella sphaerica, densa, multiflora; pedicelli perigonio 2—5-plo longiores, inaequilongi, interiores quam exteriores longiores, bracteolati. Perigonium 3—5 mm longum, ovoideum, viride anguste albo-marginatum; tepala inaequalia, cymbiformia, in vivo apice cucullata, exteriora late elliptica, obtusa, quam interiora elliptico-ovata emarginata breviora. Filamenta quam tepala vix sesquilongiora, basi connata et tepalis adnata, basi eciliata; exteriora triangulari-subulata, integra vel anguste rectangularia ad c. 2/3 longitudinis filamentorum 3-cuspidata; interiora subrectangularia quam tepala angustiora, 3—5 (—7)-cuspidata, cuspis antherifera quam basis dimidio brevior et quam laterales brevior vel longior; antherae 1,2 mm longae, pallide viridi-flavae. Stylus e perigonio exsertus. Valvae capsulae fere circulares, 3,5 mm longae, apice vix emarginatae.

Iraq: Kurd.: Mosul: Jabal Khantur, 1200 m, RECH. 12101! Inter Dagh al Raziem et Sharanish, 1000 m, RECH. 10812-b!
Talish: sec. GROSSH., l. c.
Persia: W: Kurd.: 18 km N Sanandaj, 1500 m, WDB. 1849! Esf.: Godar-e Khunsar, 2560 m, ARCHIBALD 2769! Khunsar, 2500—2800 m, IRANSHAHR 8030-E! Lur.: Dow Rud, 1500—1700 m, KOELZ 15587!, 16031!, 18088! — C: Qazv.: In montibus Halkedar prope Mardabad, 1300 m, RECH. 1051!

Distr. gen.: Anatolia australis, Iraq boreo-orientalis, Talish, Persia occidentalis, Caucasus.

69. ***A. phanerantherum*** BOISS. & HAUSSKN., Fl. Or. 5: 235 (1882).
Icon.: Tab. 5, fig. 69.
Typus: Syria borealis, Soff Dagh, 900 m, HAUSSKNECHT s. n., G!

Bulbus 1—2 cm diametro, subglobosus; tunicae exteriores integrae, membranaceae, cinerascenti-brunneae, nervis tenuibus confertis. Scapus 35—85 cm altus,

in statu sicco distincte costatus, per 1/3-usque 2/5 foliorum vaginis laevibus obtectus. Folia 4—5, quam scapus breviora, 1,5—2 mm lata et plerumque latiora, mox marcescentia, superne cylindrico-canaliculata, fistulosa, margine scabrida. Spatha 10—15 mm longa, rostro basi circiter aequilongo incluso, in partes complures fissa, persistens. Umbella sphaerica, densa; pedicelli inaequales, usque ad 2 cm longi, ebracteolati. Perigonium ovoideo-campanulatum, basi umbilicatum, albidum viridinervosum vel atropurpureum; tepala 4—5 mm longa, subcoriacea, cymbiformia; tepala exteriora elliptico-oblonga, obtusa, cymbiformia; interiora elliptico-ovata, subacuta. Filamenta breviter exserta, connata et basi tepalis adnata, ciliata; exteriora lineari-triangularia; interiora latiora basi rectangulari, ad 1/2—3/5 longitudinis tricuspidata, cuspidibus lateralibus quam mediana antherifera longioribus; antherae c. 1,5 mm longae, purpureae. Ovarium apice coronatum; stylus longe exsertus.

Iraq: Kurd.: Kirkuk: Jarmo prope Chamchamal, 2500 m, HAINES s. n., HAINES in HELBAEK 1871! 5 km W Chamchamal, 800 m, RAWI 21680! In montibus Kani Domlan, 400 m, GUEST 4305! 37 km E Kirkuk, 600 m, RECH. 12505! Prov. Kirkuk, ALI EFFENDI HADARI 3950! Arbil: M. Handren prope Rawandiz, BORNM. 1865! 7 km E Qarachoq, 700 m, GILLETT 11216! Mosul: 85 km NW Mosul, 700 m, RAWI 23124 p. p.! 8 km S Zakho, RECH. 12144!, 12148! Sul.: In montibus propre Zalam, 1300 m, RAWI 29397! — Diyala: 10 km E Mandali, RECH. 12778-a!, Koma Sang prope Mandali, 180 m, RAWI 20660!, GUEST 789! Jabal Hamrin, SUTHERLAND 404!
Persia: W: Azerb.: Goja Bel inter Ahar et Tabriz, TERME 8087-E! Lur.: Shah Bazan, 500 m, KOEIE 418! S Luristan, 700—1000 m, JACOBS 6790!, 6809! Khuz.: Siachal, KOELZ 15261!

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

70. ***A. affine*** LEDEB., Fl. Ross. 4: 166 (1852).
Icon.: Tab. 5, fig. 70.
Typus: Hab. in provinciis caucasicis.

Bulbus 1—2 cm diametro; tunicae exteriores cinereae, in fibras dissolutae, tunicae bulbi juvenilis flavae. Scapus 25—80 cm altus, usque ad 1/3—1/2 foliorum vaginis laevibus vel scabridis obtectus. Folia 3—5, 2—5 mm lata, semicylindrica, canaliculata, fistulosa, margine ± scabrida. Spatha longe rostrata, rostro cito caduco. Umbella sphaerica, multiflora, densa; pedicelli inaequilongi, centrales longiores usque ad 3 (—4,5) cm longi, infra perigonium incrassati; pedicelli exteriores bracteolis tenuibus longis filiformibus raro latis ± lobatis suffulti. Perigonium 3,5—4 mm longum, urceolato-campanulatum, album viridi-nervosum; tepala inaequalia, obtusa; exteriora cymbiformia, elliptico-ovata; interiora sublongiora, anguste elliptico-oblonga, apice retusa. Filamenta quam tepala sublongiora, prope basin connata et tepalis adnata ibique ciliata; exteriora triangulari-subulata; interiora quam tepala latiora, tricuspidata, cuspis antherifera c. 1/3 lateralium filiformium attingens et quam basis elliptico-ovata aequilonga; antherae c. 12 mm longae. Stylus exsertus. Capsulae valvae vix 5 mm longae, late ellipticae usque orbiculares, anguste emarginatae.

Persia: N: Maz.: Supra Chalus, 900 m, ARCHIBALD 2325-b! Gilan: Ispili, LINDS. 1337! — W: Azerb.: Ali Bolaghi, KNAPP! Kurd.: 64 km N Sanandaj, 1800 m, FURSE 3443! Dezh Shahpur, 2100 m, IRANSHAHR & TERME 8004-E! Lur.: Bisheh, 1200—1400 m, RECH. 5676! Dow Rud, KOELZ 18470-a! Chamchid, 1500 m, KOELZ 16023! — Persia, AUCH. 2204!

Distr. gen.: Libanon, Syria, Anatolia australis, Persia, Caucasus.

71. ***A. subvineale*** WENDELBO, sp. nov.
Typus: LINDSAY 1162, BM!

Bulbus c. 1 cm diametro, subglobosus; tunicae exteriores cinerascenti-brunneae, in collum longum basin scapi tegens productae. Scapus 45—88 cm longus, tenuis, strictus, in sicco costatus, per 3/4 longitudinis vel ultra foliorum vaginis distantibus costatis glabris tectus. Folia 2—3, scapo breviora, 1—2,5 mm lata, semicylindrica, canaliculata, fistulosa, costata. Spatha caduca, ignota. Umbella sphaerica, multiflora, densa, aut non bulbillifera aut si bulbillifera pauciflora; pedicelli valde inaequales, usque ad 16 mm longi, basi bracteolis ovatis, 2 mm longis provisi. Perigonium tubuloso-campanulatum, lilacinum vel album (e collectore); tepala c. 3,5 mm longa, elliptico-oblonga, exteriora quam interiora manifeste latiora. Filamenta vix 4 mm longa, per c. 0,5 mm connata, tepalis basi adnata; exteriora e basi anguste triangulari subulata; interiora latiora, tricuspidata, cuspide mediana quam basi filamenti subbreviore, cuspides laterales quam cuspis mediana c. duplo longiores; antherae vix 1 mm longae, atroviolaceae. Stylus exsertus. Capsula ignota.

Persia: N: Maz.: 2 km a Ileka ad viam versus Nisind, JARDINE 872! Gil.: „Yehlah: Ispili, very tall, flowerless, bulb-head. The rare mean flowers are white or pale lilac. Meadows. Very local but not rare, August 1936", LINDS. 1162!

Distr. gen.: Endem.

72. ***A. longicuspis*** REGEL, Acta Horti Petrop. 3, 2: 45 (1875).
Icon.: Tab. 5, fig. 72. — REGEL, Reise in Turkestan 3, 1: tab. 6, fig. 1—3 (1876).
Typus: Prope Taka in Kokania, O. FEDTSCHENKO 4, LE!

Bulbus 1—2 cm diametro, ovoideus; bulbi novelli 2—4; tunicae exteriores subcoriaceae, cinerascenti-brunneae; tunicae exteriores bulborum novellorum cinerascenti-roseae. Scapus 40—110 cm longus, usque ad tertiam partem vel ad dimidium foliorum vaginis laevibus tectus. Folia 4—7, quam scapus multo breviora (2—) 5—17 mm lata, linearia, plana, laevia vel margine et subtus secus nervum medianum scabrida. Spatha longe rostrata; basis 1,5—2,5 cm longa; rostrum usque ad 12 cm longum, integre dehiscens. Umbella bulbillifera, ovoideo-sphaerica, densa, multiflora; pedicelli inaequales, usque ad 2,5 cm longi; bracteolae numerosae, 1—1,5 cm longae, in lacinias filiformes fissae; bulbilli 0,5—1 cm longi, apiculati, violacei. Perigonium ovoideum, fere album vel roseum, interdum intense roseum; tepala 3—4 mm longa, dorso laevia; exteriora quam interiora paulo longiora, anguste oblongo-ovata, acuminata; interiora elliptico-ovata, acuta. Filamenta quam tepala usque ad sesquilongiora, tepalis basi adnata, eciliata; exteriora lineari-subulata; interiora 3 (—5)-cuspidata, cuspis antherifera quam basis rectangularis manifeste longior et dimidium usque ad tertiam partem cuspidum lateralium filiformium contortorum aequans; antherae 1,2 mm longae, flavae. Stylus exsertus.

Persia: W: Kurd.: 32 km E Dezh Shahpur, 1800 m, FURSE 3438!; 2100 m, IRANSHAHR & TERMÉ 8003-E!
Turcomania: Ashkhabad: Suluklü ad fines Persiae, SINT. 1013!

Distr. gen.: Persia, Turcomania, Asia centralis.

73. ***A. erubescens*** C. KOCH, Linnaea 22: 242 (1849).
Syn.: *A. rudbaricum* BOISS. & BUHSE, Nouv. Mém. Soc. Nat. Mosc. 12: 215 (1860).
Icon.: Tab. 5, fig. 73.
Typus: „Am Strande des kaspischen Meeres in der frühern Herrschaft Kuba".

Bulbus 0,5—1,5 cm diametro; tunicae alternatim pallide brunneae distincte reticulato-nervosae et crassiores atrobrunneae, indistincte nervosae, in collum longum productae; tunicae bulbi juvenilis purpurascenti-brunneae, bulbillis paucis, atropurpureis, parvis. Scapus 20—40 (—70) cm altus, usque ad 1/2—2/3 foliorum vaginis tectus. Folia 3—4, 2—7 mm lata, canaliculata, laevia vel margine scabrida. Spatha mox caduca. Umbella sphaerica vel raro hemisphaerica, densa, multiflora; pedicelli inaequilongi, usque ad 2,5 (—4) cm longi, bracteolati. Perigonium 5—8 (—9) mm longum, purpureum, papilloso-scabridum; tepala acuta apice saepe recurva, exteriora oblongo-lanceolata, quam interiora lanceolata plerumque paulo longiora. Filamenta 2/3—3/4 tepalorum longitudinis aequantia, basi connata et tepalis adnata, ibique leviter ciliata, exteriora triangulari-subulata; interiora basi tepalorum aequilata, tricuspidata, cuspide antherifera 1/5—1/3 longitudinis baseos et 1/3—1/2 longitudinis cuspidum lateralium aequante. Stylus c. 1 mm longus.

Persia: N: Maz.: Chalandar, Sab. 143! N Sari, 200—300 m, Furse 7127! In valle fluvii Chalus: Pol-e Zanguleh, Rech. 6363-b! Kojur, inter Kinch et Dasht Nazir, 800—1300 m, Rech. 6630-d! Supra Allamul, 1980 m, Archibald 2409! In valle Haraz: Darli supra Panjab, 2000 m, Wdb. 1604! Kuh-i Nizwa: Inter Orim et Taru, 2050 m, Wdb. 1111! Inter Kangalo et Orim, 1900 m, Wdb. 1012! Gil.: Ispili, Linds. 1094! Rudbar, Darja-Del 7098-E! In jugo inter Astara et Ardabil, Walton 58!

Distr. gen.: Persia borealis, Caucasia, Tauria.

74. ***A. rotundum*** L., Spec. Plant. ed. 2: 423 (1762).
Icon.: Tab. 5, fig. 74.
Typus: „Habitat in Europa australiore".

Bulbus tunicis exterioribus brunneis, coriaceis, in parte superiore ± in fibras dissolutis; tunicae bulbi juvenilis atrae; bulbilli atri. Scapus 20—70 cm altus. Folia 3—5, quam scapus breviora, 2—7 (—10) mm lata, plana vel canaliculata, non fistulosa. Spatha rostro basin c. aequante, mox caduca. Umbella sphaerica, densa, interdum subcapitata; pedicelli inaequales, bracteolati. Perigonium campanulatum; tepala 5—7 mm longa, inaequalia, tepala exteriora quam interiora ± manifeste breviora et angustiora, cymbiformia, elliptica, dorso purpurascentia, sat grosse scabrido-papillosa; interiora ovato-elliptica usque elliptica, apice retusa, dorso minute scabrido-papillosa, apicem et marginem versus pallidiora. Filamenta quam tepala aliquantum breviora, connata et tepalis prope basin adnata, ciliata; exteriora triangulari-subulata; interiora quam exteriora duplo latiora, quam tepala angustiora, tricuspidata, cuspide mediana c. 1/4 longitudinis baseos rectangularis et c. 1/2 cuspidum lateralium attingente; antherae 1,5—2 mm longae. Stylus inclusus.

Iraq: Kurd.: Mosul: Ain Tellawi prope Mosul, coll. ign. 5756! In montibus supra Al Qosh, 16 km SE Dihok, Thesiger 733! Mosul, Thesiger 770! Arbil: Salah ad-Din, 800 m, Thesiger 787! Shaqlawa, 900—1400 m, Haines s. n.!, Gillett 8065! Hab as-Sultan Dagh N Koi Sanjak, 850 m, Rawi 28164!
Talish sec. Fl. URSS. 4: 247 (1935).
Persia: W: Azerb.: Inter Sarab et Kuhha-ye Sabalan, Terme 8108-E! Lur.: Ilam, Farahbakhsh 5057-E!

Distr. gen.: Europa, Anatolia, Syria, Iraq, Talish, Persia occidentalis, Caucasus.

75. ***A. notabile*** Feinbr., Palest. Journ. Bot. Jerusalem Ser. 3: 7 (1943).
Icon.: Tab. 5, fig. 75. — Feinbr., l. c.: fig. 1 a—b, 14.
Typus: Guest 4960, K!

Bulbus 1,5—2,5 cm diametro, stratis alternantibus tunicarum pallide brunneis, fibrosis usque reticulato-fibrosis et coriaceis rufo-brunneis; bulbillis paucis c. 1 mm longis, rufo-brunneis. Scapus 35—93 cm altus, leviter costatus, usque ad tertiam partem vaginis glabris tenuiter costatis tectus. Folia 3—5, 2—4 mm lata, non fistulosa, canaliculata, subtus carinata, costata, margine papillosa. Spatha mox decidua. Umbella hemisphaerica, densa; pedicelli usque ad 3 cm longi, inaequales, dense pustulosi, basi bracteolis c. 2 mm longis suffulti. Perigonium 3—3,5 mm longum, subglobosum, basi umbilicatum, album; tepala cymbiformia, late elliptico-ovata; exteriora apice cucullata acuta, mucronata, carinata, dorso et margine squamuloso-papillosa; interiora obtusa, fere laevia. Filamenta manifeste exserta; exteriora lineari-subulata, integra, tridentata vel tricuspidata; interiora multo latiora, tricuspidata, cuspis mediana antherifera quam lateralia filiformia contorta brevior, basi rectangulari aequilonga; antherae 1 mm longae, flavae. Stylus manifeste exsertus. Capsula perigonium persistens vix superans.

Iraq: Kurd.: Sul.: Qara Dagh, BUTHAINA MAKKI 460! Kirkuk: Darband-i Bazian, 900 m, RAWI 22797!, 22821! Mosul: Zawita, 800 m, 21 km E Dihok in pinetis, substr. dolomit. RECH. 11535!; 1120 m, GUEST 4960!

Distr. gen.: Endem.

76. ***A. subnotabile*** WENDELBO, Bot. Not. 122: 34 (1969).
Icon.: Tab. 5, fig. 76. — WENDELBO, l. c.: 30, fig. 1 G.
Typus: ARCHIBALD 2671, GB!

Bulbus vix 1 cm diametro, ellipsoideus; tunicae exteriores ut videtur integrae, subcoriaceae, interiores brunneae, reticulato-nervosae, partim in reticulum fibrosum fissae; tunica bulbi juvenilis purpurascenti-violacea. Scapus 37 cm longus, per 2/5 longitudinis vaginis foliorum obtectus; vaginae nervo mediano foliorum papilloso decurrente excepto laeves. Folia 4, quam scapus breviora, c. 3 mm lata, canaliculata, costata, non fistulosa, margine et secus carinam papilloso-scabrida. Spatha caduca. Umbella densa, sat pauciflora, subsphaerica; pedicelli inaequales, usque ad 8 mm longi, infra florem aliquantum indistincte verruculosi; bracteolae breves, latae, lobatae. Perigonium campanulato-urceolatum, album, nervis indistinctis apicem versus aliquantum rubescentibus; tepala inaequalia, subacuta, in vivo apiculo cucullato reflexo; exteriora quam interiora manifeste breviora et angustiora, cymbiformia, elliptico-ovata, in dorso imprimis secus carinam grosse papilloso-verruculosa; interiora c. 6 mm longa, ovata, basi contracta, dorso dense minute scabrido-papillosa. Filamenta inaequalia, prope basin connata et tepalis adnata, in parte inferiore ciliata; exteriora c. 4,5 mm longa, triangulari-subulata; interiora c. 5 mm longa, tricuspidata; cuspis antherifera vix plus quam 1/3 longitudinis baseos ovatae et c. 2/3 longitudinis cuspidum lateralium attingens. Capsula c. 3,5 mm longa.

Persia: W: Lur.: 30 km W Khorramabad, 1280 m, ARCHIBALD 2671!

Distr. gen.: Endem.

77. ***A. qaradaghense*** FEINBR., Palest. Journ. Bot. Jerusalem Ser. 3: 8 (1943).
Icon.: Tab. 5, fig. 77. — FEINBR., l. c.: fig. 2, 15.
Typus: EIG & FEINBRUN s. n., HUJ!

Bulbus c. 1 cm diametro; tunicae exteriores subcoriaceae, cinerascentes, integrae, interiores in fibras ± distincte reticulatas fissae; interdum bulbilli minuti, brunnei evoluti. Scapus 30—60 cm altus, ad 1/3—2/5 foliorum vaginis distantibus quarum

inferiores plerumque papillosae vel pubescentes obtectus. Folia 3—5, quam scapus breviora, 2—3 mm lata, plana, costata, margine scabrida. Spatha decidua, ignota. Umbella sphaerica usque raro fasciculato-subsphaerica, ± multiflora, ± densa; pedicelli subaequales, 8—20 mm longi, membranaceo-bracteolati, bracteolis 6—10 mm longis, in lacinias filiformes ± profunde fissis. Perigonium urceolatum, album; tepala 3—3,5 mm longa, cymbiformia, apice cucullata; exteriora elliptico-ovata, apice aliquantum recurva, nervo centrali carinato-elevato, dorso et margine ± dense scabrido-papillosa; interiora quam exteriora breviora et latiora, dorso laevia vel sublaevia. Filamenta connata et tepalis paulo supra basin adnata; exteriora lineari-subulata, quam tepala vix longiora; interiora tricuspidata cuspide antherifera dimidium baseos longitudinis et dimidium cuspidum lateralium aequante et tepala paulo excedente; antherae 1,2 mm longae pallide flavae. Capsula perigonium persistens subaequans.

Iraq: Kurd.: Mosul: 8 km S Zakho, Rech. 12147! 27 km NNE Zakho prope Sharanish, 1100 m, Rawi 23275! Jabal Bakhair prope Zakho, 800—1200 m, Rawi 23074! Sirsang, 1050 m, Haines 441! Sul.: Qara Dagh prope Kani Takht, M. Bardi Racha, 1440 m, Eig & Feinbr. s. n.! Arbil: Kholan, 1500 m, Rawi 13715!
Persia: W: Azerb.: In jugo 30 km NW Khvoy, 1700—1800 m, Rech. 32702! Sarab, Koelz 17032! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 35!

Distr. gen.: Endem.

78. ***A. trachycoleum*** Wendelbo, Bot. Not. 122: 35 (1969).
Icon.: Tab. 5, fig. 78. — Wendelbo, l. c.: 30, fig. 1 H.
Typus: Rechinger 11901, W!

Bulbus c. 1,5 cm diam.; tunicae exteriores ignotae; bulbilli 0,7—1 cm longi, cymbiformes, utrinque apiculati, brunnei, nitidi. Scapus c. 80 cm longus, per c. 1/3 vaginis foliorum scabridis obtectus. Folia 5, quam scapus breviora, c. 4 mm lata, canaliculata, nervis scabridis. Spatha caduca. Umbella 5 cm diam., sphaerica, multiflora, densa; pedicelli inaequales, exteriores c. 1,5 cm longi, basi bracteolis c. 1 cm longis laciniatis provisi, interiores c. 3 cm longi. Perigonium urceolato-campanulatum, album; tepala 5—6 mm longa, cymbiformia apice in vivo cucullata; exteriora ± anguste elliptico-ovata, dorso et margine scabrido-papillosa, obtusa; interiora ovata, laevia, apice subtruncata. Filamenta quam tepala aliquantum longiora, prope basin connata et tepalis adnata, indistincte ciliata; exteriora lineari-subulata; interiora tricuspidata, cuspide antherifera cuspides laterales et c. dimidium longitudinis baseos anguste rectangularis aequante. Stylus exsertus.

Iraq: Kurd.: Mosul: Ad confines Turciae prov. Hakari inter Dihok et Amadiyah in quercetis saxosis supra Sirsang, 1200 m, Rech. 11901!

Distr. gen.: Endem.

79. ***A. talyschense*** Miscz. in Grossh., Fl. Kawk. 1: 204 (1928), descr. ross.
Icon.: Tab. 6, fig. 79 — Grossh., Fl. Kawk. ed. 2, 2: tab. 14, fig. 5 (1940).
Typus: Lenkoran, 1800—2400 m.

Bulbus 0,75—1,5 cm diametro, ovoideus; tunicae exteriores pallide brunneae, subcoriaceae, imprimis apice in fibras fissae; tunicae bulbi juvenilis flavescentes; bulbilli pauci, flavescentes. Scapus 10—30 cm altus, usque ad 1/3 longitudinis foliorum vaginis laevibus obtectus. Folia 3—4, quam scapus breviora, c. 3 mm lata, anguste linearia, canaliculata, carinata, margine papilloso-scabrida. Spatha quam

umbella brevior, rostro 1/3 baseos longitudinis aequante, caduca. Umbella 10—15 mm diametro, sphaerica, densa, multiflora; pedicelli subaequales, quam perigonium 1,5—2-plo longiores, bracteolati. Perigonium late campanulatum, fere album, nervis validis sordide purpureis; tepala 5 mm longa, subaequalia, subacuta, margine et secus carinam tenuiter verruculoso-scabrida; exteriora anguste ovato-elliptica; interiora ovato-elliptica. Filamenta quam tepala paulo breviora, basi leviter ciliata, connata et tepalis adnata; exteriora e basi anguste triangulari subulata; interiora quam tepala basi aequilata, tricuspidata, cuspide antherifera c. 1/4 longitudinis baseos ovato-oblongae et dimidiam longitudinem cuspidum lateralium aequante. Stylus inclusus. Valvae capsulae c. 4 mm longae, suborbiculares.

Talish, sec. Fl. URSS. 4: 251 (1935).

Distr. gen.: Endem.

80. ***A. laeve*** WENDELBO & VON BOTHMER, sp. nov.
Icon.: Tab. 6, fig. 80; tab. 16, fig. 3.
Typus: WENDELBO 2025, BG!

Bulbus c. 1,5 cm diametro, latiuscule ovoideus; tunicae in collum usque ad 5 cm longum prolongatae, exteriores subirregulariter in fibras ± reticulatas fissae, cinerascenti-brunneae. Scapus 25—60 (—90) cm longus, per 1/3 longitudinis vaginis distantibus laevibus inclusus. Folia 3—4, in statu explanato 2—3 mm lata, canaliculata, margine laevia vel papilloso-scabrida. Spatha 2 cm longa, rostro basi 3—4-plo longiore, integre decidua. Umbella sphaerica, multiflora, densa; pedicelli inaequilongi, 2—20 (—25) mm longi, tenues, basi bracteolati. Perigonium urceolato-campanulatum, purpureum, pallide purpureum vel album, nervis pallide viridibus; tepala 3—3,5 mm longa, laevia; exteriora subcymbiformia, elliptica usque ovato-elliptica, apice rotundata; interiora elliptico-ovata usque ovata, subacuta. Filamenta aliquantum exserta, connata et tepalis paulo supra basin adnata, margine laevia; exteriora triangulari-subulata; interiora tricuspidata, cuspis mediana quam basis subrectangularis paulo brevior et circiter dimidium longitudinis cuspidum lateralium attingens; antherae vix 1 mm longae, atro-purpureo-violaceae vel flavae. Stylus exsertus. Capsula c. 3 mm longa.

Iraq: Kurd.: Mosul: Jabal Khantur N Zakho, 1200 m, RECH. 12072! 5 km S Zakho, RECH. 12145! Prope Sirsang, 800 m, RECH. 11611! Qaiyara, 200 m, coll. ign. 136! Jabal Bakhair, 700—1200 m, RAWI 23029!, 23075! Dinarta, CHAPMAN 26139! 85 km NW Mosul, 700 m, RAWI 23124 p. p.! Arbil: Kew-e Rash, prope Ranya, 1000 m, RAWI 23784! Kirkuk: Prope Chamchamal, HAINES s. n.! — Diyala: Jabal Hamrin, 55 km NE Baquba, 120 m, STUTZ 1360! 54 km SE Mandali, RECH. 12743! 10 km E Mandali ad ripam sinistram fluvii, RECH. 12778-b! Makatu prope Mandali, GUEST 862! Ad stationem munitam Chlat, RAWI & HADDAD 25111!
Persia: W: Kurd.: 100 km N Kermanshah versus Sanandaj, 1500 m, WDB. 1990! Kermansh.: Rijāb, IRANSHAHR & TERMÉ 8005-E! Lur.: 30 km S Kuh-e Dasht, 1300 m, WDB. 2025! 30 km W Khorramabad, 1280 m, ARCHIBALD 2675!

Distr. gen.: Endem.

The new species is related to *A. atroviolaceum* BOISS. but is distinguished by its more slender habit, by the usually smaller head, the outer tepals being smooth along margin (not very finely scabrid) and smooth on the back (not papillose-verruculose), as well as in having eciliate filaments. The flower colour of *A. laeve* is either white or rather pale purplish-violet, at least in herbarium specimens. *A. atroviolaceum* has very dark purple-violet or rarely greenish-white flowers.

It seems that *A. atroviolaceum* is typically bound to fields whereas the new species is growing on stony dry slopes outside fields. It is also interesting to note that whereas *A. laeve* has been collected many times in East and Northeast Iraq, *A. atroviolaceum* has hardly been collected at all in that area.

81. ***A. atroviolaceum*** Boiss., Diagn. Pl. Or. Nov. Ser. 2, 7: 112 (1846).
Icon.: Tab. 6, fig. 81.
Typus: Kotschy 450, G!

Bulbus 1,5—2,5 (—4) cm diametro, late ovoideus; bulbi tunicae exteriores cinerascenti-brunneae, in fibras indistincte reticulatas fissae, in collum distinctum productae; tunicae bulbi juvenilis flavescentes; bulbilli numerosi, pallide brunnei. Scapus (40—) 60—100 (—150) cm altus, ad 1/4—1/3 foliorum vaginis glabris obtectus. Folia 4—5, quam scapus breviora, 2—10 (—15) mm lata, linearia, plana, margine et ad carinam scabrida. Spatha citissime caduca, longe rostrata. Umbella sphaerica, multiflora, densa; pedicelli inaequales, usque ad 2,5 cm longi, exteriores bracteolati. Perigonium urceolato-campanulatum, atro-purpureo-violaceum, raro virescenti-album; tepala 3,5—4,5 mm longa, obtusa; exteriora ± elliptico-ovata, dorso carinata, ± verruculoso-scabrida, margine minute scabrida; interiora ± elliptica apice rotundata, laevia vel sublaevia. Filamenta quam tepala aliquantum longiora, connata et perigonio basi adnata, ciliata; exteriora integra, triangulari-subulata; interiora basi tepalorum aequilata, tricuspidata, cuspide mediana c. 3/5 longitudinis partis basalis ellipticae et dimidiam longitudinem cuspidum lateralium attingente; antherae c. 1 mm longae, atro-violaceo-purpureae. Stylus exsertus. Capsula perigonio persistente circiter aequilonga.

Iraq: Kurd.: Sul.: In alveo rivi Cham-i Gogasur, c. 18 km W Penjwin, Rech. 12333! Persia: **N**: Gorg.: Shahkuh, Koelz 16338!, 16461! Ramian, Shar. 69! Maz.: Supra Chalus, 900 m, Archibald 2323! Kuh-i Nizwa: Orim, Wdb. 1159! Gil.: Ispili, Linds. 1301! — **W**: Azerb.: Senjanab, Knapp! Rezaiyeh secus fl. Shahr Chay, Knapp s. n.! Laleh prope Tabriz, Mird. 1540! Kurd.: Dezh Shahpur, Iranshahr & Termé 7093-E! Sanandaj, 1200—1400 m, Jacobs 6982! 30—64 km N Sanandaj, 1800 m, Furse 3443!, Grant 16055! Kermansh.: 29 km W Karand, 1500 m, Grant 16020! Rijab, Iranshahr & Termé 8005-E! 100 km N Kermanshah versus Sanandaj, 1300 m, Wdb. 1995! Ham.: Inter Qazvin et Hamadan, 1200—1500 m, Furse & Synge 685! Aq Bolagh-e Aqdaq, 100 km N Hamadan, Rioux & Golv. 33! Arak: M. Rasvand, Str.! Arak, Str.! Bakht.: Chashmehghirin, Koelz 15313! Lur.: Ti, 1500 m, Koelz 15958! Dow Rud, Koelz 18089!, 18094!, 18123! Chamchid, 1500 m, Koelz 16002!, 16022! Kebara, Koelz 18271! Ilam, Farahbakhsh 5058-E! Khuz.: Ahvaz, Koelz 14880! 25 km NE Haft Khel, Bent & Wr. 503—407! — **S**: Kerm.: Kuh-e Hazaran, Gabriel 202! Kerman, 2000 m, Bornm. 4773! Fars.: Namak Darya prope Shiraz, Stapf 1981! Kuh Banu, Stapf 1982! Ganaveh, Stutz 948! Infra Emamzadeh Sabz Pushan, Wdb. 894! Sabz Pushan prope Shiraz, Ky. 450! — **E**: Khor.: Sarbisheh, Manuch. 5059-E! Inter Abbasabad et Mashhad, 1000—1500 m, Schmid 6099! Prope Neyshabur, Rech. 5258! — **C**: Tehr.: Prope Polur, 1900 m, Gilli s. n.! Evin, Esfand. 7056-E! 32 km W Firuzkuh, 1800 m, Furse 3096! Qazv.: In valle fluvii Karaj, Rech. 812!, Jardine 863! Qom: Rahjerd, 1700 m, Koeie 1664! Turcomania: Ashkhabad, Firyuza, Sint. 693!
Afghanistan: **NW**: Maimana: Prope Taghab-i Shirin, 500 m, Hdg. & Wdb. 3590! Herat: Obeh, Lindb. 1183! — **SE**: Orozgan: Prope Orozgan, Lindb. 924/1960!, 925/1960! — **E**: Kabul: 50 km a Kabul versus Gardez, 1900 m, Rech. 31493! Ghazni: Inter Qarabagh et Sang-i Masha, 2400 m, Rech. 17422! Ghazni, Jörgensen s. n.! Logar: Baraki Radjah, Neub. 693! Wardak: 5 km S Saiyidabad, Ekb. W-9585!

Distr. gen.: Anatolia orientalis, Tauria, Iraq boreo-orientalis, Persia, Afghanistan, Caucasus, Syr Darya.

82. ***A. Ampeloprasum*** L., Spec. Plant. 294 (1753).

Bulbus usque ad 3 cm diametro, globosus; tunicae exteriores cinereae, papyraceae, nervis approximatis tenuibus, fissiles; bulbilli numerosi, rite longissime stipitati, flavi vel cinerascentes. Scapus 50—100 cm altus, validus, foliorum vaginis laevibus ad 1/3—2/5 obtectus. Folia 5—8, quam scapus breviora, 8—17 mm lata, plana, carinata, margine scabrida vel laevia. Spatha mox caduca, longe rostrata. Umbella sphaerica, multiflora, densa; pedicelli usque ad 4 cm longi, exteriores bracteolati. Perigonium ovoideo-campanulatum, umbilicatum, purpurascens vel raro album; tepala 3,5—5 mm longa, dorso verruculosa, inaequalia, anguste ovata usque ad obovata, exteriora cymbiformia. Filamenta quam tepala paulo usque ad sesquilongiora, sparse ciliata; exteriora lanceolato-linearia, quam petala basi paulo angustiora; interiora tricuspidata, basis elliptica quam tepala aequilata vel latior, cuspis antherifera partem basalem ± aequans, et quam cuspides laterales filiformes fragiles contortae 1/2—1/3 brevior; antherae 1—1,3 mm longae, atropurpureae. Stylus exsertus.

Distr. gen. speciei: Europa, Regio Mediterranea, Asia austro-occidentalis.

— — subsp. ***Ampeloprasum***

Syn.: *A. leucanthum* C. KOCH, Linnaea 22: 240 (1849).

Icon.: Tab. 6, fig. 82 b. — FEINBR., Palest. Journ. Bot. Jerusalem Ser. 3: 19, fig. 9—12 (1943).

Typus: „Habitat in Oriente, inque insula Holms Angliae".

Bulbilli bulbum cingentes, bulbi tunicis inclusi. Folia margine scabrida vel laevia. Tepala 3,5—5 mm longa; exteriora elliptica subacuta quam interiora aliquantum angustiora et longiora; interiora elliptica usque ad obovata apice rotundata.

Iraq: Kurd.: Mosul: Prope Sharanish in montibus calc. N Zakho, 1000 m, RECH. 11480 (fl. albi)! Prope Mosul, 200 m, LOWE 287! Arbil: M. Baradost, 1440 m, LOWE 247! Hajji Omran, 1800 m, HAINES s. n.! — Diyala: Shahraban in cultis, RECH. 9717!

Distr. gen. subspeciei: Europa, Regio Mediterranea, Asia austro-occidentalis usque ad Iraq et Caucasum.

— — subsp. ***iranicum*** WENDELBO, subsp. nov.

Icon.: Tab. 6, fig. 82a.

Typus subspeciei: RIOUX & GOLVAN 34, W!

Bulbilli longe stipitati foliorum vaginis manifeste supra bulbum inclusi. Folia margine laevia. Tepala 3,5—4,5 mm longa, acuta vel subacuta, exteriora anguste ovata, quam interiora ovata paulo longiora.

Persia: W: Azerb.: Ser, KNAPP! Kurd.: Bijar: Kuh-i Hamzah 'Arab, 2100—2500 m IRANSHAHR 8089-E! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, RIOUX & GOLV. 34! Bakht.: Gahar, 2400 m, KOELZ 18040!, 18040-a! Chashmehghirin, KOELZ 15266! Lur.: Dow Rud, 1700 m, KOELZ 15607! Arak: Inter Arak et Qom, STR. 26! Prope Arak, STR. s. n.! — S: Fars.: Chah-i Bid Kuh-e Barfi prope Shiraz, 2600 m, STAPF 1991! — C: Tehr.: 5 km NW Polur, 1520 m, ARCHIBALD 2574! In jugo Kandavan, 2080 m, GILLI s. n.! — Persia, STAPF 1973!

Distr. gen. subspeciei: Anatolia austro-orientalis, Persia occidentalis.

Sect. *Codonoprasum* (RCHB.) ENDL., Gen. Plant.: 146 (1836).

Syn.: Sect. *Crommyum* WEBB & BERTH. subsect. *Haplostemon* BOISS. § *Codonoprasa* BOISS., Fl. Or. 5: 254 (1882). Sect. *Haplostemon* (BOISS.) HALÁCSY, Consp. Fl.

Graec. 3: 240 (1904) p. p. Sect. *Rhynchoprason* Hermann, Feddes Repert. 46: 58 (1939). Sect. *Haemoprason* Hermann, ibid.

Scapus in parte supraterranea foliorum vaginis ± alte obtectus. Spatha bivalvis, valvis sensim in caudas longas protractis, cauda longiore umbellam plerumque excedente, valvis viridibus vel crasse viridi-nervosis. Perigonium campanulatum. Filamenta aequalia, anguste triangulari-subulata. Ovarium foveolis nectariferis carens vel foveolae minutissimae inconspicuae. — Typus sectionis: *A. oleraceum* L.

1a. Perigonium album, nervis coloratis provisum vel eis carens 2
b. Perigonium coloratum 4
2a. Filamenta manifeste exserta, tepalis usque ad sesquilongiora. Tepala 2,5—3,2 mm longa ..... 87. *A. myrianthum* Boiss.
b. Filamenta quam tepala breviora vel paulo longiora. Tepala 4—5 mm longa 3
3a. Tepala nervo manifeste purpureo provisa, elliptico-ovata vel ovata..... ..... 89. *A. vescum* Wendelbo
b. Tepala nervo colorato carentia, anguste subrectangularia .... 86. *A. convallarioides* Grossh.
4a. (1) Filamenta quam tepala longiora ..... 88. *A. stamineum* Boiss.
b. Filamenta quam tepala breviora 5
5a. Tepala 7—8 mm longa. Pedicelli inaequales, perigonio paulo breviores vel eo usque ad 2 (—3)-plo longiores ..... 85. *A. Kunthianum* Vved.
b. Tepala 5—6 mm longa. Pedicelli valde inaequales, longissimi perigonio usque ad 9-plo longiores 6
6a. Perigonium sub anthesi nitidum, laete vel intense roseum .... 83. *A. paniculatum* L.
b. Perigonium opacum, sordide roseum ..... 84. *A. lenkoranicum* Miscz.

83. ***A. paniculatum*** L., Syst. Nat. ed. 10: 978 (1759).
Icon.: Tab. 6, fig. 83.
Typus: Non indicatus.

Bulbus 0,75—1,5 cm diametro, ovoideus; tunicae exteriores cinerascentes usque brunnescentes, parallele nervosae, saepe prope basin et apicem fissae. Scapus 20—50 cm altus, ad 2/5—2/3 foliorum vaginis glabris obsitus. Folia 3—4, superiora scapum excedentia, 1—2,5 mm lata, ± convoluta, scabrida vel glabra. Spatha longicaudata bivalvis, valvis umbellam aequantibus vel ea usque ad quadruplo longioribus. Umbella fasciculata, laxa, ± multiflora; pedicelli inaequilongi, 1—5 cm longi, bracteolati. Perigonium anguste campanulatum, in sicco pallide roseum nervis saturatioribus; tepala 5—6 mm longa, elliptico-oblonga, apice truncata usque rotundata, in vivo verisimiliter cucullata. Filamenta tepala vix aequantia, subulata, tepalis per c. 1,5 mm adnata; antherae 1 mm longae, flavae. Stylus 1,5—2 mm longus. Capsula c. 5 mm longa, depresso-globosa, emarginata.

Iraq: Kurd.: Kirkuk: Chamchamal, Rech. 10057! 5 km W Chamchamal, 800 m, Rawi 21681 p. p.! Jarmo, Helbaek 1854!; 750 m, Haines W-319! 37 km E Kirkuk, 600 m, Rech. 10029-b! Darband-i Bazian, Rech. 10576!; 900 m, Rawi 22817! Aqrah, 1000 m, Rawi 11438! Sul.: Goizha prope Sulaymaniyah, 1100 m, Rawi 11681! Inter Halabja et Tawilla, 1400 m, Rawi 22138! Tawilla, 1360 m, Rawi 21934!, 21863!; 1400—1600 m, Rech. 10259! Inter Sulaymaniah et Dokan in jugo prope Surdash, 1000 m, Rech. 12466! Prope Penjwin, Rech. 12271! Arbil: Gali Dergala 35 km NW Ranya, 1300 m, Rawi 28912! In faucibus prope Rawandiz, 850 m, Guest 15479!; 700 m, Rech. 11835!, Roberts in Haines s. n.! Handiyan ad radices M. Baradost, Thesiger 846! M. Qandil

inter Shahidan et Pushtashan, 1000 m, RECH. 11727! Mosul: In jugo Ispindari prope Suwara Tuka, 1250 m, CHAPMAN 26313!
Persia: W: Kermansh.: „Bivamdj, Tanoureh", IRANSHAHR 8090-E! Lur.: Shah Bazan, 500 m, KOEIE 1659! Bakht.: Taleh, 3000 m, KOEIE 15213! Chashmehghirin, KOELZ 15278!

Distr. gen.: Europa australis, Anatolia, Iraq, Persia.

The group of species around *A. paniculatum* L. is a difficult one and I am not quite sure whether the material from our area is identical with the European one.

84. ***A. lenkoranicum*** MISCZ. in GROSSH., Fl. Kawk. 1: 214 (1928).
Icon.: Tab. 6, fig. 84.
Typus: Lenkoran.

Bulbus 1—2 cm diametro, tunicis exterioribus brunnescenti-cinereis, papyraceis. Scapus 20—50 cm altus. Folia 4—5, filiformia, 1—2 mm lata. Umbella fasciculata, laxa; pedicelli inaequales usque ad 35 mm longi, bracteolati. Perigonium anguste campanulatum, 5—6 mm longum, sordide lilacino-roseum; tepala anguste elliptico-oblonga, obtusa, apiculata. Filamenta tepalis breviora vel ea aequantia, per c. 1/5 connata et tepalis adnata, subulata; antherae flavae. Stylus c. 2 mm longus. Capsula 4—5 mm longa, valvis latiuscule obovatis.

Talish, sec. GROSSH., l. c.
Persia: N: Gorg. In silvis Golestan, 900 m, FURSE 8988!; 1000 m, WALTON 152! Maz.: In valle Haraz: Zardman, 600 m, WDB. 1505! In valle Talar: Prope Doab, 1100 m, WDB. 1001! Distr. Kojur: Inter Zanus et Kinch, 1300—1600 m, RECH. 7485! Inter Kinch et Dasht Nazir, 800—1300 m, RECH. 6649! — E: Khor.: Kotal-e yek Chenar, KOELZ 16702!
Turcomania: Ashkhabad: Suluklü ad fines Persiae in montosis ad Saramsaklü, SINT. 1146!

Distr. gen.: Endem.

85. ***A. Kunthianum*** VVED., Fl. URSS. 4: 207 (1935).
Syn.: *A. lepidum* KUNTH, Enum. Pl. 4: 408 (1843) p. p., non LEDEB. (1833).
Icon.: Tab. 6, fig. 85. — Fl. URSS. 4: tab. 12, fig. 2 (1935).
Typus: „Ad rupes prope font. acidul. Dipsui Schuscha versus occidentem", HOHENACKER, LE.

Bulbus 0,75—1 cm diam., ovoideus; tunicae exteriores atrocinereae, integrae, in collum distinctum productae. Scapus 15—25 cm altus, ad 1/2 foliorum vaginis laevibus vel ad nervos minute papilloso-scabridis obtectus. Folia 2—3, scapum excedentia, 0,5—1 mm lata, canaliculata, manifeste costata, ad marginem et ad nervos ± scabrido-papillosa. Spatha bivalvis; valva longissima usque ad 4 cm longa. Umbella fasciculato-hemisphaerica, densiuscula; pedicelli inaequilongi, usque ad 2 cm longi, bracteolati. Perigonium anguste campanulatum, pallide roseum, purpureo-nervosum; tepala 7—8 mm longa, anguste elliptico-oblonga, apice rotundata. Filamenta quam tepala aliquantum breviora, per c. 1/5 connata et tepalis adnata, subulata. Stylus inclusus; stigma capitatum. Ovarium elongatum, basi in stipitem attenuatum. Capsulae valvae obcordatae, c. 4—5 mm longae.

Persia: W: Azerb.: In declivibus borealibus Kuhhaye Sabalan infra Khiyav, 1600—3550 m, SCHMID 6533!

Distr. gen.: Persia boreo-occidentalis, Caucasus.

86. ***A. convallarioides*** Grossh. in Grossh. & Schischkin, Pl. Or. Exs. No. 107 (1924).
Icon.: Tab. 6, fig. 86.
Typus (isotypus): Erivan: Dzhirvish, LD!

Bulbus 10—15 mm diametro, ovoideus; tunicae exteriores cinerascentes, papyraceae; interdum bulbilli flavescentes tenuiter parallele nervosi evoluti. Scapus 36—70 cm altus, ad dimidium circiter foliorum vaginis laevibus tectus. Folia 3—4, scapo breviora, 1—1,8 mm lata, plana vel canaliculata, costata, laevia. Spatha bivalvis; valvae usque ad 5 cm longae, rostro basi dilatata aequilongo vel longiore. Umbella sphaerica vel fasciculato-sphaerica, multiflora, densa; pedicelli inaequilongi, usque ad 30 mm longi, bracteolati. Perigonium campanulatum, album; tepala 4—5 mm longa, subaequalia, anguste subrectangularia apice subtruncata in vivo cucullata, nervo mediano incrassato. Filamenta tepala aequantia vel paulo superantia, subulata, per 1/5 connata et tepalis adnata; antherae c. 1 mm longae, flavae. Ovarium elongatum, basin versus attenuatum. Stylus e perigonio exsertus; stigma capitatum. Capsula tepala persistentia paulo superans, valvis ellipticis subemarginatis.

Iraq: Kurd.: Mosul: Sirsang, 1200—1500 m, Rech. 11571-b!, 11900!, Haines 520! Ad pontem prope Mindan, 300 m, Chapman 26196! Arbil: Inter Arbil et Rawandiz, 700 m, Bornm. 1870!
Turcomania: Kopet Dagh, Kara Kala, Linczevski s. n.! Kizyl Arvat, Kara Kala prope Arabadshik, Sint. 1987!
Persia: W: Kurd.: 32 km E Dezh Shahpur, 1800 m, Furse 3414! Arak: M. Rasvand, Str. 230! — S: Fars.: Inter Shiraz et Tal-e Khosrovi, Behb. 957-E! Inter Ardakan et Tal-e Khosrovi, Davis 773!

Distr. gen.: Iraq bor.-or., Persia, Turcomania, Caucasus.

Grossheim, Fl. Kawk. 2: 134 (1940), treated *A. convallarioides* as a synonym of *A. myrianthum* Boiss. But the two species are clearly separated first of all by the difference in the size of the perigon. On the other hand I am not sure about the connection between *A. pallens* L., *A. Coppoleri* Tin. and *A. convallarioides*.

87. ***A. myrianthum*** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 5: 59 (1844).
Syn.: *A. exiguiflorum* Hayek & Siehe, Ann. Nat. Hofmus. Wien 28: 185 (1914).
A. trichocephalum Náb., Publ. Fac. Sci. Univ. Masaryk (Brno) 105: 33 (1929).
Icon.: Tab. 6, fig. 87. — Hayek & Siehe, l. c. tab. 13, fig. 3. Náb., l. c., 34, fig. 6, et 111: tab. 4, fig. 4 (1929).
Typus: „Hab. in humidis ad rupes thermarum Hierapolis in paludosis aestate exsiccatis inter juncos in valle Meandri prope Nozhbazar", Boissier, G!

Bulbus c. 1 cm diametro, ovoideus; tunicae exteriores atrobrunneae, nervis confertis, basi et apice fissae. Scapus 25—75 (—150?) cm altus, ad 1/3—1/2 foliorum vaginis laevibus obsitus. Folia 2—3, scapum circiter aequantibus, 1—2,4 mm lata, semicylindrica, canaliculata, in parte inferiore fistulosa. Spatha bivalvis, valvis e basi ovata caudatis, umbellam aequantibus vel ea raro longioribus. Umbella sphaerica, multiflora, densa; pedicelli subinaequales, plerumque c. 10 mm raro usque ad 24 mm longi, filiformes, bracteolati. Perigonium campanulatum, album; tepala 2,5—3,2 mm longa, saepe subinaequalia, anguste elliptico- usque spathulato-oblonga, obtusa, apice rotundata, nervo basi incrassato, interiora saepe aliquantum longiora et angustiora. Filamenta tepalis usque ad sesquilongiora, subulata, prope basin connata et tepalis adnata, antheris 0,6 mm longis, flavis. Stylus exsertus, ovarium substipitatum. Capsula perigonio persistente longior.

Iraq: Kurd.: Mosul: Ad confines Turciae prope Sharanish, in montibus calc. N Zakho, Jabal Khantur, 1480 m, RECH. 10867!, RAWI 23408! Arbil: Gali Warta, 30 km NW Ranya, 950 m, RAWI 28810!
Persia: W: Kermansh.: Qasr Shirin, NÁB. 2336! 44 km SW Shahabad inter Shahabad et Ilam, BENT & WR. 602—603!

Distr. gen.: Regio Mediterranea orientalis, Iraq, Persia occidentalis.

88. ***A. stamineum*** BOISS., Diagn. Pl. Or. Nov. Ser. 2, 4: 119 (1859).
Syn.: *A. pseudoflavum* VVED., Bull. Univ. As. Centr. 19: 123 (1934).
Icon.: Tab. 6, fig. 88; tab. 17, fig. 1.
Typus (syntypi): „Hab. in Laconia, Caria, Lydia, Cilicia, Syria, Libano, Palaestina, prov. Ghilan Persiae borealis", G!

Bulbus 0,75—1 cm diametro; tunicae exteriores atro-cinerascenti-brunneae, nervis ± distinctis parallelis, interdum in fibras dissolutae; tunicae intermediae saepe aurantiacae. Scapus 10—25 (—35) cm altus, plerumque ± curvatus, glaber vel raro papilloso-scabridus vel puberulus, saepe purpurascens, usque ad 1/3—2/3 foliorum vaginis glabris vel ± papilloso-scabridis vel raro pubescentibus tectus. Folia 3—4, scapo longiora, 0,5—1,5 mm lata, semicylindrica, supra canaliculata, fistulosa, margine nervisque laevia vel scabrida. Spatha bivalvis, valvis longe caudatis, quam umbella 1—3-plo longioribus. Umbella fasciculata usque fasciculato-hemisphaerica, pauci- usque multiflora, laxa; pedicelli inaequales, perigonio 2—5 (—9)-plo longiores, bracteolati. Perigonium urceolatum, sordide lilacinum usque violaceum, nervis saturatioribus, rarius flavescens; tepala 3,5—5 mm longa, elliptico-oblonga, exteriora cymbiformia, apice rotundata vel truncata, saepe apiculo reflexo provisa, in vivo verisimiliter cucullata. Filamenta quam tepala 1¼—1½-plo longiora, subulata, tepalis usque paulo supra basin adnata, quam tepala saepe saturatius colorata vel albescentia; antherae 0,8 mm longae, flavae (vel violaceae?). Ovarium sphaericum, subsessile, verruculosum. Stylus filiformis, exsertus. Capsula valvis c. 4 mm longis late obcordatis.

Iraq: Kurd.: Mosul: Sawara Tuka, 1500 m, RECH. 11571-a! In cacumine Zawita, 2100 m, RECH. 11995! Zawita, 750—800 m, LEATHERDALE 109!, GILLETT 8352! Jabal Khantur prope Sharanish, 1480 m, RECH. 10868-a!, RAWI 23422! Sharanish, 990 m, RAWI 23177! 8 km S Zakho, RECH. 12146! Inter Dagh-al Radziem et Sharanish, 900 m, RECH. 12112! 85 km NW Mosul, 700 m, RAWI 23125! Mosul, coll. ign. 120!, coll. ign. 8755—A! Kirkuk: Inter Kirkuk et Altin Köprü, ERDTMAN & GOEDEMANS in RECH. 15522! 37 km E Kirkuk, 600 m, RECH. 10029-a! Kirkuk, 400 m, BORNM. 1866!, RAWI 27891! Jarmo, HELBAEK 1285!, 1795!, HAINES W-320! 7 km S Darbandikhan, BARKLEY 5176!, SW Darbandikhan, 600 m, POORE 369! 5 km W Chamchamal, 800 m, RAWI 21681 p. p.! 20—25 km E Qara Anjir, 800 m, RAWI 21647! Darband-i Bazian, RECH. 12192! Arbil: Jabal Qara Choq, 400—600 m, GILLETT 11239!, 11240! Sul.: In jugo Malakawa prope Penjwin, 1400 m, RECH. 12317!, RAWI 22464! Kanispit inter Halabja et Tawilla, 2000 m, RAWI 22193! Sosakan prope Tawilla, 1200 m, RECH. 10148! Sulaymaniyah, GRAHAM 761! 29 km W Sulaymaniyah, RECH. 12217! Goizha, 1100—1400 m, GILLETT 11679! — Diyala: Khanaqin, HAINES W-1124!, W-1125! 10 km E Mandali, RECH. 9644! Jabal Hamrin, HAINES W-717! Koma Sang prope Mandali, 180 m, RAWI 20633! Kut al-Imara: 3 km SE Badrah, RECH. 13984! Fakka Laqlaq, 100 m, 100 m, RAWI 25824!
Talish: sec. GROSSH., Fl. Kawk. 2: Tab. geogr. 158 (1940), sub *A. pseudoflavo*.
Persia: N: Gil.: Gilan, AUCH. 5387! — W: Azerb.: E Maku, 1280 m, ARCHIBALD 2245! Bazargan, 2000 m, GRANT 16217! Senjanab, KNAPP s. n.! 44° 46′ N, 39° 6′ E, 1500 m, WALTON 45! Goja Bel, TERMÉ 8104-E! Kurd.: 18 km N Sanandaj, 1500 m, WDB. 1878! 100 km N Kermanshah versus Sanandaj, 1500 m, WDB. 1906! Kermansh.:

24 km NW Karand, 1400 m, ARCHIBALD 1843! Qasr Shirin, Naft-e Shah, FARAHBAKHSH 5054-E! Rijab, IRANSHAHR 8088-E! Tang-e Ab, BEHB. 5048-E! Khusrowvi, FARAHBAKHSH 5056-E! Ham.: ESE Rowan, 1800 m, ARCHIBALD 2591! Khuz.: 25 km NE Haft Gel, BENT & WR. 503—403! Lali, 50 km NW Masjed Soleyman, 1260 m, ŽUMER 567! Lur.: 30 km S Kuh-e Dasht, 1300 m, WDB. 2045! Gusheh, KOELZ 18605!, 18622! Kebara, KOELZ 18279-a! Arak: Inter Qom et Arak, STR. 25! Bakht.: Shah Bazan, 500 m, KOEIE 419!, 1658! Galli Sur, 2400 m, KOELZ 18034! Tali Mansur, KOELZ 15088! Seghahan, KOELZ 15008! — **S**: Fars.: Takht-e Jamshid, WDB. 811! Kazerun, STAPF 1975! Inter Borazjan et Dalaki, STAPF 1977! Shiraz, STAPF 1975! Inter jugum Chah-e Chaghak et Tarom, 1400 m, RECH. 3203! Inter Shiraz et Jahrom, 1090 m, MODJAB 8041-E! Inter Shiraz et Kazerun, MODJAB 8040-E! Hajjiabad prope Tarom, 900 m, RECH. 3311!, 3477! — **C**: Tehr.: E Rudehen, 1520 m, ARCHIBALD 2543! Inter pagum Damavand et lacum Tar, 2500 m, GILLI s. n.! Qazv.: Prope Karaj in montibus Kuh Dashteh, 1350 m, RECH. 786! In montibus Halkedar prope Mardabad, 1300 m, RECH. 1020! Prope Kalak, RECH. 993! Vardeh prope Karaj, GAUBA, MIRD. 1541! Damgh.-Semn.: Sorkheh prope Semnan, 1600 m, RECH. 1232!

Distr. gen.: Regio Mediterranea orientalis, Iraq, Talish, Persia.

VVEDENSKY, Fl. URSS. 4: 203 (1935), distinguished, apparently with some doubt, between the three species *A. stamineum* BOISS., *A. kossoricum* FOMIN and *A. pseudoflavum* VVED. I am not able to find any real correlation in the dried material between flower colours and other characters. *A. stamineum* as treated here is, however, undoubtedly a variable species.

89. ***A. vescum*** WENDELBO, Acta Horti Gotob. 28: 31 (1966).
Icon.: Tab. 6, fig. 89; tab. 17, fig. 2. — WENDELBO, l. c.: Fig. 8f—i.
Typus: KOELZ 14987, W!

Bulbus usque ad 8 mm crassus, ovoideus usque subglobosus; tunicae exteriores collo brevi provisae, atrobrunneae, coriaceae, nervis confertis crassis parallelis vel subreticulatis; tunicae intermediae flavescentes, crassae, similiter nervosae; bulbilli pauci, c. 10 mm longi, naviculiformes, pallide flavi usque pallide brunnei, nervatura subreticulata. Scapus 15—22 cm altus, tenuis, leviter curvatus, in sicco distincte costatus, ad summum ad dimidium usque vaginis foliorum laevibus obtectus. Folia 3 (—4), scapo breviora, c. 0,4 mm diametro, filiformia, sexangulariter costata, non fistulosa. Spatha bivalvis; valva longissima longe caudata, basi ovata 6 mm longa inclusa usque ad 32 mm longa, valva altera breviter caudata, quam 12 mm in toto non longior. Umbella 4—11-flora, fasciculata; pedicelli c. 7 mm longi, bracteolati. Perigonium urceolatum; tepala apice reflexa cucullata, alba, roseo-nervosa; exteriora 5 mm longa, elliptico-ovata; interiora aliquantum longiora et angustiora, ovata. Filamenta linearia, per c. 0,8 mm connata et tepalis adnata; exteriora c. 4 mm longa, interiora aliquantum longiora; antherae vix 1 mm longae, flavae. Ovarium ellipsoideum, 3-sulcatum. Stylus c. 1 mm longum, stigmate capitato.

Distr.: Persia: **W**: Khuz.: Sarbesha, KOELZ 14987!

Distr. gen.: Endem.

Subgen. ***Molium*** (KOCH) WENDELBO, Bot. Not. 122: 26 (1969).
Syn.: Sect. *Molium* G. DON ex KOCH, Syn. Fl. Germ.: 714 (1837) p. p.

Bulbus solitarius, saepe bulbillifer; tunicae exteriores saepe crassae, sculptae. Folia vaginis subterraneis vel supraterraneis ± bene evolutis; lamina plana; apex non cucullatus. Perigonium stellatum usque campanulatum, proportione magnum. Ovarium foveolis nectariferis provisum vel destitutum. Stigma integrum vel trilobum. — Typus subgeneris: *A. neapolitanum* CYR.

Sect. *Molium*

Bulbus solitarius, tunicis exterioribus crassis saepe foveolato-reticulatis sculptis. Foliorum vaginae subterraneae, rarius scapi partem supraterraneam aliquantum tegentes, plerumque pilosae; lamina plana, ± carinata, saepe ± pilosa vel ciliata. Perigonium stellatum vel campanulatum. Filamenta angusta, integra, libera. Ovarium foveolis nectariferis distinctis provisum. Stylus integer vel stigmate ± distincte 3-lobo.

The section *Molium* is typically Mediterranean in its distribution and has only one species within our area.

90. ***A. eriophyllum*** BOISS., Diagn. Pl. Or. Nov. Ser. 1, 7: 112 (1846).

Bulbus 1—1,5 cm diametro, ovoideus; tunicae exteriores crassae, foveolato-reticulatae, pallide brunneae usque cinerascentes. Scapus 8—60 cm altus, usque ad 1/3 vel 1/5 foliorum vaginis glabris vel saepius ± dense pubescentibus usque hirsuto-pilosis tectus. Folia 1—12 (—18) mm lata, scapum circiter aequantia, plana, longe acuminata, glabra, piloso-ciliata vel ± pubescentia usque hirsuta. Umbella hemisphaerica usque fasciculata, potius pauciflora; pedicelli 1—2,5 (—4) cm longi, subaequales, tenues. Spatha quam umbella brevior, 2-loba, apiculata, persistens. Perigonium campanulatum, roseum, in sicco saepe stramineum; tepala 10—15 mm longa, elliptico-ovata usque oblongo-lanceolata, integra vel denticulata usque lacerata, cucullata. Filamenta basi connata, lanceolato-subulata, quam tepala aliquanto breviora; antherae 2,5 mm longae, flavae. Stylus antheras excedens, interdum exsertus, stigmate ± distincte 3-lobo. Capsula c. 5 mm diametro, sphaerica, perigonio persistente inclusa.

Distr. gen. speciei: Anatolia orientalis, Syria, Iraq, Persia occidentalis et australis.

— —var. ***eriophyllum***

Syn.: *A. farsistanicum* GAND., Bull. Soc. Bot. Fr. 46: 290 (1919).
Icon.: Tab. 6, fig. 90a; tab. 18, fig. 1.
Typus: KOTSCHY 46, G!

Scapus tenuis, ± curvatus. Folia angusta, praecipue vaginis scabridis usque scabrido-pubescentibus. Tepala lanceolata, ± acuminata.

Iraq: Kurd.: Kirk.: 26 km S Kirkuk, BARKLEY & BRAHIM 4479! Kirkuk, GRAHAM 778!; 400 m, RAWI 10552! Jarmo, HELBAEK 351!, 466! Chamchamal, 300 m, ROGERS 231! Arbil: Algurd Dagh, LUDLOW HEWITT 1934! Hab as-Sultan Dagh N Koi Sanjak, 950 m, RAWI 28244! — Diyala: 15 km S Khanaqin, HAINES W-1899! As Sadiyah, GUEST 1779! Jalula, coll. ign. 38! Tuz, 210 m, GUEST 1412! SE Tuz Khormatu, 300 m, RAWI 10322! Kut-al Imara: Badrah, GILLETT 6676! E Zurbatiyah, 150 m, GILLETT 6687!
Persia: W: Kermansh.: Khusrowvi, BEHB. 5060-E! Kuh-i Karand, STR.! Karand in Kuh-i Dalahu, STR.! Inter Qasr Shirin et Tang-e Pataq, SHAR. 5016-E! Qasr Shirin, SHAR. 5026-E! Lur.: Gilan-e Gharb, IRANSHAHR 8097-E! Shah Bazan, 500 m, KOEIE 1665! Ad lacum Jaidar 8 km W Mirabad, BENT & WR. 416—302! Khas Ali, BEHB. 282! Khuz.: Dezful, WDB. 41! Prope „Dez-dam", 450 m, WDB. 58! Behbehan, ESFAND. 5073!, 73-E! 120 km a Behbehan versus Kazerun, 1000 m, FURSE 1232! — S: Fars.: Bushehr, KASHKOULI 8115-E! Tang-i Jiz prope Konar Takhteh, STAPF 1987! Prope Kumaraj, STAPF 1988! Tang-e Ab prope Firuzabad, KASHKOULI 5036! Prope Gere et Dalaki, KY. 46! Jahrom, KOELZ 14590! Lar.: Lar distr., 600—1000 m, POPOV 66!, SOLTANI 7014-E! Bal.: Inter Iranshahr et Bazman, SHAR. 246-E! Iranshahr, SHAR. 54!

Distr. gen. varietatis: Syria, Iraq, Persia austro-occidentalis et australis.

— — var. ***laceratum*** (BOISS. & NOË) WENDELBO, stat. nov.
Syn.: *A. laceratum* BOISS. & NOË, Diagn. Pl. Or. Nov. Ser. 2, 4: 112 (1859). *A. stupposum* BORNM., Beih. Bot. Centrbl. 28, 2: 512 (1911).
Icon.: Tab. 6, fig. 90b; tab. 18, fig. 2a, b.
Typus varietatis: Hab. prope Van Armeniae, NOË, G!

Scapus proportione validus, stricte erectus. Folia latiora, praecipue vaginis densiuscule retrorse pilosis. Tepala elliptico-ovata, apice ± lacerata.

Iraq: Kurd.: Kirkuk: Chamchamal, 300 m, LUDLOW-HEWITT 1926! Darband-i Bazian, 1200 m, RAWI 7634! Sul.: Tasluja, 850 m, RAWI 28938! Sulaymaniyah, THESIGER 387! Mosul: Sharanish, 1200 m, RECH. 12081! 5 km S Zakho, RECH. 10723! In faucibus Zawita, 900 m, GUEST 2198! Arbil: Batas, RAWI 8625!
Persia: W: Azerb.: Haydarabad S lacum Rezaiyeh, 1520 m, ARCHIBALD 2213-a! SW lacum Rezaiyeh, 1300 m, JACOBS 6847! Kurd.: 30 km E Saqqez, 1800 m, FURSE 2140! Kermansh.: 100 km N Kermanshah versus Sanandaj, 1700 m, WDB. 1951! Prope Jamnasu, STR.! Jam Tueh, STR. (Typus *A. stupposi* BORNM.)! Ham.: Kuh-e Garri, STR.! Kuh „Schachscheken", STR.! Lur.: Ilam, 700 m, JACOBS 6312! Shah Bazan, 500 m, KOEIE 1661! Dow Rud, 1500 m, KOELZ 15600!, 17678! Khuz.: Masjed Soleyman, 300—750 m, FURSE 1201! Prope Shushtar, WDB. 76! — S: Fars.: Jahrom, KOELZ 14682! Bushehr, BORNM. 660!, 666! Inter Bandar Taheri et Gavbandi, PAG E-8044! Lar, MANUCH. 5035-E!

Distr. gen. varietatis: Anatolia austro-orientalis, Syria, Iraq, Persia occidentalis et australis.

The species is very variable and the two extremes separated by BOISSIER as *A. eriophyllum* and *A. laceratum* look very different. There is, however, no good correlation of characters and there is a more or less gradual transition from the one into the other. I have felt it convenient to group the material into two varieties. Usually a specimen can be allocated to the one or the other variety; var. *laceratum* is more frequent in the northern part of the area, var. *eriophyllum* in the southern part, cf. WENDELBO, Acta Horti Gotob. 28: 32 (1966).

Sect. *Briseis* (SALISB.) STEARN, Herbertia 11: 20 (1946).
Syn.: *Briseis* SALISB., Gen. Pl.: 92 (1866).

Bulbus solitarius; tunicae exteriores ± coriaceae, ± ornatae. Scapus triqueter. Foliorum vaginae subterraneae, laeves; lamina plana, carinata. Perigonium campanulatum. Filamenta tepalis aliquantum adnata. Ovarium sine foveolis nectariferis distinctis. Stylus stigmate trilobo. Semina elaiosomate provisa. — Typus sectionis: *A. triquetrum* L.

This small section has only one species within our area.

91. ***A. paradoxum*** (M. B.) G. DON, Monograph Allium: 72 (1827).
Syn.: *Scilla paradoxa* M. B., Fl. Taur.-Cauc. 3: 267 (1819).
Icon.: Tab. 6, fig. 91; tab. 18, fig. 3. — GROSSH., Fl. Kawk. ed. 2, 2: 137, tab. 16, fig. 12 (1940).
Typus: „Habitat in Iberia", D. WILHELMS, LE.

Bulbus c. 1 cm diametro, globosus; tunicae exteriores papyraceae, cinerascenti-nigrae. Scapus 15—30 cm altus, triqueter. Folium singulum, 0,5—2,5 cm latum, carinatum, viride, nitens. Spatha bivalvis; valvae 1—2,5 cm longae. Umbella (1—) 2—5 (—10)-flora, bulbillifera vel bulbillis carens, interdum bulbilli tantum evoluti; pedicelli 1—2,5 cm longi, floribus nutantibus. Perigonium late campanulatum, album; tepala 8—12 mm longa, elliptica, obtusa. Filamenta tertiam partem tepalorum longitudinis attingentia, per 1/4 connata et basi perigonii adnata, trian-

gulari-subulata. Stigma trilobum. Capsula c. 5 mm diametro, sphaerica, tepalis persistentibus inclusa. Semina nigra, elaiosomate albo praedita.

Talish: In silvis prope Lenkoran, HOHEN.!
Persia: N: Gorg.: Nahar Khuran, SHAR. 64! 32 km E Gorgan, FURSE 5085! 87 km E Gonbad-e Kavus, 1250 m, GRANT 17209! Gorgan, BUHSE! Ziarat, SHAR. 5077-E! In silvis Golestan, IRANSHAHR & DESZFOULIAN 7066-E!, 7068-E!, IRANSHAHR 7072-E! 62 km E Loveh versus Dasht, 1200 m, RECH. 33149! Bandar-i Gaz, SINT. 1453! Maz.: In valle Haraz: Darli supra Panjab, 2200 m, WDB. 650!, 2300 m, WDB. 323! Prope Emarat, 1100 m, WDB. 223! In declivibus borealibus jugi Kandavan, 1800 m, FURSE 1056!; 2040 m, STUTZ 1116! Pol-e Zanguleh, 2300 m, GAUBA 1184! Now Shahr, 50 m, TREGUBOV 40! Gil.: Masuleh, BUHSE. — C: In montibus Elburz centralis, JACOBS 6156!
Turcomania: In angustis Jajlach, ASCHIREVA s. n.!

Distr. gen.: Talish, Persia borealis, Turcomania, Caucasus; in multis locis Europae inquilinum.

Sect. *Porphyroprason* EKBERG, Bot. Not. 122: 65 (1969).

Bulbus bulbillos stipitatos proferens. Scapus brevis, flexuosus. Folia vaginis subterraneis bene evolutis, plana. Perigonium late campanulatum. Filamenta per dimidium longitudinis connata et tepalis adnata. Stigma 3-lobum. — Typus sectionis: *A. oreophilum* C. A. MEY.

92. ***A. oreophilum*** C. A. MEY., Verz. Pfl. Cauc.: 37 (1831).
Syn.: *A. platystemon* KAR. & KIR., Bull. Soc. Nat. Mosc. 15: 514 (1842). *A. Ostrowskianum* REGEL, Acta Horti Petrop. 7: 545 (1881).
Icon.: Tab. 6, fig. 92. — REGEL, Gartenfl.: tab. 775 fig. 1—3 (1881). Bot. Mag. 127: 7756 (1901).
Typus: Caucasia: Dagestan, Tufandag, LE.

Bulbus tunicis exterioribus papyraceis, cinereis obsitus. Scapus 5—20 cm altus, ad 1/3—3/4 vaginis foliorum subterraneis obsitus. Folia 2, linearia, 2—8 mm lata, quam umbella longiora. Spatha 0,8—1,5 cm longa, breviter acuminata. Umbella fasciculata usque sphaerica, ± pauciflora, laxiuscula; pedicelli 0,7—1,5 cm longi, ebracteolati. Perigonium late campanulatum, purpureum nervis atrioribus; tepala 8—11 mm longa, elliptica vel elliptico-ovata, obtusa vel saepius acuta. Filamenta 1/3—1/2 tepalorum longitudinis aequantia, per dimidium circiter longitudinis filamentorum connata et tepalis adnata, exteriora anguste triangularia, interiora late triangularia. Stylus stigmate trilobo terminatus. Capsula c. 4 mm diametro.

Afghanistan: NE: Munjan: In jugo Munjan, 3660 m, KOELZ 12670! Kataghan: Khost-o Fereng, in parte superiore vallis Kala, 3800 m, PODLECH 11765! In parte media vallis Echani, 3700 m, PODLECH 11850!
Pakistan: Chitral: Sora Lasht, 3900 m, BOWES LYON 1079!

Distr. gen.: Afghanistan boreo-orientalis, Pakistan boreo-occidentalis, Caucasus, Dsungaro-Alatau, Tien Shan, Pamir-Alaj.

Subgen. ***Melanocrommyum*** (WEBB & BERTH.) WENDELBO, Bot. Not. 122: 27 (1969).
Syn.: Sect. *Melanocrommyum* WEBB & BERTH., Hist. Nat. Iles Canaries Bot. 3: 347 (1848).

Bulbus solitarius, raro bulbillifer. Folia omnia basalia, vaginis partem supraterraneam scapi involucrantibus nullis, plana vel canaliculata; apex cucullatus. Pedicelli ebracteolati. — Typus subgeneris: *A. nigrum L.*

1a. Inflorescentia e verticillis pluribus superpositis consistens ..... 139. *A. Regelii* Trautv.
b. Inflorescentia umbellata 2
2a. Perigonium anguste campanulatum; tepala exteriora quam interiora latiora et ± longiora. Filamenta usque ad 1/3 vel ultra tepalis adnata et plerumque etiam ultra connata 3
b. Perigonium stellatum usque campanulatum; tepala subaequalia vel interiora quam exteriora sublatiora. Filamenta tepalis basi, ad summum usque ad 1/5 adnata 6
3a. Folia subtus plerumque secus nervos scabrida. Umbella densa ..... 136. *A. Winklerianum* Regel
b. Folia secus nervos non scabrida. Umbella laxa 4
4a. Pedicelli subaequales, usque ad 4 cm longi. Tepala post anthesin ± marcescentia et contorta. Capsula obovoidea ..... 139. *A. Regelii* Trautv.
b. Pedicelli inaequales, longissimi, in statu fructifero ultra 4 cm longi. Tepala post anthesin ± erecta. Capsula subsphaerica, breviter stipitata 5
5a. Scapus ad summum 15 cm altus. Tepala 8—10,5 mm longa ..... 138. *A. cathodicarpum* Wendelbo
b. Scapus ultra 15 cm altus. Tepala 10—15 mm longa ... 137. *A. iliense* Regel
6a. (2) Tepala mox reflexa et plerumque ± contorta. Capsula tepalis non cincta 7
b. Tepala post florendum ± erecta, ± immutata, interdum rigescentia nervo incrassato fere spinosa. Capsula perigonio ± cincta 28
7a. Flores dimorphi; exteriores tepalis lineari-filiformibus usque ad 32 mm longis, interiores tepalis dimidio circiter brevioribus . 110. *A. calocephalum* Wendelbo
b. Flores omnes aequales 8
8a. Ovarium et capsula corniculata 9
b. Ovarium et capsula non corniculata 11
9a. Folia 3—8. Scapus superne incrassans. Spatha erecta basin pedicellorum involucrans. Umbella late fasciculata ..... 107. *A. Olivieri* Boiss.
b. Folia 1—2. Scapus superne non incrassans. Spatha reflexa. Umbella subsphaerica 10
10a. Perigonium album lilacino-nervosum. Filamenta basi subquadrata. Scapus 10—25 cm altus ..... 124. *A. badakhshanicum* Wendelbo
b. Perigonium roseo-violaceum. Filamenta in annulum connata, sinus inter filamenta denticulo provisi. Scapus 25—50 (—70) cm altus ..... 125. *A. sarawschanicum* Regel
11a. (8) Folia elliptica usque late elliptica, usque ad 12 cm lata, scapum excedentia. Tepala elliptica, alba ..... 113. *A. colchicifolium* Boiss.
b. Folia ad summum anguste elliptico-oblonga. Tepala linearia usque anguste elliptico-oblonga 12
12a. Filamenta interiora supra medium obtuse bidenticulata. Tepala aterrime vinosa, 3—4,5 mm longa ..... 112. *A. cardiostemon* Fisch.
b. Filamenta numquam supra medium bidenticulata. Tepala colore alio 13
13a. Tepala 4—5 mm longa, linearia. Antherae 2/3 filamentorum aequantes. Flores exteriores vel omnes flavescentes, interiores interdum purpurei .... 111. *A. chrysantherum* Boiss. & Reut.
b. Plantae alia combinatione characterum 14
14a. Tepala alba vel flavescentia, nervis ± concoloribus vel lilacinis vel purpurascentibus 15

b. Tepala lilacina, violacea vel purpurascentia, nervis saturatioribus vel virescentibus 18
15a. Scapus humilis ad summum 25 cm altus, ± flexuosus. Folia 1—2 scapum excedentia 16
b. Scapus elatior, ultra 35 cm altus, strictus. Folia quam scapus breviora ... 17
16a. Filamenta atro-purpurea basi triangularia ... 115. *A. scotostemon* WENDELBO
b. Filamenta pallida basi subquadrata ..... 124. *A. badakhshanicum* WENDELBO
17a. (15) Tepala obtusa. Filamenta carnosa, flavescentia ..... 108. *A. kharputense* FREYN & SINT.
b. Tepala subacuta. Filamenta albo-membranacea .... 109. *A. Fedtschenkoi* NÁB.
18a. (14) Scapus brevis ad summum 25 cm longus 19
b. Scapus elatior ad minimum 35 cm longus 21
19a. Filamenta e basi subquadrata ± abrupte subulata. Scapus tenuis ..... 122. *A. chitralicum* WANG & TANG
b. Filamenta e basi triangulari sensim subulato-attenuata. Scapus validus ... 20
20a. Folia 5—6, 0,2—0,3 cm lata. Scapus strictus. Pedicelli fructiferi usque ad 9 cm longi, valde inaequilongi ..... 132. *A. helicophyllum* VVED.
b. Folia 1—2, 0,8—2,5 (—4,5) cm lata. Scapus flexuosus. Pedicelli fructiferi usque ad 2,5 cm longi, subaequilongi ..... 114. *A. brachyscapum* VVED.
21a. (18) Folia imprimis in parte inferiore ± pilosa vel raro subtus ± scabrida 22
b. Folia glabra, margine saepe ± scabrido excepto 23
22a. Tepala e basi apicem versus ± sensim attenuata. Scapus manifeste costatus (Afghanistan orientalis) ..... 121. *A. stipitatum* REGEL
b. Tepala marginibus per 2/3 longitudinis parallelis, demum apicem versus attenuata. Scapus leviter costatus (Iraq, Persia) ... 120. *A. hirtifolium* BOISS.
23a. (21) Tepala apice emarginata. Umbella saepe bulbillifera 126. *A. chelotum* WENDELBO
b. Tepala apice non emarginata. Umbella numquam bulbillifera 24
24a. Folia margine cartilagineo, manifeste ciliata. Bulbus stratis fibrorum grosse reticulatis dense obsitus ..... 123. *A. fibriferum* WENDELBO
b. Folia margine laevia vel ± scabrida. Bulbus tunicis exterioribus integris vel tenuissime reticulatis 25
25a. Bulbi tunicae exteriores tenuissime reticulato-fibrosae. Scapus plerumque tenuis. Folia margine laevia. Filamenta interiora basi semper angulosa ± quadrata ..... 119. *A. jesdianum* BOISS. & BUHSE
b. Bulbi tunicae exteriores integrae, interdum reticulato-nervosae et basi fissae. Scapus plerumque validus. Folia margine ± scabrida. Filamenta basi triangularia usque ± angulosa 26
26a. Tepala 4—5 mm longa. Bulbi tunicae exteriores coriaceae, in collum basin scapi cingentem elongatae ..... 116. *A. Suworowii* REGEL
b. Tepala 6—10 mm longa. Bulbi tunicae exteriores papyraceae vel subcoriaceae, in collum non elongatae 27
27a. Scapus manifeste costatus, 30—70 (—100) cm altus, saepe basin et apicem versus obscure coloratus. Folia 2—4 .....118. *A. Rosenbachianum* REGEL
b. Scapus leviter costatus, 80—150 cm altus, non obscure coloratus. Folia 4—6 ..... 117. *A. altissimum* REGEL
28a. (6) Tepala post florendum ± immutata; tepalorum nervus centralis non manifeste incrassatus; petalorum margo non involutus 29
b. Tepala post florendum mox margine revoluto quasi attenuata et nervo centrali incrassato rigescentia 38

29a. Tepala apice emarginata. Umbella saepe bulbillifera ..... 126. *A. chelotum* Wendelbo
b. Tepala apice non emarginata. Umbella numquam bulbillifera 30
30a. Filamenta e perigonio exserta 31
b. Filamenta tepala circiter aequantia vel eis breviora 33
31a. Perigonium campanulatum. Scapus florendi tempore 10—20 cm altus ..... 131. *A. caspium* (Pall.) M. B.
b. Perigonium substellatum. Scapus ultra 50 cm altus 32
32a. Tepala obtusa, elliptica usque obovata. Folia glaucescentia ..... 127. *A. giganteum* Regel
b. Tepala plerumque subacuta, elliptico-ovata. Folia laete viridia ..... 128. *A. Macleanii* Baker
33a. (30) Filamenta vix dimidium longitudinis tepalorum aequantia per dimidium fere filamentorum longitudinis connata et tepalis adnata. Tepala purpurascenti-rubra ..... 106. *A. Noëanum* Reut. ex Regel
b. Filamenta ultra dimidium longitudinis tepalorum attingentia vel tepala subaequantia. Tepala alba vel ± colorata nec autem purpurascenti-rubra 34
34a. Pedicelli longitudine valde inaequales, longissimi quam brevissimi 3—4-plo longiores. Tepala lineari-lanceolata. Folia (2—) 3 (—5) ..... 129. *A. protensum* Wendelbo
b. Pedicelli ± aequales. Tepala elliptica, ovata vel obovata. Folia 1—2 35
35a. Tepala cymbiformia, apice cucullata, demum patula vel reflexa. Umbella non fragilis ..... 113. *A. colchicifolium* Boiss.
b. Tepala ± plana apice non cucullata. Umbella fragillima 36
36a. Tepala albescentia, nervo centrali valde manifesto, virescente vel purpurascente, imprimis secus nervos saepe purpurascentia. Ovarium et fructus profunde lobati ..... 133. *A. mirum* Wendelbo
b. Tepala brunneo-flavida ± purpureo-suffusa. Ovarium et fructus non profunde lobati 37
37a. Tepala aequalia, 6—8 mm longa, elliptico-oblonga ..... 135. *A. cucullatum* Wendelbo
b. Tepala inaequalia, c. 10 mm longa, exteriora elliptica, interiora subbreviora, ovata ..... 134. *A. Caroli-Henrici* Wendelbo
38a. (28) Folia dense pilosa, pilis retrorsis ..... 102. *A. Cristophii* Trautv.
b. Folia glabra aut margine et (vel) subtus secus nervos scabrido-puberula... 39
39a. Filamenta e basi subquadrata abrupte subulata 40
b. Filamenta e basi triangulari sensim subulata 41
40a. Tepala lineari-lanceolata, acuta. Folia subtus secus nervos saepe scabrida usque scabrido-puberula ..... 103. *A. Bodeanum* Regel
b. Tepala anguste elliptico-oblonga, subobtusa. Folia margine tantum scabrida ..... 104. *A. Ellisii* J. D. Hook.
41a. (39) Tepala 4—5 mm longa ..... 101. *A. minutiflorum* Regel
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42a. Filamenta quam tepala paulo breviora vel aequilonga 43
b. Filamenta 1/3 usque ad 2/3 longitudinis tepalorum aequantia 44
43a. Pedicelli usque ad 3 cm longi. Spatha 3—4-loba, ± erecta. Umbella late fasciculata ..... 100. *A. materculae* Bordz.
b. Pedicelli usque ad 6 (—8) cm longi. Spatha bivalvis, valvis demum reflexis. Umbella sphaerica usque ad hemisphaerica ..... 130. *A. bucharicum* Regel

44a. (42) Folia (3—) 4—5, subtus secus nervos ± papillosa ..... 96. *A. breviscapum* STAPF
b. Folia 1—3, subtus non papillosa 45
45a. Tepala apice acuta vel subacuta 46
b. Tepala apice obtusa vel subobtusa 47
46a. Perigonium album; tepala lanceolata usque lineari-lanceolata. Antherae violaceae ..... 93. *A. Nevskianum* VVED.
b. Perigonium purpurascens; tepala anguste elliptica usque anguste ovata. Antherae flavae ..... 99. *A. Shelkovnikovii* GROSSH.
47a. (45) Tepala linearia, 9—15 mm longa 48
b. Tepala anguste elliptica vel anguste elliptico-oblonga, 5—8,5 mm longa .. 49
48a. Perigonium campanulatum; tepala in statu fructifero nervo incrassato stricte erecta, margine demum manifeste involuta. Filamenta 1/3 vel raro usque ad dimidium longitudinis tepalorum attingentia..... 97. *A. haemanthoides* BOISS. & REUT. ex REGEL
b. Perigonium stellatum; tepala in statu fructifero ± immutata nec autem rigida, margine demum leviter involuta. Filamenta 3/5—2/3 longitudinis tepalorum attingentia ..... 105. *A. elburzense* WENDELBO
49a. (47) Folia 2—6 cm lata ..... 98. *A. akaka* GMELIN
b. Folia quam 1,5 cm angustiora 50
50a. Filamenta c. 1/2 tepalorum longitudinis aequantia. Antherae purpurascenti-violaceae ..... 95. *A. Derderianum* REGEL
b. Filamenta c. 2/3 tepalorum longitudinis aequantia. Antherae flavae ..... 94. *A. monophyllum* VVED.

Sect. *Acanthoprason* WENDELBO, Bot. Not. 122: 27 (1969).

Scapus sat brevis et crassus quam folia brevior. Umbella plerumque densa, pedicellis ± aequilongis. Perigonium stellatum usque ± late campanulatum; tepala supra basin aliquantum connata, nervo mediano demum incrassato ± rigido, marginibus ± involutis. — Typus sectionis: *A. Akaka* GMELIN.

93. ***A. Nevskianum*** VVED. apud WENDELBO, Bot. Not. 122: 37 (1969).
Syn.: *A. Alexejanum* REGEL var. *hissaricum* LIPSKY, Acta Horti Petrop. 18, 1: 136 (1901).
Icon.: Tab. 7, fig. 93.
Typus: Sary-Socho, LIPSKY.

Bulbus 1—3 cm diametro, globosus; tunicae exteriores atro-griseae, in speciminibus parvis coriaceae, in vetustioribus diffractae. Scapus solitarius (raro bini), 5—15 cm longi, proportione crassiusculi, usque ad 4,5 mm diametro, ± flexuosi. Folia 2—3, umbellam non superantia, 1—3,5 cm lata, linearia usque elliptica, margine laevia. Spatha quam pedicelli brevior, 2—3-valvis, distincte rostrata. Umbella sphaerica usque subsphaerica, multiflora, densiuscula; pedicelli subinaequales, (1—) 1,5—2,5 cm longi. Perigonium latiuscule campanulatum, album, nervis purpurascentibus usque violaceis; tepala 7—9,5 mm longa, lanceolata usque lineari-lanceolata, subacuta, sub fructu nervo incrassato, rigidiuscule erecta. Filamenta c. 5 mm longa, tepalis per c. 1 mm adnata et supra per c. 0,5 mm in annulum connata, e basi latiore subulata, in parte superiore violacea usque purpurascentia; antherae 1,3 mm longae, violaceae. Ovarium sphaericum, verruculosum, stipitatum. Stylus c. 3,5 mm longus. Capsula ignota.

Afghanistan: E: Ghazni: M. Saperlebuli ad marginem austro-orientalem Dasht-i Nawar, 3200—4200 m, W. Rech. 37317! — C: Bamian: Band-i Amir, Band-i Zolfikar, 2900 m, Rech. 18426! Inter Kargana-tu et Band-i Amir, 3100 m, Hdg. & Wdb. 4732! Nil Kotal, 3150 m, Freitag 1278! — NW: Herat: Kuh-e Darunta supra Cheshmeh Obeh, 2700—2800 m, Hdg., Wdb. & Ekb. W-7882!

Distr. gen.: Afghanistan, Tadjikistan.

94. ***A. monophyllum*** Vved., Flora Turkmen. 1, 2: 290 (1932), descr. ross.
Icon.: Tab. 7, fig. 94. — Fl. URSS. 4: tab. 15, fig. 3 (1935).
Typus (paratypus): Korovin 684, BG!

Bulbus c. 1,5 cm diametro, ovoideus; tunicae exteriores crassae irregulariter cristatae, nigrescentes. Scapus usque ad umbellam fere terra occultus, 5—10 cm longus. Folium singulum lineari-lanceolatum, quam scapus manifeste longior, 3—11 mm latum, margine scabridum, subtus verisimiliter purpurascens. Spatha quam umbella aliquantum brevior, bivalvis. Umbella hemisphaerica ± multiflora; pedicelli aequales, usque ad 20 mm longi. Perigonium stellatum, sordide vel roseo-violaceum nervis atrioribus; tepala 5—7 mm longa, anguste elliptico-oblonga, ± obtusa, post florendum erecta, ± immutata. Filamenta 2/3 tepalorum longitudinis aequantia, perigonio per vix 1 mm adnata, supra per 0,5 mm in annulum connata, triangulari-subulata; antherae c. 1,5 mm longa, flava. Ovarium pyriforme, verruculosum. Capsula quam perigonium brevior.

Persia: E: Khor.: M. Hazar Masjed, 2000 m, Rech. 5137!, Czernjak. 393!
Turcomania: Tschapan Dagh, Korovin 684!; 2880 m, Nikitin. Joldere, Gontsch. & Jarmolenko.

Distr. gen.: Endem.

95. ***A. Derderianum*** Regel, Acta Horti Petrop. 3, 2: 242 (1875) p.p.
Icon.: Tab. 7, fig. 95.
Typus: Persia, Derderian, LE!

Bulbus 1—1,5 cm diametro, late ovoideus; tunicae exteriores integrae, cinerascentes. Scapus 4—10 (—14) cm longus, tenuis, curvatus, demum incrassatus, indistincte costatus. Folia 2, quam scapus longiora, usque ad 1,5 cm lata, linearia, ± canaliculata, margine scabrida, saepe ± undulata, in parte superiore saepe ± circinata. Spatha c. 1,5 cm longa, acuminata, bivalvis, persistens. Umbella sphaerica, multiflora, densiuscula; pedicelli 1—1,5 cm longi, subaequales, purpurascenti-violacei. Perigonium latiuscule campanulatum, sordide album nervis purpureo-violaceis; tepala c. 8 mm longa, anguste elliptico-oblonga, per 3/4 longitudinis subaequilata demum in apicem obtusum attenuata, nervo incrassato rigescentia, margine mox involuta. Filamenta c. dimidium longitudinis tepalorum attingentia, anguste triangularia, subaequalia, per c. 1 mm connata et tepalis adnata; antherae c. 1 mm longae, purpurascenti-violaceae. Ovarium late pyriforme. Stylus antheras non excedens. Capsula latiuscule pyriformis, dimidium tepalorum aequans.

Persia: N: Maz.: In valle fluvii Chalus, Rech. 508-c! Kojur, M. Uloj, 3200—3400 m, Rech. 6479! 16 km W Firuzkuh, 2400 m, Furse 3053! In jugo Kandavan, 2700—3140 m, Gilli s. n.!, Wdb. 2106! — C: Tehr.: Supra Ab Ali, 64 km E Tehran, 2700 m, Furse 2571! M. Tuchal prope Manzariyeh, 1800—2200 m, Žumer 691! Prope Tehran, Bruns s. n.! — Persia, Derderian!

Distr. gen.: Endem.

96. ***A. breviscapum*** STAPF, Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 50: 14 (1885).
Icon.: Tab. 7, fig. 96.
Typus: PICHLER, WU!

Bulbus c. 2 cm diametro, late ovoideus; tunicae exteriores coriaceae nervis distantibus, atro-cinereae, apice fissae. Scapus 5—6 cm longus, pro maxima parte subterraneus. Folia 2—6, quam umbella multo longiora, parte supraterranea 10—15 cm longa, 4—11 mm lata, falcata, undulato-flexuosa, margine distincte cartilaginea, papilloso-scabrida, nervis subtus imprimis basin versus papilloso-scabridis. Spatha c. 1,5 cm longa, bifida, acuminata. Umbella hemisphaerica, ± densa; pedicelli inaequales, 5—14 mm longi, purpurascentes. Perigonium campanulatum, album nervis purpureis; tepala 6,5—10 mm longa, lineari-oblonga usque linearia, subobtusa, post florendum erecta nervo mediano aliquantum incrassato, marginibus involutis. Filamenta 4—5 mm longa, tepalis per c. 1 mm adnata, supra in annulum connata, parte libera e basi lata subulata, interiora quam exteriora duplo latiora; antherae 1,2—1,5 mm longae. Stylus c. 3 mm longus, stigmate trilobo. Capsula valvis 4,5 mm latis late obcordatis, perigonio persistente inclusa.

Persia: W: Ham.: Takht-i Suleiman inter Hamadan et Tabriz, STR. s. n.! M. Alvand, STR. s. n.!, AUCH. 2929! In declivibus boreo-orientalibus M. Alvand, 14 km SW Hamadan, FURSE 1986!

Distr. gen.: Endem.

97. ***A. haemanthoides*** BOISS. & REUT. ex REGEL, Acta Horti Petrop. 3, 2: 240 (1875).
Icon.: Tab. 7, fig. 97.
Typus (isotypus): „Hab. in monte Schahu Kurdistaniae Persicae", HAUSSKNECHT, G!

Bulbus usque ad 3,5 cm diam., globoso-ovoideus; tunicae exteriores coriaceae, diffractae, nigrae usque nigrescenti-purpureae. Scapus 7—16 cm altus, validus, saepe curvatus. Folia (1—) 2—3, scapo longiora, (1—) 2—4 cm lata, margine scabra vel sublaevia. Spatha 2—2,5 cm longa, 2—3-valvis, breviter acuminata. Umbella late fasciculata usque hemisphaerica vel raro sphaerica, multiflora, densa; pedicelli subaequales, 2—3,5 cm longi, violascentes. Perigonium campanulatum, purpurascens vel pallide roseo-purpureum viridi- vel sordide purpurascenti-nervosum, in sicco saepe album; tepala 9—15 mm longa, linearia, obtusa, in statu fructifero nervo incrassato stricte erecta, margine demum involuto. Filamenta 1/3 (—1/2) tepalorum longitudinis aequantia, saepe purpurea, per 1/3 longitudinis filamentorum connata et tepalis adnata, subtriangularia, exteriora quam interiora angustiora; antherae c. 1 mm longae, violaceae. Capsula c. 5 mm longa.

Iraq: Kurd.: Sul.: N Sulaymaniyah, THESIGER 424! Penjwin, 1300—1800 m, RECH. 12270!, RAWI 8907!, 12237!, 22672! Pira Magrun, 1500 m, GILLETT 7793! M. Avroman, 2200 m, GILLETT 11892! In jugo Azmir, 1400 m, POORE 408! Arbil: M. Baradost, 2030 m, THESIGER 909! Hab as-Sultan Dagh prope Koi Sanjak, 950 m, RAWI 28253!
Persia: W: Lur.: Dow Rud, 1680 m, KOELZ 15675!, 17382! Shah Bazan, 1200 m, KOEIE 1660! Najiu, 2200 m, KOEIE 556! Oshtoran Kuh, 2440 m, KOELZ 17825! M. Saverz, 3050—3960 m, HAUSSKN.! Ham.: Sibdar, 2440 m, KOELZ 18592! Kurd.: M. Shahu, HAUSSKN.! Bakht.: Taleh, KOELZ 15126!, 15214! Kuh Rang, 2400 m, WDB. 946!, 998! Esf.: Chehel Dokhtoran Kuh, 3100 m, WDB. 1786! — S: Fars.: Inter Abadeh et Dowlatabad, 1500—2000 m, SCHMID 5265! Kakun, KASHKOULI 8045-E! Deh Bid, 2250 m, PRAVITZ 769! Sabz Pushan S Shiraz, 2200 m, WDB. 895!

Distr. gen.: Endem.

A. haemanthoides is a rather variable species. Forms that are more or less transitional to *A. akaka* Gmelin and *A. Shelkovnikovii* Grossh. are rather frequent. The whole group is in need of a critical study based on living material from many localities.

98. ***A. Akaka*** Gmelin in Roemer & Schultes, Syst. Veg. 7: 1132 (1830).
Syn.: *A. latifolium* Jaub. & Spach, Ill. Pl. Or. 2: tab. 103 (1844).
Icon.: Tab. 7, fig. 98; tab. 25, fig. 3. — Jaub. & Spach, l. c.
Typus: In Provincia Ghilan, Pallas.

Bulbus globosus, 1,5—2,5 cm diametro; tunicae exteriores papyraceae, nigrescentes. Scapus (3—) 5—15 cm altus, validus. Folia 1—2, quam scapus longiora, 2—6 cm lata, elliptico-oblonga usque ovata. Spatha 1,5—2 cm longa, 3—4-loba. Umbella late fasciculata usque hemisphaerica, multiflora; pedicelli ± aequales, 8—30 mm longi. Perigonium late campanulatum, roseo-purpureum, in sicco rosaceo-lilacinum nervis saturatioribus; tepala 6,5—8,5 mm longa, anguste elliptico-oblonga marginibus subparallelis, apice rotundata, nervo centrali incrassante rigescente, marginibus mox involutis. Filamenta c. dimidiam longitudinem tepalorum attingentia, per c. 1 mm connata et tepalis adnata, roseo-purpurea; exteriora e basi triangulari subulata; interiora triangularia; antherae c. 1 mm longae, flavae. Capsula 4—5 mm longa.

Persia: W: Azerb.: In montosis prope Ser, Knapp! Liqvan, Knapp! Tabriz, in argillosis, Knapp! Ad radices Kuh-e Aq Kan Dagh, 64 km N Rezaiyeh, 2000 m, Furse 2255! Azerbaijan, Auch. 5384!

Distr. gen.: Anatolia orientalis, Persia boreo-occidentalis, Transcaucasia.

99. ***A. Shelkovnikovii*** Grossh., Beih. Bot. Centrbl. 44, 2: 204 (1927).
Icon.: Tab. 7, fig. 99; tab. 25, fig. 4.
Typus: Shelkownikow s.n.

Bulbus 1,5—2 cm diametro, latiuscule ovoideus; tunicae exteriores cinerascenti-brunneae, subcoriaceae. Scapus 5—12 cm altus, crassiusculus. Folia 2 (—3), inaequalia, quam scapus longiora, 0,5—1,5 (—3) cm lata, falcata, margine laevia vel indistincte papilloso-scabrida. Spatha vix 2 cm longa, acuminata, plerumque biloba. Umbella multiflora, plerumque densiuscula, fasciculata vel rarius subsphaerica; pedicelli inaequales, usque ad 4 cm longi, lilacini. Perigonium latiuscule campanulatum, purpurascens nervis saturatioribus; tepala 8—10 mm longa, anguste elliptica usque anguste ovata, acuta, rigida, nervo demum incrassato et marginibus demum involutis. Filamenta dimidio tepalorum paulo breviora, alternatim ovato-triangularia et anguste triangularia, per 1/3 usque 1/2 longitudinis connata et tepalis adnata; antherae 1—1,5 mm longae, flavae. Capsula subglobosa, vix 5 mm diametro.

Persia: W: Azerb.: Tabriz, in schistosis, 1400 m, Schelkownikow. Bandar-e Danalu ad lacum Rezaiyeh, Schelkownikow. Kuhha-ye Sabalan, 32 km W Ardabil, 2100 m, Furse 2452! Kuh-i Sahand supra Liqvan, 2400—3000 m, Furse 2332! Kurd.: Kurdistan centralis, 1600—1900 m, Jacobs 6576! 16 km N Hoseyanabad inter Sanandaj et Saqqez, Archibald 2110! 16 km E Sanandaj, 2000 m, Furse 2071! 20—32 km W Sanandaj versus Dezh Shahpur, Bent & Wr. 520—102!; 2220 m, Archibald 2075! Ham.: M. Karaghan (media), Pichler! Arak: Mowdar, Str.! Kermansh.: Inter Ilam et Mehran, Iranshahr 8096-E! — C: Qazv.: Qazvin, 1200—1300 m, Bornm. 8316! Inter Qazvin et Zereshk, Polak!

Distr. gen.: Endem.

No authentic material of *A. Shelkovnikovii* has been seen, and as the original description is rather poor, I cannot be quite sure that the name has been correctly applied

to the above material. It is not always easy to distinguish the three species *A. Akaka* GMELIN, *A. haemanthoides* REGEL and *A. Shelkovnikovii* from each other. Transitional forms between any of them may occur.

100. ***A. matercula*e** BORDZ., Zap. Kiev. Obsheh. Yest. 25, 1: 73 (1915).
Icon.: Tab. 7, fig. 100. — Fl. Kawk. ed. 2, 2: tab. 17, fig. 7 (1940).
Typus: Nakhichevan, KW.

Bulbus 1—3 cm diametro, globosus; tunicae exteriores nigrae vel cinerascentes. Scapus 8—13 (—30) cm altus, crassiusculus. Folia 1 (—4), scapo plerumque longiora, 1—2 cm lata, falcata, glauca, papillosa, margine scabrida. Spatha c. 1,5 cm longa, 2—4-loba, persistens. Umbella latiuscule fasciculata, fructificatione hemisphaerica, multiflora; pedicelli inaequales, usque ad 3 cm longi. Perigonium campanulatum, lilacinum nervis purpurascenti-violaceis; tepala (5—) 7—9 mm longa, linearia, subacuta, nervo centrali incrassato et marginibus demum involutis, post florendum erecta, rigida. Filamenta tepala aequantia vel eis subbreviora, subaequalia, e basi anguste triangulari subulata, per 1,5—2 mm connata et tepalis per 1—1,5 mm adnata; antherae c. 1,2 mm longae. Stylus filiformis, filamenta non excedens. Capsula c. dimidium tepalorum aequans.

Persia: W: Prope Seyyed Hajjin, Szov.! Liqvan, KNAPP! Arak: Mowdar, STR.! — C: Qom: 48 km W Qom, 1600 m, STUTZ 1044!

Distr. gen.: Persia, Transcaucasia.

101. ***A. minutiflorum*** REGEL, Acta Horti Petrop. 3, 2: 242 (1875).
Syn.: *A. stenopetalum* BOISS. & KY. var. *pumilum* PARSÁ, Kew Bull. 1949: 34 (1950).
Icon.: Tab. 7, fig. 101.
Typus: BODE, LE!

Bulbus c. 2,5 cm diametro; tunicae exteriores ignotae. Scapus 8,5 cm longus, 3 mm diametro. Folia 2, quam scapus longiora, 10—16 mm lata, crassa, margine minutissime scabrida. Spatha bivalvis, valvis 15 mm longis, apiculatis. Umbella hemisphaerica, multiflora, pedicellis inaequalibus usque ad 20 mm longis. Perigonium late campanulatum, lilacinum; tepala 4—5 mm longa, anguste elliptico-oblonga, subacuta, post anthesin erecta nervo mediano incrassato, marginibus involutis. Filamenta vix 3 mm longa, triangulari-subulata, alternatim latiora, per c. 1 mm connata et tepalis adnata, purpurascentia; antherae c. 0,8 mm longae. Stylus c. 1 mm longus, purpureus. Capsula c. 4 mm diametro, depresso-globosa.

Persia: W: Esf.: Esfahan, AUCH. 5383! Bakhtiari, BODE! — C: Yazd: Shir Kuh, GIUSEPPI 43!

Distr. gen.: Endem.

102. ***A. Cristophii*** TRAUTV., Acta Horti Petrop. 9: 268 (1884).
Syn.: *A. albopilosum* C. H. WRIGHT, Gard. Chron. 34: 34 (1903).
Icon.: Tab. 7, fig. 102; tab. 26, fig. 1. — Bot. Mag. 130: tab. 7982 (1904).
Typus: „Dubium est utrum in Turcomania australi (Achalteke) anne in Karabach species haec a CRISTOPH reperta sit."

Bulbus 2—3 cm diametro, tunicis exterioribus papyraceis. Scapus 10—60 cm longus, (3—) 5—12 mm crassus, costatus. Folia 2—7, 10—38 mm lata, margine et imprimis in pagina inferiore pilis ± rigidis patulis usque retrorsis obsita, rarissime subglabra. Spatha 2,5 cm longa, apiculata. Umbella hemisphaerica usque sphaerica, multiflora, laxa; pedicelli ± purpurei, subaequales, fructiferi usque ad 11 cm longi,

ebracteolati. Perigonium stellatum, purpurascenti-violaceum; tepala 10—15 (—18) mm longa, lineari-triangularia, subacuta, erecta, rigida, marginibus post florendum involutis. Filamenta dimidiam longitudinem tepalorum attingentia, subaequalia, prope basin connata et tepalis adnata, e basi dilatata abrupte attenuata, atropurpurea. Capsula 5—8 mm lata, late obovoidea, basin versus attenuata, substipitata.

Persia: N: Gorg.: 64 km E Gonbad-e Kavus, 1100 m, Furse 7417! In silvis Gulestan, 65—80 km E Gonbad-e Kavus, 900 m, Furse 7275!; 1000 m, Walton 219!, Merton 3965! Gonbad-e Kavus, Shar. 58!, 5069-E!, Gauba 1539! Maz.: In valle Haraz: Darli supra Panjab, 2000—2200 m, Wdb. 622!, 1597! — E: Khor.: Kotal-e yek Chenar, Koelz 16704! — C: Damgh.-Semn.: Kuh-i Nizwa prope Taru, 2250 m, Wdb. 1157!
Turcomania: Ashkhabad: Supra Nephton, Sint. 308! M. Sjunt, Czernjak. 1101! Gaudan, 400 m, Fedtsch., Bobrov & Massagetov 339! Kaachka, Michelson. Bagir, Michelson. Joldere, Czernjak., Michelson, Fedtsch. Garmab, Radde. Chuli, Lipsky, Michelson. Firyuza, Androssov. Prokhladnoje, Czernjak. Risarash, Czernjak. Shidljak, Markova! Mustafar-dere, Bobrov & Fedtsch. Sundukli, Bobrov & Fedtsch. Djalila, Czernjak. Parkhai, Czernjak. Jarty-kala, Czernjak. Khosar, Michelson. Khandjallu, Czernjak.

Distr. gen.: Endem.

103. ***A. Bodeanum*** Regel, Acta Horti Petrop. 3, 2: 238 (1875).
Syn.: *A. Walteri* Regel, l.c. 10: 357 (1887).
Icon.: Tab. 7, fig. 103. — Regel, Acta Horti Petrop. 10: tab. 7, fig. 3.
Typus: Habitat in Persia, Bode, LE!

Haec species *A. Cristophii* Trautv. valde affinis, differt ab eo scapo breviore (in speciminibus spontaneis 10—20 cm longo) proportione crassiore, foliis 1—3, proportione latioribus falcatis (in speciminibus spontaneis usque ad 3 cm latis) margine scabrido-ciliatis, nervis subtus interdum scabridis. Perigonium saepe fere album.

Persia: E: Khor.: Kuh-e Neyshabur, Darreh Abshar supra Akhlamad, 1600—1800 m, Rech. 4605! Kopet Dagh: In jugo Alam Ali, 2000 m, Rech. 4816! 24 km N Quchan, 2000—2300 m, Furse 7471! — Persia, Bode!
Turcomania: In angustiis Karanki supra 1500 m, Walter (Typus *A. Walteri* Regel, LE)! Risarash, Czernjak. Chapan, Korovin. Gaudan, 450 m, Fedtsch., Massagetov & Bobrov 339! Seamasur, Czernjak.

Distr. gen.: Endem.

A. Bodeanum is very close to *A. Cristophii* and they may represent different facies of the same species. In this case the name *A. Bodeanum* would have priority. Unfortunately the type specimen is very incomplete and the exact locality is not known.

104. ***A. Ellisii*** J. D. Hook., Bot. Mag. 129: tab. 7875 (1903).
Icon.: Tab. 7, fig. 104. — Hook., l. c.
Typus: Specimen cultum, K!

Bulbus magnus, globosus; tunicae exteriores nigrescentes, integrae. Scapus 11—30 cm longus, validus. Folia 2—5, scapo longiora, 2,5—6 cm lata, margine scabrida, glaucescenti-viridia. Spatha 1,5—3 cm longa, trivalvis, viridi-nervosa. Umbella multiflora, densa; pedicelli inaequales, usque ad 6 cm longi. Perigonium stellatum, fere album lilascens (roseum secundum descriptionem originalem), violaceo-nervosum; tepala 9,5—13 mm longa, anguste elliptico-oblonga, subobtusa, post anthesin rigida marginibus ± involutis. Filamenta 2/3 longitudinis tepalorum aequantia, e basi ± quadrata subulata; interiora quam exteriora latiora, basi alba,

apicem purpureo-violaceum versus sensim intensius colorata; antherae c. 1,5 mm longae, violaceae; pollen violaceum. Ovarium substipitatum. Stylus filiformis. Capsula depressa, c. 7 mm diametro.

Persia: E: Khor.: Prope Mashhad, coll. ign.[1])

Distr. gen.: Endem.

A. Ellisii is known only from cultivated material. Most probably the type specimen — cultivated in a private garden — represents an extremely well-grown plant which is much larger in all vegetative parts than any plant one might find in the field. The lower measurements given in the description above are taken from two specimens (FURSE 2591) flowering in the Botanical Garden of Gothenburg in the summer of 1968. Admiral FURSE (*in litt.*) has informed me that there must have been an exchange of labels; according to his notes 2591 should be a member of *Cruciferae*. His no. 2571 collected in the Elburz mts. is, however, an *Allium*, named as *A. Derderianum* by me on pressed material. There is probably no way of finding out about the true origin of the Gothenburg bulbs.

Undoubtedly *A. Ellisii* is closely related to *A. Bodeanum*.

105. ***A. elburzense*** WENDELBO, Bot. Not. 122: 36 (1969).
Icon.: Tab. 7, fig. 105. — WENDELBO, l. c.: 30, fig. 1 I.
Typus: WENDELBO 752, BG!

Bulbus subglobosus, 1,5—3 cm diametro; tunicae exteriores coriaceae, cinerascenti-brunneae, aliquantum fractae. Scapus 5—16 cm longus, usque ad 8 mm diametro, validus, curvatus, in sicco subcostatus. Folia 1—2, basalia, (1—) 2—6,5 cm lata, elliptica usque anguste elliptico-oblonga, crassa, margine laevia, apice cucullata, glaucescenti-viridia. Spatha usque ad 2,5 cm longa, apiculata, 4-loba, persistens, basi basin pedicellorum includente. Umbella hemisphaerica usque late fasciculata, multiflora, densa; pedicelli usque ad 3,5 cm longi, subaequales. Perigonium stellatum, purpurascens; tepala 10—12 mm longa, 1,5—2 mm lata, linearia, apicem et basin versus subattenuata, obtusa, ± immutata nec autem rigida, margine demum leviter involuta. Filamenta 3/5—2/3 longitudinis tepalorum attingentia, e basi leviter dilatata lineari-subulata, usque ad paulo supra basin connata et tepalis adnata, purpurascentia; antherae 2 mm longae, purpurascenti-violaceae. Stylus filamenta non excedens. Ovarium subglobosum, breviter crasse stipitatum, loculis 3—4-ovulatis. Capsula 5—8 mm diametro, depressa.

Persia: N: Maz.: In valle Haraz supra Zardman, 900 m, WDB. 380! — E: Khor.: 48 km S Quchan, 2000 m, FURSE 7554! — C: Tehr.: Ab-Ali, 1900—2900 m, WDB. 752!, SCHMID 5630! Inter Lashkarak et Ushan Pasha, BRUNS s.n.! M. Tuchal, 1800—3700 m, EGGER 75!, LINDS. 504! Abshar, 2000—2500 m, ŽUMER 808! Prope Shahrestanak, 2600 m, BORNM. 8306! Qazv.: Inter Karaj et Gach Sar, 1200—2500 m, SCHMID 5713! Purkan, N Karaj, 1600 m, WALLE 54!

Distr. gen.: Endem.

Sect. *Melanocrommyum*

Scapus ± elongatus, folia plerumque excedens. Umbella late fasciculata usque subsphaerica. Perigonium stellatum usque late campanulatum; tepala mox reflexa ± contorta. Ovarium sessile, laeve (in vivo quidem).

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[1]) Cultivated in the garden at Trensham Hall, Haslemere, Britain, by CHARLES ELLIS who got the bulbs from a collector sent out from Mashhad by Mr. NEY ELIAS.

106. ***A. Noëanum*** Reut. ex Regel, Acta Horti Petrop. 3, 2: 235 (1875).
Syn.: *A. Jenischianum* Regel, l. c., p. p. *A. dilutum* Stapf, Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 50, 2: 13 (1885).
Icon.: Tab. 8, fig. 106.
Typus (isotypus): „Habitat in Syria boreali", Hausskneht, W!

Bulbus usque ad 2,5 cm diametro, ± late ovoideus. Scapus usque ad 30 cm altus, basin versus sensim attenuatus, tenuiter costatus. Folia 3—4, scapum superantia, usque ad 20 mm lata, margine scabrida. Spatha 1,5—3 cm longa, triloba, biloba vel unilateraliter usque ad basin fissa, saepe purpureo-suffusa, sub anthesi basin pedicellorum includens, demum reflexa. Umbella fasciculata, fructifera interdum hemisphaerica; pedicelli fructiferi usque ad 7 cm longi demum aliquantum inaequales. Perigonium campanulatum, roseo-purpureum, raro album; tepala 9—14 mm longa, elliptica usque anguste ovata, exteriora quam interiora angustiora, subacuta usque obtusa, basi connata, post florendum ± immutata. Filamenta 3,5—5 mm longa, subaequalia, anguste triangularia, per 1—2 mm connata et tepalis adnata; antherae 1 mm longae, atropurpureae. Stylus 2—2,5 mm longus, filiformis, stigmate punctiformi. Capsula 6—8 mm diametro, superficie reticulata.

Iraq: Kurd.: Arbil: Rawandiz, Guest 2149! Arbil, Shahrwani 25105! In jugo Khanzad prope Arbil, Guest 619! Ad radices M. Baradost 10—20 km SSW Shanidar, 700 m, Erdtman & Goedemans in Rech. 15599!, 15602! Mosul: Tall Kayf, Bradburne 48! Dihok, 450 m, Guest 1386! Inter Dihok et Zakho, Guest 2242! Mosul, Lazar 3351 p.p.! Sul.: In planitie Sulaymaniyah, Thesiger 386! In collibus Kurdistan, 350—1000 m, Low 199!
Persia: W: Kermansh.: Sonqur, Str. s.n.! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 38! 64 km W Hamadan, 1800 m, Furse 2000! — C: Qazv. Inter Qazvin et Zereshk, Pichler s.n.! — Cult. hort. Vindobona 1887, bulbus e Persia boreali (1886) misit Dr. Polak!

Distr. gen.: Anatolia austro-orientalis, Syria borealis, Iraq borealis, Persia boreo-occidentalis.

107. ***A. Olivieri*** Boiss., Fl. Or. 5: 284 (1882).
Icon.: Tab. 8, fig. 107; tab. 19, fig. 1.
Typus.: „Hab. in Mesopotamia inter Mossul et Baghdad," Olivier, G!

Bulbus c. 2,5 cm diametro; tunicae exteriores in collum breve protracta, brunnescenti-griseae, tenues, fractae et in fibras ± fissae. Scapus 15—25 cm longus, basin versus sensim attenuatus. Folia 3—5 (—8), umbellam saepe superantia, ad summum 1,5 cm lata, plerumque multo angustiora, margine scabrida. Spatha 1/2—1/3 umbellae attingens, biloba, basin pedicellorum includens. Umbella fasciculata usque hemisphaerica; pedicelli inaequales, usque ad 5 cm longi. Perigonium late campanulatum, roseo-purpureum; tepala 5—6,5 mm longa, anguste elliptico-oblonga usque lanceolata, obtusa vel subacuta, mox reflexa. Filamenta c. 5 mm longa, e basi lata attenuata, per c. 1 mm connata et paulo supra basin tepalis adnata; antherae c. 2,5 mm longae. Ovarium apice 6-corniculatum. Stylus c. 4 mm longus; stigma punctiforme. Capsula c. 6 mm longa, apice cornibus 6 bene evolutis.

Iraq: Kurd.: Mosul: Mosul, 300 m, Guest 1486!, Lazar 3351 p.p.! Kirkuk: Chamchamal, Rogers 1391! Hawija, 200 m, Gillett 10690! N Tauq, 200 m, Guest 5094! — Diyala: Jalula, Rogers 0132-A!
Persia: W: Khuz.: Behbehan, Esfand. 5074-E! — S: Fars.: Jahrom, Koelz 14640!

Distr. gen.: Iraq, Persia austro-occidentalis.

108. ***A. kharputense*** FREYN & SINT., Öst. Bot. Zeitschr. 42: 378 (1892).
Icon.: Tab. 8, fig. 108.
Typus (isotypus): Turcia; Armenia, Kharput, prope Miadun, SINTENIS 711, LD!

Bulbus 2—2,5 cm diam., subglobosus, tunicis ignotis. Scapus 35—58 cm altus, in sicco distincte costatus, strictus. Folia 3—6, quam scapus breviora, 0,7—2,5 (—4) cm lata, canaliculata, apice cucullata, margine minute scabrida. Spatha c. 2,5 cm longa, 4-loba, reflexa, persistens. Umbella fasciculato-hemisphaerica usque hemisphaerica, multiflora, densa; pedicelli subaequales, 2—3 cm longi. Perigonium probabiliter stellatum sed tepala mox reflexa, alba in sicco aliquantum flavescentia; tepala 6—8 mm longa, ± anguste elliptico-oblonga, obtusa, alternatim longiora et latiora. Filamenta c. 3/4 tepalorum longitudinis aequantia, carnosa, in sicco flavescentia et quam tepala atriora, alternatim longiora et latiora, ambitu anguste triangularia, prope basin connata et tepalis adnata; antherae c. 1,5 mm longae, flavae. Ovarium subglobosum, aterrime rubrum vel viride. Stylus c. 4 mm longus; stigma minute trilobum. Capsula valvis 6—7 mm longis, 4—5 mm latis.

Persia: W: Kurd.: 32 km E Sanandaj, 1500 m, FURSE 2036! Dezh Shahpur, 1600—1700 m, JACOBS 6551! 32 km WNW Sanandaj versus Dezh Shahpur, 2200 m, ARCHIBALD 2074!

Distr. gen.: Anatolia, Persia occidentalis.

109. ***A. Fedtschenkoi*** NÁB., Publ. Fac. Sci. Univ. Masaryk (Brno) 105: 36 (1929).
Icon.: Tab. 8, fig. 109. — NÁB., l. c., 36 fig. 8, tab. 2, fig. 1.
Typus: NÁBELEK 2313, BRA!

Bulbus c. 3 cm diametro; tunicae exteriores nigrescentes, fractae. Scapus c. 40 cm altus, (in speciminibus complete evolutis probabiliter elatior), c. 13 mm diametro. Folia 6, quam scapus breviora, usque ad 4 cm lata, basalia. Spatha bivalvis, quam pedicelli brevior, breviter apiculata. Umbella hemisphaerica, multiflora, densa; pedicelli aequales, c. 2,5 cm longi. Perigonium late campanulatum, album; tepala 7—8 mm longa, anguste elliptico-oblonga, subacuta, demum reflexa et contorta. Filamenta c. 6 mm longa, per c. 1,5 mm connata et tepalis adnata; exteriora lineari-subulata; interiora e basi triangulari subulata; antherae c. 2 mm longae, flavae. Ovarium depresso-globosum, verruculosum. Stylus filiformis, c. 7 mm longus.

Persia: W: Kermansh.: Supra pagum Rijab prope Qasr Shirin, 1800 m, NÁB. 2313!

Distr. gen.: Endem.

110. ***A. calocephalum*** WENDELBO, Acta Horti Gotob. 28: 40 (1966).
Icon.: Tab. 8, fig. 110; tab. 17, fig. 3; tab. 26, fig. 2. — WENDELBO, l. c.: fig. 10.
Typus: O. POLUNIN 5084, K!

Bulbus 1,5—3 cm diametro, ovoideo-globosus, tunicis exterioribus griseis papyraceis, apice fissis. Scapus 30—67 cm longus, c. 4 mm diametro, teres, laevis, viridis, basi purpurascens. Folia 4—5, 17—22 cm longa, 0,7—3 cm lata (in speciminibus cultis ad 30×4,5 cm), lineari-elliptica, plana, margine scabrida. Spatha 17—25 mm longa, valvis 2—3 ovatis apiculatis persistentibus. Umbella 4—8 cm diametro, ± depresso-hemisphaerica, multiflora; pedicelli ± inaequales, exteriores 1,5—3 cm longi, interiores 0,8—2 cm longi. Flores lactei, in sicco flavescentes, exteriores tepalis usque ad 32 mm longis, lineari-subulatis, erecto-patentibus; flores interiores tepalis c. 14 mm longis, 0,9 mm latis, lineari-subulatis, patentibus mox reflexis. Filamenta 3—4,5 mm longa, lineari-subulata, basi connata, atro-purpurea, apice viridia;

antherae 1—2,5 mm longae, virescentes. Ovarium, depresso-globosum, atro-purpureum. Stylus 1—1,5 mm longus, crassus, atro-purpureus; stigma punctiforme. Capsula 6 mm diametro, valvis late ovato-suborbicularibus, emarginatis.

Iraq: Kurd.: Arbil: Gali Warta, 30 km NW Ranya, 1300—1400 m, Rawi 28732! Algurd Dagh, 3000 m, cult., Ludlow-Hewitt s.n.! Mosul: Sirsang, 1350 m, O. Polunin 5084!

Distr. gen.: Endem.

111. ***A. chrysantherum*** Boiss. & Reut. in Boiss., Fl. Or. 5: 280 (1882).
Syn.: *A. reflexum* Boiss. & Reut. in Boiss., l. c.: 281 (1882).
Icon.: Tab. 8, fig. 111.
Typus: Iraq: „In deserto inter Nisibin et Sindjar", Haussknecht 959, G!, W!

Bulbus usque ad 4 cm diametro, globosus; tunicae exteriores cinerascentes, tenues, in fibras parallelas ± dissolutae. Scapus 30—100 cm altus, usque ad 6 mm crassus, laevis. Folia 6—8, 5—35 mm lata, basalia, linearia usque lineari-loriformia, margine scabrida. Spatha 3—4-valvis; valvae usque ad 3 cm longae, apiculatae, reflexae, persistentes. Umbella fasciculata usque hemisphaerica, multiflora; pedicelli usque ad 3 cm longi, tenues. Flores exteriores vel omnes flavescentes, interiores interdum purpurei; tepala 4—5,5 mm longa, linearia, obtusa vel subacuta, mox reflexa. Filamenta 3—4 mm longa, subtriangularia, carnosa, erecta, interiora quam exteriora sublatiora; antherae c. 2 mm longae, oblongae. Ovarium verruculosum. Stylus 2 mm longus, filiformi-clavatus; stigma breviter trilobum. Capsula 5—6 mm longa, 6—7 mm lata, valvis emarginatis.

Iraq: Kurd.: Kirkuk: Chamchamal, Agnew & Haines s.n.! Arbil: In faucibus Bekma, 500 m, Gillett 8253! Handiyan ad radices M. Baradost, Thesiger 845!
Persia: W: Kermansh.: 44 km SW Shahabad inter Shahabad et Ilam, 1900 m, Bent & Wr. 602-604! Khusrowvi, Farahbakhsh 5055-E! 100 km N Kermanshah versus Sanandaj, 1700 m, Wdb. 1949! Lur.: Kuh-e Pariz, 2135 m, Koelz 15899!

Distr. gen.: Anatolia austro-orientalis, Syria, Iraq borealis, Persia occidentalis.

112. ***A. cardiostemon*** Fisch., Ind. Sem. Horti Petrop. 6: 43 (1840).
Icon.: Tab. 8, fig. 112.
Typus (isotypus): „Armeniae ruthenicae provincia Nakitschiwan, in valle Koschadara", Szovits, K!

Bulbus tunicis exterioribus nigrescentibus papyraceis obsitus. Scapus 20—40 (—60) cm altus. Folia 2—3 (—4), lineari-lanceolata vel linearia, scapo breviora, 2—8 (—20) mm lata, margine ± scabrida. Spatha breviter acuminata, quam umbella brevior. Umbella fasciculato-hemisphaerica usque subsphaerica, multiflora, densa; pedicelli aequales, 9—18 mm longi. Perigonium stellatum, atrovinaceum; tepala 3—4,5 mm longa, anguste elliptico-oblonga vel sublinearia, obtusa, demum reflexa et torta. Filamenta quam tepala vix breviora, per c. 1 mm connata et prope basin tepalis adnata; exteriora subulata; interiora multo latiora et supra medium utrinque denticulo obtuso provisa; antherae c. 1,5 mm longae, flavae. Ovarium sessile, laeve. Capsula c. 5 mm lata, subsphaerica.

Persia: W: Azerb.: Shahpur in M. Gelosa lapidosis, Knapp! Inter Shahpur et Rezaiyeh, Shar. 7027-E! Kuh-e Sahand prope Shah Zardi, Buhse. In jugo SE Shahpur, 1750 m, Petrovitz 71! In valle Gusheh Daraq, in argillosis, Szov. 382!

Distr. gen.: Anatolia orientalis, Persia boreo-occidentalis, Transcaucasia.

113. ***A. colchicifolium*** BOISS., Diagn. Pl. Or. Nov. Ser. 2, 4: 112 (1859).
Syn.: *A. Straussii* BORNM., Beih. Bot. Centrbl. 28, 2: 515 (1911). *A. Haussknechtii* NÁB., Publ. Fac. Sci. Univ. Masaryk (Brno) 105: 37 (1929).
Icon.: Tab. 8, fig. 113. — NÁB., l. c.: 35 fig. 7, 4—6.
Typus: „Hab. prope Bakker Maaden Armeniae", NOË, G!, W!

Bulbus magnus, ovoideo-globosus; tunicae exteriores atrobrunneae, papyraceae. Scapus 6—18 cm altus, 3—15 mm crassus, validus, tenuiter costatus. Folia scapum superantia, 4—12 cm lata, elliptica usque suborbicularia. Spatha umbella e brevior, 2—3-loba, persistens. Umbella hemisphaerica, multiflora, densa; pedicelli 1,5 — 4 cm longi, subaequilongi. Perigonium late campanulatum, albidum nervis virescentibus; tepala 5—8 mm longa, ± cymbiformia, apice cucullata, elliptica, obtusa, margine integra, tenuiter crenulata, irregulariter denticulata vel lobulata, demum patula usque reflexa, ceterum ± immutata. Filamenta 4—6 mm longa, per 1,5—2,5 mm in annulum connata et basi tepalorum adnata, interiora quam exteriora basi latiora; antherae 1,2—2,5 mm longae, flavae. Stylus 2—4,5 mm longus, tenuis. Ovarium verruculosum. Capsula 5—7 mm lata, subglobosa, trisulcata, superficie reticulata.

Iraq: Kurd.: Arbil: M. Baradost, 2100 m, THESIGER 898!
Persia: W: Kermansh.: Rijab prope Qasr Shirin, NÁB. 2339! Kuh-e Kinisht, STR. s.n.! M. Shahu, STR.! In valle Gavehrud prope „Nischur", STR.!

Distr. gen.: Anatolia austro-orientalis, Iraq orientalis, Persia boreo-occidentalis.

Sect. *Megaloprason* WENDELBO, Bot. Not. 122: 28 (1969).

Scapus valde elongatus proportione tenuis, strictus, raro brevis, flexuosus, folia plerumque excedens. Umbella plerumque sphaerica, densa. Perigonium stellatum; tepala libera, mox reflexa et ± contorta. Ovarium plerumque manifeste stipitatum, verruculosum. — Typus sectionis: *A. Rosenbachianum* REGEL.

114. ***A. brachyscapum*** VVED., Flora Turkmen. 1, 2: 291 (1932), descr. ross.
Icon.: Tab. 8, fig. 114. — VVED., l. c.: 291, fig. 104 (1932).
Typus: ANDROSSOV, TAK, fragm.!

Bulbus 1,5—2,5 cm diametro, globosus, tunicis exterioribus papyraceis griseis. Scapus 10—14 cm altus, validus. Folia 1—2, scapum multo excedentia, 0,8—2,5 (—4,5) cm lata, linearia usque anguste elliptica, margine cartilaginea, scabrida vel laevia. Spatha c. 1,5 cm longa, trivalvis, valvis acuminatis, albo-membranaceis, purpureo-nervosis. Umbella late fasciculata usque hemisphaerica, multiflora, densa; pedicelli 12—25 mm longi, ebracteolati. Perigonium stellatum, ± pallide purpurascenti-violaceum nervis viridibus; tepala 5—7 (—10) mm longa, anguste ovata usque anguste elliptica vel anguste elliptico-oblonga, exteriora subacuta, interiora obtusa, per c. 1 mm connata, demum reflexa et contorta. Filamenta quam tepala paulo usque sesquilongiora, per 1—1,5 mm connata et tepalis adnata, lineari-subulata, interiora quam exteriora sublatiora; antherae 1,5—2 mm longae. Ovarium breviter stipitatum, verruculosum. Stylus filiformis, exsertus. Capsula depresso-globosa, c. 6 mm diametro, substipitata.

Persia: W: Esf.: Inter Esfahan et Abadeh, 1500—2500 m, SCHMID 5391! — S: Kerm.: Zahedan, 1500—1800 m, POPOV 51/126! Bal.: Inter Khash et Iranshahr, 1700 m, PAZOUKI 8042-E!
Turcomania: Suluklü, ANDROSSOV!

Distr. gen.: Endem.

115. ***A. scotostemon*** Wendelbo, Acta Horti Gotob. 28: 51 (1966).
Icon.: Tab. 8, fig. 115; tab. 19, fig. 2 a, b. — Wendelbo, l. c.: fig. 14.
Typus: Wendelbo 1292, BG!

Bulbus solitarius, 1,5—2,5 cm diametro, late ovoideus; tunicae exteriores subpapyraceae, integrae, atro-brunnescenti-canescentes. Scapus solitarius, 3—10 cm longus, usque ad 4 mm diametro, flexuosus, magna pro parte subterraneus. Folia 1—2, basalia, scapum valde superantia, 4—15 mm lata, crassa, flexuosa et undulata vel circinata, scabrido-ciliata. Spatha 8—12 mm longa, apiculata, 3—4-loba, persistens. Umbella hemisphaerica vel sphaerica, 3—4,5 cm diametro; pedicelli subaequales, fructiferi c. 15 mm longi. Tepala subaequalia, 5—6 mm longa, anguste elliptico-oblonga, obtusa vel subobtusa, subconcava, alba, nervo in sicco purpureo, in vivo violaceo percursa, mox reflexa et ± contorta. Filamenta tepala c. aequantia, per c. 1,5 mm connata, et tepalis per c. 1 mm adnata, subaequalia, parte libera lineari-triangulari, crassiuscula, saturate purpurea (in sicco); antherae c. 1 mm longae, violaceae. Ovarium obovoideum, apice emarginatum, 6-cristatum, verruculosum. Stylus c. 3,5 mm longus, filiformis. Capsula (submatura) valvis 5,5 mm latis obcordatis.

Persia: N: Maz.: In declivibus borealibus summi occidentalis Kuh-i Nizwa, 3100 m, Wdb. 1292! — C: Shahr.-Bust.: In declivibus australibus M. Shahvar supra Nokarman, 3200—3400 m, Rech. 5964! Damgh.-Semn.: In summo occidentale Kuh-i Nizwa, 3400 m, Wdb. 1280-a!

Distr. gen.: Endem.

116. ***A. Suworowii*** Regel, Gartenfl. 30: 356 (1881).
Icon.: Tab. 8, fig. 116. — Regel, l. c.: tab. 1062, fig. 4—5. Bot. Mag. 114: tab. 6994 (1888).
Typus: „In deserto kirghisico prope pagum Uralsk", A. Regel, LE?

Bulbus 2—3 cm diametro; tunicae exteriores coriaceae, cinerascentes, fissae, in collum basin scapi cingens elongatae. Scapus 30—100 cm altus, indistincte costatus. Folia (2—) 3—6, quam scapus breviora, 5—27 mm lata, margine semper et saepe subtus secus nervos aliquantum scabrida. Spatha c. 2 cm longa, in valvas 3—4 fissa. Umbella hemisphaerica usque sphaerica, multiflora, densa; pedicelli 10—40 mm longi, subaequales. Tepala 4—5,5 mm longa, anguste elliptico-oblonga, obtusa vel subobtusa, demum reflexa et flexuosa, purpureo-violacea nervo virescente. Filamenta quam tepala aequilonga vel eis paulo longiora, basi adnata et connata. Ovarium breviter stipitatum non verruculosum. Capsula c. 6 mm diametro, subsphaerica, basi aliquantum attenuata.

Turcomania: Chaman-i Bid, Korovin, Lipsky. Kushka, Lipsky. Alekseevskii, Androssov.
Afghanistan: NW: Kushk ad fines URSS., Lipsky. Badghiz: Inter Qala Nau et Khushmargh, 1140 m, Hdg., Wdb. & Ekb. W-8145! Herat: In declivibus borealibus jugi Sabzzak, 1500 m, Hdg., Wdb. & Ekb. W-8104! — E: Gardez: 100 km S Kabul verus Gardez in declivibus borealibus jugi Altimur, 2500—2700 m, Rech. 31541!

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

The occurrence of *A. Suworowii* in E. Afghanistan (Rech. 31541) seems surprising. The gap in the distribution may however well be due to undercollecting in the area between the main road Kandahar-Herat and the mountains of Central Afghanistan. More or less similar disjunctions are found in the geographical areas of several other species.

117. ***A. altissimum*** REGEL, Acta Horti Petrop. 8: 666 (1884).
Icon.: Tab. 8, fig. 117; tab. 26, fig. 3. — REGEL, l. c.: tab. 21, fig. k—m.
Typus: „Bulbos vivos misit A. REGEL e provincia Bucharae occidentalis Baldschuan", LE!

Bulbus tunicis cinerascentibus papyraceis obsitus. Scapus (65—) 80—150 cm altus, leviter costatus. Folia 4—6, scapo manifeste breviora, 2—9 cm lata, linearia vel loriformia. Umbella sphaerica, multiflora, densa; pedicelli inaequales, 2,5—4,5 (—6) cm longi. Perigonium stellatum, violaceum nervis saturatioribus; tepala 6—8 (—10) mm longa, lineari-oblonga, marginibus subparallelis, obtusa, demum reflexa et torta. Filamenta tepala aequantia vel eis paulo breviora, in annulum connata et tepalis basi adnata, e basi ± triangulari subulata, interiora quam exteriora basi duplo latiora. Ovarium breviter stipitatum, verruculosum. Capsula c. 5 mm diametro, obovoidea.

Persia: E: Khor.: Kuh-e Bezg, RECH. 1487! M. Hazar Masjed inter Ardak et Talqur, 1200—1600 m, RECH. 5032! 33 km SE Fariman versus Torbat-e Jam, 1200 m, RECH. 33213! Prope Mughan et in declivibus borealibus Kuh-i Binalud, 1900—2300 m, SCHMID 6225!
Turcomania: Chuli, LIPSKY. Firyuza, CZERNJAK. Inter Chuli et Firyuza, BOBROV & FEDTSCH.
Afghanistan: NW: Maimana: Narin, in pratis humidis, 1100 m, HDG., WDB. & EKB. W-8237! Belchiragh, in populetis cultis, 1150 m, HDG., WDB. & EKB. W-8340!

Distr. gen.: Persia boreo-orientalis, Turcomania, Afghanistan boreo-occidentalis, montes Asiae centralis.

118. ***A. Rosenbachianum*** REGEL, Acta Horti Petrop. 8: 664 (1884).
Syn.: *A. angustitepalum* WENDELBO, Dan. Biol. Skr. 10, 3: 169 (1958).
Icon.: Tab. 8, fig. 118; tab. 27, fig. 1, 2. — REGEL, l. c.: tab. 21, fig. c—i.
Typus: „Bulbos vivos legit A. REGEL in chanato Bucharae orientalis Baldschuan ad ripam dextram fluvii Kysil-su, 4—5000′ alt." LE!

Bulbus tunicis exterioribus nigrescentibus, papyraceis. Scapus (30—) 50—100 cm altus, in sicco sulcatus saepe apicem et basin versus obscure coloratus. Folia 2—4, quam scapus manifeste breviora, (0,5—) 1—5 cm lata, linearia vel late linearia, margine sublaevia. Umbella sphaerica, multiflora, laxa; pedicelli inaequales, 2—6 cm longi. Perigonium stellatum, atropurpureo-violaceum (raro album), nervis atrioribus; tepala 7—10 mm longa, sublinearia, a basi apicem versus sensim attenuata, subacuta, mox reflexa et contorta. Filamenta tepala aequantia vel eis aliquantum breviora, perigonio basi adnata, supra basin in annulum connata, e basi ± triangulari subulata, interiora quam exteriora duplo latiora; antherae violaceae. Ovarium stipitatum, verruculosum. Capsula c. 5 mm diametro, depresso-globosa.

Afghanistan: NW: Herat: Chisht, 1600—1800 m, KOEIE 4286! Kuh-e Darunta supra Chashmeh Obeh, 2300 m, HDG., WDB. & EKB. W-7883!, W-7884! Kotal-e Sabzzak, 2000 m, HDG., WDB. & EKB. W-8034!, LINDB. 634! — SW: Farah: 15 km N Gulistan, 2100—2200 m, HDG. & EKB. W-7289! — SE: Orozgan: Inter Orozgan et Malestan, 2200—2900 m, RECH. 35215! — E: Laghman: Kail, 2700 m, KOELZ 11691 (Typus *A. angustitepali* WENDELBO)! — NE: Kataghan: S Darrah-i Shu in valle Taganak, 2600 m, PODLECH 11107! Badakhshan: Prope Khambuk in valle SW Robat, 2700 m, HDG. & WDB. 9425! In valle Zebak, 2300 m, FURSE 6385! Supra Yawarzan, 1800 m, HDG. & WDB. W-9371! — C: Bamian: Karund Kalai Mir, 2800 m, HDG. & WDB. W-8796! In jugo Shahtu, 3200 m, HDG. & WDB. 4865! Deh Kundi: Inter juga Waras et Khonak,

2600 m, RECH. 36630! Deh Kundi, 2800 m, EDELB. 1870! Panjao: Inter Panjao et jugum Shahtu, 2800—3000 m, RECH. 36288! Ghorat: Mollah Allah, 12 km SW Qala-i Ghor, 2200—2300 m, RECH. 18982-a!
Pakistan: Quetta: In montibus SW Ziarat, 2200—2500 m, RECH. 29351!, LAMOND 1189!

Distr. gen.: Afghanistan, Baluchistan, Tadjikistan.

119. ***A. jesdianum*** BOISS. & BUHSE, Nouv. Mém. Soc. Nat. Mosc. 12: 217 (1860). Syn.: *A. kazerouni* PARSA, Kew Bull. 1949: 33 (1950). *A. Suvorovii* sensu NÁB., Publ. Fac. Sci. Univ. Masaryk (Brno) 105: 38, fig. 7, tab. 1 (1929), non REGEL (1881). Icon.: Tab. 8, fig. 119; tab. 20, fig. 1. — WENDELBO, Acta Horti Gotob. 28: 46 fig. 12 (1966).
Typus: BUHSE 1341, 1346, LE!

Bulbus 2—3,5 cm diametro, latiuscule ovoideus, tunicis exterioribus griseo-brunnescentibus, tenuiter reticulato-fibrosis. Scapus 36—90 cm altus, distincte costatus. Folia 2—3, basalia c. 2/3 scapi longitudinis aequantia, 6—23 (—30) mm lata, linearia, margine laevia. Spatha 1,5—3 cm longa (apiculata, unilateraliter fissa vel in valvas duas late ovatas divisa), reflexa. Umbella hemisphaerica, 4,5—12 cm diametro, multiflora; pedicelli 1,5—5 cm longi, subaequilongi. Tepala 8—9 mm longa, 1,2—1,5 mm lata, ab infra medium apicem subobtusum versus sensim attenuata, lilacina usque purpurea, nervo mediano distincto, mox reflexa et contorta. Filamenta tepalis subaequilonga vel distincte breviora; exteriora interioribus similia sed plerumque basi angustiora triangularia usque subquadrata; interiora e basi fere quadrata filiformia; antherae 2—2,5 mm longae. Ovarium verruculosum, distincte stipitatum. Stylus 3—5 mm longus, filiformis. Capsula c. 7 mm lata, valvis late ellipticis, apice emarginata, superficie rugulosa.

Iraq: Kurd.: Arbil: M. Baradost, 2034 m, THESIGER 898 p. p.! M. Karokh prope Rawandiz, 1700 m, NÁB. 2330! In montibus N pagum Rost, 2400—3000 m, THESIGER 963!, 964! Hajji Omran, 1750 m, CHAPMAN 12289! Gali Warta 30 km NNW Ranya, 1300—1400 m, RAWI, NURI & KASS 28750! Algurd Dagh, LUDLOW HEWITT s. n.! Rayat, Low 274! Sul.: Qara Dagh, 1000—1400 m, GILLETT 7903!, POORE 600! Jabal Avroman supra 2000 m, GILLETT 11868! Halabja, 700 m, RAWI 8906!
Persia: W: Ham.: Bahar, BAHAI 7018-E! Kermansh.: Shahu, STR.! Arak: M. Rasvand, STR.! Bakht.: Taleh, 3000 m, KOELZ 15201! Damaver, 3700 m, KOELZ 15182! Kuh Rang, in faucibus Shah Abbas, 2400 m, WDB. 1700! Lur.: Dow Rud, KOELZ 17427!, 17457!; 2100 m, KOELZ 17389! — S: Fars.: Kotal Henan prope Kazerun, STAPF! Kotal-i Abdui prope Dasht-e Arzhan, STAPF! Tang-i Kaeldu prope Dasht-e Arzhan, STAPF! Kakun, KASHKOULI 7079-E! — C: Yazd: Deh Bala, BUHSE 1341!, 1346!

Distr. gen.: Endem.

A. jesdianum is undoubtedly very closely related to *A. Rosenbachianum* and *A. altissimum*. LIPSKY, Acta Horti Petrop. 18, 1: 143 (1901) has a lengthy discussion on the problem of distinguishing between the three, and he concludes by uniting them. *A. jesdianum* is clearly distinct from the two others by the finely reticulate-fibrous outer bulb tunics. There are, however, difficulties with the naming of some specimens where the bulbs have not been collected. RECHINGER 3752, Kerman: M. Jebal Barez inter Bam et Jiroft, in declivibus borealibus supra Deh Bakri, 2400 m, is a broad-leaved plant with rather broad tepals. RUTTNER 383, Khorasan: Ad marginem orientalem deserti Kavir, Ozbagu, in cultis, could from the general habit be any of the three species but ecologically this locality would be rather unexpected for the species involved. More complete collections from East Persia would be of great interest to establish the eastern and western limits of the species involved.

120. ***A. hirtifolium*** BOISS., Fl. Or. 5: 281 (1882).
Syn.: *A. atropurpureum* WALDST. & KIT. var. *hirtulum* REGEL, Acta Horti Petrop. 3,2: 248 (1875).
Icon.: Tab. 9, fig. 120.
Typus: AUCHER-ELOY 5389, G!

Bulbus 2,5—4 cm diametro; tunicae exteriores cinereae, tenues, valde fissae et partim in fibras dissolutae. Scapus 80—120 cm longus, leviter costatus. Folia 4—5, usque ad 5 cm lata, margine ciliata vel raro glabra, in parte infima ± pubescentia vel fere glabra. Spatha biloba, c. 3 cm longa. Umbella sphaerica; pedicelli 3,5—5 cm longi. Perigonium stellatum, purpureum raro album; tepala 8—9 mm longa, sublinearia, marginibus per 2/3 parallelis demum attenuata, obtusa, mox reflexa et contorta. Filamenta 6—7 mm longa, e basi ± distincte angulato-dilatata vel triangulari filiformia, per c. 1 mm connata et paulo supra basin tepalis adnata; antherae c. 2 mm longae. Ovarium verruculosum, stipitatum. Stylus 3—4 mm longus. Capsula 5—8 mm diametro, globosa.

Persia: W: Kurd.: 64 km N Sanandaj, 1700 m, FURSE 2109! 15—32 km WNW Sanandaj versus Dezh Shahpur, 2220 m, ARCHIBALD 2077!, BENT & WR. 519-1202! Kermanshah: „Kolgar, Gorgchan", SHAR. 5078-E! Ham.: M. Alvand supra Ganjnameh, PICHLER! Esf.: Esfahan, AUCH. 5389! Arak: Oshtoran Kuh S Arak, 2100 m, BOWLES scholarships Exped. 1840! Lur.: Najiu, 1900 m, KOEIE 534! 96 km N Khorramabad versus Kermanshah, 1800 m, FURSE 1867! Kharon, 2200 m, KOEIE 1667! Bakht.: Kuh Rang, 2400 m, WDB. 928! Damaver, 3600 m, KOELZ 15180! Gahar, 2100 m, KOELZ 17872!; 2400 m, KOELZ 17928! — S: Fars.: Kakun, KASHKOULI 8048-E!, 8113-E! Kuh Bil prope Dasht-e Arzhan, STAPF 1984!

Distr. gen.: Endem.

121. ***A. stipitatum*** REGEL, Gartenfl. 30: 355 (1881).
Icon.: Tab. 9, fig. 121. — REGEL, l. c.: tab. 1062, fig. 1—3.
Typus: „Saravshanskii bassein: Pereval Anzob 10000'", O. FEDTSCHENKO, LE!

Speciei praecedenti arcte affinis sed differt ab ea bulbi tunicis nigrescentibus ± integris, scapo manifeste costato, foliis saepe dense pilosis, tepalis a basi ± attenuatis.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, 2080 m, HDG. & WDB. W-7574! Paghman: In montibus prope Paghman, 2500—2800 m, GILLI 199!, HDG. & WDB. 2842!, 3137! — NE: Kataghan: In declivibus borealibus jugi Salang, 1900—3000 m, HDG., WDB. & EKB. W-8585!, LAMOND 2242!, RECH. 31665!, FURSE 7865!, 8054!
Pakistan: Chitral: Ojor, 2900 m, BOWES LYON 845!

Distr. gen.: Afghanistan orientalis, Pakistan, Pamir-Alaj, Tien Shan.

Even if *A. stipitatum* and *A. hirtifolium* BOISS. can be easily distinguished from species like *A. altissimum* REGEL, *A. Rosenbachianum* REGEL and *A. jesdianum* BOISS. & BUHSE on the pubescence of the leaves, they are all closely related. In fact, there is reason to doubt whether *A. stipitatum* as it occurs in Afghanistan is more than a pubescent form of *A. Rosenbachianum*. I have preferred to keep them separate until a comparison on living cultivated material can give further clues to the true relationship.

Plants of *A. stipitatum* from the north side of the Salang pass have no real pubescence, but the leaves are scabrid on the nerves of the underside.

122. ***A. chitralicum*** WANG & TANG, Bull. Fan. Mem. Inst. Biol. Bot. (Peking) 7: 298 (1936/37).
Syn.: *A. chitralicum* var. *bifoliatum* WANG & TANG, l.c.
Icon.: Tab. 9, fig. 122.
Typus: HARRISS 16691-a, K!

Bulbus late ovoideus, c. 1,5 cm diametro, tunicis exterioribus chartaceis, griseo-brunnescentibus, integris. Scapus 13—23 cm longus. Folia (1—) 2—6, scapum paulo superantia vel eo breviora, 3—9 mm lata. Spatha caudata, bivalvis; valvae ovatae, rostro dimidiam valvam aequante provisae, pallide roseae, quam pedicelli breviores. Umbella hemisphaerica, laxiuscula; pedicelli subaequales, usque ad 20 mm longi. Perigonium substellatum, pallide roseum nervis atrioribus; tepala (4—) 5—6 mm longa, anguste elliptico-oblonga vel lanceolato-oblonga, obtusa, mox reflexa et contorta. Filamenta quam tepala paulo breviora vel aequilonga, prope basin connata et tepalis adnata, e basi subquadrata abrupte subulato-attenuata. Ovarium breviter stipitatum, verruculosum Capsula ignota.

Afghanistan: E: Nuristan: Urmur, Kushtos, 1470-1850 m, Neub. 4528! Kushtos, Edelb. 2057! Pashki, 2500 m, Edelb. 743! Kantivo, 2200 m, Edelb. 701! Shtive, 2550 m, Edelb. 1027! Parun supra Chetras, 2100—2200 m, Kerst. 860! Netshingel, Karim Nushin 699!
Pakistan: Chitral: In jugo Dorah, 3600 m, Giles 266! Birmogh Lasht, 3000 m, Bowes Lyon 737! Rumbur, 2800 m, Bowes Lyon 666! Chitral, 2400—3000 m, Harriss 16691-a!

Distr. gen.: Endem.

123. ***A. fibriferum*** Wendelbo, Dan. Biol. Skr. 10, 3: 175 (1958).
Icon.: Tab. 9, fig. 123; tab. 20, fig. 2.—Wendelbo, l. c.: 170, fig. 59d—f., 184, fig. 70g.
Typus: Kerstan 247, HAL!

Bulbi tunicae exteriores cinerascentes, in fibras grossas dissolutae, in collum basin scapi cingens productae. Scapus usque ad 33 cm altus. Folia 5, linearia, quam scapus breviora, usque ad 6,5 mm lata, margine cartilagineo manifeste ciliata. Spatha 1/3 umbellae attingens. Umbella multiflora, hemisphaerica; pedicelli usque ad 35 mm longi. Tepala 7 mm longa, 1,2 mm lata, sublinearia, obtusa, rubra (e collectore), distincte nervosa, mox reflexa et contorta. Filamenta subaequalia 2/3 circiter longitudinis tepalorum attingentia, per c. 1,5 mm connata et per c. 1 mm tepalis adnata, lineari-triangularia; antherae 2 mm longae. Ovarium subsphaericum, substipitatum, verruculosum. Capsula c. 6 mm longa.

Afghanistan: SE: Kandahar: Inter Kandahar et Kalat-i Ghilzai, 1100 m, Kerst. 247! 5 km SW Kalat-i Ghilzai, 1600 m, Freitag 387!

Distr. gen.: Endem.

124. ***A. badakhshanicum*** Wendelbo, Acta Horti Gotob. 28: 39 (1966).
Icon.: Tab. 9, fig. 124; tab. 21, fig. 2. — Wendelbo, l. c.: fig. 6 d—f.
Typus: Lindberg 709, BG!

Bulbus c. 12 mm diametro; tunicae exteriores canescentes, integrae, nervis distinctis, distantibus. Scapus 10—25 cm longus, aliquantum flexuosus, in sicco costatus, purpurascens. Folium singulum, 14—24 cm longum, 4,5—14 mm latum, canaliculatum, margine papilloso-ciliatum, cinereo-viride. Spatha circiter 10 mm longa; valvae 2, late ovatae, apiculatae. Umbella hemisphaerico-fasciculata, 2,2—3,5 cm diametro; pedicelli floriferi 8—10 mm longi, fructiferi manifeste incrassati et aliquantum elongati. Perigonium stellatum, album nervis lilacinis; tepala 5—7 mm longa, 1,3 mm lata, a medio sensim apicem obtusum versus attenuata, demum reflexa et contorta. Filamenta tepala longitudine aequantia, lineari-filiformia, per 0,7 mm connata, basi quadrata, ibique plerumque utrinque obtuse denticulata, perigonio paulo supra basin adnata; antherae c. 1 mm longae. Ovarium subglobosum, indistincte 6-corniculatum, papilloso-verruculosum, manifeste stipitatum. Capsula c. 4,5 mm diam., late obovoidea, verruculosa.

Afghanistan: NE: Badakhshan: Mian Kuh ad lacum Shiva, LINDB. 709! Prope Khambuk in valle SW Robat, 3000 m, HDG. & WDB. W-9414!

Distr. gen.: Endem.

125. ***A. sarawschanicum*** REGEL, Acta Horti Petrop. 3, 2: 244 (1875).
Syn.: *A. pseudo-seravschanicum* M. POP. & VVED., Sched. Herb. Fl. As. Med. no. 621 (1935).
Icon.: Tab. 9, fig. 125. — REGEL, Reise in Turkestan 3, 1: tab. 17, fig. 1—4 (1876).
Typus: „Turkestaniae, in valle fluvii Sarawschan, 2700—7000′ alt. s. m.", O. FEDTSCHENKO, LE.

Bulbus 1—2 cm diametro, tunicis griseis papyraceis. Scapus 25—50 (—70) cm, in sicco costatus. Folia 1—2, 1—4 cm lata, quam scapus breviora, lineari-lanceolata, margine scabrida vel laevia, canescenti-viridia. Spatha quam umbella brevior, breviter acuminata. Umbella sphaerica usque subsphaerica, multiflora, ± densa; pedicelli inaequales, ad 5 cm longi. Perigonium stellatum, roseo-violaceum nervis atrioribus; tepala 6—8 mm longa, lineari-lanceolata, acuta, mox reflexa et contorta. Filamenta quam tepala aliquantum breviora, subulata, tepalis basi adnata, supra basin in annulum connata, denticulo singulo vel denticulis binis inter filamenta ± bene evolutis. Ovarium breviter stipitatum, laeve apice cornibus brevibus 6 provisum. Capsula 4 mm diametro, subsphaerica.

Persia: E: Khor.: 64 km E Gonbad-e Kavus, 1100 m, FURSE 7415!
Turcomania: Kopet Dagh: Garmab, GUBANOV 399-a!, Inter Garmab et Masinev, ANTONOV. Masinev, ANTONOV. Karasudere versus Nokhur, BOBROV & FEDTSCH. Sjunt, LIPSKY, CZERNJAK., FEDTSCH. Khodzhakala versus Bami, RADDE. Inter Kheirabad et Chaek, LIPSKY. Seamasur, CZERNJAK.
Afghanistan: N: Mazar-i Sharif: Ali Kuh 15 km S Mazar-i Sharif, 1700 m, HDG., WDB. & EKB. W-8503! — NW: Maimana: Darrah Belchiragh, 1200 m, HDG. & WDB. 3781!; EKB., HDG. & WDB. 8373!

Distr. gen.: Persia boreo-occidentalis, Turcomania, Afghanistan, Tadjikistan.

The finds of *A. sarawschanicum* in North Afghanistan give a geographical link between the area of this species in Central Asia and that of *A. pseudo-seravschanicum* in the Kopet Dagh mountains. The distinction between the two species seems to be a feeble one, and Dr. VVEDENSKY (in litt.) has informed me that he now thinks the two are conspecific.

126. ***A. chelotum*** WENDELBO, Acta Horti Gotob. 28: 42 (1966).
Icon.: Tab. 9, fig. 126; tab. 21, fig. 1. — WENDELBO, l. c.: fig. 11.
Typus: WENDELBO 643, BG!

Bulbus c. 2,5 cm diametro, subglobosus, tunicis exterioribus papyraceis, integris, canescentibus. Scapus c. 60 cm altus, 5—6 mm diametro. Folia 3—4, scapo multo breviora, 2—5 cm lata (in natura usque ad 8 cm lata observata), margine glabra. Spatha 3-fida, 2—2,5 cm longa, lobis ovatis, acuminatis, persistentibus. Umbella hemisphaerico-fasciculata, c. 5 cm diametro; pedicelli subinaequales usque ad 2 cm longi, basi bulbillis nonnullis 0,5—0,7 cm longis provisa. Perigonium violaceum, late campanulatum; tepala 6—8 mm longa, anguste ovata vel anguste elliptico-oblonga, apicem versus attenuata, emarginata subbifida, interdum margine irregulariter paucidenticulata (post florendum ± immutata?). Filamenta tepalis paulo longiora, filiformia, basin versus paulo dilatata, subaequalia, per c. 1 mm connata et tepalis per c. 0,5 mm adnata; antherae 1—1,5 mm longae. Ovarium trisulcatum,

depressum, verruculosum, stipite c. 1 mm longo triquetro suffultum. Stylus c. 5 mm longus, filiformis.

Persia: N: Gorg.: In jugo Golestan, IRANSHAHR & DEZFOULIAN 7069-E-a! 87 km E Gonbad-e Kavus, 1250 m, GRANT 17202! Maz.: In valle Haraz: Supra Panjab, 2100 m, WDB. 643!

Distr. gen.: Endem.

The material of GRANT no. 17207 is in bud and thus not possible to name with certainty. The other material is also rather young and the description is accordingly not quite satisfactory. *A. chelotum* is undoubtedly related to *A. grande* LIPSKY, Acta Horti Petrop. 13: 343 (1893), and may be conspecific with it. According to the description *A. grande* has pale rose tepals and not exserted filaments. There is also no mention of bulbils in the umbel. The ovary is distinctly verruculose in *A. chelotum* but is stated to be smooth in *A. grande*. I have seen no material of the latter.

127. ***A. giganteum*** REGEL, Gartenfl. 32: 97 (1883).
Icon.: Tab. 9, fig. 127; tab. 26, fig. 4. — REGEL, l. c.: tab. 1113. Bot. Mag. 111: 6828 (1885).
Typus: „Planta quaedam culta, probabiliter e bulbis in Persia inter Mashhad et Chacha", O'DONOVAN, LE.

Bulbus magnus, tunicis potius numerosis, griseo-brunneis, coriaceis, fissis. Scapus robustus, 80—200 cm altus, nervis leviter prominentibus. Folia loriformia, 1/2—1/3 scapi longitudinis attingentia, 5—10 cm lata, glaucescentia. Spatha dimidiam umbellam attingens, breviter rostrata. Umbella sphaerica, multiflora, densa; pedicelli subaequales usque ad 6 cm longi, tenues. Perigonium stellatum, purpureo-violaceum, raro album, nervis inconspicuis; tepala 5—6 (—7) mm longa, elliptica usque obovata, obtusa; post florendum immutata. Filamenta quam tepala paulo longiora vel fere sesquilongiora, basi connata et perigonio basi adnata, e basi triangulari in filamentis interioribus sesquilatiori subulata. Ovarium subsessile, verruculosum. Capsula c. 5 mm diametro.

Persia: E: Khor.: M. Kopet Dagh inter Quchan et Lotfabad, in jugo Allah Akbar, 1800 m, RECH. 1713! Khorasan orientalis, in montibus, DIEZ!
Turcomania: Ashkhabad: Firyuza, SINT. 628! Kaachka, KOROVIN. Kurd-Ssu, CZERNJAK. Garmab, RADDE. Inter Garmab et Chuli, RADDE, VVED. Karanki, GONTSCHAROV & JARMOLENKO. Sundukli, BOBROV & FEDTSCH. Prope Chuli, MICHELSON, VVED. Chaman-i bed, MICHELSON. Dagh-Bolak, KOROVIN. Chapan, KOROVIN. Inter Khan et Djaljau, CZERNJAK.
Afghanistan: N: Mazar-i Sharif: Chashmeh-i Shafal, 900 m, HDG. & WDB. 3880!, RECH. 16223!, 34108! 50 km W Mazar-i Sharif, 500 m, FREITAG 188! Tang-i Tashkurghan, 450 m, EKB. W-9058! — NW: Maimana: Inter Maimana et Belchiragh, 1000 m, HDG. & WDB. 3681! Chashmeh Yan Bolaq, 650 m, JAKEŠ! Bala Morghab: Inter Qala Nau et Morghab, 1200 m, FURSE 7730! In faucibus Selsela Koh-i Bazartu, 570 m, HDG., WDB. & EKB. W-8218! Darrah Taghab Laman prope Qala Nau, 1140 m, HDG., WDB. & EKB. W-8127! Herat: Badghiz, AITCH. 356 p. p.!, 463!

Distr. gen.: Persia boreo-orientalis, Afghanistan borealis et occidentalis, Turcomania, Pamir-Alaj.

128. ***A. Macleanii*** BAKER, Bot. Mag. 109, tab. 6707 (1883).
Syn.: *A. elatum* REGEL, Acta Horti Petrop. 8: 665 (1884). *A. giganteum* sensu WENDELBO, Dan. Biol. Skr. 10, 3: 175 (1958) p.p., non REGEL (1883).
Icon.: Tab. 9, fig. 128. — BAKER, l. c. REGEL, l. c.: tab. 20, fig. g—k. Fl. Tadjik. SSR. 2: tab. 62 (1963).
Typus: „Cultivated material. Bulb brought from Cabul by Colonel MACLEAN", K!

A. giganteo arcte affine sed ab eo notis sequentibus diversum: foliis lucide viridibus (2—8 cm latis), scapo distincte costato saepius aliquanto humiliore (usque ad 125 cm), umbella aliquanto minore, tepalis sublongioribus (6—7 mm longis), magis elliptico-ovatis, subacutis.

Afghanistan: E: Kabul: Kuh Korogh, 2250—2760 m, GILLI 200!, HDG. & EKB. W-7020—7023! Jagdalak, 2100 m, KOELZ 11486! Tang-e Gharu, NEUB. 4186! 1400—1500 m, RECH. 34369! Paghman, 3000—3100 m, HDG. & WDB. 4404!, 4422! Logar: In declivibus occidentalibus Kotal Aogardan, 2900 m, EKB. W-9191! Gardez: Nozi, 3150 m, KOELZ 11980! M. Safed Kuh, in declivibus boreo-occidentalibus jugi Altimur, 2600—2700 m, RECH. 31912!, LAMOND 2389! Ghazni: 50 km NW Ghazni versus Dasht-i Nawar, 2800 m, HDG. & EKB. W-7334! Laghman: Nilkhan, 2450 m, KOELZ 11700! — C: Doab: Darreh-i Shikar, 30 km supra Doab, 2100 m, HDG. & WDB. 3365!
Pakistan: Kurram: In valle Kurram, 1850 m, COLLETT 40!

Distr. gen.: Afghanistan orientalis, Pakistan occidentalis (Kurram), Tadjikistan.

In Symbolae afghanicae 4: 175 (WENDELBO, *l. c.*) *A. Macleanii* was treated as a synonym of *A. giganteum* REGEL. Since then I have had the possibility to study both species in the field at several occasions. There is no doubt that they are clearly distinguished from each other in several characters. On the other hand I have found that *A. elatum* REGEL from Tadjikistan which is well known in cultivation, must be considered a synonym of *A. Macleanii*. There is a rather large gap between the occurrences in Tadjikistan (*A. elatum*) and E. Afghanistan (*A. Macleanii*), but a similar disjunction has been found in the geographical area of many other species.

Sect. *Kaloprason* C. KOCH, Linnaea 22: 235 (1849).

Scapus sat brevis quam folia brevior, maturitate valde incrassatus, basin versus valde attenuatus. Umbella ± laxa, pedicellis aliquantum usque valde inaequalibus. Perigonium stellatum usque ± late campanulatum; tepala libera. — Typus sectionis: *A. caspium* (PALL.) M.B.

129. ***A. protensum*** WENDELBO, Bot. Not. 121: 276 (1968).
Syn.: *A. Schubertii* sensu VVED., Fl. URSS. 4: 275 (1935) p.p., non ZUCC. (1843).
Icon.: Tab. 9, fig. 129; tab. 27, fig. 3. — Fl. URSS. 4: tab. 16, fig. 2 (1935). WENDELBO, l. c.: fig. 3.
Typus: HEDGE & WENDELBO 4815, BG!

Bulbus 2—3 cm diametro, globosus; tunicae coriaceae, apice in fibras fissae, exteriores nigrae, sequentes purpurascentes. Scapus 10—25 (—30) cm altus, crassus, apice plerumque crassissimus (usque ad 1,7 cm), basin versus sensim attenuatus. Folia (2—) 3 (—5), quam scapus longiora, 1—5 cm lata, plana, margine minute scabrida. Spatha c. 2 cm longa, acuminata, 3-valvis. Umbella sphaerica, multiflora, laxa; pedicelli valde inaequales, longissimi, ei florum sterilium 6—16 cm longi, quam ei florum fertilium circiter duplo longiores, apice clavato-incrassati. Perigonium late campanulatum, in vivo pallide brunnescens nervis atrioribus, in sicco sordide album nervis purpurascentibus; tepala 7—8 (—10) mm longa, lineari-lanceolata usque lanceolata, obtusa usque subobtusa, apice leviter involuta, post florendum ± erecta, nervo centrali non incrassato. Filamenta c. 2/3—3/4 tepalorum longitudinis aequantia vel ad summum quam tepala aliquanto longiora, e basi triangulari subulata, alternatim basi latiora, per 1—1,5 mm connata et paulo supra basin perigonio adnata. Ovarium florum fertilium sphaericum, verruculosum, stipitatum. Stylus non exsertus, filiformis. Capsula c. 4 mm diametro, stipitata.

Afghanistan: N: Mazar-i Sharif: Ali Kuh, 18 km S Mazar-i Sharif, 1600 m, HDG., WDB. & EKB. W-8500! 1 km W Tashkurghan, 300 m, EKB. W-9045! — NW: Maimana:

Darrah Abdullah E Belchiragh, 1200 m, Hdg., Wdb. & Ekb. W-8361! Bala Morghab: Khushmargh in Darrah Tagao-Laman S Qala Nau, 1140 m, Hdg., Wdb. & Ekb. W-8126! 4 km E Darrah-i Bum, 1100 m, Hdg., Wdb. & Ekb. W-8168! Herat: Inter Obeh et Khwajachisht, 1430 m, Hdg., Wdb. & Ekb. W-7773! Kuh-e Darunta, supra Chashmeh Obeh, 2300 m, Hdg., Wdb. & Ekb. W-7886! In jugo Sabzak, 2000 m, Hdg., Wdb. & Ekb. W-8033!, Neub. 4263! — **SW**: Herat, Amsel! Inter Herat et Shindand, 1400 m, Koeie 3946! 40 km S Herat, 1650 m, Hdg., Wdb. & Ekb. W-7970! — **C**: Bamian: E Naiak versus Panjao, 2800 m, Hdg. & Wdb. 4815!

Distr. gen.: Afghanistan borealis et boreo-occidentalis, Aralo-Caspia, Balkhash, Kizyl-Kum.

130. ***A. bucharicum*** Regel, Acta Horti Petrop. 8, 3: 660 (1884).
Icon.: Tab. 9, fig. 130; tab. 27, fig. 4. — Regel, l. c.: tab. 20a—c. Fl. Tadjik. SSR. 2: tab. 61, fig. 1, 2 (1963).
Typus: „In Buchara Orientali ad fluvium Pändsch, 4000′ alt.", A. Regel, LE!

Bulbus 1—3 cm diametro, subglobosus; tunicae exteriores atrocinereae, papyraceae. Scapus 10—30 cm altus, validus. Folia (2—) 3—6, quam scapus longiora, (3—) 7—20 (—30) mm lata, margine scabrida. Spatha quam umbella multo brevior. Umbella hemisphaerica, rarius sphaerica, laxiuscula; pedicelli inaequales, centrales quam marginales longiores, 2—6 (—8) cm longi. Perigonium substellatum, album, nervis sordide virescenti-purpurascentibus; tepala (7—) 8—10 mm longa, lineari-lanceolata, acuta, post florendum erecta, nervo mediano incrassato rigescentia. Filamenta tepalis paulo breviora, per c. 1,5 mm connata et tepalis adnata, subulata, alternatim basi aliquanto latiora; antherae c. 2 mm longae. Ovarium stipitatum, verruculosum. Stylus filiformis. Capsula c. 5 mm diametro, subglobosa, stipitata.

Afghanistan: **NE**: Badakhshan: Faizabad, 1500—2100 m, Furse 6268! Supra Yawarzan, 1900 m, Hdg. & Wdb. W-9350!

Distr. gen.: Afghanistan boreo-orientalis, Tadjikistan australis.

Vvedensky, Fl. URSS 4: 275 (1935), treated *A. bucharicum* Regel as a synonym of *A. Schubertii* Zucc. Later on, Fl. Tadjik. SSR 2:344 (1963) he came to the conclusion that two taxa were involved, *A. bucharicum* in the Pamir-Alai area and *A. Schubertii* in the Aral-Casp. — Kyzil Kum area. Vvedensky stated that the colour of the tepals of *A. bucharicum* is dirty rose with dirty purplish nerves. Hdg. & Wdb. W-9350 (also cultivated in the Botanical Garden of Gothenburg) had white tepals with greenish purple nerves and this fits the original description of Regel.

A. Schubertii was originally described from Palestine, and after having studied a large material from the East Mediterranean as well as from Central Asia I came to the conclusion that plants from the latter area represented a separate taxon to which I gave the name *A. protensum*. Very little material of what Vvedensky considers to be true *A. bucharicum* has been available.

131. ***A. caspium*** (Pall.) M. B., Fl. Taur.-Cauc. 1: 265 (1808).
Syn.: *Crinum caspium* Pall., Reise 2: 736 (1773). *Allium brahuicum* Boiss., Fl. Or. 5: 278 (1882).
Icon.: Tab. 9, fig. 131; tab. 24, fig. a, b. — Pallas, l. c.: tab. q. Bot. Mag. 77: tab. 4598 (1851).
Typus: „Circa mare Caspium", N. Sokolof.

Bulbus tunicis exterioribus papyraceis cinerascenti-nigris. Scapus (7—) 10—20 (—35) cm altus, validus, usque ad 25 mm diametro. Folia 3—6, linearia usque late lanceolata, scapum non excedentia, 5—35 mm lata, falcata, margine laevi vel scabrido cartilagineo. Spatha 12—25 mm longa. Umbella fasciculata usque sphaerica,

multiflora, laxiuscula; pedicelli ± inaequales, 3—15 cm longi. Perigonium campanulatum, sordide virescenti-violaceum interdum pallescens, nervis atris; tepala 5—11 mm longa (in speciminibus nostris 6—7 mm), ovata usque anguste elliptico-oblonga, obtusa, interiora quam exteriora latiora, interdum denticulata, post florendum immutata. Filamenta quam tepala sesqui- usque duplo longiora, per c. 1 mm connata et tepalis adnata, e basi latiore lineari-subulata, ± aequalia, violascentia. Ovarium stipitatum. Stylus filiformis, exsertus. Capsula subsphaerica, 6—8 mm diametro, breviter stipitata.

Persia: **N**: Gorg.: Dasht-e Gorgan, SHAR. 61! Ad marginem orientalem deserti Kavir, Ozbagu, Dasht, RUTTNER 290! Shir Geshk prope Tabas, RUTTNER 566!
Turcomania: Prope Ashkhabad, Keltenczinar, LITW. 2097! Inter Annaju et Gyaurs, SINT. 307! In montibus Turcomaniae distr. Kushkin, sec. Fl. URSS. Turcomania, sec. Flora Turkmen. 1, 2: 294—295 (1932).
Afghanistan: **N**: Mazar-i Sharif: In declivibus occidentalibus jugi Shibaghlu 34 km E Tashkurghan, 600 m, RECH. 34264! Tashkurghan, 500 m, RECH. 34063!, EKB. W-9046! 25—35 km E Mazar-i Sharif versus Tashkurghan, 400 m, RECH. 34206! 20—30 km NW Haibak versus Tashkurghan, 600 m, RECH. 34013! — **NW**: Maimana: Prope Khest Pul, 16 km E Maimana, 800 m, HDG., WDB. & EKB. W-8290! Herat: 10 km NW Herat prope Ziarat Khodja Mullah-i Kuhi, FREITAG 5370! In valle fluvii Hari Rud, AITCH. 412!, 429! — **E**: Kabul: E Kabul, NEUB. 4428! 2—15 km W Sarobi, 1000—1300 m, RECH. 34421! In valle Logar, VOLK 140! Urgun: 35 km NW Urgun versus Surmat, 2200—2400 m, RECH. 35908! — **NE**: Kataghan: Inter Doshi et Khinjan, 1120 m, HDG., WDB. & EKB. 8604!
Pakistan: Quetta: Inter Bostan et Khanozai, 1600 m, RECH. 29161!, LAMOND 1108! In jugo prope Mungochar, STOCKS 936!

Distr. gen.: Persia boreo-orientalis, montes Turcomaniae, Afghanistan, Pakistan occidentalis, Wolga inferior, Caucasus, Aralo-Caspia, Kizyl-Kum, Kara Kum, Syr-Darya, Amu Darya.

132. ***A. helicophyllum*** VVED., Bull. Univ. As. Centr. 19: 127 (1934).
Icon.: Tab. 9, fig. 132; tab. 28, fig. 1.
Typus: Kara-Kaly, TAK.

Bulbi tunicae exteriores nigrescentes. Scapus 10—20 cm altus, 5—10 mm crassus. Folia 5—6, linearia, 2—3 mm lata, in parte superiore spiraliter torta, scapum excedentia. Spatha c. 1 cm longa, acuminata. Umbella fasciculato-hemisphaerica vel hemisphaerica, multiflora, laxiuscula; pedicelli inaequilongi, usque ad 9 cm longi, in statu fructifero in parte superiore incrassati. Perigonium stellatum; tepala 5 mm longa, linearia, obtusa, lilacina nervo valido purpurascenti-viridi percursa, post florendum reflexa et contorta. Filamenta quam tepala breviora, basi tepalis adnata, supra leviter connata, e basi subtriangulari subulata, interiora quam exteriora sesquilatiora. Ovarium verruculosum. Capsula 4—5 mm diametro, late obovoidea.

Persia: **E**: Khor.: Kopet Dag: 48 km E Bojnurd, 1200 m, FURSE 7454! — **C**: Shahr.-Bust.: In jugo Khash Aylan, c. 70 km ab oppido Shahrud orientem versus, 2000—2200 m, RECH. 5443!
Turcomania: Ashkhabad: Suluklü, SINT. 893!

Distr. gen.: Endem.

Sect. *Thaumasioprason* WENDELBO, Bot. Not. 122: 29 (1969).

Scapus proportione brevis, crassus. Folia 1—2, scapum excedentia, lata. Umbella sphaerica, densa, fragillima. Perigonium late campanulatum; tepala magna, lata, immutata. — Typus sectionis: *A. mirum* WENDELBO.

This section consists of 3 species only, all found in East and Central Afghanistan. These 3 species seem to form an isolated and very distinct group. Especially characteristic are the large tepals that are erect and keep their form in the fruiting stage, as well as the very fragile umbel.

133. ***A. mirum*** Wendelbo, Dan. Biol. Skr. 10, 3: 178 (1958).
Icon.: Tab. 10, fig. 133; tab. 28, fig. 4. — Wendelbo, l. c.: fig. 66. Wendelbo, Acta Horti Gotob. 28: 48, fig. 13 (1966).
Typus: Volk 208, W!

Bulbus usque ad 4 cm diametro, subglobosus; tunicae exteriores papyraceae, cinerascentes. Scapus 8—40 cm altus, crassus. Folia 1—2, 9—30 cm longa, 1,5—8 cm lata, elliptica usque anguste ovata, crassa, glauco-viridia saepe purpureo-striata. Umbella 5—9 cm diametro, densa, multiflora, sphaerica, fragilis; pedicelli 1,5—3 cm longi. Perigonium late campanulatum, pallide brunnescenti-purpureum usque fere album nervis atris; tepala 8—12 mm longa, anguste obovata usque obovata vel elliptica, emarginata vel integra, post florendum immutata. Filamenta quam tepala aliquanto breviora vel longiora, e basi latiore filiformia, prope basin connata et tepalis adnata, interiora basi quam exteriora duplo latiora. Ovarium 6-lobum. Capsula 6 mm diametro, lobata.

Afghanistan: **SE**: Orozgan: Kuh Langar Khil, Lindb. 950! **E**: Kabul: Prope Kabul, Koelz 11417! Band-i Kargha, 1900 m, Reichert in Rech. 33574! Sher Darwasa, Neub. 671!, Kerst. 99!, Hdg. & Wdb. 2934! Kuh-i Asmai, 1600—1900 m, Hdg. & Wdb. 2776!, Gilli 197! 10 km NW Kabul, 2000—2100 m, Lamond 1987! Tang-i Gharu, 1700 m, Hay 65! Kuh Jaouz, Lindb. 782! Panjshir: Gulbahar, Volk 208! Mukeni, 2600 m, Hdg. & Wdb. 5270! In jugo Salang, 2700—3300 m, Rech. 31427!, 37096!, Lamond 2211!; 1800—2400 m, Furse 7937!, Furse 8043! Top Darrah 3 km SW Charikar, 2300 m, Ekb., Hdg. & Wdb. W-7365-A! Logar: In valle Logar, Volk 1809! Jaji: Drekalla, Aitch. 845! N Khane, 50 km E Shutargardan, 2600 m, Ekb. W-9226! Ghorband: In valle Ghorband, 2300 m, Furse 5759!, Neub. 4152! 15 km a Surkh-i Parsa, 2150 m, Freitag 1172! 10 km W Chordeh-Ghorband prope Farinjal, 2000 m, Freitag 1117! Nuristan: Kantivo, 2100 m, Edelb. 723! — **NE**: Kataghan: In declivibus borealibus jugi Salang, 1700 m, Freitag 2752! In parte superiore vallis Andarab: Darrah-i Til, 2700 m, Podlech 11195! — **C**: Bamian: Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16796! In declivibus occidentalibus jugi Shibar, 3000 m, Hdg. & Wdb. 4205! 31 km W Bamian, 3000 m, Freitag 1300!

Distr. gen.: Endem.

134. ***A. Caroli-Henrici*** Wendelbo, Bot. Not. 121: 274 (1968).
Icon.: Tab. 10, fig. 134. — Wendelbo, l. c.: fig. 2 A, B.
Typus: Rechinger 35053, W!

Bulbus 1,5—2 cm diametro, globosus; tunicae exteriores coriaceae, nigrescentes, interiores tenuiores, pallide brunneae, dense tenuiter nervosae, longitudinaliter fissae; bulbilli 1,5 cm longi, cymbiformes, rostrati, flavi, nitentes. Scapus 8—12,5 cm longus, leviter curvatus, ± purpureo-suffusus. Folia 1—2, quam scapus longiora, 4—9 mm lata, margine minute scabrida. Spatha 1,5 cm longa, 4-loba. Umbella hemisphaerica usque fasciculato-hemisphaerica, ± multiflora, densiuscula; pedicelli inaequales, usque ad 3 cm longi, tenues. Perigonium campanulatum, in sicco in parte inferiore pallide brunnescenti-flavidum, in parte superiore purpurascens et atrius nervosum; tepala inaequalia, c. 10 mm longa, obtusa, post florendum immutata, exteriora elliptica, interiora ovata margine saepe denticulata. Filamenta dimidium circiter tepalorum longitudinis aequantia, per c. 1,5 mm connata et tepalis

adnata; exteriora e basi latiore subulata; interiora sublongiora et duplo latiora; antherae 2 mm longae, oblongae, flavae. Ovarium ovoideo-cylindricum, viride, angulis indistincte verruculosis.

Afghanistan: **SW:** Farah: 15 km N Gulestan, 1900 m, HDG. & EKB. W-7272! — **SE:** Tirin: 42 km S Tirin versus Kandahar, 1800 m, RECH. 35053! Orozgan: Inter Tirin et Orozgan, RECH. 35150!

Distr. gen.: Endem.

135. ***A. cucullatum*** WENDELBO, Dan. Biol. Skr. 10, 3: 173 (1958).
Icon.: Tab. 10, fig. 135; tab. 19, fig. 3; tab. 28, fig. 2. — WENDELBO, l. c.: fig. 62a—c, 70c.
Typus: KOELZ 12025, US!

Bulbus usque ad 3 cm diametro; tunicae exteriores papyraceae, griseae, fragiles. Scapus 7—35 cm altus, saepe aliquantum flexuosus, saepe purpurascens. Folia 1—2, 5—30 mm lata, florendi tempore plerumque ± emarcida, glauca, margine laevia vel scabrida. Umbella 4,5—8 cm diametro, sphaerica, densa, multiflora, fragilis; pedicelli 2—3,5 cm longi, tenues. Perigonium campanulatum, brunnescenti-flavum purpureo-suffusum; tepala 6—7 (—8) mm longa, elliptico-oblonga, apice rotundata, subaequalia, post florendum immutata. Filamenta c. 5 mm longa, purpurascentia, per 1—1,5 mm connata, e basi triangulari subulata, interiora quam exteriora basi multo latiora. Ovarium late obovoideum, costis 6 papillosis provisum; ovula 6—8. Capsula sphaerica, 4 mm diametro.

Afghanistan: **E:** Kabul: Paghman, 3000 m, HDG. & WDB. 4406!, CHAW.-MUST.! In jugo Unai, 3000 m, HDG. & WDB. 4540! In jugo Lataband, 1800—2100 m, RECH. 31067! Gardez: Nozi, 2750 m, KOELZ 12025! Safed Kuh, in montibus E jugi Altimur, 2700—2800 m, RECH. 31996!, LAMOND 2403! Ghazni: Malestan, inter jugum Kotal-e Kechru et pagum Miradina NW Sang-i Masha, 2700—3200 m, RECH. 17587! — **C:** Bamian: Koh-i Baba: In jugo Hajjigak, 2700 m, FURSE 8552! Panjao: Panjao, 2700 m, KOEIE 2752!, HDG. & WDB. 4946! 12 km W Panjao, 2650—2800 m, RECH. 36165! Kotal-Akhsarat W Panjao, 3000 m, HDG. & WDB. 4973! Deh Kundi: 3—30 km NE Shahrestan, 2200 m, RECH. 36801! 50 km SW Panjao in summo jugo Waras, 3150 m, RECH. 36590! 10 km W Shahrestan versus Deh Kundi, 2200 m, RECH. 36814! Behzud: Ad pontem Khash Kul trans fluvium Helmand, 2460 m, HDG. & WDB. W-8668! Ghorat: Dolaini, Darreh Garmak inter Qala Shahrak et Sar-i Naorak, 2450 m, RECH. 18906! SW Sar-i Naorak, 2480 m, RECH. 18956!

Distr. gen.: Endem.

Sect. *Regeloprason* WENDELBO, Acta Horti Gotob. 28: 36 (1966).

Scapus ± elongatus, proportione tenuis, folia excedens. Inflorescentia umbellata (vel in *A. Regelii* e verticillastris florum pluribus superpositis consistens), fasciculata usque hemisphaerica; pedicelli demum ± elongati saepe inaequales. Perigonium anguste campanulatum; tepala aliquantum connata, exteriora quam interiora latiora. Ovarium stipitatum; ovula in loculis usque ad 20, quam in sectionibus aliis numerosiora. — Typus sectionis: *A. Regelii* TRAUTV.

136. ***A. Winklerianum*** REGEL, Acta Horti Petrop. 8: 661 (1884).
Icon.: Tab. 10, fig. 136. — Fl. URSS. 4: tab. XIV., fig. 3 (1935).
Typus: „Bulbos e Turkestania occidentali misit", A. REGEL, LE!

Bulbus 0,75—2 cm diametro; tunicae exteriores papyraceae, nigrescentes. Scapus 15—50 cm longus, costatus. Folia 1—2, quam scapus breviora, linearia usque anguste lineari-lanceolata, 5—15 mm lata, laevia vel margine et subtus secus nervos scabrida.

Spatha acuminata, umbellae subaequilonga vel dimidiam umbellam aequans. Umbella fasciculata vel hemisphaerica, multiflora, densa; pedicelli 5—20 mm longi. Perigonium anguste campanulatum, purpurascens; tepala 7—13 mm longa, anguste elliptico-oblonga, exteriora quam interiora sesquilatiora. Filamenta exteriora dimidium tepalorum longitudinis aequantia, per 1/2—2/3 connata et perigonio adnata, in parte superiore libera, triangularia, interiora quam exteriora duplo latiora et paulo longiora. Ovarium breviter stipitatum. Capsula subsphaerica, c. 5 mm diametro.

Afghanistan: E: Kabul: In declivibus australibus jugi Salang, 2700—3400 m, Rech. 31555!, Hdg., Wdb. & Ekb. W-8627!, Lindb. 837!, Furse 8000! Panjshir: Chimar, 2800 m, Hdg. & Wdb. 5378! — NE: Kataghan: In declivibus borealibus jugi Salang, 3000—3700 m, Furse 7903! In parte superiore vallis Andarab: Darrah-i Til, 2800 m, Podlech 11171! Darrah-i Shu, 2500 m, Podlech 11095! In valle Echani, 3700 m, Podlech 11851!

Distr. gen.: Afghanistan boreo-orientalis, montes Asiae centrales.

137. ***A. iliense*** Regel, Bull. Soc. Nat. Mosc. 41, 1: 452 (1868).
Icon.: Tab. 10, fig. 137. — Regel, Reise in Turkestan 3, 1: tab. 15, fig. 9—10 (1876).
Typus: Habitat in Songoriae regionibus iliensibus, Semenow 1085, LE!

Bulbus tunicis exterioribus nigrescenti-brunneis, papyraceis tectus. Scapus 15—35 cm altus. Folia 7—35 mm lata, scapum subaequantia, margine ± crispa. Spatha quam umbella pluries brevior, breviter acuminata. Umbella 6—30 (—50)-flora, fasciculata vel ± hemisphaerica, laxissima; pedicelli inaequales, 2—10 (—14) cm longi. Perigonium anguste campanulatum, violaceo-roseum, nervis sordide viridibus; tepala 10—15 mm longa, ± anguste lanceolata vel linearia, subacuta, exteriora quam interiora usque ad sesquilongiora, post anthesin erecta, rigidula, margine partis liberae involuta. Filamenta 2/5—1/2 tepalorum longitudinis aequantia, perigonio per 3/5—2/3 adnata, inter se per 4/5—5/6 connata, interiora triangularia, quam exteriora latiora et manifeste longiora; antherae c. 2,5 mm longae. Ovarium stipitatum. Capsula subsphaerica, 6 mm diametro.

Turcomania: Inter Khodzhakala et Bami, Radde. Garmab, Antonov. Gyaurs, Antonov.
Afghanistan: „Dajn Haf", Griff. 456!

Distr. gen.: Turcomania, Afghanistan, Asia centralis.

138. ***A. cathodicarpum*** Wendelbo, Acta Horti Gotob. 28: 37 (1966).
Icon.: Tab. 10, fig. 138; tab. 22, fig. 2a, b. — Wendelbo, l. c.: fig. 9.
Typus: Bornmüller 4770, B!

Bulbus c. 1,5 cm diametro, ovoideus; tunicae exteriores integrae, crassae, nigrescentes. Scapus leviter flexuosus vel strictus, usque ad 14 cm longus, teres. Folium solitarium, basale, ad 17 cm longum, ad 1,6 cm latum, falcatum, apice cucullatum, probabiliter glaucescens, margine papilloso-scabridum. Spatha bivalvata, persistens, valvis ovatis ad 1 cm longis. Umbella fasciculata vel hemisphaerica, 6—50-flora, laxa; pedicelli tenues, roseo-violascentes, ebracteolati, sub anthesi aequilongi vel subaequilongi, 0,7—2,5 cm longi, post anthesin ± elongati, exteriores fructiferi c. 3 cm longi, recurvati, subaequilongi, interiores — ut videtur flores masculos gerentes — inaequilongi, ad 7 cm longi, radiantes. Perigonium 8—10,5 mm longum, anguste campanulatum, purpureo-violascens; tepala anguste elliptico-oblonga, interiora quam exteriora angustiora, basi per 2 mm connata, obtusa. Filamenta c. 2/3 peri-

gonii longitudinis aequantia, perigonio per 3—3,5 mm adnata, superne per 0,5—1 mm inter se connata; partes liberae filamentorum inaequales triangulares, 1—1,5 mm longae; antherae c. 1 mm longae. Ovarium obovoideum, minute verruculosum. Capsula c. 4,5 mm diametro, subglobosa, breviter stipitata, tepalis subflaccidis inclusa.

Persia: S: Kerm.: In regionibus alpinibus montis Kuh-e Nasr, et Kuh-i Sirj, 3000—3700 m, BORNM. 4770. Kuh-e Jupar, 2100 m, BALLS 32!; 3700—3800 m, BORNM. 4778! Kuh-e Laleh Zar, 1800—2400 m, BALLS 38! Inter Mashiz et jugum Khaneh Sorkh, 2580 m, RECH. 3035! Inter Saidabad et jugum Chah-e Chaghak, 1900 m, RECH. 3525! Distr. Kerman, HEWER 937!

Distr. gen.: Endem.

139. ***A. Regelii*** TRAUTV., Acta Horti Petrop. 9: 275 (1884).
Syn.: *A. Yatei* AITCH. & BAKER, Trans. Linn. Soc. Ser. 2, 3: 117 (1888).
Icon.: Tab. 10, fig. 139a, b; tab. 22, fig. 1; tab. 23; tab. 28, fig. 3.
Typus: „in tractu Achalteke Turcomaniae", LE?

Bulbus tunicis brunnescentibus usque nigrescentibus fissis tectus. Scapus 20—70 (—100) cm altus. Folia 2—4 (—5), 0,5—4 (—8,5) cm lata, margine ± scabrida. Spatha c. 1 cm longa, roseo tincta, basin pedicellorum includens. Inflorescentia umbellata vel e verticillis usque ad 6 superpositis consistens; pedicelli usque ad 4 (—8,5) cm longi, subinaequales. Perigonium anguste campanulatum, ± purpurascens raro albescens; tepala 9—13 mm longa, anguste elliptico-oblonga, obtusa, exteriora quam interiora manifeste latiora et paulo longiora. Filamenta dimidium usque ad 2/3 longitudinis tepalorum attingentia, perigonio per 2/3 adnata, per dimidium partis non adnatae connata, interiora triangularia, quam exteriora duplo latiora et aliquanto longiora. Stylus subtrilobatus. Capsula late obovoidea, 6—8 mm diametro.

Persia: E: Khor.: Inter Tayyebat et Kisil Islam Qaleh, 700 m, RECH. 33228! Inter Mashhad et Herat ad finem Persiae-Afghanistan, 900 m, FURSE 5334!
Turcomania: Ashkhabad: In promontorio prope Ashkhabad, LITW. 35! In montibus supra Nephton, SINT. 311! Inter Annaju et Gyaurs, SINT. 309! Gyaurs, LIPSKY. Kizyl Arvat, SINT. 1678!, BECKER, LIPSKY. Djalila, GEDEWANOV & DRANICYN. Khodzhakala versus Bami, RADDE. Chuli, MICHELSON. Inter Chaek et Chuli, VVEDENSKY. Dushak, MICHELSON. Gaudan, CZERNJAK. Inter Jablonka et Kurt-Ssu, CZERNJAK. Firyuza, CZERNJAK. Gelle-cheshme, GEDEWANOV & DRANICYN. Islim-cheshme, KOROVIN. Inter Akrabad et Islim-cheshme, KORSCHINSKY. Karyzli, GEDEWANOV & DRANICYN. Ashkhabad, ANTONOV. Iskander, SEIDMURATOV. Inter Annenkova et Kara-kujo, BUKINICH. Sarajazy, ANDROSOV, MICHELSON, LIPSKY.
Afghanistan: N: Mazar-i Sharif: Ali Kuh, 18 km S Mazar-i Sharif, 1700 m, HDG., WDB. & EKB. W-8443! — NW: Maimana: Inter Narin et Almar, 900 m, HDG., WDB. & EKB. W-8243! Inter Nishar et Belchiragh, 1150 m, HDG., WDB. & EKB. W-8334! 30 km W Maimana, 500 m, HDG. & WDB. 3636! Herat: In jugo Sabzzak, 2400 m, FURSE 7693! Kotal Mir-Ali, 1580—1680 m, HDG., WDB. & EKB. W-7741!, 7753! Infra Chashmeh Obeh, 1600 m, HDG., WDB. & EKB. W-7925! In valle fluvii Hari Rud, AITCH. 289!, 414! — SW: Herat: 40—48 km S Herat, 1200—1600 m, HDG., WDB. & EKB. W-7993!, FURSE 5433! Shindand, 1150 m, RECH. 33367! Inter Shindand et Farah Rud, 1150 m, RECH. 33374! 100 km S Herat, 1300 m, RECH. 33353! 30 km N Gulran, FREITAG 5622! — NE: Kataghan: Paigah Kotal, 1350—1450 m, HDG. & WDB. 3554!, HDG., WDB. & EKB. W-8555! In declivibus borealibus jugi Salang, 2450 m, FURSE 6614! Badakhshan: 7 km SE Ishkamish, 1400 m, PODLECH 10609!

Distr. gen.: Persia boreo-occidentalis, Turcomania, Afghanistan, Kara Kum.

As only plants with a simple umbel have been collected in the Herat-area, it is possible that *A. Yatei* AITCH. & BAKER might be distinguished as a geographical race. On the other hand small and poorly developed plants with one umbel usually grow together with normal plants in other areas. Plants from the north side of Salang always seem to have a pale nearly white flower colour.

Species incomplete notae vel dubiae:

A. bakhtiaricum REGEL, Acta Horti Petrop. 3, 2: 222 (1875).
Typus: „Habitat in Persia australi in montibus Bakhtiaricis", BODE, LE!

The type sheet contains the upper part of 2 scapes with very young inflorescences. The description of Regel is very misleading as he thought the specimens were overflowered. Most probably the material belongs to *A. hirtifolium* Boiss. or *A. jesdianum* BOISS. & BUHSE but it is absolutely impossible to attach this older name to any of them with certainty.

A. cabulicum BAKER, Bot. Mag. 119: tab. 7294 (1893).
Typus: Kew, planta culta, K!

The species was described on a cultivated specimen from a bulb said to have been brought from Cabul by Dr. Aitchison. Undoubtedly there has been an exchange of labels. The type specimen clearly belongs to *A. karataviense* REGEL (conf. WENDELBO, Acta Horti Gotob. 28: 47; 1966). The illustration also shows the typical narrow tepals which become reflexed. A specimen collected at Kabul (COLLETT 75) referred to *A. cabulicum* by BAKER consists of a leaf of *A. mirum* WENDELBO and an inflorescence of *A. stipitatum* REGEL.

A. ramazanicum PARSA, Kew Bull. 1949: 33 (1950).
Typus: „S. Persia: Shahzad-i-Kuh, 3100 m, PARSA", K!

The material is in a poor state and is difficult to name with certainty inasmuch as it belongs to a very difficult group of species within the section *Acanthoprason*. In habit it looks very like *A. Derderianum* REGEL but that species has only been found in northern Persia. It is difficult to understand that the description of PARSA is based on the type specimen as the measurements are very different from what they should be. The comparison with *A. Kotschyi* BOISS. of the section *Allium* is also quite out of the way.

Shahzad-i Kuh is a high mountain in Central Elburz, in the North of Persia. It has been visited by GAUBA. The fact, that PARSA wrongly indicates „South Persia" is a new proof that this specimen — as many others, which have served as basis for PARSA's descriptions — has not been collected by himself but by GAUBA.

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minutiflorum Regel 75
mirum Wendelbo 92
miserabile Wendelbo 40
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myrianthum Boiss. 62
neapolitanum Cyr. 64
Nevskianum Vved. 71
nigrum L. 67
Noëanum Reut. ex Regel 78
notabile Feinbr. 54
nuristanicum Kitamura 9
obtusifolium Klotzsch 14
oleraceum L. 60
Olivieri Boiss. 78
oreophiloides Regel 24
subsp. **oreophiloides** 25
subsp. **salangense** Wendelbo 25
oreophilum C. A. Mey. 67
Oschaninii O. Fedtsch. 18
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pallens L. 62
pamiricum Wendelbo 36
paniculatum L. 60
panjaoënse Wendelbo 39
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platystemon Kar. & Kir. 67
pogonotepalum Wendelbo 10
polyphyllum Kar. & Kir. 14
protensum Wendelbo 89
pseudoflavum Vved. 63
pseudo-seravschanicum M. Pop. & Vved. 87
pseudoxiphopetalum Wendelbo 12
qaradaghense Feinbr. 55

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Rechingeri WENDELBO 29
reflexum BOISS. & REUT.
in BOISS. 80
Regelii TRAUTV. 95
registanicum WENDELBO 28
Rosenbachianum REGEL 83
roseum L.
subsp. *persicum* BORNM. 2
rotundum L. 54
Roylei STEARN 15
rubellum M. B. 34
var. *grandiflorum* BOISS. 37
var. *stellatum* C. KOCH 34
rubens BAKER 15
rudbaricum BOISS. & BUHSE 53
sabulosum STEV. ex BUNGE 29
sabzakense WENDELBO 32
sarawschanicum REGEL 87
sativum L. 19
scabrellum BOISS. & BUHSE 35
scabriscapum BOISS. & KY. 9
scabrum GILLI 39
schoenoprasoides REGEL 25
Schoenoprasum L. 17
var. *Buhseanum* (REGEL) BOISS. 17
Schubertii VVED. 89
Schubertii ZUCC. 90
scotostemon WENDELBO 82
Semenovii WENDELBO 16
Semenowii REGEL 17
senescens L. 6
Shelkovnikovii GROSSH. 74
sindjarense BOISS. & HAUSSKN.
ex REGEL 28
spirophyllum WENDELBO 42
stamineum BOISS. 63
stenopetalum BOISS. & KY.
var. *pumilum* PARSA 75

Allium *(cont.)*
stipitatum REGEL 85
Stocksianum BOISS. 43
var. *persicum* BOISS. 46
Straussii BORNM. 81
stupposum BORNM. 66
subnotabile WENDELBO 55
subvineale WENDELBO 53
Suvorovii NAB. 84
Suworowii REGEL 82
synthamanthum C. KOCH 33
talyschense MISCZ. 56
tenuicaule REGEL 13
Thomsonii BAKER 14
trachycoleum WENDELBO 56
trichocephalum NÁB. 62
tripedale TRAUTV. 2
triquetrum L. 66
tschulpias REGEL 37
turcomanicum REGEL 47
turkestanicum REGEL 50
umbilicatum BOISS. 35
Vavilovii M. POP. & VVED. 19
vescum WENDELBO 64
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Walteri REGEL 76
Winklerianum REGEL 93
xiphopetalum AITCH. & BAKER ... 11
Yatei AITCH. & BAKER 95
Briseis SALISB. 66
Crinum L.
caspium PALL. 90
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Sect. **Nectaroscordum** 2
Sect. **Pseudoprason** WENDELBO .. 2
Koelzii WENDELBO 2
persicum BORNM. 2
tripedale (TRAUTV.) GROSSH. 2
Scilla L.
paradoxa M. B. 66

Illustrationes:

Miranda Bödtker del.

Tab. 1, fig. 1a; tab. 11; tab. 12, fig. 1—2; tab. 14, fig. 3—4; tab. 15; tab. 16, fig. 1; tab. 17, fig. 2—3; tab. 19, fig. 2—3; tab. 20; tab. 21; tab. 22, fig. 2.

Lars Ekberg del.

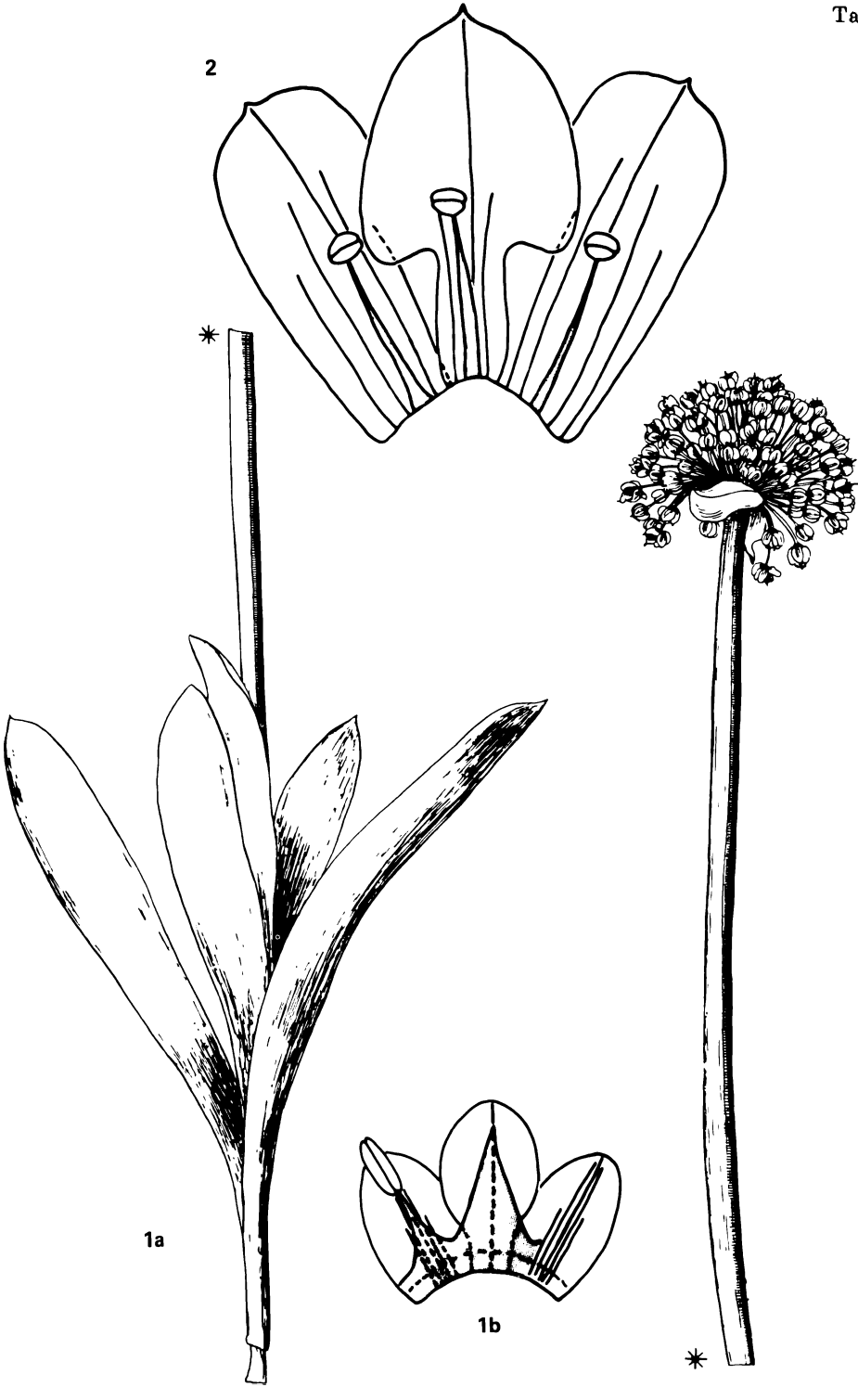
Tab. 1, fig. 1b, 2; tab. 2; tab. 10.

Marianne [redacted]landsson del.

Tab. 12, fig[redacted]; tab. 13; tab. 14, fig. 1, 2, 5; tab. 16, fig. 2—3; tab. 17, fig. 1; tab. 19, fig. 1; tab. 22, fig[redacted]; tab. 23.

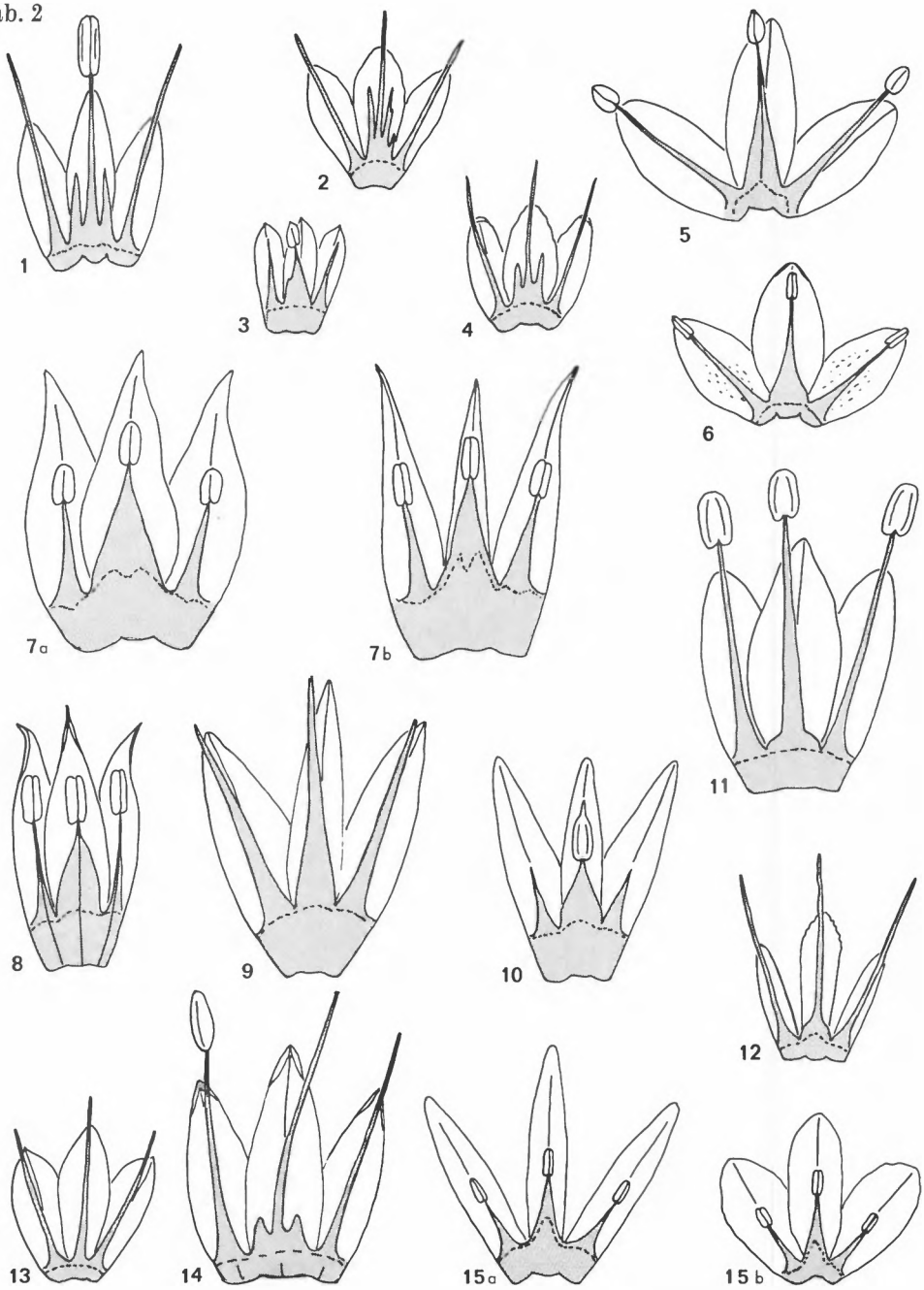
Sven Vind[redacted]öd del.

Tab. 18.

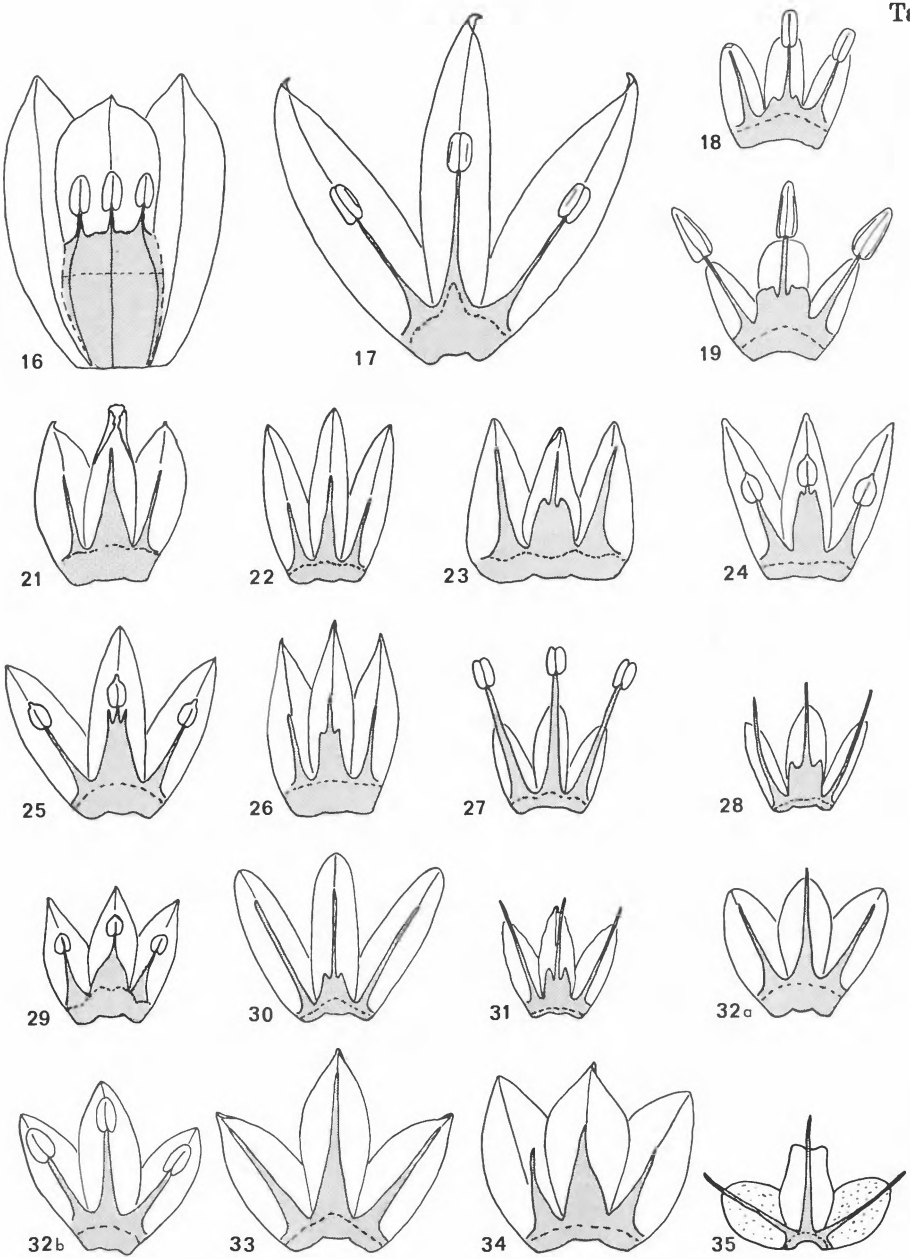


1: *Nectaroscordum Koelzii* WENDELBO — KOELZ 15913. **a**. habitus × ½; **b**. tepala × 4.
2: *N. tripedale* (TRAUTV.) GROSSH. — STAPF 1986: tepala × 4

Tab. 2

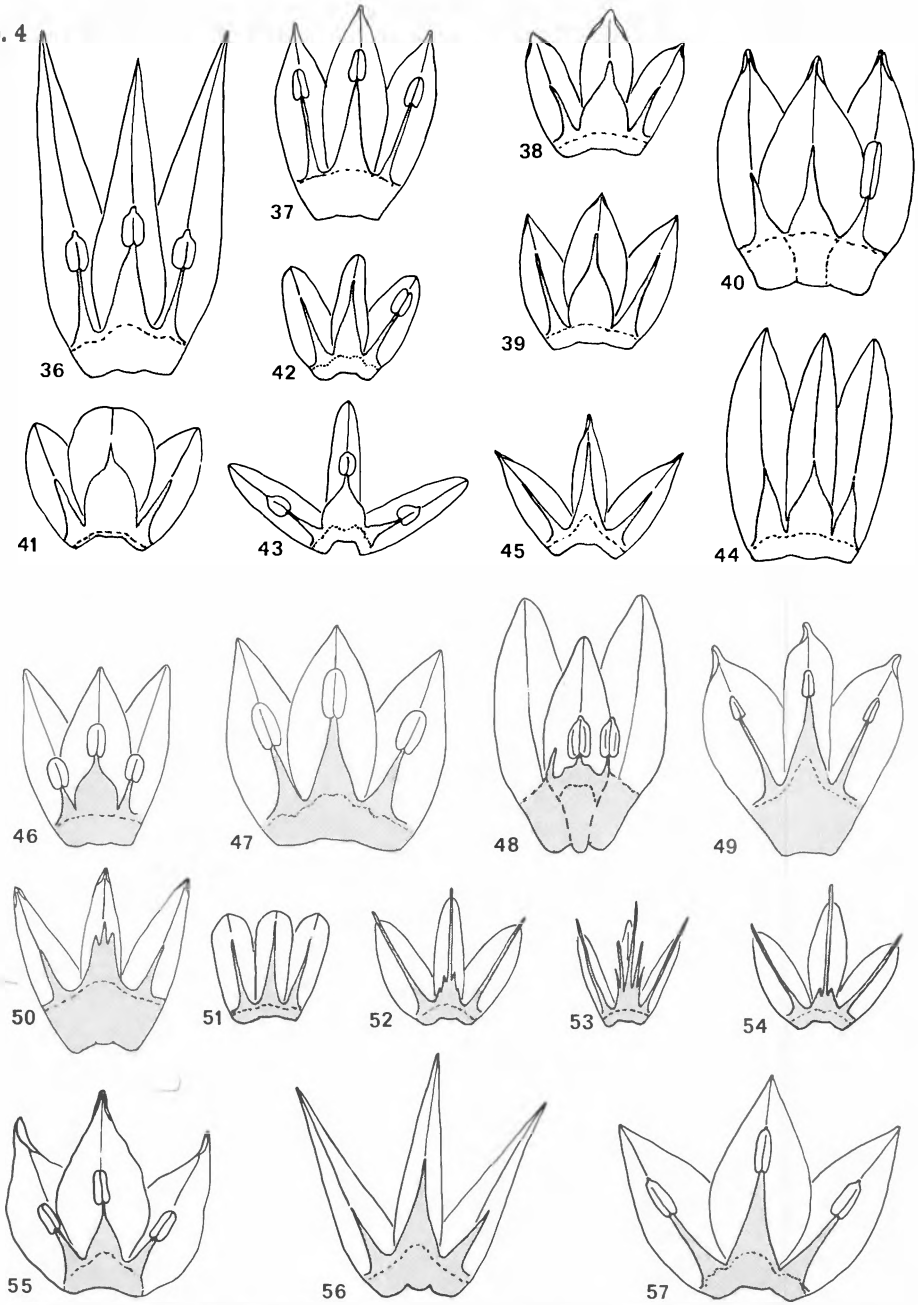


1: *Allium afghanicum* WENDELBO — WDB. 5379. **2:** *A. brachyodon* BOISS. — STAPF 1990. **3:** *A. baluchistanicum* WENDELBO — LACE s. n. **4:** *A. nuristanicum* KITAMURA — WDB. 5521. **5:** *A. scabriscapum* BOISS. & KY. — WDB. 1858. **6:** *A. pogonotepalum* WENDELBO — WDB. 4110. **7a:** *A. xiphopetalum* AITCH. & BAKER — WDB. 1746. **7b:** *A. xiphopetalum* AITCH. & BAKER — WDB. 7824. **8:** *A. Barszczewskii* LIPSKY — WDB. s. n. **9:** *A. dolichostylum* VVED. — RECH. 36375. **10:** *A. tenuicaule* REGEL — RECH. 37243. **11:** *A. carolinianum* DC. — FREY 299: (23). **12:** *A. hymenorrhizum* LEDEB. — FURSE 8460. **13:** *A. filifolium* REGEL — M. Talassicis, GUBAIDULLINA s. n. **14:** *A. Roylei* STEARN — NEUB. 888. **15a:** *A. humile* KUNTH — Kashmir, LUDLOW & SHERRIFF 8131. **15b:** *A. humile* KUNTH — HARRISS 16693. Omnia × 4

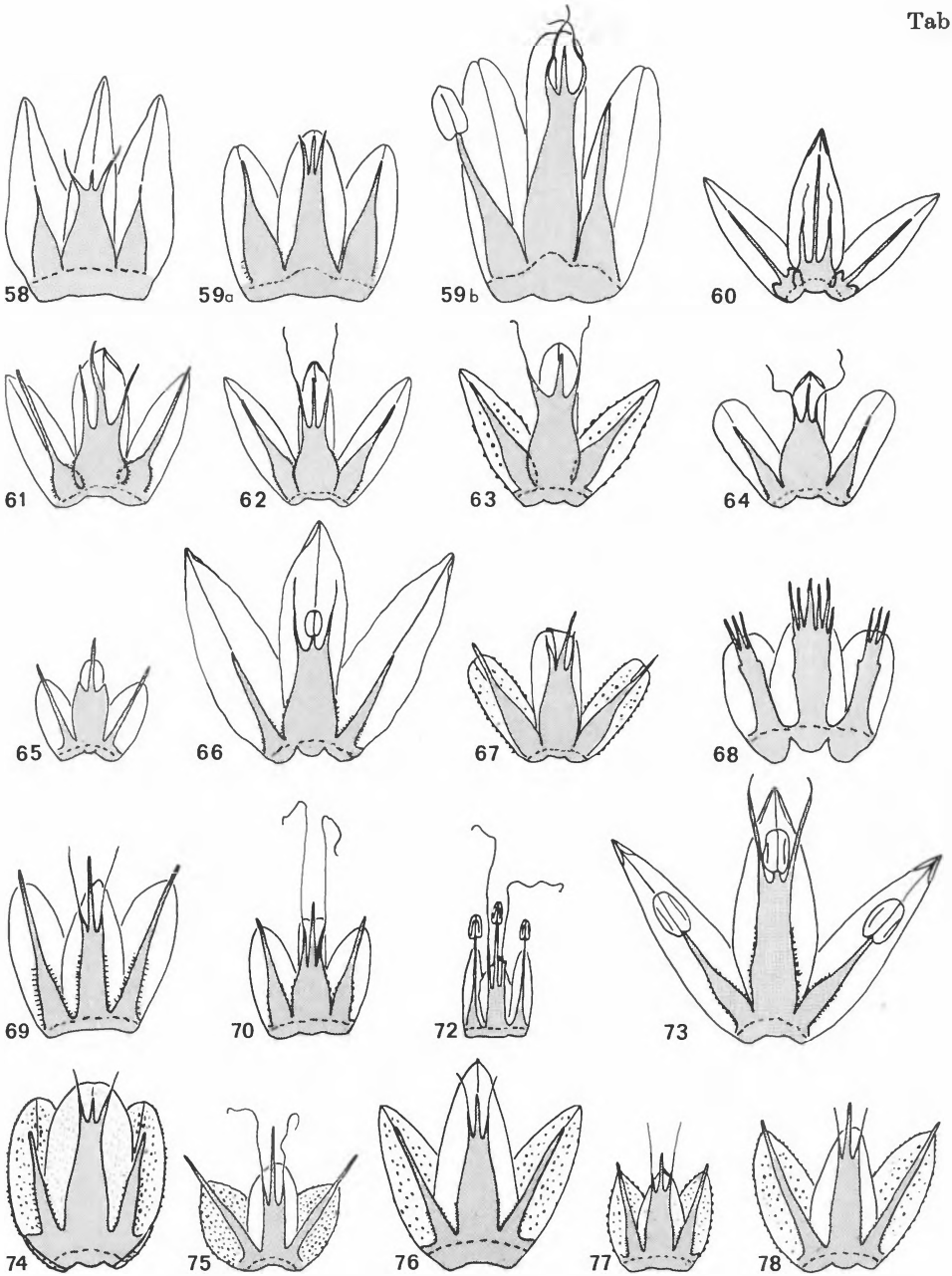


16: *Allium Fedtschenkoanum* Regel — Wdb. 5173. **17:** *A. schoenoprasum* L. — Shar. 7024-E. **18:** *A. farctum* Wendelbo — Lamond 1265. **19:** *A. Oschaninii* O. Fedtsch. — Wdb. 3876. **21:** *A. callidictyon* C. A. Mey. — Archibald 2606. **22:** *A. kirindicum* Bornm. — Str. s. n. **23:** *A. caesium* Schrenk — Koelz 11976. **24:** *A. caesioides* Wendelbo — Giles 210. **25:** *A. oreophiloides* Regel subsp. *oreophiloides* — Lindb. 713. **26:** *A. schoenoprasoides* Regel — Roemer 259. **27:** *A. capitellatum* Boiss. — Archibald 3034. **28:** *A. anacoleum* Hand.-Mzt. — Gillett 9715. **29:** *A. arlgirdense* Blakelock — Gillett 9604. **30:** *A. longivaginatum* Wendelbo — Koelz 18533. **31:** *A. lalesaricum* Freyn & Bornm. — Gabriel s. n. **32a:** *A. registanicum* Wendelbo — Rech. 34606. **32b:** *A. registanicum* Wendelbo — Furse 5576. **33:** *A. sindjarense* Boiss. & Hausskn. — Boiss. 9604-b. **34:** *A. Bungei* Boiss. — Bunge 10. **35:** *A. sabulosum* Stev. — Kizyl Kum, Adylov 177. Omnia × 4

Tab. 4

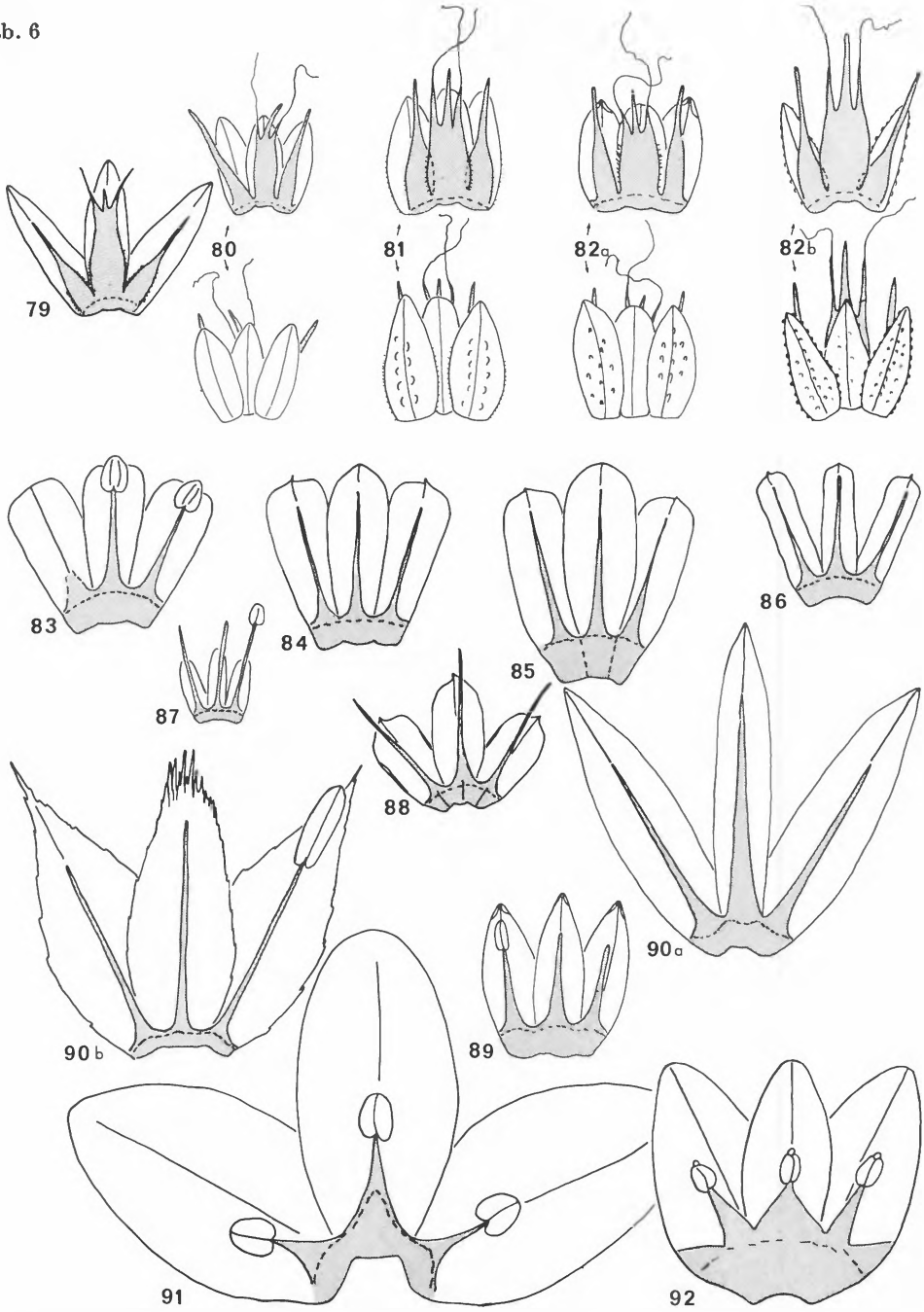


36: *Allium Rechingeri* WENDELBO — WDB. 4207. **37:** *A. bracteolatum* WENDELBO — WDB. 4654. **38:** *A. fibrosum* REGEL — WDB. 3591. **39:** *A. Lamondiae* WENDELBO — LAMOND 1055. **40:** *A. sabzakense* WENDELBO — WDB. 8032. **41:** *A. chloroneurum* BOISS. — RECH. 3794. **42:** *A. synthamanthum* C. KOCH — ARCHIBALD 2243. **43:** *A. rubellum* M. B. — WDB. 1014. **44:** *A. umbilicatum* BOISS. — WDB. 5051. **45:** *A. Jacquemontii* KUNTH — VOLK 2581. **46:** *A. pamiricum* WENDELBO — RAJKOVA s. n. **47:** *A. choriotepalum* WENDELBO — RECH. 35864. **48:** *A. Griffithianum* BOISS. — JÖRGENSEN 64. **49:** *A. panjaoënse* WENDELBO — RECH. 36341. **50:** *A. Gillii* WENDELBO — WDB. 4359. **51:** *A. miserabile* WENDELBO — RECH. 35497. **52:** *A. circumflexum* WENDELBO — WDB. 4653. **53:** *A. micranthum* WENDELBO — RECH. 35807. **54:** *A. ionandrum* WENDELBO — RECH. 35915. **55:** *A. spirophyllum* WENDELBO — WDB. 3292. **56:** *A. kopetdagense* VVED. — VVED. s. n. **57:** *A. Stocksianum* BOISS. — WDB.7066. Omnia × 4

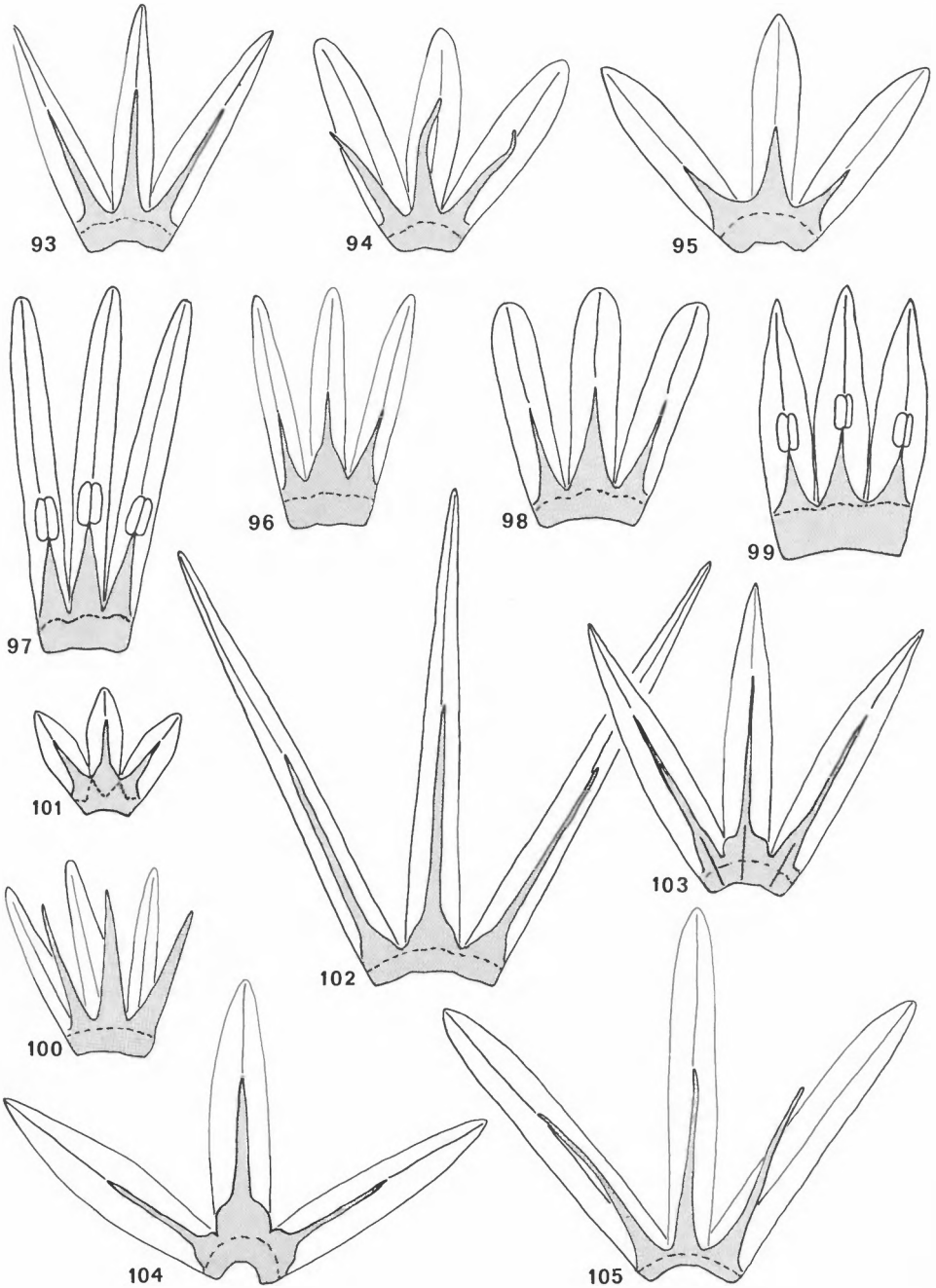


58: *Allium Kotschyi* Boiss. — Ky. 777. **59a:** *A. Borszczowii* Regel — Rech. 11901. **59b:** *A. Borszczowii* Regel — Wdb. 7622. **60:** *A. Hedgei* Wendelbo — Ekb. W-9093. **61:** *A. turcomanicum* Regel — Wdb. 9323. **62:** *A. filidens* Regel — Lamond 1618. **63:** *A. dictyoscordum* Vved. — Vved. 53. **64:** *A. longicollum* Wendelbo — Rech. 34823. **65:** *A. turkestanicum* Regel — Tien Shan, Bondarenko & Butkov 36. **66:** *A. Aucheri* Boiss. — Auch. 2198. **67:** *A. hamrinense* Hand-Mzt. — Rech. 12549. **68:** *A. viride* Grossh. — Archibald 2769. **69:** *A. phanerantherum* Boiss. & Hausskn. — Rech. 12148. **70:** *A. affine* Ledeb. — Archibald 2325-b. **72:** *A. longicuspis* Regel — Furse 3438. **73:** *A. erubescens* C. Koch — Wdb. 1111. **74:** *A. rotundum* L. — Thesiger 770. **75:** *A. notabile* Feinbr. — Buthaina Makki 460. **76:** *A. subnotabile* Wendelbo — Archibald 2671. **77:** *A. qaradaghense* Feinbr. — Rech. 12147. **78:** *A. trachycoleum* Wendelbo — Rech. 11901. Omnia × 4

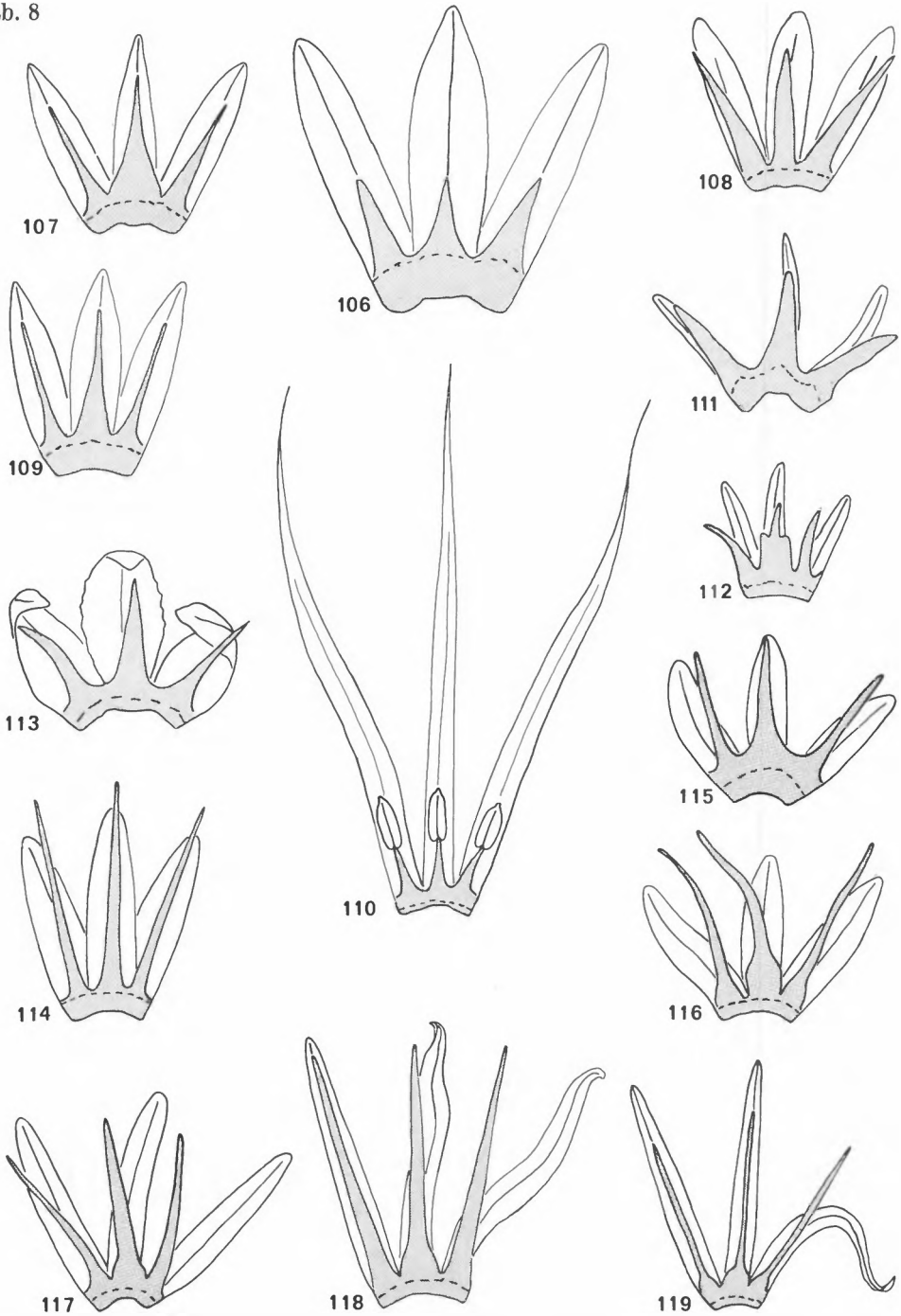
Tab. 6



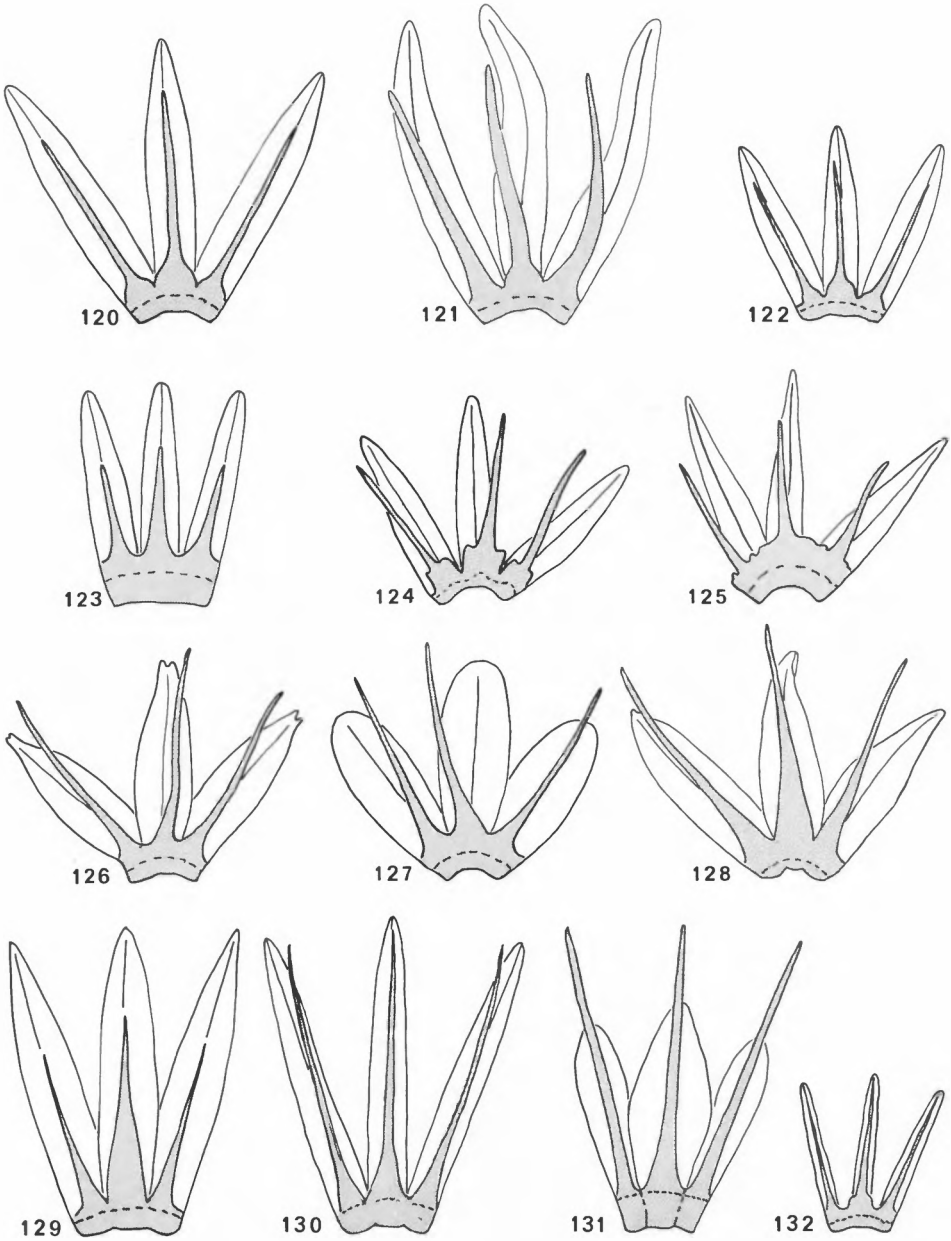
79: *Allium talyschense* Miscz. — reprod. Fl. Kawk 2: tab. 14, fig. 5a. **80:** *A. laeve* Wendelbo & von Bothmer — Wdb. 2025. **81:** *A. atroviolaceum* Boiss. — Wdb. 894. **82a:** *A. Ampeloprasum* L. subsp. *iranicum* Wendelbo — Archibald 2574. **82b:** *A. Ampeloprasum* L. subsp. *Ampeloprasum* — Rech. 9717. **83:** *A. paniculatum* L. — Rech. 12466. **84:** *A. lenkoranicum* Miscz. — Wdb. 1505. **85:** *A. Kunthianum* Vved. — Schmid 6533. **86:** *A. convallarioides* Grossh. — Rech. 11900. **87:** *A. myrianthum* Boiss. — Rech. 10867. **88:** *A. stamineum* Boiss. — Archibald 2543. **89:** *A. vescum* Wendelbo — Koelz 14987. **90a:** *A. eriophyllum* Boiss. var. *eriophyllum* — Wdb. 41. **90b:** *A. eriophyllum* Boiss. var. *laceratum* (Boiss. & Noë) Wendelbo — Archibald 2213-a. **91:** *A. paradoxum* (M. B.) G. Don — Rech. 33149. **92:** *A. oreophilum* C. A. Mey. — cult. Hort. Bot. Gothob. Omnia × 4



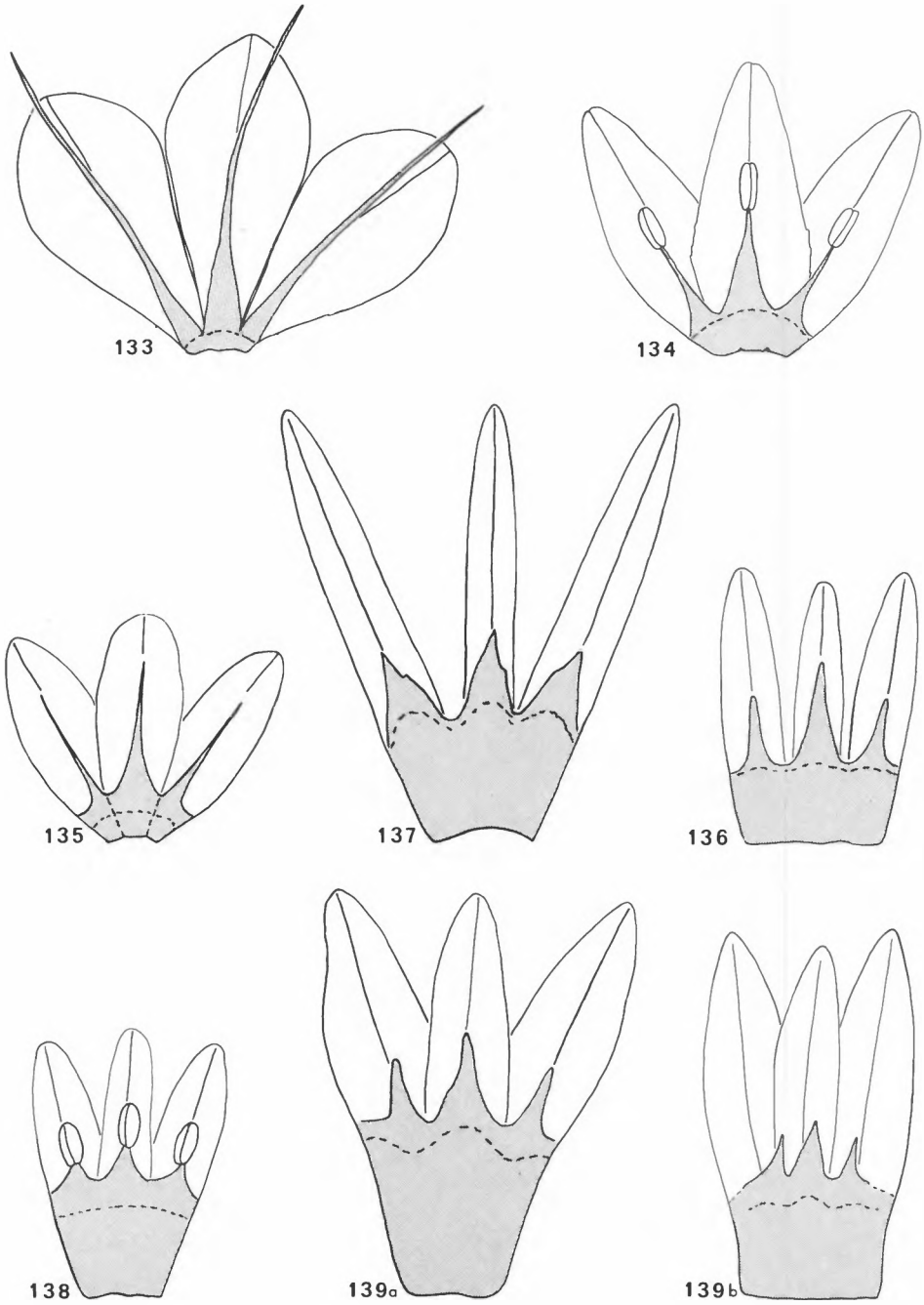
93: *Allium Nevskianum* VVED. — WDB. 4732. **94:** *A. monophyllum* VVED. — RECH. 5137. **95:** *A. Derderianum* REGEL — WDB. 2106. **96:** *A. breviscapum* STAPF — STR. s. n. **97:** *A. haemanthoides* BOISS. & REUT. ex REGEL — WDB. 1786. **98:** *A. Akaka* GMEL. — Anatolia, FRÖDIN 239. **99:** *A. Shelkovnikovii* GROSSH. — FURSE 2452. **100:** *A. materculae* BORDZ. — STUTZ 1044. **101:** *A. minutiflorum* REGEL — BODE s. n. **102:** *A. Cristophii* TRAUTV. — SHAR. 5069-E. **103:** *A. Bodeanum* REGEL — BODE s. n. **104:** *A. Ellisii* J. D. HOOK. — FURSE s. n. **105:** *A. elburzense* WENDELBO — WDB. 752. Omnia × 4



106: *Allium Noëanum* Reut. ex Regel — Furse 2000. **107:** *A. Olivieri* Boiss. — Esf. 5074-E. **108:** *A. kharputense* Freyn. & Sint. — Archibald 2074. **109:** *A. Fedtschenkoi* Náb. — Náb. 2313. **110:** *A. calocephalum* Wendelbo — Furse s. n., cult. **111:** *A. chrysantherum* Boiss. & Reut. ex Boiss. — Wdb. 1949. **112:** *A. cardiostemon* Fisch. — Shar. 7024-E. **113:** *A. colchicifolium* Boiss. — Str. s. n. **114:** *A. brachyscapum* Vved. — Androsov s. n. **115:** *A. scotostemon* Wendelbo — Wdb. 1292. **116:** *A. Suworowii* Regel — Wdb. 8145. **117:** *A. altissimum* Regel — Wdb. 8340. **118:** *A. Rosenbachianum* Regel — Wdb. 4865. **119:** *A. jesdianum* Boiss. & Buhse — Wdb. 1700. Omnia × 4



120: *Allium hirtifolium* Boiss. — Wdb. 928. **121:** *A. stipitatum* Regel — Wdb. 7574. **122:** *A. chitralicum* Wang & Tang — Kerst. 860. **123:** *A. fibriferum* Wendelbo — Kerst. 247. **124:** *A. badakhshanicum* Wendelbo — Wdb. 9414. **125:** *A. sarawschanicum* Regel — Wdb. 8503. **126:** *A. chelotum* Wendelbo — Wdb. 643. **127:** *A. giganteum* Regel — Wdb. 8218. **128:** *A. Macleanii* Baker — Wdb. 4422. **129:** *A. protensum* Wendelbo — Wdb. 4815. **130:** *A. bucharicum* Regel — Pamir-Alaj, Bukassov s. n. **131:** *A. caspium* (Pall.) M. B. — Lamond 1108. **132:** *A. helicophyllum* Vved. — Rech. 5443. Omnia × 4

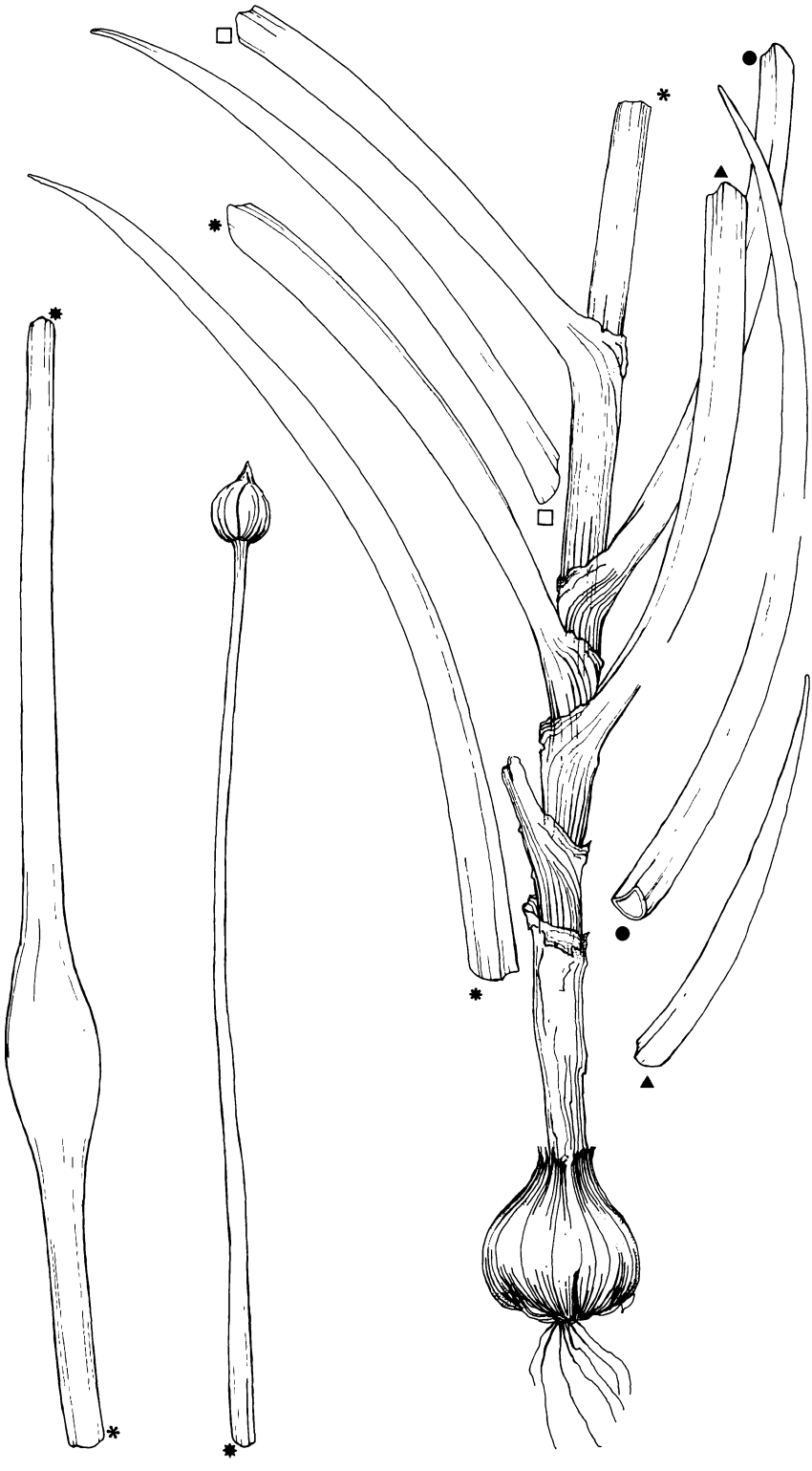


133: *Allium mirum* WENDELBO — WDB. 2934. **134:** *A. Caroli-Henrici* WENDELBO — RECH. 35053. **135:** *A. cucullatum* WENDELBO — RECH. 36814. **136:** *A. Winklerianum* REGEL — WDB. 8627. **137:** *A. iliense* REGEL — GRIFF. 456. **138:** *A. cathodicarpum* WENDELBO — BORNM. 4778. **139a:** *A. Regelii* TRAUTV. — WDB. 8243. **139b:** *A. Regelii* TRAUTV. — WDB. 7993. Omnia × 4

1: *Allium afghanicum* WENDELBO — WDB. 5379. **2:** *A. baluchistanicum* WENDELBO — LACE s. n. Omnia × ½

Tab. 12

1: *Allium pogonotepalum* WENDELBO — WDB. 4110. **2:** *A. dolichostylum* VVED. — EDELB. 1921. **3:** *A. humile* KUNTH — HARRISS 16693. Omnia × ½



Allium Oschaninii O. Fedtsch., × ½. — Wdb. 7806

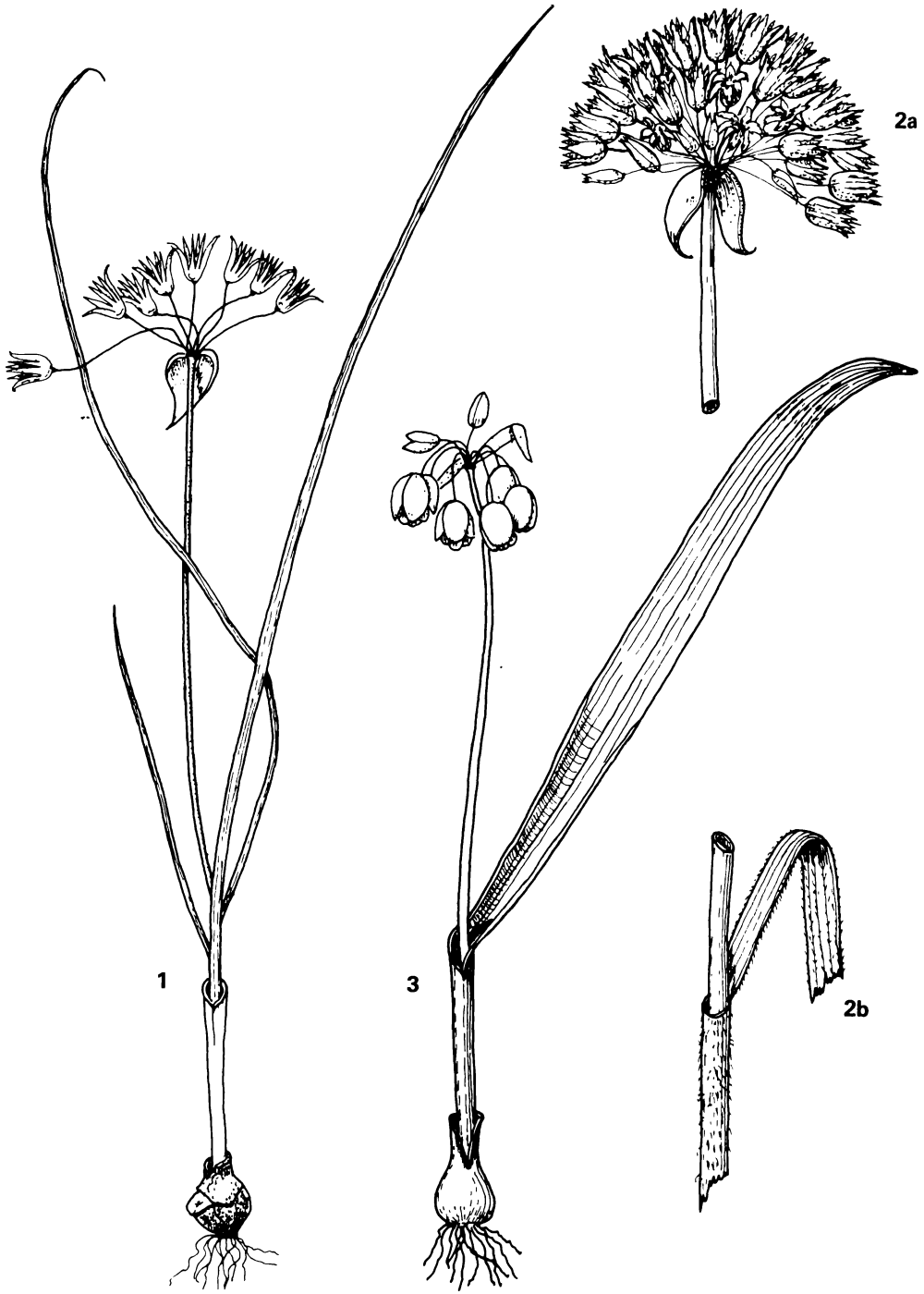
1: *Allium callidictyon* C. Koch. — Arch. 2606. **2**: *A. oreophiloides* Regel — Lindb. 713. **3**: *A. longivaginatum* Wendelbo — Koelz 18533. **4**: *A. Rechingeri* Wendelbo — Wdb. 4207. **5**: *A. Griffithianum* Boiss. — Wdb. 8234. Omnia × ½

1: *Allium Gillii* WENDELBO — NEUB. 204. **2:** *A. circumflexum* WENDELBO — WDB. 4803. **3:** *A. micranthum* WENDELBO — AITCH. 228. **4:** *A. spirophyllum* WENDELBO — **a.** WDB. 3292, **b.** WDB. 4102. **5:** *A. kopetdagense* VVED. — RECH. 5174. **6:** *A. Stocksianum* BOISS. — HDG. & EKB. 7247. Omnia × ½

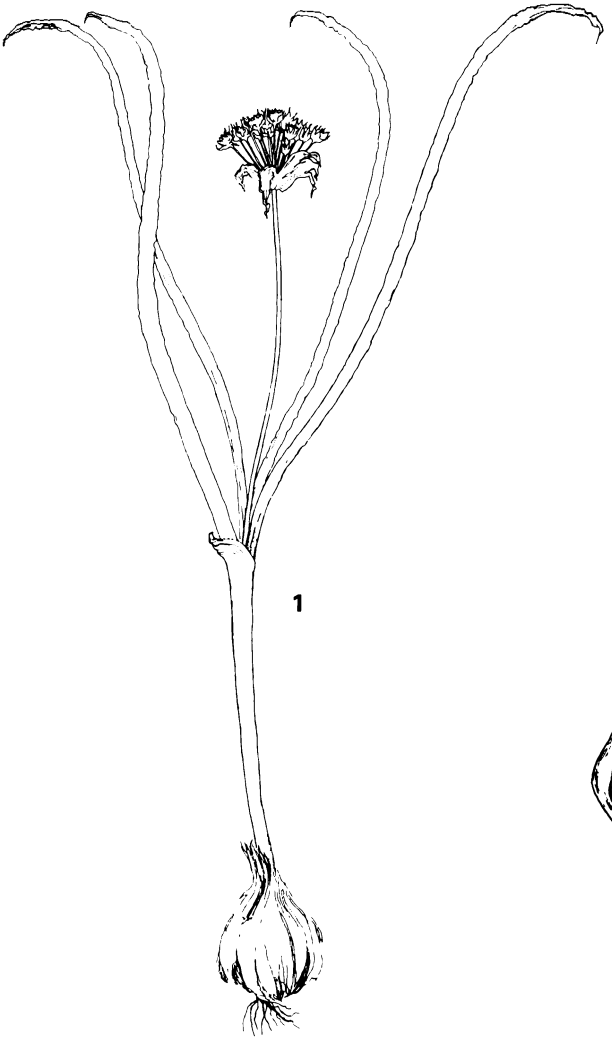
Tab. 16

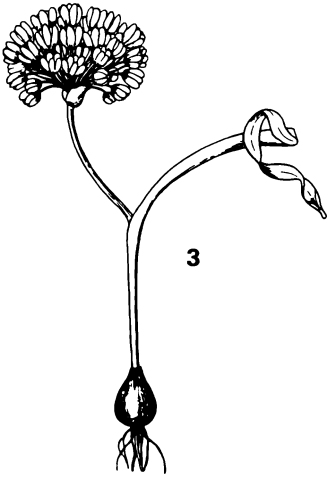
1: *Allium Hedgei* WENDELBO — WDB. 3990. **2**: *A. filidens* REGEL — WDB. 8535. **3**: *A. laeve* WENDELBO & VON BOTHMER — WDB. 2025. Omnia × ½

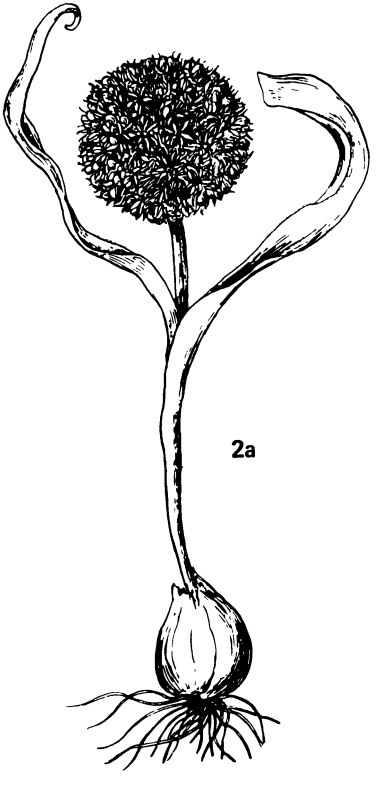
1: *Allium stamineum* Boiss. — Wdb. 1878. **2:** *A. vescum* Wendelbo — Koelz 14987.
3: *A. calocephalum* Wendelbo — Polunin 5084. Omnia × ½

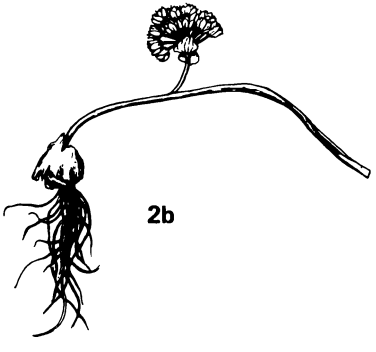


1: *Allium eriophyllum* Boiss. var. *eriophyllum* — Wdb. 41. **2**: *A. eriophyllum* Boiss. var. *laceratum* (Boiss. & Noë) Wendelbo — Jacobs 6847: **a.** Inflorescentia, **b.** pars scapi cum folio. **3**: *A. paradoxum* (M. B.) G. Don — Iranshahr & Dezfoulian 7066-E. — Omnia × ½



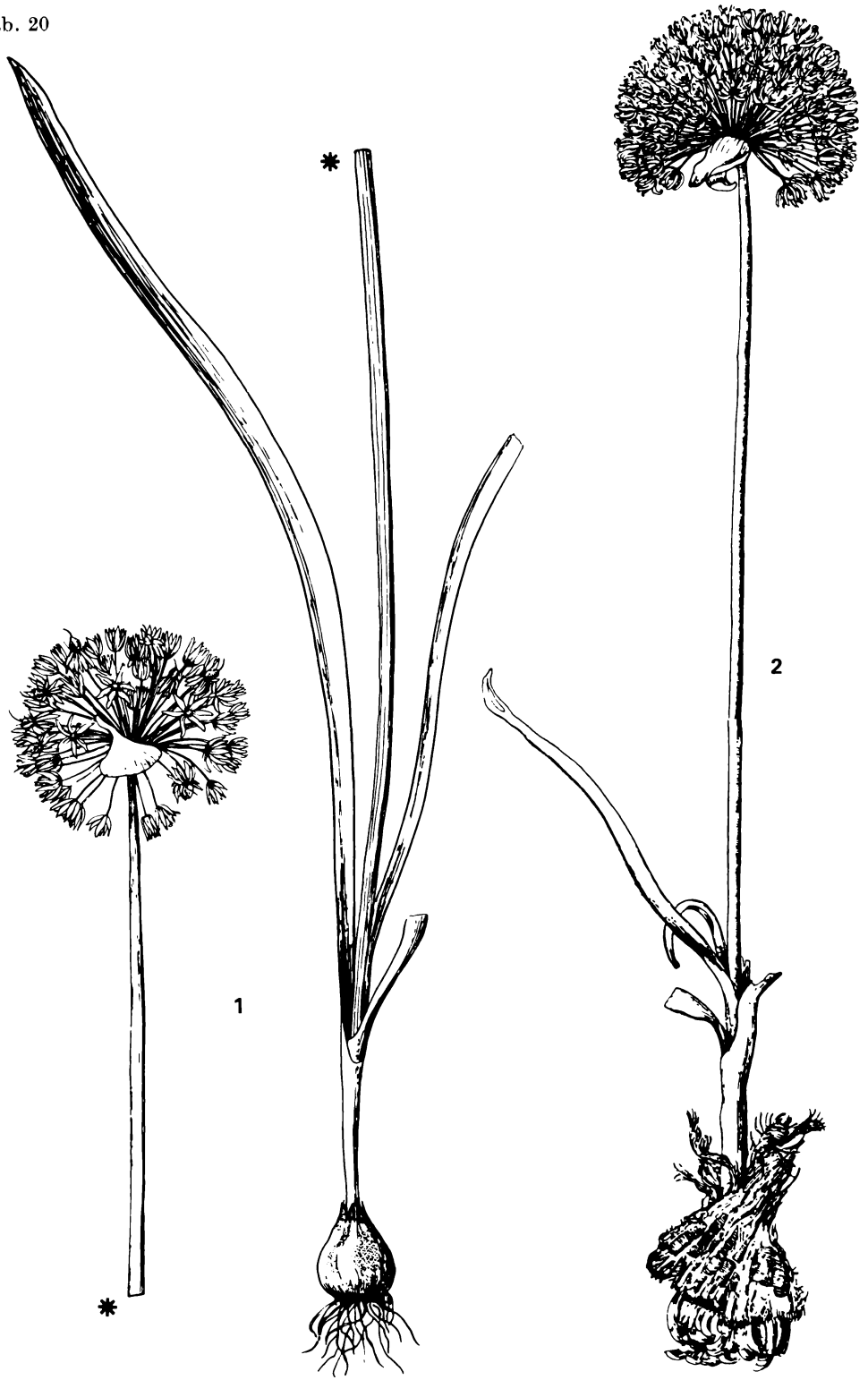






1: *Allium Olivieri* BOISS. — ESFAND. 5074. **2:** *A. scotostemon* WENDELBO — **a.** WDB. 1280-a; **b.** WDB. 1292. **3:** *A. cucullatum* WENDELBO — KOEIE 2752. Omnia × ½

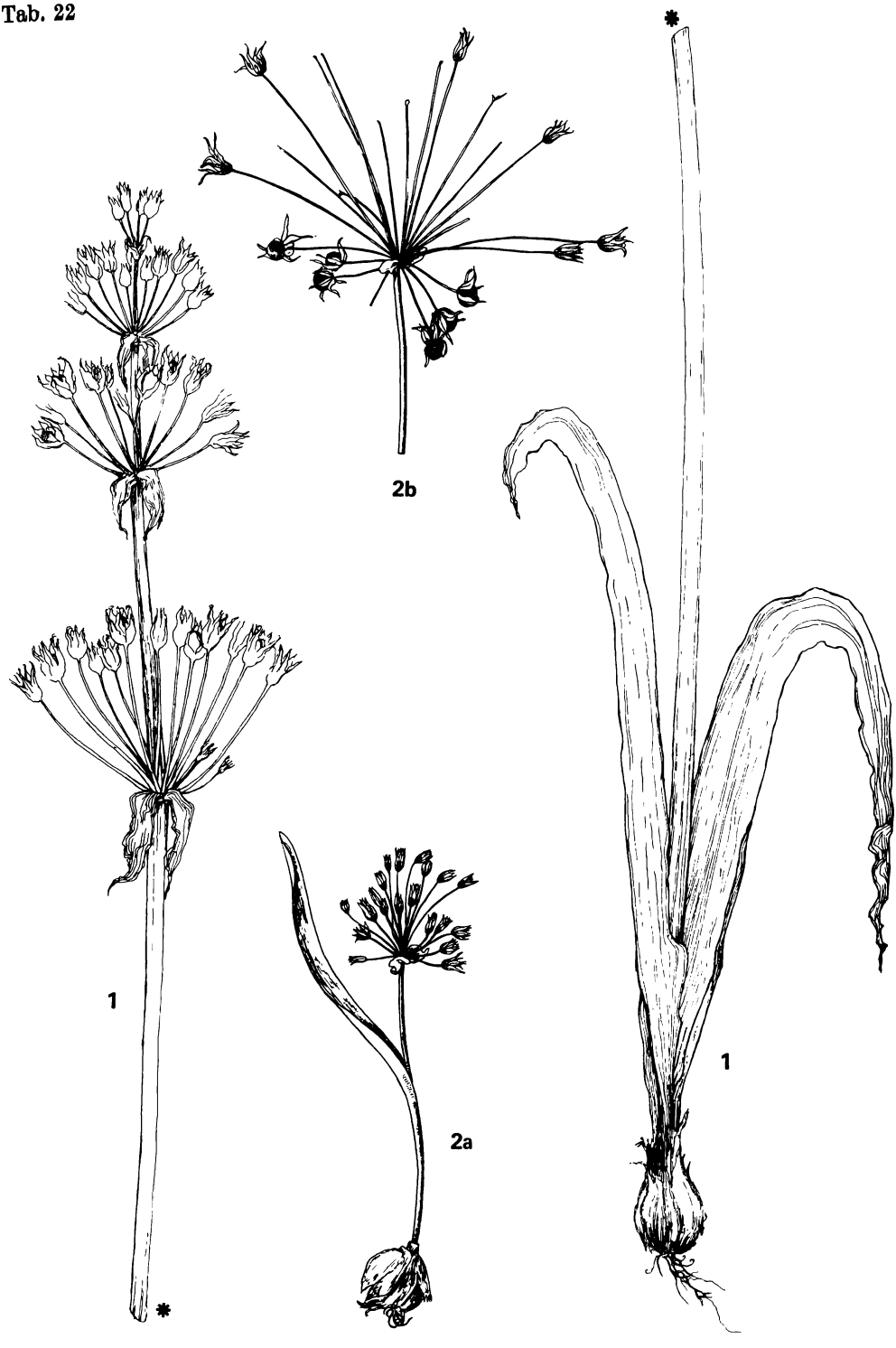
Tab. 20



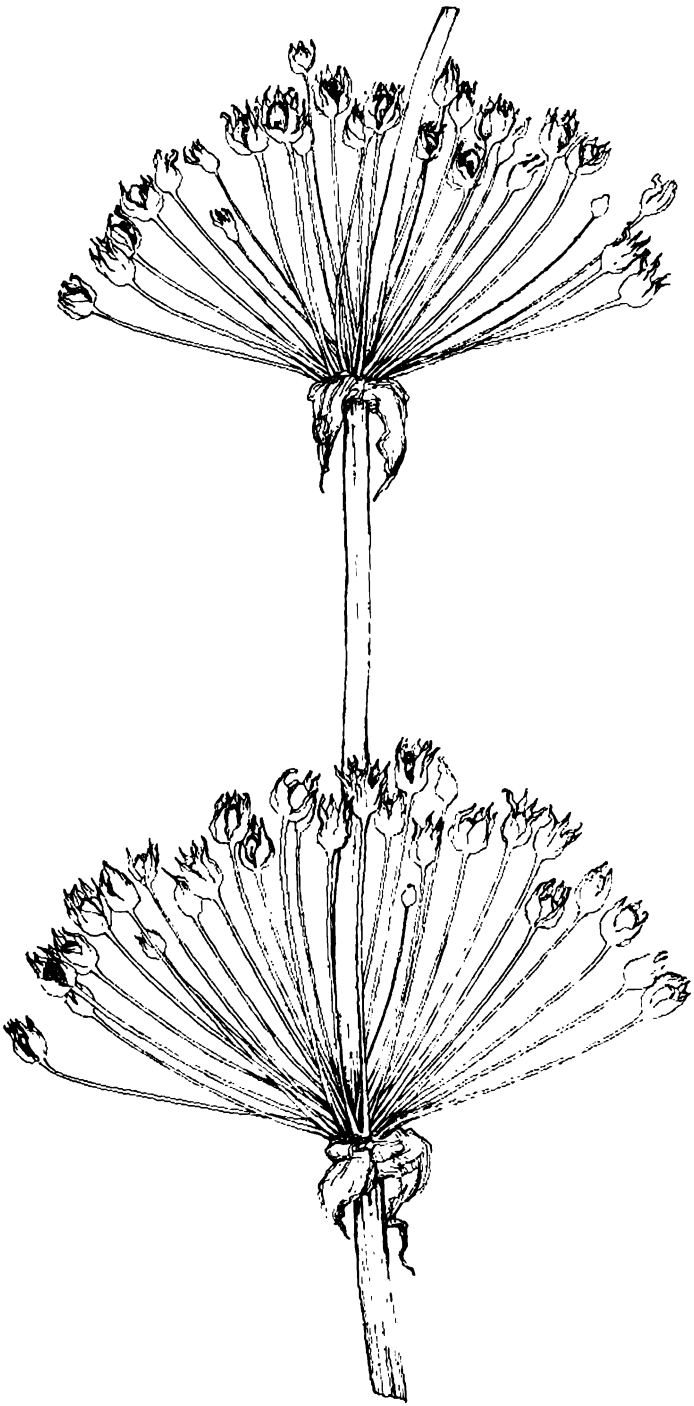
1: *Allium jesdianum* Boiss. & Buhse — Wdb. 1700. **2:** *A. fibriferum* Wendelbo — Kerstan 247. Omnia × ½

1: *Allium chelotum* WENDELBO — WDB. 643. **2**: *A. badakhshanicum* WENDELBO — LINDB. 709. Omnia × ½

Tab. 22



1: *Allium Regelii* TRAUTV. — WDB. 8574. 2: *A. cathodicarpum* WENDELBO — **a.** BORNM. 4770: planta florifera; **b.** BORNM. 4778: inflorescentia cum fructibus submaturis. Omnia × ½



Allium Regelii TRAUTV. — WDB. 8555: pars inflorescentiae, × ½

Allium caspium (PALL.) M. B. — **a.** RECH. 29161; **b.** RECH. 34206

1

2

3

4

1: *Allium Fedtschenkoanum* Regel — Wdb. 5173. **2:** *A. Oschaninii* O. Fedtsch. — Furse. **3:** *A. Akaka* Gmelin — Furse. **4:** *A. Shelkovnikovii* Grossh. — Archibald 2075

1

2

3

4

1: *Allium Cristophii* TRAUTV. — FURSE. **2:** *A. calocephalum* WENDELBO — FURSE. **3:** *A. altissimum* REGEL — WDB. 8237. **4:** *A. giganteum* REGEL — WDB. 8127

1

2

3

4

1: *Allium Rosenbachianum* Regel — Wdb. 7784. **2:** *A. Rosenbachianum* Regel — Rech. 36288. **3:** *A. protensum* Wendelbo — Wdb. 8500. **4:** *A. bucharicum* Regel — Furse

1

2

3

4

1: *Allium helicophyllum* VVED. — FURSE. **2:** *A. cucullatum* WENDELBO — WDB. 4406. **3:** *A. Regelii* TRAUTV. — WDB. 8574. **4:** *A. mirum* WENDELBO — BRECKLE

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
78	Alismataceae	16	127	115	124	146
76	Alliaceae	26	133	128	116	155
	Amaranthaceae	45	23	93	92	112
67	Amaryllidaceae	27	134	128	114	162
74	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
73	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
79	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
68	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
	Commelinaceae	24	138	132	117	154
	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
72	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
77	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
89	Eriocaulaceae	23a	138b	–	125a	154a
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
77	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
69	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
70	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
80	Hydrocharitaceae	18	129	114	111	146
49	Hypericaceae	95	55	19	27	54

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2.ed.
25	Ilicineae	82	86	70	38	58
	Illecebraceae	50	29	13	23	109
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
86	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	50	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
73	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
70	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
	Pontederiaceae	24a	133a	–	116a	155a
	Portulacaceae	49	28	14	24	107
83	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
84	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
82	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
88	Sphenocleaceae	145	125	62a	66	130
87	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
63	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
71	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
74	Vitaceae	91	91	32	41	66
85	Zannichelliaceae	14	131	117	125a	152
81	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48

Fagaceae
uctoribus K. BROWICZ, Kornik et G. L. MENITSKY, Leningrad

Lfg. Cont. No. 77 / 1. 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

Fagaceae

auctoribus K. Browicz, Kornik et G. L. Menitsky, Leningrad

Fagaceae Dumort., Anal. Fam. 11, 12 (1829) „*Fagineae*".

Arbores deciduae vel sempervirentes vel frutices. Folia alterna, simplicia, integra, dentata vel pinnati-lobata, petiolata. Stipulae evolutae, saepe mox deciduae. Flores unisexuales, monoici. Perianthium parvum, 4—7 (—8)-lobum. Stamina aequo vel duplo numero perianthii loborum, rarius numerosiora, usque ad 40. Ovarium inferum, plerumque 3-, rarius 6 (—7—9)-loculare, loculis biovulatis, ovulis pendulis. Styli aequo numero ovarii loculorum. Fructus nux 1-, rarius 2-sperma, solitaria vel binae usque ad ternae, involucro indurato vel cupula partim vel omnino inclusae. Semina endospermo carentes.

1a. Flores masculi in capitula longe pedunculata pendula congesti. Cupula quadrivalvis, nuces 2 triquetras complete includens ..... 1. *Fagus* L.
b. Flores masculi in amenta elongata pendula congesti. Cupula indivisa, cupularis, partem inferiorem nucis teretis laevis includens ..... 2. *Quercus* L.

1. *Fagus*

auctore K. Browicz, Kornik

Fagus L., Spec. Plant. 997 (1753).

Arbores decidui, inermes. Folia alterna, biseriata, simplicia, indivisa, nervatura pinnata. Flores monoici, anemophili. Flores masculi numerosi, in capitula longe pedunculata conferti. Perianthium parvum, inferne coalitum, 4—7-lobum; stamina 8—16, quam perianthium longiora. Flores feminei plerumque bini, involucro quadripartito pedunculato (cupula) provisi; involucrum in statu maturo lignosum, intus velutinum, extus squamis numerosis longis subulatis vel foliaceis provisum. Perianthium florum femineorum 4—6-lobum, cum ovario triloculari coalitum; loculus quisque biovulatus. Styli 3, tenues. Nux ovoidea, triquetra, acutangula.

1. ***F. orientalis*** Lipsky, Acta Horti Petrop. 14, 2: 300 (1898).
Syn.: *F. sylvatica* L. var. *macrophylla* Hohen., Bull. Soc. Nat. Mosc. 11, 3: 259 (1838). *F. sylvatica* L. var. *asiatica* DC., Prodr. 16, 2: 119 (1868) p. p. *F. asiatica* (DC.) Winkler, Pflanzengeogr. Stud. Buchenwäld. 5 (1901). *F. Hohenackeriana* Palib., Bull. Herb. Boissier ser. 2, 8: 378 (1908). *F. macrophylla* (Hohen.) Koidzumi, Bot. Mag. Tokyo 30: 95 (1916). *F. Hohenackeri* Palib. ex Grossh., Fl. Kawk. 2: 21 (1930).

Lit.: H. Czeczott, Distribution of Fagus orientalis Lipsky, Veröffentlichungen des Geobotanischen Instituts Rübel in Zürich, 8: 362—387 (1932). H. Czeczott, A Study on the variability of the leaves of beeches: Fagus orientalis Lipsky, F. silvatica L., and intermediate forms, Annuaire de la Société dendrologique de Pologne, 5: 45—121 (1933), 2, 6: 1—80 (1935).

Typus: Caucasus, LE!

Arbor usque ad 50 m alta; coma ovoidea vel late cylindrica, densa. Cortex pallide cinereus, laevis. Rami juveniles appresse sericeo-pubescentes, gradatim glabrescentes, annotini brunnescentes. Gemmae anguste ovatae vel fusiformes, usque ad 2 cm longae. Folia (5—) 7—14 (—20) × (2,5—) 4—8 (—11) cm, ± elliptica, in dimidio superiore latissima, basi cuneata, apice acuminata, primum utrinque secus nervos et petiolum appresse sericeo-pubescentia, deinde supra glabra vel secus costam medianam leviter pubescentia, margine integra vel undulata, vel nervis in denticulos breves obtusos excurrentibus, imprimis in statu juvenili sericeo-ciliata. Nervi paribus (7—) 9—12 (—14) subtus prominentes. Petiolus 5—20 mm longus. Perianthium florum masculorum breve, late campanulatum, lobis brevibus latis, tubum aequantibus vel superantibus, sericeo-pubescens. Cupula 20 (—25) mm longa, sericeo-pubescens, pedicello (1—) 2—8 cm longo suffulta. Squamae in parte inferiore cupulae foliaceae, virides, nervosae, lineares vel subspathulatae, usque ad 17 × 4 mm; squamae superiores breviores, angustiores, subulatae. Nux usque ad 2 × 1 cm, valvas cupulae aequans vel brevior.

Talish: In silvis, Hohen., C. A. Mey., Alesch 801. Lenkoran, Hohen., Lewandowsky, Pastoukhoff. Inter Lenkoran et Swant, Hohen. Inter Assakudcha et Aliabad, Busch. Persia: N: Gorg.: Ziarat, Merton 3395!, Bunge!; 1400—2000 m, Bobek obs. Bandar-i Gaz, Shar. 355! In montibus Gorgan, Homaire de Hell. Radkan in valle Nika, Bobek obs. Maz.: Chalus, Sab. 325! Infra Waliabad, 2000—2200 m, Bobek obs. Weyser E vallis Chalus, 30 km a litore Caspico, 1100 m, Steiner 72!, 77! In convalle Dalir vallis Chalus, 1500—1900 m, Bobek obs. In jugo Grezu 22 km S Zirab, 1100 m, Kasapligil 2791! Lajim, Aghamashad, Tregubov 202! Lajim, 750—1500 m, Tregubov 38!, Mooney 6622! In decl. borealibus jugi Gaduk, 2200 m, Mird. in Gauba 1910! Prope Nur, 1000—2000 m, Gauba 1909! In valle Haraz S Karehsang, 1100 m, Wdb. 279! In valle fluvii Talar inter jugum Gaduk et Abbasabad, 1800 m, Rech. 2006! Gil.: In silvis Gilani, Auch. 5325!, Linds. 1051-a!, -b! S Hashtpar prope Navrud, 1250 m, Steiner 41! Harsevil prope Manjil, 1500 m, Gauba & Sab. 1908! In valle Denya Chal, 1600 m, Gauba & Sab. 1907! Kaluraz, Gadd 360. Inter Deylaman et Lahijan, 1000—2000 m, Bobek obs. W Deleyman, Bobek obs. S Kuh-e Dalak in valle Reshi, Bobek obs. In jugo inter Damash et Miankushk S Deylaman, Bobek obs. In jugo Astara, Cowan & Darlington 1666!, Gauba & Sab. 1906! Navrud prope Astara, 100 m, Gauba & Sab. 1905! — W: Azerb.: Prope Asbine, Mird. in Gauba 1911!, Parsa 808. In jugo Hajji Amir 28 km NE Ardabil, 1600 m, Grant 16302! — C: Qazvin: Bibersin, 1200—1900 m, Bobek obs.

Distr. gen.: Peninsula Balcanica, Tauria, Anatolia borealis, Caucasus, Amanus, Persia boreo-occidentalis.

Palibin, welcher beabsichtigte, die Gattungen *Fagus* und *Nothofagus* monographisch zu bearbeiten, hat *F. Hohenackeriana* auf Grund der Blätter und der Anzahl der Nervenpaare (9—14) von *F. sylvatica* L. unterschieden. Tatsächlich haben die Blätter des Typus der *F. Hohenackeriana:* Ziarat, Bunge, hb G, 11—13 Nervenpaare.

Grossheim, 1930, gibt in der ersten Ausgabe seiner Flora des Kaukasus für sein Gebiet sowohl *F. Hohenackeriana* als auch *F. orientalis* an. Er unterscheidet die beiden Arten folgendermaßen: *F. Hohenackeriana:* Blätter 10—15 cm lang, mit 10—14 Nervenpaaren; Stiel des Fruchtbechers 2,5—4 cm lang. Bei *F. orientalis* dagegen sind die Blätter 7—10 cm lang, mit 9—12 Nervenpaaren und der Stiel des Fruchtbechers 2—2,5 cm lang.

Czeczott, 1932, l. c. hat bei der Bearbeitung der Karte des allgemeinen Verbreitungsgebietes der *F. orientalis* unter dem Einfluß von Palibin *F. Hohenackeriana* angenommen, bemerkt aber gleichzeitig, daß die von ihr gesehenen Herbarexemplare aus dem Iran doch zu *F. orientalis* gehören.

Nach der Durchsicht eines größeren Materials aus dem Iran und Kaukasus erwies es sich, daß zwischen den Merkmalen des Blattes und der Länge des Stielchens der Frucht-

becher keine Korrelation besteht, daß sowohl Exemplare mit kleinen Blättern und langen Stielchen wie solche mit großen Blättern und kurzen Stielchen vorkommen. Außerdem sind die Schwankungen in den Ausmaßen der Blätter und Stielchen viel größer, als dies GROSSHEIM angab. So fällt also *F. Hohenackeriana* gänzlich in die Variationsbreite der *F. orientalis*, welche in den Zeiten, als PALIBIN seine Art beschrieb, noch nicht genügend bekannt war. Diese Veränderlichkeit ist jedoch begrenzt und vom Formenkreis der *F. sylvatica* getrennt. Diese letztere Art wurde bekanntlich von verschiedenen Autoren bis vor kurzem aus dem Iran angegeben, z. B. BOISSIER & BUHSE, Aufzählung (1860); BOISSIER, Fl. Or. 4 (1879); ZOHARY, On the Geobotanical Structure of Iran: 22, 27 (1963). Bei der Unterscheidung dieser zwei Arten kommt noch ein wichtiges Merkmal hinzu, welches mit der Zahl der Nervenpaare korreliert ist (bei *F. sylvatica* 5—8), und zwar die Form der Borsten auf den Fruchtbechern. Bei *F. sylvatica* sind die Borsten ausschließlich pfriemlich, während bei *F. orientalis* diese besonders im unteren Teil des Fruchtbechers blattartig, grün, lineal oder spatelig und mit verzweigten Nerven versehen sind.

2. *Quercus*

auctore G. L. MENITSKY, Leningrad. [1])

Quercus L., Spec. Plant. 1: 994 (1753).
Syn.: *Cyclobalanopsis* ÖRSTED, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 69 (1867). *Erythrobalanus* (ÖRSTED) O. SCHWARZ, Notizbl. Bot. Gart. Berlin 13, 116: 8 (1936). *Macrobalanus* (ÖRSTED) O. SCHWARZ, l. c.

Lit.: TH. KOTSCHY, Die Eichen Europas und des Orients (WIEN 1862). A. S. ÖRSTED, Recherches sur la classification des chênes, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 65 (1867). A. CAMUS, Les Chênes, Monographie du genre Quercus, vol. 1—3, Atlas (Paris 1934—1954). O. SCHWARZ, Monographie der Eichen Europas und des Mittelmeergebietes, Feddes Repertorium, Sonderbeiheft D (1936—1939). KARIM DJAVANCHIR-KHOIE, Les chênes de l'Iran (1967). G. L. MENITSKY, Conspectus specierum caucasicarum subsectionum Robur (REICHB.) MALEEV et Gallifera (SPACH) GÜRKE generis Quercus L. in Nov. Syst. Pl. Vasc. Leningrad 81—94 (1968).

Arbores magnae vel frutices, foliis deciduis vel sempervirentibus, dentatis, lobatis vel integerrimis. Flores masculi in dichasiis uni- (raro tri-) floris, amenta formantibus, congesti. Perigonium 4—8-fidum, stamina 4—12, filamentis brevibus. Flores feminei solitarii vel pauci, rachide brevi ex axilla foliorum superiorum enata. Ovarium inferum, 3—6-loculare, ovulis in loculo binis (ovulorum 6—12 unico tantum evoluto); cupula extus squamis liberis vel in lamellas concentricas connatis tecta cinctum. Styli 3—6, partim connati vel liberi, tubulati, partim vel omnino secundum rimam longitudinalem faciei superioris explicati, secus superficiem interiorem ad 1/10—9/10 longitudinis stigmatosi. Fructus nux (glans) monosperma unilocularis, ovulis abortivis in parte superiore vel inferiore sitis. Endocarpium glabrum vel pubescens.

1a. Lobi vel dentes foliorum obtusi vel acutati. Cupulae squamae breves, appressae vel vix tantum patulae 2
b. Lobi vel dentes foliorum acuminati vel subspinosi, vel folia integerrima ... 5
2a. Folia breviter lobata vel dentata; pedunculus fructiferus petiolo brevior vel ei aequilongus 3
b. Folia longe lobata, glabra vel puberula; pedunculus fructiferus petiolo multo longior ..... 1. *Q. Robur* L.

[1]) Latine vertit N. N. ZABINKOVA.

3a. Folia obovata, breviter lobata, lobis rotundatis, homomorpha 4
b. Folia elliptica, mucronato-dentata vel acute dentata, inferiora superioribus forma manifeste dissimilia, saepe integerrima .....3. *Q. infectoria* Oliv.
4a. Rami glabri; folia subtus tenuiter pubescentia; cupulae squamae omnes appressae; stipulae deciduae ..... 2. *Q. petraea* L. ex Liebl.
b. Rami et folia subtus dense flavido-pubescentes; cupulae squamae superiores patulae vel laxe adhaerentes; stipulae persistentes .... 4. *Q. macranthera* Fisch. & C. A. Mey. ex Hohen.
5a. Folia dentata 6
b. Folia integerrima 11
6a. Dentes foliorum in acumen ad 1 mm longum abeuntes. Folia oblongo-elliptica, rarius oblongo-obovata. Cupulae squamae angustae, horizontaliter patentes vel reflexae, rarissime breves, appressae. Stipulae persistentes. Endocarpium glabrum. ..... 5. *Q. castaneifolia* C. A. Mey.
b. Dentes foliorum in acumen longius 1,5—3,0 mm longum abeuntes. Folia elliptica, ovata vel orbicularia 7
7a. Acumen dente multo brevius 8
b. Acumen (vel spina) denti aequilongum vel eo vix tantum brevius 10
8a. Folia oblongo-elliptica vel oblongo-ovata, 6—13 cm longa, ut rami glabra vel subtus tenuissime pubescentia, utrinque viridia. Endocarpium glabrum. ..... 6. *Q. Libani* Oliv.
b. Folia orbicularia, late elliptica vel ovata, ut rami subtus dense pubescentia 9
9a. Folia ovata vel oblongo-ovata, ut rami subtus dense flavido-pubescentia, 6—15 cm longa. Glandes magnae. Cupulae squamae latae, longae, horizontaliter patentes vel reflexae. Endocarpium glabrum ... 7. *Q. Brantii* Lindl.
b. Folia orbicularia vel elliptica, 3—6 cm longa, subtus pubescentia, albo-pruinosa. Cupulae squamae appressae, parvae. Endocarpium tomentosum ..... 8. *Q. Baloot* Griff.
10a. Folia elliptica, glabra, tenuia, rigida, utrinque viridia, nervis secundariis non omnibus ramosis, nervo primario recto. Endocarpium tomentosum .... 9. *Q. dilatata* Royle
b. Folia late elliptica, nervis secundariis supra impressis, subtus valde prominentibus, furcatim ramosis, nervo primario lineae angulato-flexuosae ad instar directo, supra viridia, subtus ferrugineo-brunnea; endocarpium glabrum ..... 10. *Q. semecarpifolia* Sm. in Rees
11a. Folia utrinque griseo-viridia vel subtus albida 12
b. Folia subtus ferrugineo-brunnea, nervis supra impressis. Endocarpium glabrum. Maturatio fructus annua ..... 10. *Q. semecarpifolia* Sm. in Rees
12a. Folia subtus albida, crassa, rigida, tenuiter pubescentia. Endocarpium tomentosum. Maturatio fructus annua ..... 8. *Q. Baloot* Griff.
b. Folia subtus griseo-viridia, tenuia 13
13a. Folia apice acuminata, utrinque glabra. Endocarpium pubescens. Maturatio fructus biennis ..... 9. *Q. dilatata* Royle
b. Folia apice rotundata, subtus puberula. Endocarpium glabrum. Maturatio fructus annua ..... 3. *Q. infectoria* Oliv.

Subgen. ***Quercus***

Syn.: „A" *Lepidobalanus* ENDL., Gen. Plant. Suppl. 4, 2: 24 (1842), stat. indefin. Sect. *Lepidobalanus* (ENDL.) DC., Prodr. 16, 2: 3 (1864). Subgen. *Lepidobalanus* (ENDL.) ÖRSTED, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 65 (1867). Subgenus *Cerris* (LOUDON) ÖRSTED, l.c.: 75. Sect. *Euquercus* HICKEL & A. CAMUS, Ann. Scienc. Nat. Ser. 9, 3: 379 (1921). Subgen. *Sclerophyllodrys* O. SCHWARZ, Notizbl. Bot. Gart. Berlin 13, 116: 20 (1936), nomen invalid. Subgen. *Euquercus* (HICKEL & A. CAMUS) A. CAMUS, Monogr. Gen. Quercus 1: 373 (1936—1938). Subgen. *Complanatae* DJAVANCHIR, Les chênes de l'Iran 50 (1967).

Ovula abortiva ad basin embryonis sita. Cupula imbricatim patule squamosa, lamellis concentricis carens. Perianthopodium non annulatum.

Sect. 1. *Quercus*

Syn.: „b" *Robur* REICHENB., Fl. Germ. Excurs. 177 (1831), stat. indefin. Sect. *Robur* LOUDON, Arbor. Fruticet. Brit. 3: 1731 (1838). Sect. *Gallifera* SPACH, Hist. Nat. Veg. 11: 170 (1842). Sect. *Eulepidobalanus* ÖRSTED, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 65 (1867). Sect. *Confertae* STEF., Sect. *Macrantherae* STEF., Sect. *Ponticae* STEF., Ann. Univ. Sofia Fac. Agr. et Sylvicult. 8: 60 (1930). Sect. *Mesobalanus* A. CAMUS, Bull. Soc. Bot. Fr. 81: 815 (1934). Sect. *Castaneiformis* O. SCHWARZ, Feddes Repert. 33: 322 (1934). Sect. *Cerridopsis* MALEEV, Journ. Bot. URSS. 20, 2: 163 (1935). Sect. *Roburoides* (O. SCHWARZ) O. SCHWARZ, Feddes Repert. Sonderbeih. D, 5: 55 (1937). Sect. *Dascia* (KY.) O. SCHWARZ, l.c.: 121.

Folia dentata, lobata vel pinnatifida, lobis dentibusque obtusis vel acutis muticis vel mucronatis, nec autem spinosis vel acuminatis. Cupula squamis brevibus imbricatis, rarissime longis patentibus sed mollibus tecta. Styli pro more breves, apice rotundati. Maturatio fructus annua. Endocarpium glabrum vel apice tantum puberulum. Perigonium florum masculorum ad basin fere in lacinias lineares partitum.

Subsect. *Quercus*

Syn.: Subsect. *Robur* (ENDL.) GÜRKE in RICHTER & GÜRKE, Pl. Eur. 2: 55 (1897) p.p. Subsect. *Roburoides* O. SCHWARZ, Feddes Repert. 33: 323 (1934). Subsect. *Eurobur* O. SCHWARZ, l.c. p.p. Subsect. *Robur* (REICHENB.) MALEEV, Journ. Bot. URSS. 20, 2: 164 (1935). Subsect. *Roburiformis* O. SCHWARZ, Feddes Repert. Sonderbeih. D, 5: 60 (1937). Subsect. *Hartwissianae* (MALEEV) A. CAMUS, Monogr. Gen. Quercus 2: 194 (1938—1939). Subsect. *Sessiliflorae* (LOJAC.) A. CAMUS, l.c. 2: 198 (1938—1939). Subsect. *Pedunculatae* A. CAMUS, l.c. 2: 4 (1938—1939), nomen invalid.

Lobi dentesque foliorum obtusi vel acuti, non mucronati. Stipulae deciduae. Folia tenuiter pubescentia vel glabra, homomorpha. Squamae cupulae breves, appressae. Styli lati, breves, usque ad 1 mm longi, liberi vel connati, in parte terminali rotundati, apice tantum vel ad medium explicati.

1. ***Q. Robur*** L., Spec. Plant. 996 (1753).
Syn.: *Q. pedunculata* EHRH., Arb. frut. 9: 87 (1789), nom. nud.
Typus speciei: „Habitat in Europa".
Arbor magna. Folia obovata rarius oblonga, sinuato-lobata vel pinnatifida, plerumque glabra, petiolis abbreviatis. Pedunculi fructiferi elongati, petiolis multo longiores. Styli breves, plerumque connati, capitati.

Distr. gen. speciei: Europa temperata et australis, Caucasus et Transcaucasia, Anatolia, Kurdistan et Persia borealis.

In regione nostra tantum occurrit:

— — subsp. ***pedunculiflora*** (C. KOCH) MENITSKY, Acta Inst. Bot. Acad. Sci. Armeniae 16: 129 (1967).
Syn.: *Q. pedunculiflora* C. KOCH, Linnaea 22: 324 (1849). *Q. longipes* STEV., Bull. Soc. Nat. Mosc. 30: 388 (1857). *Q. haas* KY., Eichen t. 2 (1862). *Q. kurdica* WENZIG, Jahrb. Bot. Gart. Berl. 4: 186 (1886). *Q. rhodopea* VELEN., Sitz.-Ber. Böhm. Ges. Wiss. 37: 57 (1893). *Q. pedunculata* EHRH. subsp. *pedunculiflora* (C. KOCH) MAIRE & PETITM., Etudes pl. vasc. Graec. 1: 189 (1908). *Q. brutia* TEN. subsp. *pedunculiflora* (C. KOCH) O. SCHWARZ, Feddes Repert. 33: 324 (1934).
Typus subspeciei: „Im südlichen Dagestan auf Kalk und Mergel, 200—1000′ hoch."

Arbor alta, cortice crasso, rimoso. Rami, gemmae atque pedunculi glabri vel tenuiter pubescentes. Stipulae deciduae. Gemmae breves, ovoideae, obtusae. Folia magna usque ad 15 cm longa, firma, interdum subtus pubescentia vel glaberrima (locus classicus), cinerascenti- vel glaucescenti-viridia; lamina obovata vel suborbicularis, lobata, lobis longis, saepe dentatis, 5—8-jugis, longe auriculatis. Nervi secundarii non paralleli, intercalares numerosi, laminam totam percurrentes. Petioli longitudine varii, 5—25 mm longi. Styli connati, rarius liberi (hybridisatione introgressiva), apice tantum explicati. Cupula hemisphaerica vel patelliformis, squamis crassis brevibus tecta; pedunculus 2—10 cm longus; glandes ad 4 cm longae.

Talish, sec. GROSSH.
Persia: W: Azerb.: In planitie prope Khvoy et Tabris, DJAVANCHIR. — E: Khor.: Mashhad, DJAVANCHIR (vix spontanea).

Distr. gen. subspeciei: Europa australis (Peninsula Balcanica, Tauria), Armenia, Anatolia, Transcaucasia et Caucasus, Persia borealis.

Differt a subspecie *Robur* foliis latioribus, firmis, subtus saepe pubescentibus, lobis longioribus saepe dentatis, angulo divergentiae eorum majore, cupula glandibusque majoribus. Proles valde heterogena, polytopice ut videtur hybridisatione introgressiva *Q. Robur* subsp. *Robur* cum *Q. pubescente* WILLD., *Q. petraea* LIEBL. et *Q. infectoria* OLIV. perfecta in limite areae speciei australi necnon austro-orientali orta. In variabilitate characterum subspeciei *Q. pedunculiflorae* in partibus areae boreali-occidentalibus *Q. pubescens*, in Transcaucasia *Q. petraea*, in Turcia et Persia *Q. infectoria* maximi valoris hybridogeni sunt.

2. ***Q. petraea*** L. ex LIEBL., Fl. Fuld. 403 (1784).
Syn.: *Q. Robur* „Spielart" *Q. petraea* MATTUSCHKA, Fl. Siles. 375 (1777), stat. indefin. *Q. sessilis* EHRH., Arb. frut. 9: 87 (1789), nom. nud. *Q. sessiliflora* SALISB., Prodr. Stirp. 392 (1796). *Q. Robur* L. subsp. *sessiliflora* DC., Prodr. 16, 2: 8 (1864) p.p.
Typus speciei: „Fulda: Wachst in den mehresten Forsten, in dem Ulmbacher allein nicht."

Arbor magna. Folia elliptica vel obovata, sinuato-lobata, subtus tenuiter pubescentia, petiolis ± elongatis. Pedunculi fructiferi plerumque abbreviati vel nulli, rarius petiolis aequilongi. Styli breves liberi, in parte terminali explicati.

Distr. gen. speciei: Europa occidentalis, media et australis, Caucasus et Transcaucasia, Anatolia, Kurdistan et Persia borealis.

In regione nostra tantum occurrit:

— — subsp. ***iberica*** (STEV.) KRASSILN. in MENITSKY, Nov. Syst. Pl. Vasc. Leningrad 1966: 86 (1968).
Syn. subspeciei: *Q. iberica* STEV. in MB., Fl. Taur.-cauc. 2: 402 (1808). *Q. lampro-*

phyllos C. KOCH, Linnaea 22: 327 (1849). *Q. sessiliflora* SALISB. f. *iberica* (STEV.) LEDEB., Fl. Ross. 3: 590 (1851). *Q. hypochrysa* STEV., Bull. Soc. Nat. Mosc. 30: 388 (1857). *Q. macrocarpa* (SOSN.) GROSSH., Fl. Kawk. ed. 2, 3: 57 (1945), non MICHX. (1801)
Icon.: Tab. 1.
Typus: „Habitat in Carthalinia." TGM.

Arbor alta (in locis demissis) vel humilis (in solis montium superficialibus). Rami initio puberuli, dein ut gemmae omnino glabrescentes. Gemmae magnae, pallide brunneae, apice acuminatae. Stipulae caducae. Folia firma, subcoriacea, nitida, supra atro-viridia, elliptica vel obovata, subtus pilis stellatis brevibus, secundum nervos pilis simplicibus longioribus tecta. Lobi 7—12-jugi, rotundati, breves, triente semilaminae latitudinis breviores. Nervi intercalares nulli vel pauci, tertiarii paralleli, rete regulare tenue formantes. Flores masculi in amentis longis congesti, perigonio in lacinias lineares fere ad basin dissecto, feminei pauci vel solitarii, rachide brevi, 0,5—1,5 cm longa ex axilla foliorum superiorum enata. Styli breves, usque ad 1 mm longi, liberi, in parte terminali ad 1/3—2/3 longitudinis explicati. Cupula hemisphaerica, 1,5—1,8 cm in diam., 1,0—1,5 cm alta, crassa, squamis lanceolatis albotomentosis convexis appressis tecta.
Talish: Prope Achewlar, BUHSE! Inter Lenkoran et Asaküdra, BUSCH! Prope Lenkoran, PASTUCHOV! Inter M. Naduz-Galasi et pagum Az, PRILIPKO! M. Kyz-Jürdy, AL. THEOD.! Distr. Masally, Al. THEOD.! Inter Sijow et Tazdy-pok supra pag. Hamurat, 1020—1260 m, ALEXEENKO 2869! Inter pagos Orant et Dshangamiran, 1500—1800 m, ALEXEENKO 2870! Inter Balabant et Lüljakheran, 1350 m, ALEXEENKO 2871!
Persia: N: Gorg.: Radkan, BUHSE! Maz.: Pol-e Zanguleh, 2250—2300 m, GAUBA 1896!, 1897!, 1898!, RECH. 849!, SAB. 318! In jugo Gaduk, 2200 m, GAUBA & MIRD. 1890! In valle fl. Talar inter jugum Gaduk et Abbasabad, 1800 m, RECH. 1998! In declivibus borealibus jugi Kandavan, 2250 m, GAUBA 1895! Prope Nur, 2000 m, GAUBA 1877! Kojur, 1200 m, GAUBA & SAB. 1883! Inter Kinch et Dasht-Nazir, 800—1300 m, RECH. 6601-a!, -b!, 6603!, 6612-a!, -b! Pol-e Zoghal, 600 m, GAUBA & SAB. 1880! Valiabad, SAB. 319! Gil.: Harsevil prope Manjil, GAUBA & SAB. 1884!, 1888! Denya Chal, 1800 m, GAUBA & SAB. 1876!

Distr. gen. subspeciei: Talish, Persia borealis, Caucasus, Transcaucasia.

Partes boreali-occidentales territorii „Florae Iranicae" limitem distributionis speciei praebent. In zona contagionis huius speciei cum *Q. infectoria* hybridisatio copiosissima fit et populationes hybridogenae omnibus characteribus inter *Q. petraeam* et *Q. infectoriam* (*Q.* × *mannifera* LINDL.) locum intermedium tenentes nascuntur, qua de causa characteres harum populationum maxime polymorphi sunt. Folia in arboribus fruticibusque juvenilibus in statu hybridisationis diverso et e speciminibus circumcissis vel a pecu depastis praecipue lecta formam variam saepe irregularem habent. *Q. Komarovii* A. CAMUS a cl. DJAVANCHIR pro Azerbaidjania indicata ad formas, quae etiam in Transcaucasia (Zangezur) saepissime obveniunt, probabiliter pertinet. Nomen *Q. Kochiana* O. SCHWARZ, Feddes Repert. Sonderbeih. D. 5: 90 (1937) nomine *Q. Komarovii* A. CAMUS, Monogr. Gen. Quercus II: 259 (1938—1939) comparato vim prioritatis habet; nomen vero cl. C. KOCHII *Q. longifolia*, Linnaea, 22: 327 (1849) etsi primum videtur, ad speciem hanc referri non potest, ut pridem a cl. RAFINESQUE, Alsogr. Amer. 21 (1838), pro planta americana usitatum idcirca homonymicum est. Hae omnes formae mea sententia hybridogenae inter *Q. infectoriam* subsp. *Boissieri* et *Q. petraeam* subspec. *ibericam* potius habeantur.

Propter materiam deficientem duae species rarae sine dubio *Q. petraeae* affines nobis obscurae remanent: *Q. cedrorum* KOTSCHY, Eich. t. 37 (1862) nempe, ramorum pubescentia foliisque subtus pubescentibus magis dissectis insignis necnon *Q. pinnatiloba* C. KOCH, Linnaea 22: 326 (1849) foliis firmioribus subelongatis usque ad oblongo-ellipticis pinnatisectis ab ea distinguenda, quarum prior a cl. DJAVANCHIR pro Azerbaidjania indicatur.

Subsect. *Gallifera* (Spach) Gürke in Richter & Gürke, Pl. Eur. 2: 68 (1897).

Syn.: Sect. *Gallifera* Spach, Hist. Vég. Phan. 11: 170 (1842).
Subsect. *Chimonophyllum* (Ky.) O. Schwarz, Notizbl. Bot. Gart. Berlin 13: 16 (1936).

Folia heteromorpha rigida, serrato-dentata, dentibus acutis vel mucronatis nec autem acuminatis. Stipulae deciduae. Cupulae squamae breves appressae. Styli breves, usque ad 1 mm longi, lati, ad basin liberi, apice rotundati, ad 1/3—2/3 longitudinis explicati.

3. ***Q. infectoria*** Oliv., Voy. Emp. Othom. 1: 252 (1801); ed. min. 2: 64 (1801); Atlas, tab. 14, 15 (1801).
Syn.: *Q. alpestris* C. Koch, Linnaea 22: 318 (1849) non Boiss. (1838). *Q. lusitanica* Lam. subsp. *orientalis* DC., Prodr. 16, 2: 18 (1864).
Typus speciei: „dans toute l'Asie Mineure, depuis le Bosphore jusqu'en Syrie, depuis les cotes de l'Archipel jusqu'aux frontières de la Perse".

Frutex vel arbor mediocris pube in ramulis et pagina inferiore foliorum variante non persistente. Folia valde heteromorpha, viridim perhiemantia, superiora elliptica vel ovata, plerumque regulariter serrato-dentata, rarius profundius dentato-lobata, dentibus acutis vel integerrima, infima parva, elliptica, plerumque integerrima vel paucidentata. Cupula hemisphaerica vel subconica, velutina; glans ovoidea; pedunculus fructiferus petiolo aequilongus.

Distr. gen. speciei: Thracia, Anatolia, Cyprus, Syria, Kurdistan, Persia occidentalis, Transcaucasia australis.

In regione nostra tantum occurrit:

— — subsp. ***Boissieri*** (Reut.) O. Schwarz, Feddes Repert. 33: 336 (1934), quoad nom.
Syn.: *Q. Boissieri* Reut. in Boiss., Diagn. Pl. Or. Nov. Ser. 1, 12: 119 (1853). *Q. petiolaris* Boiss., l.c. 120. *Q. syriaca* Ky., Eichen, tab. 1 (1862). *Q. tauricola* Ky., l.c.: tab. 10. *Q. Pfaeffingeri* Ky., l.c.: tab. 23. *Q. araxina* (Trautv.) Grossh., Fl. Kawk. 2: 23 (1930) p.p.
Icon.: Tab. 2.
Typus subspeciei: „Hab. in jugo Cassio Syriae borealis."

Arbor mediocriter alta vel frutex procerus, cortice rimoso griseo. Rami juveniles et folia initio floccoso-pubescentes dein pro parte glabrescentes. Gemmae oblongo-ovatae, apice acutatae vel obtusiusculae, brunneae. Folia superiora 5—10 cm longa, 2—4 cm lata, elliptica vel oblongo-elliptica, nervis secundariis 8—11-jugis, in partibus terminalibus vix undulatis, dentata, dentibus totidem brevibus sursum incurvatis acutatis, rarius integerrima; inferiora 1—5-dentata vel integerrima, parva, petiolo 1,5—3 cm longo tenui, flexibili subtereti vel vix canaliculato. Folia tarde pro more hieme media vel exeunte decidua. Flores masculi in amentis longis congesti, feminei pauci vel solitarii, rachide brevi 0,2—1,5 (5) cm longa, ex axillis foliorum superiorum enati. Styli breves, obtusi, ad medium explicati; cupula hemisphaerica 1—2 cm in diam., squamis angustis vix incrassatis cinereo-pubescentibus tecta. Glandes ad 3—4 cm longae. In foliis cecidia saepe obveniunt.

Iraq: Kurd.: Mosul: Supra Sirsang, 800 m, Rech. 11698!, 11951! 1 km W Sirsang, Abbas & Barkley 9050! SW Sirsang, 900 m, Anders 1355! 5 km S Zakho, Rech. 10721! Jabal Khantur prope Sharanish, 1200 m, Rech. 10755! Supra Sawara Tuka, 1500 m, Rech. 11592!, 11959! Arbil: 5 km W Diana, 1000 m, Helbaek 782!, 783!, 784! Rost, 1230 m, Haley 86!, 86-a!, 115-a! Walash, Haley 39! Kuh Safin prope Shaqlawa, 900 m,

BORNM. 1815! In montibus prope Salah ad-Din, BARKLEY 3488! Algurd Dagh supra Nowanda, 1200—1500 m, RECH. 11364!, 11475! 5 km N Shaqlawa versus Harir, 700 m, ERDTMAN & GOEDEMANS in RECH. 15569! Sul.: Prope Penjwin, 1200—1600 m, RECH. 10521! In jugo prope Surdash, 1000 m, RECH. 10118!
Persia: W: Kurd.: W Sardasht, 1500 m, FURSE 3485! Bagh-e Khan, SAB. 321!, 322!, 323!, 1002-j! Dezh Shahpur, 1500—1700 m, JACOBS 6497! 7—32 km E Dezh Shahpur, 1380—1800 m, FURSE 3429 p.p.! Mahabad, 1850 m, PABOT 13175! M. Shahu, 1800 m, HAUSSKN.! M. Avroman, Mazi Bon, 1500—2700 m, HAUSSKN.! Lur.: Khorramabad, ESFAND. 23! — Baskmaq, 1800 m, BROWN 853-c!

Distr. gen. subspeciei: Cyprus, Anatolia, Kurdistan, Syria, Persia occidentalis, Transcaucasia.

Subsect. *Macrantherae* (STEF.) A. CAMUS, Bull. Soc. Bot. Fr. 81: 815 (1934).

Syn.: Sect. *Macrantherae* STEF., Ann. Univ. Sofia Fac. Agr. et Sylvicult. 8: 60 (1930). Sect. *Confertae* STEF., l.c. Sect. *Mesobalanus* A. CAMUS, Bull. Soc. Bot. Fr. 81: 815 (1934) p.p. Subsect. *Macrolepides* A. CAMUS, l.c., non A. CAMUS, Monogr. Gen. Quercus 1: 375 (1936—1938). Sect. *Cerridopsis* MALEEV, Journ. Bot. URSS 20, 2: 163 (1935). Subsect. *Confertae* (STEF.) MALEEV, l.c. Sect. *Dascia* (KY.) O. SCHWARZ, Feddes Repert. Sonderbeih. D, 5: 121 (1937) p.p. Subsect. *Daimio* O. SCHWARZ, l.c.: 122. Subsect. *Esculus* (O. SCHWARZ) O. SCHWARZ, l.c. 122 p.p. Subsect. *Malacolepides* A. CAMUS, Monogr. Gen. Quercus 1: 608 (1936—1938), nomen invalid.

Lobi vel dentes foliorum obtusi vel subacutati. Stipulae pubescentes, persistentes. Rami et folia subtus dense flavido-pubescentes. Squamae cupulae breves vel longae, superiores patulae, molles. Rami homoeophylli. Styli obtusi, longi (2—3 mm), liberi, fere ad basin explicati.

4. ***Q. macranthera*** FISCH. & C. A. MEY. ex HOHEN., Bull. Soc. Nat. Mosc. 11: 259 (1838).
Icon.: Tab. 3, 4.
Typus: „In sylvis prov. Talysch prope Lenkoran, Astara, Suwant, Drych (alt. 1—4000′) et ad latera montis Sarial in t. Elisabethpolensi" LE.

Arbor procera usque ad 25 m alta. Rami, gemmae, folia subtus, petioli stipulaeque dense pubescentes, pube persistente. Gemmae ovoideae, obtusatae, 5—7 mm longae. Stipulae lineares. Folia obovata, basi cordata vel rotundata, 10—17 cm longa, 5—10 cm lata, lamina lobata, lobis 7—10 (—12)-jugis, brevibus (rarius ad dimidium latitudinis semilaminae longis) rotundatis vel subacutatis, saepe dentatis, nervis secundariis totidem, intercalaribus nullis vel basalibus tantum praedita. Petiolus 5—15 mm longus, pubescens. Amenta mascula multiflora, longa, rachide dense pubescente. Perigonium florum masculorum ad medium vel ad basin fere in lacinias latas dissectum. Flores feminei rachide brevi, usque ad 1 cm longa. Styli 2—3 mm longi, ad basin fere explicati, apice obtusi. Cupula hemisphaerica, 1—1,5 (—2) cm in diam., squamis angustis dense pubescentibus patulis tecta. Glandes 1,5—2,5 cm longae.

Talish: Inter Balabant et Lüljakheran, 1350 m, ALEXEENKO 2907! In silvis M. Talish, HOHEN.!, C. A. MEY.! M. Naduz Galasi, FOMIN!, LOMAKIN! Prope Czairü, 1440 m, ALEXEENKO 2906! M. Chan-Bulak, 2330 m, KIRICENKO! Lerik, GROSSH.!
Persia: N: Gorg.: In declivibus borealibus M. Shahvar prope Hajjilang, 2400 m, RECH. 6188! Zarrin Gol, 2300 m, GAUBA & SAB. 1893! In valle Katul, 2000 m, GAUBA & SAB. 1889! Maz.: In valle fl. Chalus, Pol-e Zanguleh, 2200—2400 m, RECH. 897!, 6350!, GAUBA 1899!, SAB. 320! Zardman, PABOT 13177-E! In declivibus borealibus jugi Kandavan,

2250 m, Gauba 1900! Kalar Dasht, 1900 m, Gauba & Sab. 1881! Inter Nemasieh et Zanus, 2400 m, Rech. 6547! In valle Haraz: Darli supra Panjab, 2000 m, Wdb. 1580! Gil.: Kuh-e Dalak prope Rudbar, 2100 m, Behb. in Gauba 1878! Inter Ardabil et Astara, Buhse 764! In jugo supra Astara, 1400 m, Gauba & Sab. 1891!, 1892! Astara, Bunge 1840! Inter „Drasdohan" et Kelishom, Alexeenko 1012! — W: Azerb.: M. Qara Dagh prope Hasanbeyglu, Mird. in Gauba 1879! Kaleybar, Mird. 1886!, 1887! Dishgaduki, 1500 m, Mird. in Gauba 1885!

Distr. gen.: Caucasus, Transcaucasia, Talish, Persia borealis.

Sect. 2. *Cerris* Loudon, Arbor Fruticet. Brit. 3: 1846 (1838)

Syn.: „c" *Aegilops* Reichenb., Fl. Germ. Excurs. 177 (1831) stat. indefin. Sect. *Eucerris* Örsted, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 75 (1867). Sect. *Erythrobalanopsis* Örsted, l.c.: 76. Subsect. *Cerris* (Spach) Gürke in Richter & Gürke, Pl. Eur. 2: 69 (1897). Sect. *Castaneifolia* O. Schwarz, Feddes Repert. 33: 322 (1934). Sect. *Vallonea* O. Schwarz, l.c. Subgen. *Complanatae* Djavanchir, Les chênes de l'Iran 50 (1967) p.p.

Folia dentata, lobata vel pinnatipartita, lobis dentibusque acuminatis, acumine quam 0,5—1 mm longiore. Squamae cupulae rigidae, omnes vel superiores tantum elongatae, reflexae, raro breves et appressae. Styli breves, usque ad 1 mm longi, lineares, apice acutati, ad basin fere explicati. Maturatio fructus biennis. Endocarpium glabrum. Perigonium florum masculorum usque ad medium (non profundius) in lacinias 4—6 latas incisum.

Subsect. *Cerris*

Syn.: Sect. *Eucerris* Örsted, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 75 (1867). Sect. *Vallonea* O. Schwarz, Feddes Repert. 33: 324 (1934) p.p. Subsect. *Eucerris* (Örsted) Maleev, Journ. Bot. URSS. 20, 2: 162 (1935) p.p.

Folia decidua, dentata, lobata vel pinnatipartita, tenuia, lobis vel dentibus in acumen usque ad 1 mm longum abeuntibus. Cupulae squamae angustae, saepe lineares. Stipulae lineares, persistentes.

5. ***Q. castaneifolia*** C. A. Mey., Verz. Pfl. Cauc. 44 (1831).

— — subsp. ***castaneifolia***

Syn.: *Q. Aegilops* L. var. *castaneifolia* (C. A. Mey.) C. Koch, Linnaea 22: 329 (1849). *C. castaneifolia* C. A. Mey. subsp. *Aitchisoniana* A. Camus, Monogr. Gen. Quercus. Atl. 1, Expl. pl. 45 (1934). *Q. Sintenisiana* O. Schwarz, Notizbl. Bot. Gart. Berlin 12: 468 (1935). *Q. castaneifolia* C. A. Mey. subsp. *eu-castaneifolia* A. Camus, Monogr. Gen. Quercus 1: 552 (1936—1938). *Q. castaneifolia* C. A. Mey. subsp. *subrotundata* Djavanchir, Les chênes de l'Iran 73 (1967). *Q. castaneifolia* C. A. Mey. subsp. *triangularis* Djavanchir, l.c.: 75. *Q. castaneifolia* C. A. Mey. subsp. *undulata* Djavanchir, l.c.: 77. *Q. castaneifolia* C. A. Mey. subsp. *incurvata* Djavanchir l.c.: 72. Typus: „Frequens in sylvis montium Talüsch", C. A. Meyer, LE!

Arbor procera usque ad 50 m alta, cortice atro-griseo rimuloso. Rami juveniles pubescentes, mox glabrescentes. Gemmae parvae, ovatae, obtusae, pubescentes. Stipulae longae, lineares, pubescentes, persistentes. Folia tenuia, oblongo-elliptica, basi rotundata vel cuneata, 7—18 cm longa, 3—4 cm lata, subtus griseolo-viridia, pilis stellatis vestita, dein interdum glabrescentia; lamina dentata, dentibus 7—12 (—14)-jugis magnis acuminatis, nervis secundariis totidem apice dentium acumen

breve usque ad 1 mm longum formantibus percursa, petiolo 1—1,5 (—2) cm longo. Amenta mascula 4—10 cm longa, rachide pubescente. Perigonium in lacinias 3—5 latas non profunde incisum. Stamina in numero 4—6. Flores feminei solitarii vel pauci, rachide brevi; styli parvi lineares. Cupula 1,5—2,5 cm in diam., hemisphaerica, squamis pro more longis angustisque subapplanatis, reflexis, rarius brevioribus planis patulis vel etiam appressis tecta. Glandes 2—3,5 cm longae.

Talish: Lenkoran, HOHEN.!, ILUSCHKIN 3008!, PASTUCHOV!, WORON. & SCHELKOWNIKOW 211! Inter Lenkoran et Thermas, GROSSH.! In silvis montosis prope Talish, C. A. MEY.! Inter Orant et Dshangamiran, 1800—2400 m, ALEXEENKO! Germüsh, RADDE! In jugo Tangurjuband prope Tangehrud, KOENIG! Prope Balabur ad fl. Lenkoran Czay, ALEXEENKO 2889! Gelglov, 750 m, LOMAKIN! Prope Havzava, 500 m, VASILJEV & VASILJEVA! M. Sei-Turba, KURLJUSCHIN! M. Shandan-Kalasi, SCHIPZINSKY 1197! Prope Masally, AL. THEOD. 1893! Girdany, BANDIN! Inter Axakudja et Aliabad, BUSCH! Prope Gazho, PRILIPKO! M. Quinager, BUSCH! Prope Vela Gula, MATVEEVA 254! Inter Alasapin et fl. Vasharu Czay, PRILIPKO! Chambalang, PRILIPKO! Inter Alexeevka et M. Kizil-Halasy, PRILIPKO! Inter Balabant et Lüljakheran, 1350 m, ALEXEENKO 2890! Prope Czairü, 1440 m, ALEXEENKO! Inter Sijow et Tazdy-pok supra Hamurat, 1040—1260 m, ALEXEENKO 2885! Supra Tengivan, 240—600 m, ALEXEENKO 2888! Prope cas. Dongobyn, 360 m, ALEXEENKO 2886! Burdaly, PRILIPKO!
Persia: N: Gorg.: Minudasht, SHAR. 351-a!, -b!, 352! Robat-e Qozloq, 2400 m, KOELZ 16563!, 16565!, 16568! Prope Gonbad-e Kavus, MICHELSON 542!, 560! 87 km E Gonbad-e Kavus, 1250 m, GRANT 17200! Aliabad in promontoriis prope fl. Qozloq, 1500—2000 m, PANTSCHENKO! M. Salgule prope Gonbad-e Kavus, MICHELSON 232! 6 km SE Shah Pasand, 200 m, GRANT 17336! Prope Behshahr, BUHSE! Gorgan, FISCHER 75!, KOELZ 16992!, GAUBA 1873!, NIKOLSKY!, LEDEBOUR 83816! „In litore maris Caspii prope Gorgan, 2100 m" (Typus *Q. castaneifoliae* C. A. MEY. subsp. *Aitchisonianae* A. CAMUS), AITCH. In jugo Loveh, 400 m, RECH. 33111! Golestan, 160 km W Bojnurd, 800 m, RECH. 37632! Hajilar Dagh, GAUBA 1867!, MICHELSON 430!, 676!, 506! Prope Bandar-i Gaz, GAUBA & SAB. 1865!, SINT. 1323!, 1385!, 1485!, MICHELSON 95!, 108! Inter Gorgan et Ziarat, GAUBA & SAB. 1874!, PETROFF! Kalpush prope Nardin, NIKOLSKY! Radkan, BUHSE! Maz.: Inter Sari et Behshahr, RECH. 33086! Kojur: Inter Zanus et Kinch, 1300—1600 m, RECH. 6590! Inter Kinch et Dasht Nazir, 800—1300 m, RECH. 6611! Prope Nur, 2000 m, GAUBA & SAB. 1869! 5 km E Neyriz, 960 m, BAKER 31! In valle fl. Talar inter jugum Gaduk et Abbasabad, 1800 m, RECH. 2002! 32 km E Chalus, STUTZ 1217! Bastam S Chalus, TREGUBOV 201-a! Nowshahr, GAUBA & SAB. 1870!, TREGUBOV 201-b! Nika, GAUBA 1875! Haraz: Karehsang, 100 m, WDB. 541! Inter Babol Sar et Nowshahr, RECH. 2078! Gil.: Harsevil prope Manjil, 1400 m, GAUBA & SAB. 1866! Sistan prope Lahijan, GAUBA 1871! Pahlavi, MIRD. 1872! S Hashtpar prope Navrud, 1250 m, STEINER 29!, 30! In silvis Gilani, AUCH. 1332! Prope Rasht, BUHSE!, BUHSE 920-a!, KY. 28! In litore prope Gilan, BUHSE! Ad radices M. Talish, BUHSE! 20 km E Astara, STUTZ 578! Inter Ardabil et Astara, BUHSE 762! In jugo Shindan prope Ardabil, BUHSE 763! Inter Lahijan et Chalus, RECH. 81! — E: Khor.: M. Golidagh prope Bojnurd, 1000 m, GAUBA & SAB. 1868! Kotal-e yek Chenar, KOELZ 16712!

Distr. gen.: Endem.

Species quoad laminam folii ± dissectam, pubescentiam et cupulae squamarum formam manifeste variat. Cupulae squamae in plantis diversis sunt longae ac tenues (6-plo longiores quam latae) valde reflexae vel multo rarius latae applanatae patulae aut appressae, quae formae a cl. A. CAMUS (1936—1938) et DJAVANCHIR (1967) ut subsp. *Aitchisoniana* A. CAMUS, subsp. *triangularis* DJAVANCHIR, subsp. *incurvata* DJAVANCHIR etc. descriptae sunt sed nexus inter characteres et distributionem harum formarum deest (quod e materia a cl. DJAVANCHIR allata patet), qua de causa pro subspeciebus sejungendis hae notae insufficientes videntur.

Subsect. *Aegilops* (Reichenb.) Menitsky, comb. nov.

Basion.: „c" *Aegilops* Reichenb., Fl. Germ. Excurs. 177 (1831) p.p., stat. indefin. — Typus subsect. *Q. Aegilops* L.
Syn.: Sect. *Eucerris* Örsted, Vid. Meddel. Dansk Naturh. Foren. 75 (1867) p.p. Sect. *Erythrobalanopsis* Örsted, l.c.: 76. Sect. *Castaneifolia* O. Schwarz, Feddes Repert. 33: 322 (1934). Sect. *Vallonea* O. Schwarz, l.c. Sect. *Aegilops* (Reichenb.) O. Schwarz, Notizbl. Bot. Gart. Berlin 13, 116: 19 (1936). Subsect. *Macrolepides* A. Camus, Monogr. Gen. Quercus 1: 375 (1936—1938), nomen invalid., non A. Camus, Bull. Soc. Bot. Fr. 81: 815 (1934). Subsect. *Campylolepides* A. Camus, Monogr. Gen. Quercus 1: 375 (1936—1938) p.p., nomen invalid.

Folia dentata, in ramis hibernantia, dentibus in acumen 1,5—2 mm longum abeuntibus. Cupulae squamae planae, pro more longae, superiores saltem reflexae, raro breves, latae, appressae. Stipulae deciduae.

6. ***Q. Libani*** Oliv., Voy. Emp. Ottoman, Atlas: tab. 32 (1801); 2: 290 (1804); ed. min. 4: 150 (1804).
Syn.: *Q. regia* Lindl., Bot. Reg. 26, suppl. 41 (1840). *Q. Carduchorum* C. Koch, Linnaea 22: 320 (1849). *Q. Tchihatchewii* Ky. ex Tchihatch., Asie Mineure 2: 468 (1860) et Atlas: tab. 40, fig. 1 (1860). *Q. apiculata* Djavanchir, Les chênes de l'Iran 55 (1967). *Q. Hedjazii* Djavanchir, l.c.: 82. *Q. ophiosquamata* Djavanchir, l.c.: 97. *Q. ovicarpa* Djavanchir, l.c.: 101. *Q. polynervata* Djavanchir, l.c.: 105. *Q. Tregubovii* Djavanchir, l.c.: 117.
Icon.: Tab. 5, 6.
Typus: „Montagnes de la Syrie."

Arbor humilis usque ad 10—12 m alta, cortice atro-griseo, rimoso. Rami juveniles initio tenuiter pubescentes, dein cito glabrescentes. Gemmae oblongo-ovoideae brunneae, acutatae, 4—5 mm longae. Folia oblonga vel ovato-lanceolata, basi rotundata vel cordata, 6—10 (—15) cm longa, 2—3 (—6) cm lata, initio utrinque tenuiter pubescentia, dein supra, interdum etiam subtus glabrescentia, dentata, dentibus 10—14 (—15)-jugis brevibus acuminatis, nervis secundariis parallelis 10—16-jugis, intercalaribus nullis. Amenta mascula brevia. Perigonium florum masculorum usque ad medium 3—5-partitum; stamina 4—5, filamentis brevibus. Flores feminei solitarii vel bini-terni, rachide brevi (usque ad 1,5 cm longa). Cupula 1/3—2/3 et majorem partem glandis vestiens, hemisphaerica vel dolioliformis, 2—3,5 cm in diam., squamis brevibus rhombeis vel triangularibus appressis, rarius superioribus praecipue appendice elongata tenui patenti terminatis obtecta. Glandes usque ad 3,5 cm longae, 2—2,5 cm in diam., cylindricae vel doliiformes, cicatrice valde prominente convexa vel plana.

Iraq: Kurd.: Mosul: Prope Sharanish N Zakho, 1300 m, Rech. 10875! Sirsang, 1200 m, Anders 2347!; 1200 m, Rech. 11666! Gara prope Amadiyah, Ky. 340! M. Chiya-e Gara, Hohen.! Arbil: Rayat in valle Darband, 1200 m, Haley 32! Sul.: In ditione Penjwin, 1200—1600 m, Rech. 10488!, 10489!, 12256!, Hausskn.!
Persia: W: Azerb.: 90 km S Mahabad, 1500 m, Pabot 13176-E! Kurd.: 32 km E Dezh Shahpur, 1800 m, Furse 3429 p.p.! Bagh-e Khan Sab. 317!, 1001-j!

Distr. gen.: Anatolia austro-orientalis, Iraq (Kurdistan), Persia occidentalis.

Species dimensionibus foliorum necnon forma squamarum cupulae valde variabilis est: folia usque ad 20 cm longa, 10—12 cm lata, nunc glaberrima, nunc manifeste pubescentia, squamas triangulari-rhombeas appressas usque ad anguste triangulares superiores praecipue appendiculatas praebens. In Kurdistan variabilitas characterum (ut

cupulae ac pubescentiae) propter hybridisationem introgressivam speciei cum *Q. Brantii* manifeste increscit. *Q. apiculata* DJAVANCHIR, *Q. ovicarpa* DJAVANCHIR, *Q. scalaridentata* DJAVANCHIR, *Q. Tregubovii* DJAVANCHIR e Kurdistania iranica (Baneh — Sardachte, Balakeh) descriptae, ut ex iconibus auctoris bonis judicari possit (specimina typica e Herb. Montpellier et Herb. Fac. forest. Univ. Karaj (Teheran) mihi videre non contigit) sunt specimina *Q. Libani* vestigiis introgressionis *Q. Brantii*, squamis nempe cupulae superioribus elongatis varie patentibus insignia.

7. ***Q. Brantii*** LINDL., Bot. Reg. 26, suppl.: 41 (1840).
Syn.: *Q. persica* JAUB. & SPACH, Ill. Pl. Or. 3, 1: tab. 55 (1842—1843). *Q. Brantii* LINDL. subsp. *persica* (JAUB. & SPACH) O. SCHWARZ, Notizbl. Bot. Gart. Berlin 13, 116: 19 (1936). *Q. baneica* DJAVANCHIR, Les chênes de l'Iran 123 (1967). *Q. globularis* DJAVANCHIR, l.c. 127. *Q. Saii* DJAVANCHIR, l.c. 143 (1967). *Q. Ungeri* DJAVANCHIR, l.c.: 151 non KY. (1862).
Icon.: Tab. 7.

Arbor haud procera, ad 10 m alta, cortice griseo, rimuloso. Rami juveniles flavido- vel cinerascenti-tomentosi. Gemmae ovoideae, 2—5 mm longae, squamis magnis, pubescentibus. Folia hieme decidua, supra sparse stellato-pilosa, subtus ob pilos stellatos flavidos vel cinerascentes interdum pilis glandulosis intermixtis tomentosa, lamina 6—10 (—15) cm longa, 4—7 (—9) cm lata, ovata vel oblongo-ovata, basi cordata, dentibus 7—14 brevibus in acumen 1—2 mm longum abeuntibus, nervis secundariis 8—16-jugis, parallelis, in dentes penetrantibus, intercalaribus nullis, petiolo 1—2 cm longo. Amenta mascula 4—5 cm longa, rachide pubescente. Perigonium florum masculorum in lacinias latas 4—6 haud profunde incisum, incisionibus dimidium perigonii non attingentibus, stamina 5—7. Flores feminei solitarii vel bini, rachide ad 15 cm longa. Cupula hemisphaerica vel conica, 1/5—1/2 glandis tegens, 2—3 cm alta, 3—4 cm in diam., squamis magnis, pubescentibus, horizontaliter patentibus. Glans ad 5 cm longa, cicatrice convexa. Species saepe cecidia format.

Iraq: Kurd.: Arbil: Rawandiz, 1200—2300 m, HAUSSKN.!, HALEY 57! In faucibus Bekma, HELBAEK 760!, 777! 10—20 km SSW Shanidar, 700 m, ERDTMAN & GOEDEMANS in RECH. 15580! M. Qandil inter Shahidan et Pushtashan, 600—1200 m, RECH. 11004! 8 km W Diyana, HELBAEK 781! Rost, HALEY 115! Gali Dinarta, 900 m, ANDERS 1318! Mosul: Inter Dihok et Amadiyah supra Sawara Tuka, 1500 m, RECH. 11593! Sirsang, BARKLEY & ABBAS 9052!, 9077! In valle Zawita, 885 m, GUEST 4150!, 4441!, 4503!, 4642! Sul.: M. Avroman, Sosakan, 1200 m, RECH. 10171! Kanispit, 1000 m, RECH. 10388! Inter Sulaymaniyah et Dokan, 1000 m, RECH. 10119! Sulaymaniyah, 660 m, STUTZ 1381! Supra Penjwin, 2100 m, HAUSSKN.!
Persia: W: Kurd.: 7 km E Dezh Shahpur, 1380 m, BENT & WR. 524—102-b! Dezh Shahpur, SAB. 1006-j! Kermansh.: Prope Karand, 1500 m, GRANT 16012! Inter Karand et Qasr Shirin, NIXON 5!, 290!, 293! Inter Kermanshah et Karand, RECH. 2134! Kermanshah, 1650 m, BROWN 817! Rijab, IRANSHAHR 13174-E! 100 km N Kermanshah, 1650 m, WDB. 1942! Inter Kermanshah et Shahabad, 2000 m, GAUBA & ESFAND. 1902!, 1904! 16 km NW Shahabad, 1200 m, STUTZ 1333! 40 km SW Shahabad, 1875 m, BENT & WR. 602—502! Kaseh Garan, BEHB. 303! Kuh-e Qalajeh, BEHB. 306! Sarcheleh, BEHB. 304! Lur.: Gilan-e Gharb, Doraheh, BEHB. 305! Khorramabad, 1000 m, TREGUBOV 203! 44 km W Khorramabad, BENT & WR. 413—102! Inter Pol-e Kalchor et Khorramabad, GAUBA & SAB. 901! Bisheh, 1200—1400 m, RECH. 5663! Ilam, 1200—1550 m, JACOBS 6320!, 6323!, IRANSHAHR 13174-E! 2 km E Malavi, 750 m, BENT & WR. 420—140! Dow Rud, KOELZ 17229!, 18522! Takht Darreh, SAB. 1004-j! Chaghani et Tarhan, SAB. 1005-j! Ham.: Heyran, SAB. 1007-j! Esf.: 48 km W Esfahan, STUTZ 842!, 843! Bakht.: Chashmehghirin, KOELZ 15333! Prope Dshunneke, ALEXEENKO 846!, 854!, 2849!

Dehdez, GADD 361! Qaleh Madresse, GADD 834! Persia occidentalis, BELANGER 104! — S: Fars.: Inter Bushehr et Shiraz, 900 m, KY. 115! 5 km E Mian Kotal, 2200 m, GRANT 15869! 37 km N Kazerun, GRANT 15881! Inter Shiraz et Kazerun, GAUBA & SAB. 1903! Kuh Kable, N Kazerun, 1200—1260 m, STAPF 884! Abdui, STAPF 881! In valle prope Nowdan, STAPF 883! Prope Khaneh-ye Zenyan, STAPF 880! Kuh-e Dasht W Kazerun, STAPF 882!

Distr. gen. speciei: Anatolia orientalis, Armenia, Kurdistan, Persia austro-occidentalis.

Species forma laminae, pubescentiae coloratione necnon forma cupulae, squamarum huius glandisque variabilis est, laminam nempe oblongo-ovatam ad oblongo-cordatam, cupulam etiam infundibuliformem usque ad hemisphaericam praebens.

E characteribus posterioribus varietates duae aegre tamen distinguendae separari possunt.

— — var. ***Brantii***

Syn.: *Q. globularis* DJAVANCHIR, Les chênes de l'Iran 127 (1967). *Q. Saii* DJAVANCHIR, l.c.: 143. *Q. persica* JAUB. & SPACH var. *ovoidea* DJAVANCHIR, l.c.: 140. *Q. Ungeri* DJAVANCHIR, l.c.: 151 non KY. (1862).

Typus: „Koordestan", BRANT.

Cupulae squamae late lanceolatae, inferiores appressae, superiores vero patulae (introgressio ut videtur *Q. Libani*).

Iraq: Kurd.: Mosul: Ad confines Turciae prov. Hakari in ditione Sharanish N Zakho, RECH. 10821! Inter Dihok et Amadiyah, in declivibus borealibus montium supra Sirsang, 1200 m, RECH. 11920!

Distr. gen. varietatis: Armenia, Kurdistan.

— — var. ***Belangeri*** (DC.) ZOHARY, Bull. Res. Counc. Israel 9D: 174 (1961).

Syn.: *Q. persica* JAUB. & SPACH var. *Belangeri* DC., Prodr. 16, 2: 48 (1868). *Q. baneica* DJAVANCHIR, Les chênes de l'Iran, 123 (1967). *Q. persica* JAUB. & SPACH var. *longicupulata* DJAVANCHIR, l.c.: 140 (1967).

Typus varietatis: „In Persia", BELANGER 639.

Cupulae squamae superiores lineari-filiformes, reflexae saepe ad 2 cm longae, inferioribus latis dissimiles.

Iraq: Kurd.: Mosul: Ad confines Turciae prov. Hakari 8 km S Zakho, RECH. 10677!, 10824!

Persia: W: Kermanshah: Kuh-e Gale Hajji inter Kermanshah et Shahabad, 2000 m, GAUBA & ESFAND. 1904! Arak: Prope Astaneh, STR.! Lur.: Shah Bazan, 700 m, KOEIE 436! 6 km E Khorramabad, PABOT 13179-E! Bakht.: Inter Kuh-e Kukular et Sabzekuh, ALEXEENKO 834! Prope Dshunneke, ALEXEENKO 843!

Distr. gen. varietatis: Armenia, Kurdistan, Persia occidentalis.

— — var. ***persica*** (JAUB. & SPACH) ZOHARY, Bull. Res. Counc. Israel 9D: 174 (1961).

Syn.: *Q. persica* JAUB. & SPACH, Ill. Pl. Or. 3, 1: 55 (1842—1843). *Q. Brantii* LINDL. subsp. *persica* (JAUB. & SPACH) O. SCHWARZ, Notizbl. Bot. Gart. Berlin 13, 116: 19 (1936). *Q. persica* JAUB. & SPACH var. *retrosquamata* DJAVANCHIR, Les chênes de l'Iran 141 (1967).

Typus varietatis: „Crescit in Persiae australis monte Pirezend", AUCHER-ELOY 5331, P.

Cupula infundibuliformis, squamis patentibus lanceolatis, inferioribus subconformibus. Glans longa, fusiformis.

Persia: W: Kermanshah: 40 km SW Shahabad inter Shahabad et Ilam, 1875 m, BENT & WR. 602—501! M. Lolan prope Kermanshah, 2700 m, HAUSSKN.! Lur.: Dow Rud, KOELZ 18521!, 18542! 44 km W Khorramabad, 1000 m, GRANT 15934! Kuh Giluye, HAUSSKN.! Bakht.: In montibus Bakhtiaricis, HAUSSKN. — S: Fars.: Mian Kotal prope Kazerun, 2200 m, BORNM. 4334! In jugo Dasht-e Arzhan, 80 km W Shiraz, 2300 m, GRANT 15105! M. Pireh Zan, AUCH. 5331.

Distr. gen. varietatis: Endem.

Q. oophora KY., Eichen 26 (1862), sine dubio hybrida — *Q. Brantii* LINDL. × *Q. Libani* OLIV. — est; *Q. squamulosa* DJAVANCHIR, Les chênes de l'Iran 147 (1967) ut ex icone auctoris judicari possit, specimen hybridum *Q. Brantii* LINDL. × *Q. infectoria* OLIV. est.

Sect. 3. *Ilex* LOUDON, Arbor Fruticet. Brit. 3: 1899 (1838).

Syn.: Subsect. *Ilex* (ÖRSTED) GÜRKE in RICHTER & GÜRKE, Pl. Eur. 2: 66 (1897) p.p. Sect. *Cerris* LOUDON subsect. *Brachylepides* A. CAMUS, Monogr. Gen. Quercus 1: 374 (1936—1938), nomen invalid. p.p. Subgen. *Complanatae* DJAVANCHIR, Les chênes de l'Iran 50 (1967) p.p.

Folia integerrima vel dentata, dentibus mucronatis vel acuminatis, rigida, sempervirentia, subtus ut rami dense albo-tomentosa vel sparsius stellato-pilosa. Endocarpium pubescens. Stipulae deciduae. Maturatio fructus annua.

8. ***Q. Baloot*** GRIFF., Itin. Not. 328 (1848).
Syn.: *Q. ilicifolius* GRIFF., l.c.: 316. *Q. Ilex* sensu HOOK., Fl. Brit. Ind. 5: 602 (1888) non L. (1753).
Icon.: Tab. 8, 9.
Typus: Afghanistan „Mountains Bala Chugur serai 3000 to 5000 ft cum Oleina", GRIFFITH 4448, K.

Arbor procera ramosa, trunco crasso, cortice griseo crebro nec profunde rimoso. Rami juveniles et gemmae pubescentes. Folia crassa, rigida, supra griseolo-viridia, subtus albida vel glauca, initio utrinque dense pubescentia, dein supra, interdum subtus glabrescentia; folia adulta subtus tenuiter vel dense pilosa (nec tomentosa), albo-cerata, cera epidermide inferiore cellulis stomatalibus praecipue secreta, lamellulas orbiculares (sub microscopio visas) formante; lamina 2—4 (—6) cm lata, 3—4,5 (—7) cm longa, orbicularis, obovata vel elliptica, margine incrassato, integerrima vel 3—7 (—8) dentata, dentibus ad 1/3—1/5 latitudinis semilaminae longis, triangularibus, in acumen ad 2 mm longum eis multo brevius sensim abeuntibus, nervis secundariis 6—7 (—8)-jugis, in partibus terminalibus saepe furcatim ramosis, petiolis 2—6 mm longis, stellato-pilosis. Amenta mascula ad 4—5 cm longa, rachide pubescenti; perigonium florum masculorum ad medium, rarius ad basin fere in lacinias 4—6 (—7) latas pubescentes partitum; stamina 7—9, filamentis brevibus. Flores feminei solitarii vel inflorescentias paucifloras formantes, rachide brevi; styli breves, ad 1 mm longi, recti vel divergentes, liberi, basi cylindrici, pro more ad medium, rarius ad marginem perigonii explicati, apice non acutati. Cupula ovato-conica, tenuiter pilosa. Squamae elliptice vel oblongo-ovatae, inferiores et intermediae inflatae, crista longitudinali mediana et striis lateralibus convexis ornatae, apice brevi appresso rubescenti terminatae. Glans elliptica, ad 2,5 cm longa, cicatrice convexa.

Afghanistan: E: Kabul: Sarobi, 2000 m, VOLK 1568! Giri, 2400 m, KOELZ 11520! Jalalabad, GILLI 2416! Panjshir: Prope Gulbahar, PODLECH 12784!, REINER 794! Ruka, 1700 m, KOEIE 2942! Basarak, NEUB. 286! Khost: In declivibus borealibus jugi Narai Kotal, 1900 m, RECH. 35597! Versus Chakmanni, 1800 m, RECH. 35621! Jaji: Waziri

N Safed Kuh, 1700—2400 m, VOLK 2514! In parte superiore vallis Kurram, REINER 798! Gardez: In declivibus austro-orientalibus jugi Sata Kandao, 3000—2200 m, RECH. 32139!, LAMOND 2448! In jugo Sata Kandao, 2750 m, RECH. 35459! Nuristan: Inter Urmur et Kushtos, NEUB. 4589! Wama, BUKINICZ 59!; 1380 m, KERST. 825-b! Inter Chetras et Wama, 1400—2000 m, KERST. 848-b!, 1276! Prope Chetras, 2100 m, KERST. 1299! In valle fl. Pech, 1000—1200 m, KERST. 697! Inter Gusalak et confl. fl. Kurder et Pech, 1150 m, KERST. 719! Gusalak, 1000—1200 m, EDELB. 46!, 155!, 1503!, 1509! Prope Kurder, 1600—1700 m, NEUB. 774!, 780!, EDELB. 80! Pashki, 2300 m, EDELB. 631! Pushol in valle Rangul, 2250 m, KERST. 1106! Inter Asmar et Barikot, 840—900 m, EDELB. 1636!, GILLI 2415! Inter Ningalam et Darim, 1300—1600 m, NEUB. 959! Inter Nishai et Ningalam, NEUB. 786!, 802! Bala Chugur Serai, 900—1500 m, GRIFF. 4448! Pakistan: Chitral: Drosh, 1350 m, BOWES LYON 616! Prope Bromotul, 2000 m, KERST. 2086! — Swat: In valle Jabba prope Kolalai, RECH. 30712! Utror prope Kalam, RECH. 30816! — Kurram: In valle Kurram et in distr. Hariab, 1950—2700 m, AITCH. 25!, 87!, 128!, 262! Sarsurang, Y. M. KHAN 48! Geedo village, Y. M. KHAN 2! — N. Wazir.: Boya, BLATT. & FZ. Dosalli Fort, BLATT. & FZ. Dosalli, BLATT. & FZ. Razani, BLATT. & FZ. — S. Wazir.: Razmak, BLATT. & FZ. Wana, BLATT. & FZ. Kaniguram, STEWART. Pre Ghal. HAY, WILLIAMS.

Distr. gen.: Afghanistan orientalis, Pakistan, India (montes Himalayae, Kashmir.)

Species *Q. Ilici* L. proxima, a qua tamen foliis aliter pubescentibus (nec subtus dense stellato-tomentosis, pruina ceracea nulla), cupula ovato-conica (nec hemisphaerica), forma squamarum (quae in *Q. Ilice* sculpturam indistinctam et apicem longum, dimidium earum attingentem praebent) differt. In societate cum *Q. dilatata* ROYLE et *Q. semecarpifolia* SM. vigens, hybridas format.

Sect. 4. *Coccifera* SPACH, Hist. Vég. Phan. 2: 177 (1842).

Syn.: Sect. *Ilicopsis* ÖRSTED, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 76 (1867). Subsect. *Coccifera* (SPACH) GÜRKE in RICHTER & GÜRKE, Pl. Eur. 2: 70 (1897). Subsect. *Ilicopsis* (ÖRSTED) MALEEV, Journ. Bot. URSS. 20, 2: 162 (1935). Subsect. *Floribundae* A. CAMUS, Monogr. Gen. Quercus 2: 1 (1938—1939), nomen invalid. Subgen. *Complanatae* DJAVANCHIR, Les chênes de l'Iran 50 (1967) p.p.

Folia tenuia, rigidissima, sempervirentia, glabra, integerrima vel denticulata, denticulis acuminatis vel subspinosis. Cupulae squamae rigidae, breves, appressae vel longae revolutae. Styli breves apice dilatati, ad medium, rarius fere ad basin explicati. Endocarpium tomentosum. Maturatio fructus biennis.

9. ***Q. dilatata*** ROYLE, Ill. Bot. Himal. Mount. 2: tab. 84, fig. 2 (1836) errore sub *Q. dealbata*, corrig. in indice alphabet.
Syn.: *Q. floribunda* LINDL. ex WALL., Cat. nr. 2773 (1831), nom nud.; A. CAMUS, Monogr. Gen. Quercus 2: 5 (1938—1939), nomen invalid.
Icon.: Tab. 10.
Typus: ROYLE, l.c.: tab. 84, fig. 2.

Arbor procera ad 30 cm alta, cortice griseolo-brunneo, profunde longitudinaliter ac transverse rimoso. Rami juveniles et gemmae initio tenuiter pubescentes, dein cito omnino glabrati. Gemmae ovoideae, acutatae, parvae. Stipulae cito deciduae. Folia juvenilia initio floccoso-puberula, dein cito omnino glabrata, lamina 3—7 (—11) cm longa, 2—4 (—6) cm lata, griseolo-viridia, elliptica, obovata vel oblongo-obovata, apice in acumen producta, basi rotundata, integerrima vel 4—9 (—11)-dentata, dentibus brevissimis, in acumen usque ad 5—6 mm longum eis subaequilongum vel etiam longius sub angulo acuto folii margini directum productis, nervis

secundariis utrinque elevatis, in partibus terminalibus furcatim ramosis, petiolo 2—7 (—10) mm longo. Amenta mascula 2—4 cm longa, rachide pubescenti; perigonium florum masculorum in lacinias 5—6 latas margine ciliatas usque ad medium partitum; stamina 5—7, filamentis brevissimis. Flores feminei solitarii, bini vel terni, rachide ad 1,5 cm longa; styli 1 mm breviores, cylindrici, apice dilatati, ad medium, rarius ad 3/4 explicati. Cupula hemisphaerica, 1,3—2 cm in diam., margine flavido-fimbriato-ciliata. Squamae inferiores late ellipticae vel ovatae, apice angusto brevi rubescenti terminatae, superiores oblongae lanceolatae, dense pubescentes. Glandes 1,5—2,5 cm longae, ad 1—1,5 cm in diam., cylindricae vel ellipticae, cicatrice convexa angusta.

Afghanistan: E: Nuristan: Derin, EDELB. 1661! Kurder, 1600—1700 m, NEUB. 759!, EDELB. 72! Supra Kamdesh, 2100 m, GILLI 2417! In declivibus occidentalibus jugi Donda, KERST. 1262!; 1900—3000 m, KERST. 1263! In jugo Urura, NEUB. 569! Ashpi, EDELB. 1666! Supra Wama, 1400—2000 m, KERST. 848-a! Prope Urmur, 1580—1800 m, NEUB. 4586!
Pakistan: Swat: Inter Khawazakhiela et Shangla, RECH. 30631! — Dir: Jambatai, 1950 m, HARRISS 16643! — Kurram: In valle Kurram, AITCH. 25!, 87! — N. Wazir.: Razani, FZ. — S. Wazir.: Pre Ghal, HAY, WILLIAMS. Razmak, BLATT. & FZ.

Distr. gen.: Afghanistan orientalis, Pakistan, India (Himalaya), Nepal.

Species cum *Q. Baloot* GRIFF. saepe hybridas producit.

Sect. 5. *Suber* SPACH, Hist. Vêg. Phan. 2: 171 (1842) p.p.

Syn.: „a" *Suber* REICHENB., Fl. Germ. Excurs. 176 (1831) stat. indefin. p.p. Subgen. *Heterobalanus* ÖRSTED, Vid. Meddel. Dansk Naturh. Foren. Kjöbenhavn 69 (1867). Subsect. *Suber* (SPACH) MALEEV, Journ Bot. URSS. 20, 2: 162 (1935). Sect. *Cerris* subsect. *Brachylepides* A. CAMUS, Monogr. Gen. Quercus 1: 374 (1938—1939), nomen invalid.

Folia rigida, in ramis hibernantia, integerrima vel brevidentata, dentibus acuminatis; lamina nervis supra impressis, subtus vero elevatis percursa, primario lineae angulato-flexuoso ad instar „zigzag" directo, secundariis in partibus saltem terminalibus ramosis, subtus pilis simplicibus et glandulosis tecta, quorum secreto rubescenti ferrugineo colorata. Cupulae squamae angustae, breves appressae vel longae reflexae. Styli liberi, lineares, apice acutati, ad basin explicati. Perigonium florum masculorum ad medium in lacinias latas partitum. Maturatio fructus annua. Endocarpium glabrum.

10. ***Q. semecarpifolia*** SM. in REES, Cyclop. 29, „*Quercus*": 29 (1814).
Syn.: *Q. obtusifolia* D. DON, Prodr. Fl. Nepal 56 (1825). *Q. aquifolioides* REHDER & WILSON, Plantae Wilsonianae 3, 2: 222 (1916).
Icon.: Tab. 11, 12.
Typus: „Banks of torrents in Upper Nepaul", F. BUCHANAN.

Arbor procera, ad 30 m alta, cortice griseolo in lamellas quadratas fissurato. Rami juveniles, gemmae et stipulae pubescentes, autumno pro parte glabrescentes. Stipulae persistentes. Folia initio utrinque pubescentia, dein supra et pro parte subtus glabrata, lamina 4—8 (—12) cm longa, 3—4 (—7) cm lata, elliptica, oblongo-elliptica, orbiculari vel obovata, basi rotundata vel cordata, nervo primario lineae „zigzag" ad instar directo, secundariis 7—9 (—13) ramosis percursa, integerrima vel dentata, dentibus 1—6 (—11)-jugis brevissimis, in acumen 2—3 (—4) mm longum abeuntibus, subtus pilis simplicibus stellatis et glandulosis tecta, quorum secreto pubescentia

etiam degenerata in foliis persistenti ferrugineo-fusco colorata, petiolo 3—7 (—10) mm longo. Amenta mascula 5—10 cm longa, rachide pubescenti; perigonium florum masculorum ad 1/3—1/2 in lacinias latas ciliatas partitum; stamina 5—7 (—16, teste cl. A. CAMUS, l.c.). Flores feminei solitarii- terni, rachide brevi; styli 2,5—3,5 mm longi, acutati, fere ad basin explicati. Cupula patelliformis, 1—1,5 cm in diam., ad 1 cm alta, squamae late triangulares appressae pubescentes, apice angusto appresso. Glans breviter elliptica, vel subglobosa, ad maturationem nigrescens, 1,5—2 cm longa, 1—1,5 cm in diam., cicatrice parva usque ad 4 mm in diam., convexa.

Afghanistan: E: Nuristan: Inter Kotal-e Agok et Waigel, NEUB. 942! In declivibus orientalibus jugi Mum inter Parun et fl. Kantiwo, 2700—2900 m, KERST. 870-a!, -b!, c! Wama, EDELB. 358!, 360! Kurder, 1700 m, EDELB. 76! Inter vallem Sadel et pagum Maswi, 2000—2800 m, KERST. 1209! In declivibus occidentalibus jugi Donda, 1900—3000 m, KERST. 1264!
Pakistan: Kurram: In valle Kurram, AITCH. 394! — S. Wazir.: Pre Ghal, HAY. Shindar, 2700—3000 m, FZ.

Distr. gen.: Afghanistan, Pakistan, India (Himalaya), Sina (Szechuan).

Hybridae

Q. Baloot GRIFF. × ***dilatata*** ROYLE

Afghanistan: E: Nuristan: In valle et prope pagum Kurder, 1600—1700 m, NEUB. 769!, 779!, EDELB. 71!
Pakistan: Swat: Ushu, 2400 m, RECH. 19523! — Kurram: Sarsurang, Y. M. KHAN 51! In valle Kurram, Y. M. KHAN 50!

Q. infectoria OLIV. × ***Brantii*** LINDL.?

Iraq: Kurd.: Mosul: Sirsang, 1200 m, ANDERS 2348!
Persia: W: Lorestan, ABEDI 1003-j!

Q. Brantii LINDL. × ***infectoria*** OLIV. subsp. ***Boissieri*** (REUT.) O. SCHWARZ

Iraq: Kurd.: Arbil: 5 km N Shaqlawa versus Harir, 700 m, ERDTMAN & GOEDEMANS in RECH. 15569!

Q. Brantii LINDL. × ?

Iraq: Kurd.: Arbil: Rost, 1230 m, HALEY 85!
Persia: S: Fars.: Tal-e Khosravi, Sisakht, BEHB. 1106-E!

Q. dilatata ROYLE × ***semecarpifolia*** SM. in REES.

Afghanistan: E: Nuristan: Wama, EDELB. 359!

Q. infectoria OLIV. subsp. ***Boissieri*** (REUT.) O. SCHWARZ × ?

Persia: W: Kurd.: 7 km E Dezh Shahpur, BENT & WR. 524—102-a!

Q. petraea L. ex LIEBL. subsp. ***iberica*** (STEV.) KRASSILN. × ?

Persia: N: Maz.: Valiabad, SAB. 319!

Zweifelhafte Angabe

Castanea sativa MILLER, Gard. Dict. ed. 8, 1 (1768).
Syn.: *C. vulgaris* LAM., Encycl. Meth. Bot. 1: 708 (1783). *C. vesca* GAERTN., Fruct. Sem. Pl. 1: 181 (1788).

BOISSIER, Fl. Or. 4: 1175 (1879) gibt die Art für den Talysch und Nord-Persien unter Berufung auf LEDEBOUR und C. A. MEYER an. Diese Angaben wurden in neuerer Zeit

nicht bestätigt und sie dürften irrtümlich sein. LEDEBOUR, Fl. Ross. 3: 594 (1849—51) gibt die Edelkastanie aus Kaukasien, aber nicht aus dem Talysch an. Auch in der neueren einschlägigen russischen Literatur, wie BOBROV in Fl. URSS. 5 (1936), GROSSHEIM, Fl. Kawk. 2 (1930), GROSSHEIM, Rastitelnyj pokrov Kavkaza (1948), PRILIPKO, Lesnaja rastitelnost Azerbajdzana (1954), LAVRENKO-SOCZAVA, redactors, Descriptio Vegetationis URSS (1956), wird Talysch nicht erwähnt. Die Verbreitung von *C. sativa* in der Sowjet-Union hat V. Z. GULISASVILI genau bearbeitet, Dendroflora Kawk. 2: 177 (1961), aber auch auf seiner Karte wird Talysch nicht angegeben (K. BROWICZ).

Castanea
- **sativa** MILLER 18
- *vesca* GAERTN. 18
- *vulgaris* LAM. 18

Cyclobalanopsis ÖRSTED 3
Erythrobalanus (ÖRSTED) O. SCHWARZ . 3
Fagus L. 1
- *asiatica* (DC.) WINKLER 1
- *Hohenackeri* PALIB. ex GROSSH. 1
- *Hohenackeriana* PALIB. 1
- *macrophylla* (HOHEN.) KOIDZUMI ... 1
- **orientalis** LIPSKY 1
- **sylvatica** L.
  - var. *asiatica* DC. 1
  - var. *macrophylla* HOHEN. 1

Macrobalanus (ÖRSTED) O. SCHWARZ .. 3
Quercus L. 3
- „*A*" *Lepidobalanus* ENDL. 5
- „*a*" *Suber* REICHENB. 17
- „*b*" *Robur* REICHENB. 5
- „*c*" *Aegilops* REICHENB. 10, 12
- Subgen. *Cerris* (LOUDON) ÖRSTED .. 5
- Subgen. *Complanatae* DJAVANCHIR 5, 10, 15, 16
- Subgen. *Euquercus* (HICKEL & A. CAMUS) A. CAMUS 5
- Subgen. *Heterobalanus* ÖRSTED 17
- Subgen. *Lepidobalanus* (ENDL.) ÖRSTED 5
- Subgen. **Quercus** 5
- Subgen. *Sclerophyllodrys* O. SCHWARZ 5
- Sect. *Aegilops* (REICHENB.) O. SCHWARZ 12
- Sect. *Castaneifolia* O. SCHWARZ . 10, 12
- Sect. *Castaneiformis* O. SCHWARZ ... 5
- Sect. *Cerridopsis* MALEEV 5, 9
- Sect. **Cerris** LOUDON 10
- Sect. **Coccifera** SPACH 16
- Sect. *Confertae* STEF. 5, 9
- Sect. *Dascia* (KY.) O. SCHWARZ ... 5, 9
- Sect. *Erythrobalanopsis* ÖRSTED . 10, 12
- Sect. *Eucerris* ÖRSTED 10, 12
- Sect. *Eulepidobalanus* ÖRSTED 5
- Sect. *Euquercus* HICKEL & A. CAMUS 5
- Sect. *Gallifera* SPACH 5, 8

Quercus L. *(cont.)*
- Sect. **Ilex** LOUDON 15
- Sect. *Ilicopsis* ÖRSTED 16
- Sect. *Lepidobalanus* (ENDL.) DC. ... 5
- Sect. *Macrantherae* STEF. 5, 9
- Sect. *Mesobalanus* A. CAMUS 5, 9
- Sect. *Ponticae* STEF. 5
- Sect. **Quercus** 5
- Sect. *Robur* LOUDON 5
- Sect. *Roburoides* (O. SCHWARZ) O. SCHWARZ 5
- Sect. **Suber** SPACH 17
- Sect. *Vallonea* O. SCHWARZ 10, 12
- Subsect. **Aegilops** (REICHENB.) MENITSKY 12
- Subsect. *Brachylepides* A. CAMUS 15, 17
- Subsect. *Campylolepides* A. CAMUS .. 12
- Subsect. **Cerris** 10
- Subsect. *Cerris* (SPACH) GÜRKE 10
- Subsect. *Chimonophyllum* (KY.) O. SCHWARZ 8
- Subsect. *Coccifera* (SPACH) GÜRKE .. 16
- Subsect. *Confertae* (STEF.) MALEEV . 9
- Subsect. *Daimio* O. SCHWARZ 9
- Subsect. *Esculus* (O. SCHWARZ) O. SCHWARZ 9
- Subsect. *Eucerris* (ÖRSTED) MALEEV. 10
- Subsect. *Eurobur* O. SCHWARZ 5
- Subsect. *Floribundae* A. CAMUS 16
- Subsect. **Gallifera** (SPACH) GÜRKE . 8
- Subsect. *Hartwissianae* (MALEEV) A. CAMUS 5
- Subsect. *Ilex* (ÖRSTED) GÜRKE 15
- Subsect. *Ilicopsis* (ÖRSTED) MALEEV 16
- Subsect. **Macrantherae** (STEF.) A. CAMUS 9
- Subsect. *Macrolepides* A. CAMUS . 9, 12
- Subsect. *Malacolepides* A. CAMUS ... 9
- Subsect. *Pedunculatae* A. CAMUS ... 5
- Subsect. **Quercus** 5
- Subsect. *Robur* (REICHENB.) MALEEV 5
- Subsect. *Robur* (ENDL.) GÜRKE p.p. 5
- Subsect. *Roburiformis* O. SCHWARZ . 5
- Subsect. *Roburoides* O. SCHWARZ ... 5
- Subsect. *Sessiliflorae* (LOJAC.) A. CAMUS 5

Quercus L. *(cont.)*
Subsect. *Suber* (Spach) Maleev 17
Aegilops L. 12
var. *castaneifolia* (C. A. Mey.) C. Koch 10
alpestris C. Koch 8
apiculata Djavanchir 12
aquifolioides Rehder & Wilson ... 17
araxina (Trautv.) Grossh. 8
Baloot Griff. 15
Baloot Griff. × **dilatata** Royle . 18
baneica Djavanchir 13
Boissieri Reut. 8
Brantii Lindl. 13
subsp. *persica* (Jaub. & Spach) O. Schwarz 13
var. **Belangeri** (dc.) Zohary ... 14
var. **Brantii** 14
var. **persica** (Jaub. & Spach) Zohary 14
Brantii Lindl. × **infectoria** Oliv. subsp. **Boissieri** (Reut.) O. Schwarz 18
brutia Ten. 6
subsp. *pedunculiflora* (C. Koch) O. Schwarz 6
Carduchorum C. Koch 12
castaneifolia C. A. Mey. 10
subsp. *Aitchisoniana* A. Camus ... 10
subsp. **castaneifolia** 10
subsp. *eu-castaneifolia* A. Camus . 10
subsp. *incurvata* Djavanchir 10
subsp. *subrotundata* Djavanchir . 10
subsp. *triangularis* Djavanchir .. 10
subsp. *undulata* Djavanchir 10
cedrorum Ky. 7
dealbata Royle 16
dilatata Royle 16
dilatata Royle × **semecarpifolia** Sm. 18
floribunda Lindl. ex Wall. 16
globularis Djavanchir 13
haas Ky. 6
Hedjazii Djavanchir 12
hypochrysa Stev. 7
iberica Stev. 6
Ilex L. 16
Ilex sensu Hook. 15
ilicifolius Griff. 15
infectoria Oliv. 6, 8
subsp. **Boissieri** (Reut.) O. Schwarz 8
Kochiana O. Schwarz 7

Quercus L. *(cont.)*
Komarovii A. Camus 7
kurdica Wenzig 6
lamprophyllos C. Koch 7
Libani Oliv. 12
longifolia C. Koch 7
longipes Stev. 6
lusitanica Lam. subsp. *orientalis* dc. 8
macranthera Fisch. & C. A. Mey. ex Hohen. 9
macrocarpa (Sosn.) Grossh. 7
× **mannifera** Lindl. 7
obtusifolia D. Don 17
× **oophora** Ky. 15
ophiosquamata Djavanchir 12
ovicarpa Djavanchir 12
pedunculata Ehrh. 5
subsp. *pedunculiflora* (C. Koch) Maire & Petitm. 6
pedunculiflora C. Koch 6
persica Jaub. & Spach 13
var. *Belangeri* dc. 14
var. *ovoidea* Djavanchir 14
var. *longicupulata* Djavanchir .. 14
var. *retrosquamata* Djavanchir .. 14
petiolaris Boiss. 8
petraea L. ex Liebl. 6
subsp. **iberica** (Stev.) Krassiln. 6
Pfaeffingeri Ky. 8
pinnatiloba C. Koch 7
polynervata Djavanchir 12
pubescens Willd. 6
regia Lindl. 12
rhodopea Velen. 6
Robur L. 5
subsp. **pedunculiflora** (C. Koch) Menitsky 6
subsp. **Robur** 6
subsp. *sessiliflora* dc. 6
„Spielart" *Q. petraea* Mattuschka 6
Saii Djavanchir 13
scalaridentata Djavanchir 13
semecarpifolia Sm. 17
sessiliflora Salisb. 6
f. *iberica* (Stev.) Ledeb. 7
sessilis Ehrh. 6
Sintenisiana O. Schwarz 10
squamulosa Djavanchir 15
syriaca Ky. 8
tauricola Ky. 8
Tchihatchewii Ky. ex Tchihatch. .. 12
Tregubovii Djavanchir 12
Ungeri Djavanchir 13

Quercus petraea subsp. *iberica* (Stev.) Krassiln. — Rech. 6603

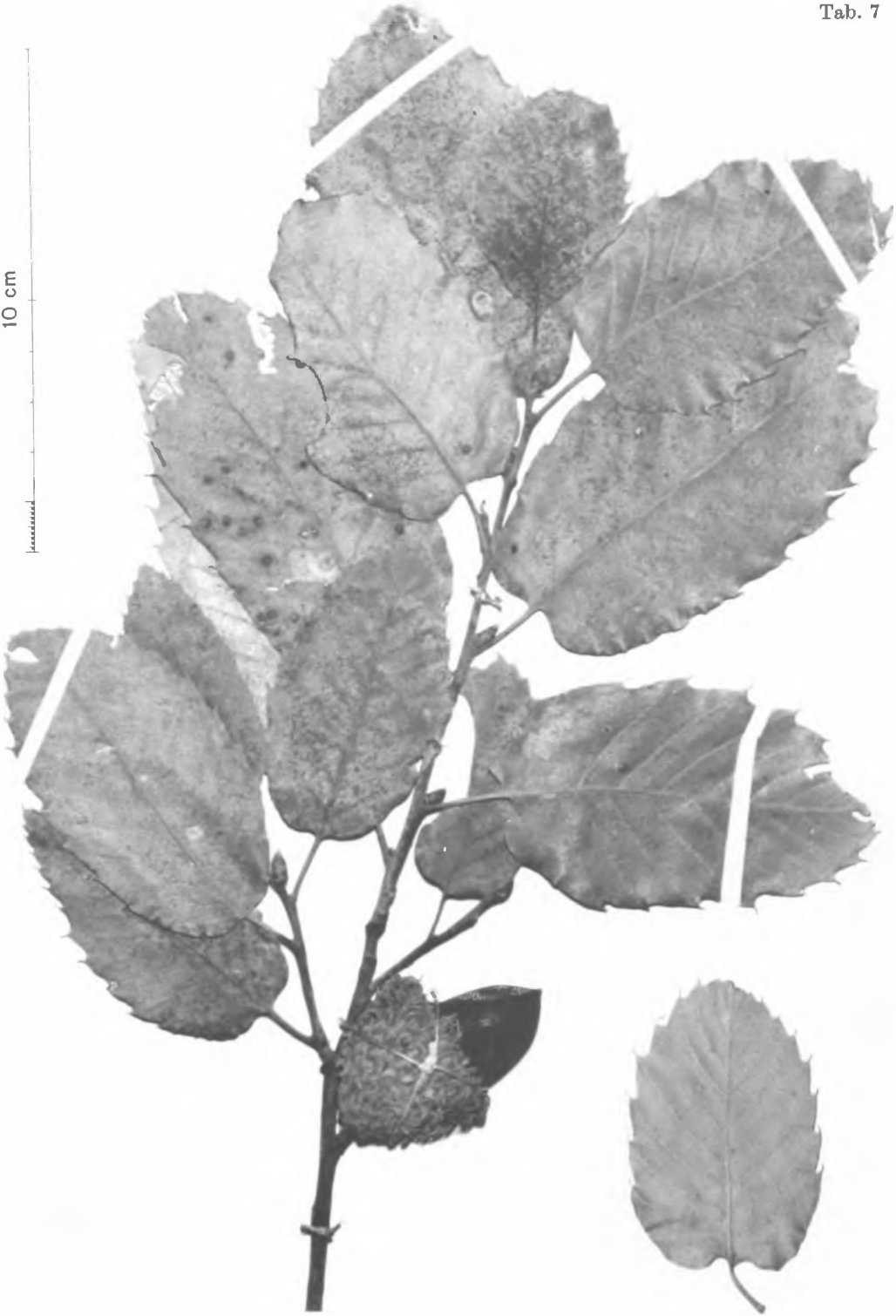
Quercus infectoria subsp. *Boissieri* (Reut.) O. Schwarz — Rech. 11475

Quercus macranthera Fisch. & C. A. Mey. — Rech. 6188

Quercus macranthera FISCH. & C. A. MEY. — RECH. 6547

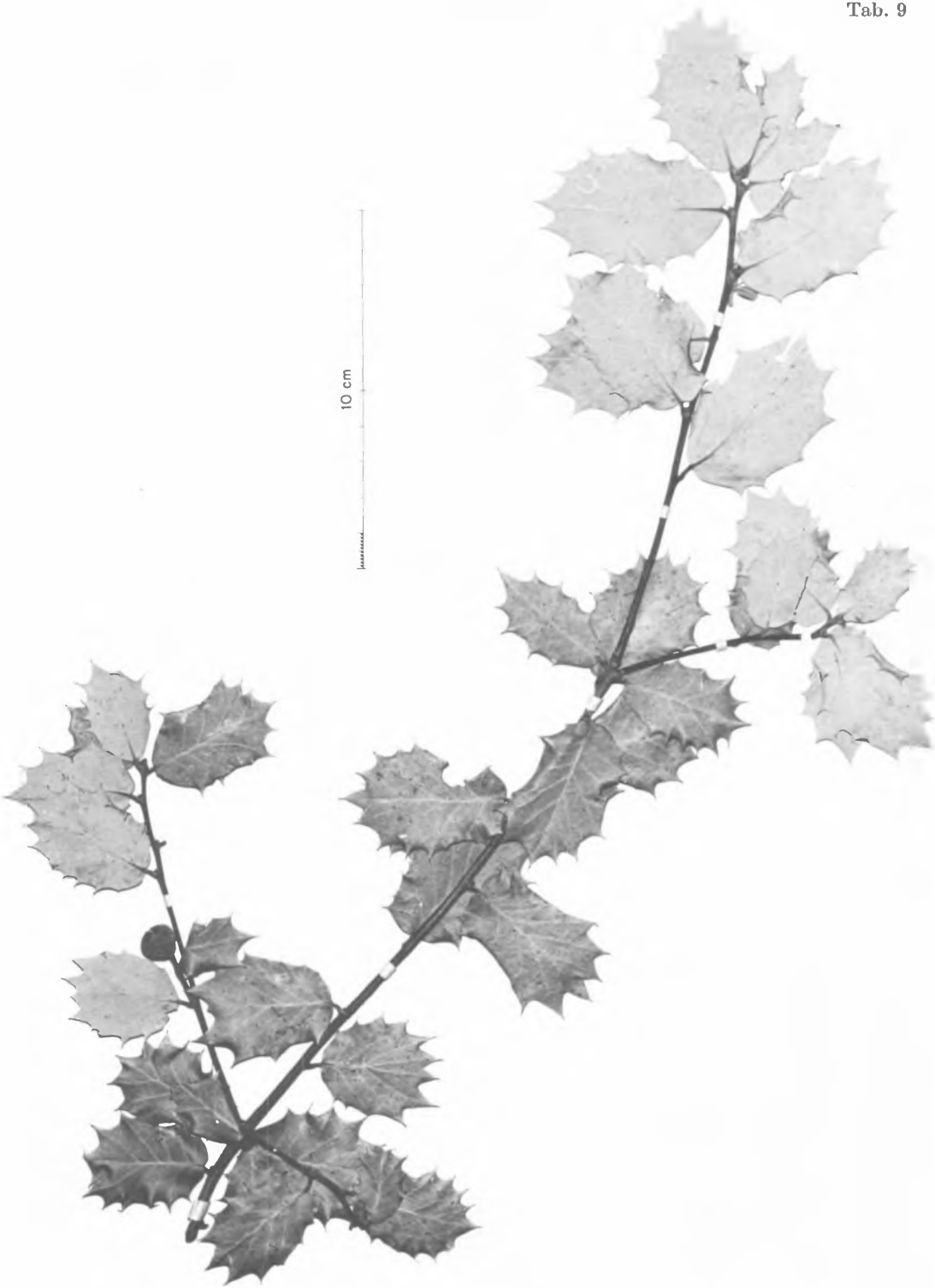
Quercus Libani OLIV. — PABOT 13176-E

Quercus Libani Oliv. — Rech. 11666



Quercus Brantii LINDL. — BARKLEY 9077

Quercus Baloot GRIFF. — Y. M. KHAN 48



Quercus Baloot GRIFF. — EDELB. 1636

Quercus dilatata ROYLE — EDELB. 1661

Quercus semecarpifolia Sm. — Edelb. 358

Quercus semecarpifolia Sm. — Edelb. 76

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
78	Alismataceae	16	127	115	124	146
76	Alliaceae	26	133	128	116	155
	Amaranthaceae	45	23	93	92	112
67	Amaryllidaceae	27	134	128	114	162
74	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
73	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
79	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
68	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
	Commelinaceae	24	138	132	117	154
	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
72	Crassulaceae	63	56	51	48	123
57	Cruciferae	60	46	7	16	101
	Cucurbitaceae	144	124	48	55	42
77	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
89	Eriocaulaceae	23a	138b	—	125a	154a
6	Euphorbiaceae	78	30	104	104	49
	Fabaceae	68	59	38	45	13-5
77	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
69	Geraniaceae	70	74	26	33	138
17	Globulariaceae	137	108	85	87	142
70	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
80	Hydrocharitaceae	18	129	114	111	146
49	Hypericaceae	95	55	19	27	54

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2.ed.
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
75	Juncaceae	25	136	133	118	168
82	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
86	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
73	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
70	Poaceae	19	140	135	127	170
	Podophyllaceae	54	40	3	13	93
	Polygalaceae	77	80	12	21	41

Cont. Nr.		Engler & Diels	Wettstein	De Candolle Boissier	Bentham & Hooker	Hutchinson 2. ed.
56	Polygonaceae	43	21	94	95	108
	Pontederiaceae	24a	133a	–	116a	155a
	Portulacaceae	49	28	14	24	107
83	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
84	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
82	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
88	Sphenocleaceae	145	125	62a	66	130
87	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
63	Therebinthaceae	81	81	46	43	75
	Thymelaeaceae	102	60	96	99	34
	Tiliaceae	92	70	22	30	44
71	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
74	Vitaceae	91	91	32	41	66
85	Zannichelliaceae	14	131	117	125a	152
81	Zosteraceae	14	131	117	125a	149
	Zygophyllaceae	72	75	27	32	48

81: Zosteraceae - 82: Juncaginaceae - 83: Potamogetonaceae
84: Ruppiaceae - 85: Zannichelliaceae - 86: Najadaceae
auctore J. E. DANDY, London.

Lfg. Cont. No. 78-86
1. 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

Alismataceae

auctore J. E. DANDY, London

Alismataceae VENT., Tabl. Règne Vég. 2: 157 (1799) „*Alismoideae*".

Herbae aquaticae vel interdum subterrestres, plerumque scapigerae. Folia radicalia, alterna, simplicia, petiolata vel phyllodina, basi vaginantia, margine integra. Flores hermaphroditi vel unisexuales, actinomorphi, bracteati, in inflorescentias pedunculatas simplices vel compositas verticillatim dispositi, pedicellati vel raro subsessiles. Sepala 3, libera. Petala 3 (raro 0), libera. Stamina 6(—3) vel plura, libera; filamenta filiformia vel dilatata; antherae 2-thecae, longitudinaliter dehiscentes. Gynoecium superum; carpella 6(—3) vel plura, libera vel ima basi concrescentia, 1—multi-ovulata, ovulis basalibus vel ventralibus; styli terminales vel subventrales. Fructiculi indehiscentes vel a basi soluti; semina exalbuminosa, embryone hippocrepico.

1 a. Flores monoici vel polygami, inferiores fertiles carpellis numerosis spiraliter insertis, superiores masculi. Stamina 6 vel plura. Fructiculi margine alati .. .. 1. *Sagittaria* L.
b. Flores hermaphroditi, carpellis univerticillatis. Stamina 6. Fructiculi exalati 2
2 a. Carpella numerosa, 1-ovulata, in fructu libera, ventre sub apice brevissime rostrata ..... 2. *Alisma* L.
b. Carpella 6(—9), 2—multi-ovulata, in fructu stellatim radiata, ima basi concrescentia, apice in rostrum longe attenuata ..... 3. *Damasonium* MILLER

1. *Sagittaria*

Sagittaria L., Spec. Plant. 993 (1753); Gen. Plant. ed. 5: 429 (1754).

Folia emersa sagittata ad lanceolata, vel natantia cordata, interdum submersa linearia. Flores unisexuales vel polygami. Stamina 6 vel plura. Carpella numerosa, spiraliter inserta, libera, 1-ovulata. Fructiculi compressi, margine alati, apice vel ventre sub apice ± rostrati, indehiscentes.

1 a. Folia emersa sagittata. Flores monoici, inferiores feminei. Fructiculi integro-alati ..... 1. *S. trifolia* L.
b. Folia natantia cordato-ovata vel cordato-orbicularia. Flores polygami, inferiores hermaphroditi. Fructiculi dentato-alati .. 2. *S. guayanensis* KUNTH

Sect. *Sagittaria*

Sepala in fructu reflexa.

1. ***S. trifolia*** L., Spec. Plant. 993 (1753).

Syn.: *S. sinensis* SIMS, Bot. Mag. 39: tab. 1631 (1814). *S. sagittifolia* sensu HOHEN., Bull. Soc. Nat. Mosc. 11: 242 (1838) et auct. plur., non L. (1753). *S. sagittifolia* L. var. *leucopetala* MIQ., Ill. Fl. Archip. Ind. 2: 49 (1870). *S. sagittifolia* L. subsp. *leucopetala* (MIQ.) DEN HARTOG, Fl. Males. ser. 1, 5: 332 (1957).

Icon.: DEN HARTOG, l. c.: fig. 11, 12 (1957).
Typus: China, PETIVER, Gazoph. tab. 19, fig. 5 (1702).

Folia plerumque emersa, sagittata, lobis ovatis ad lineari-lanceolatis, 2 basalibus terminali aequilongis vel ad 2-plo longioribus usque ad 14 cm longis apice acicularibus. Flores racemosi vel paniculati, monoici, inferiores feminei. Sepala in fructu reflexa. Petala alba. Stamina numerosa. Fructiculi 3—5 mm longi, integro-alati.

Talish: Prope Lenkoran et Astara, HOHEN. Prope Lenkoran versus Kunel, ALEXEENKO! Lenkoran, Suta-Murdov ad ostium fl. Nyuada, PASTUCHOV!
Persia: N: Gil.: Lahijan, GAUBA 1538!
Afghanistan: NE: Kataghan: 15 km E Kunduz ad viam versus Khanabad, 500 m, PODLECH 11339! — Afghanistan, GRIFF. 5400!
Pakistan: Dir: Dir, 1500 m, HARRISS 16730! — Swat: In valle Swat, 750—900 m, GATACRE 17598!, WEATHERHEAD 60! — Peshawar: Peshawar, DEANE! Warsak, Charsadda, SUHAIL 239! — Kurram: Shalozan, AITCH. 869! In valle Zeran, 2000 m, AFENDI 136! — S. Wazir.: In planitie prope Wana, Fz. 3455.

Distr. gen.: Asia australis ad Japoniam et Malesiam.

Sect. *Lophiocarpus* BENTH. in BENTH. & HOOK., Gen. Plant. 3: 1006 (1883)
Syn.: *Lophotocarpus* TH. DURAND, Index Gen. Phan. X, 627 (1888).

Sepala in fructu appressa vel patentia.

2. ***S. guayanensis*** KUNTH, Nov. Gen. Spec. Plant. 1: 250 (1816).

Syn.: *Lophotocarpus guayanensis* (KUNTH) J. G. SMITH, Missouri Bot. Gard. Ann. Rep. 6: 61 (1894).
Typus speciei: Colombia, HUMBOLDT.
Distr. gen. speciei: Africa tropica, Asia tropica et subtropica, America tropica.

In ditione tantum occurrit:

— — subsp. ***Lappula*** (D. DON) BOGIN, Mem. N. Y. Bot. Gard. 9: 192 (1955).

Syn.: *S. Lappula* D. DON, Prodr. Fl. Nepal. 22 (1825). *Lophotocarpus guayanensis* (KUNTH) J. G. SMITH var. *Lappula* (D. DON) BUCHEN. in ENGLER, Pflanzenr. IV. 15: 36 (1903).
Icon.: Tab. 1; DEN HARTOG, Fl. Males. ser. 1, 5: 328, fig. 6 (1957).
Typus subspeciei: Nepal, BUCHANAN-HAMILTON, BM!

Folia plerumque natantia, ovata ad orbicularia, usque ad 11,5 cm longa et 10,5 cm lata, basi profunde cordata, apice rotundata vel emarginata; inferiora interdum submersa, linearia vel lanceolata. Flores racemosi, 2—6-verticillati, polygami, inferiores hermaphroditi. Sepala in fructu appressa. Petala alba, basi luteo-tincta. Stamina 6—12. Fructiculi 3—4 mm longi, dentato-alati, dentibus obtusis spinosis.

Afghanistan: E: Nur.: In valle fl. Pech, Gusalak, NEUB. 861! Chigha Serai, BRECKLE 3311!; 890 m, PODLECH 16792!
Pakistan: Swat: Inter Barikot et Mingora, 900 m, R. R. STEWART & RAHMAN 25427! In valle Swat, 900 m, GATACRE 17597!

Distr. gen. subspeciei: Africa tropica, Asia tropica et subtropica.

2. *Alisma*

Alisma L., Spec. Plant. 342 (1753); Gen. Plant. ed. 5: 160 (1754).

Lit.: I. BJÖRKQVIST, Op. Bot. 17 (1967); 19 (1968).

Folia emersa vel submersa, interdum natantia. Flores hermaphroditi, plerumque multiverticillati paniculati, raro umbellati. Stamina 6. Carpella numerosa, univerticillata, libera, 1-ovulata; styli subventrales. Fructiculi compressi, ventre sub apice brevissime rostrati, indehiscentes.

1a. Styli ad anthesin ovariis breviores, recurvi. Antherae suborbiculares. Folia linearia vel in laminam oblongam ad ellipticam obtusam expansa, in plantis subterrestribus laminata brevius petiolata. Fructiculorum pericarpium lateribus crassum opacum ..... 3. *A. gramineum* LEJ.
b. Styli ad anthesin ovariis aequilongi vel longiores, ± erecti. Antherae ellipticae. Folia emersa ovata ad elliptica vel lanceolata, in apicem obtusum ± acuminata 2
2a. Folia emersa ovata vel elliptico-ovata, basi plerumque subcordata vel rotundata. Styli per $^1/_8$—$^1/_5$ longitudinis stigmatosi. Fructiculorum pericarpium lateribus crassum opacum ..... 1. *A. Plantago-aquatica* L.
b. Folia emersa lanceolata ad elliptica, basi cuneata. Styli per $^1/_2$—$^2/_3$ longitudinis stigmatosi. Fructiculorum pericarpium lateribus macerum ± pellucidum ..... 2. *A. lanceolatum* WITH.

1. *A. Plantago-aquatica* L., Spec. Plant. 342 (1753).

Icon.: Tab. 2; REICHENB., Icon. Fl. Germ. 7: tab. 57 (100) (1845).
Typus: „Habitat in Europae aquosis & ad ripas fluviorum, lacuum", Herb. L. folium 473.1!

Folia plerumque emersa, ovata vel elliptico-ovata, usque ad 30 cm longa et 12 cm lata, basi plerumque subcordata vel rotundata interdum cuneata, in apicem obtusum ± acuminata. Petala alba vel purpureo-alba. Antherae ellipticae. Styli ad anthesin ovariis aequilongi vel longiores, ± erecti, filiformes, per $^1/_8$—$^1/_5$ longitudinis stigmatosi. Fructiculi 2—3 mm longi, pericarpio lateribus crasso opaco.

Iraq: Diyala: Shahraban, HAINES 1027!, RECH. 9707!
Talish: Prope Lenkoran et Astara, HOHEN. Prope Luvassar, GURVITSCH!
Persia: N: Maz.: In valle Haraz prope Emarat, 350 m, WDB. 1542-a!, -b! Gil.: Gilan, AUCH. 5340! W Rasht, 24 m, BOWLES Scholarship Exp. 2280!
Afghanistan: E: Kabul: Istalif, 1825 m, LINDB. 1323! Paghman, NEUB. 658! — NE: Kataghan: In valle Andarab, 1500 m, FURSE 6552! NE Dch Salah, 2100 m, PODLECH 12000! 4 km supra Godarrah, 1850 m, PODLECH 11011! 2 km supra Khinjan, 1050 m, PODLECH 16103! — C: Doab: Kamard, 1800 m, KOELZ 13618! — Afghanistan, GRIFF. 5394!
Pakistan: Swat: Utror, 2500 m, RECH. 19558! In fl. Swat prope Mingora, 800 m, RECH. 30667!, LAMOND 1744! Prope Saidu Sharif, RODIN 5433! — Peshawar: Peshawar, DEANE! — Kohat: Ad font. Khawaga Khezar, Ustarzai, SUHAIL 282! — Kurram: Shalozan, AITCH. 652! In valle Kurram, HARSUKH 15500! — S. Wazir.: In planitie prope Wana, Fz. 3400, 3412. E Wana Fort, Fz. 3402. N Razmak, 3200 m, BLATT. & Fz. 1856. Kaniguram, STEWART.

Distr. gen.: Europa, Africa borealis et orientalis, Asia temperata.

2. ***A. lanceolatum*** With., Arr. Br. Pl. ed. 3, 2: 362 (1796).

Syn.: *A. Plantago-aquatica* L. var. *lanceolatum* (With.) Koch, Syn. Fl. Germ. 669 (1837). *A. Plantago-aquatica* sensu Boiss., Fl. Or. 5: 9 (1882) „*Plantago*" p. p. et auct. plur., non L. (1753).

Icon.: Tab. 3; Reichenb., Icon. Fl. Germ. 7: tab. 57 (101) (1845).

Typus: Britannia.

Folia emersa, lanceolata ad elliptica, usque ad 23 cm longa et 5 cm lata, basi cuneata, in apicem obtusum ± acuminata. Petala plerumque purpureo-rosea. Antherae ellipticae. Styli ad anthesin ovariis aequilongi vel longiores, ± erecti, filiformes, per $^1/_2$—$^2/_3$ longitudinis stigmatosi. Fructiculi 2—3 mm longi, pericarpio lateribus macero ± pellucido.

Iraq: Kurd.: Sul.: Prope pontem trans fl. Tanjaro, Haines! Arbil: Haruna, 700 m, Gillett 9640!

Persia: N: Maz.: Istgah-e Tir Tash, Shar. 349!, 618! Gil.: Lahijan, Linds. 875! — W: Azerb.: „Tschongarari", prope Rezaiyeh, Knapp! Kurd.: Prope Saqqez, Jardine 747! Khamseh: Soltaniyeh, 1650 m, Furse 3223! Arak: Oshtoran Kuh, Str. M. Rasvand, Str. Lur.: Borujerd, Koelz 18224! Bakht.: Belu, Koelz 15217! — S: Fars.: Takht-e Jamshid, Ky. 389! Inter Shiraz et Takht-e Jamshid, 800—1000 m, Schmid 5519! Kuh Barfi prope Shiraz, Ky. Ad fl. Pol-e Fasa, 18 km SE Shiraz, 1600 m, Grant 15034! Inter Zarqan et Band-e Amir, Stapf 1911! — E: Sistan: Sistan, Ayazi 5865!

Afghanistan: SW: Herat: 60 km S Herat, 1600 m, Koeie 2279! — NE: Badakhshan: Jurm, 2100 m, Koelz 12881!

Distr. gen.: Europa, Africa boreo-occidentalis, Asia temperata occidentalis.

This species has been confused with both *A. Plantago-aquatica* L. and *A. gramineum* Lej. Records of *A. lanceolatum* from Kurram, Pakistan (Samuelsson, 1932; Björkqvist, 1967), and from Band-e Kargha, Afghanistan (Björkqvist, 1967), belong to *A. gramineum*.

3. ***A. gramineum*** Lej., Fl. Spa 1: 175 (1811).

Syn.: *A. Loeselii* Gorski in Eichwald, Naturhist. Skizze Lith. Volh. Podol. 127 (1830). *A. Plantago-aquatica* sensu Aitch., Journ. Linn. Soc. Bot. 18: 99 (1880). „*Plantago*" p. p. et auct. plur., non L. (1753). *A. Plantago-aquatica* var. *decumbens* Boiss., Fl. Or. 5: 9 (1882). *A. lanceolatum* sensu Samuelsson, Ark. Bot. Stockh. 24 A (7): 21 (1932) p. p. et Björkqvist, Op. Bot. 17: 122 (1967) p. p., non With. (1796).

Icon.: Tab. 4; Reichenb., Icon. Fl. Germ. 7: tab. 57 (102) (1845).

Typus: Belgium, Hocquart.

Folia plerumque submersa, linearia vel superne in laminam oblongam ad ellipticam usque ad 4,5 cm latam basi attenuatam apice obtusam expansa; in plantis subterrestribus folia laminata brevius petiolata. Petala alba vel purpureo-alba. Antherae suborbiculares. Styli ovariis breviores, recurvi, per ¼—½ longitudinis stigmatosi. Fructiculi 2—2,75 mm longi, pericarpio lateribus crasso opaco.

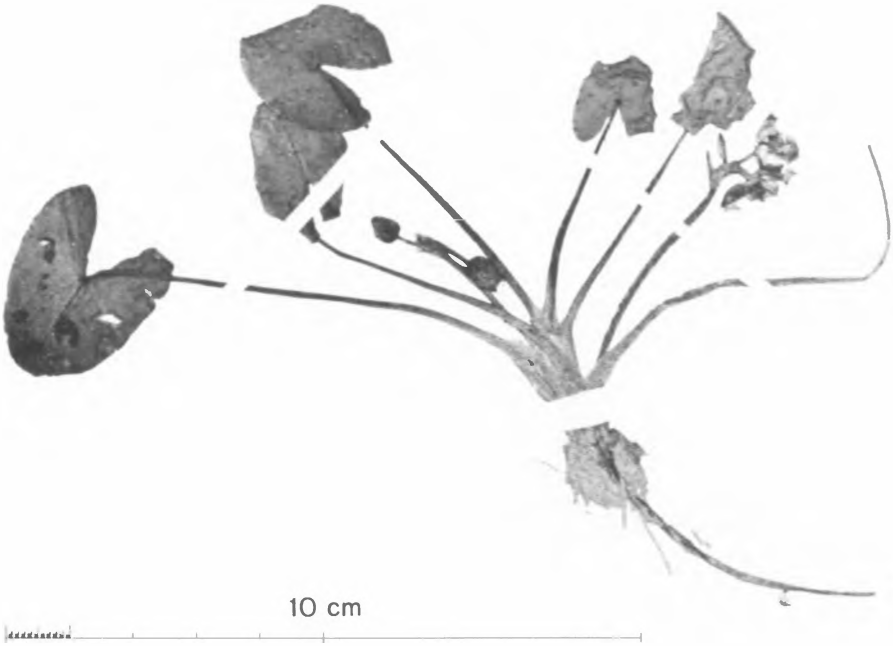
Talish: sec. Fl. URSS 1: 282 (1934).

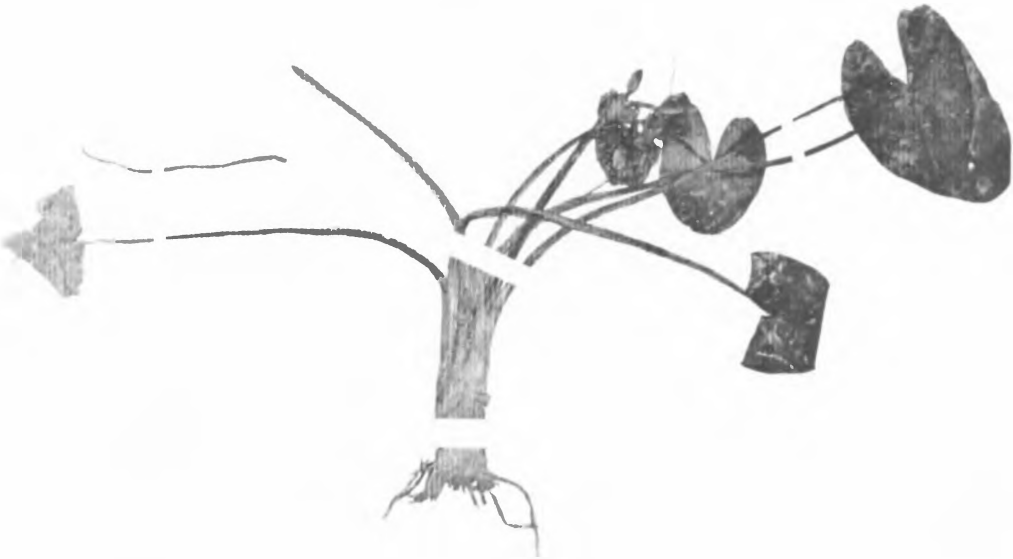
Persia: W: Azerb.: Gol, inter Maragheh et Miandow Ab, Knapp!

Afghanistan: E: Kabul: Band-e Kargha inter Kabul et Paghman, 2000 m, Lindb. 1372!, Rech. 19313-a!, -b! Guzar Gah, Neub. 15! Gulbagh, 1800 m, Gilli 61! Fl. Kabul inter Tang-i Saidan et Lalandar, 1810 m, Gilli 62! In valle Logar E Charasiah, 1780 m, Gilli 60! Inter Maidan et Jalrez, 2200 m, Rech. 18023! Ghazni: Inter Mukur et Ghazni, Griff.! Khost: In planitie Khost, Reiner 809!

Pakistan: Kurram: Shalozan, Aitch. 619!

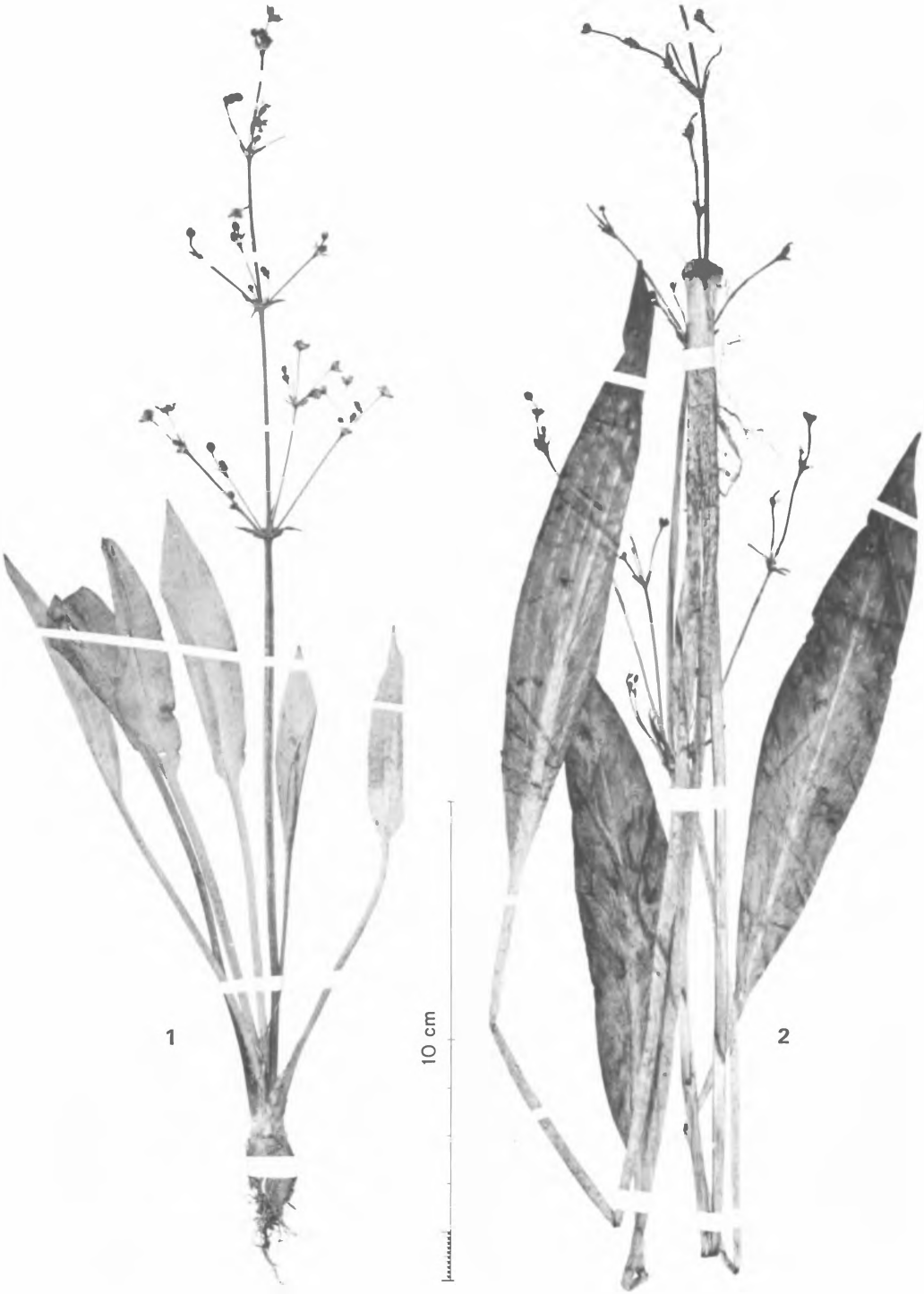
Distr. gen.: Europa, Africa borealis, Asia temperata, America borealis.





Sagittaria guayanensis subsp. *Lappula* (D. Don) Bogin — Breckle 3311

Alisma Plantago-aquatica L. — Rech. 30667



Alisma lanceolatum WITH. **1**: FURSE 3223. **2**: KOELZ 18224

Alisma gramineum Lej. **1:** Rech. 19313-b. **2:** Rech. 19313-a. **3:** Gilli 62

3. *Damasonium*

Damasonium MILLER, Gard. Dict. Abridg. ed. 4, 1 (1754).
Syn.: *Actinocarpus* R. BR., Prodr. Fl. Nov. Holl. 342 (1810), nom. illeg.

Folia natantia vel emersa, tantum primana interdum submersa. Flores hermaphroditi, 1—multi-verticillati, umbellati vel racemosi vel paniculati. Stamina 6. Carpella 6—9, univerticillata, ima basi concrescentia, 2—multi-ovulata; styli terminales. Fructiculi compressi, stellatim radiati, apice in rostrum longe attenuati, a basi soluti.

1. ***D. Alisma*** MILLER, Gard. Dict. ed. 8, nr. 1 (1768).

Syn.: *D. Bourgaei* COSSON, Not. Pl. Crit. 47 (1849). *D. polyspermum* COSSON, l. c. (1849). *Alisma Damasonium* L., Spec. Plant. 343 (1753). *A. Plantago-aquatica* sensu NÁBĚLEK, Publ. Fac. Sci. Univ. Masaryk (Brno) 105: 25 (1929) „*Plantago*" p. p., non L. (1753). *Actinocarpus Damasonium* (L.) SMITH in REES, Cyclop. 39, nr. 1 (1819).
Icon.: FIORI & PAOLETTI, Icon. Fl. Ital. 66, fig. 570, 571 (1895).
Typus: „Habitat in Angliae, Galliae aquosis", Herb. L. folium 473.3!

Folia natantia oblonga vel ovato-oblonga, usque ad 8 cm longa et 3 cm lata, basi subcordata vel truncata, apice obtusa vel rotundata; in plantis subterrestribus folia emersa, saepe lanceolata vel lineari-lanceolata basi cuneata. Flores umbellati vel racemosi vel paniculati. Petala alba, basi luteo-tincta. Carpella 6 (—9), 2—multi-ovulata. Fructiculi 5—12 mm longi.

Iraq: Diyala: Jabal Hamrin, SUTHERLAND 414! Shahraban, HAINES 1028!, RECH. 9706!
Talish: Inter Sallian et Lenkoran, C. A. MEY.
Persia: W: Azerb.: Gol, inter Maragheh et Miandow Ab, KNAPP! Khuz.: Ab-e Shur ad Shush (ruinas Susorum), NÁB. 247!

Distr. gen.: Europa australis, Africa borealis, Asia temperata occidentalis.

This species is here interpreted in a wide sense, including *D. polyspermum*. The number of ovules is very unstable over the range of the species and does not afford a reliable character: thus SUTHERLAND's plant from Jabal Hamrin has biovulate carpels, whereas KNAPP's Gol plant, which is otherwise similar, has multiovulate carpels and was originally named *D. polyspermum*.

Actinocarpus R. BR. 5
Damasonium (L.) SMITH 5
Alisma L.
Damasonium L. 5
gramineum LEJ. 4
lanceolatum WITH. 4
lanceolatum sensu BJÖRKQVIST 4
lanceolatum sensu SAMUELSSON 4
Loeselii GORSKI 4
Plantago-aquatica L. 3
var. *decumbens* BOISS. 4
var. *lanceolatum* (WITH.) KOCH ... 4
Plantago-aquatica sensu AITCH. 4
Plantago-aquatica sensu BOISS. 4
Plantago aquatica sensu NÁBĚLEK .. 5
Damasonium MILLER 5
Alisma MILLER 5
Bourgaei COSSON 5
polyspermum COSSON 5
Lophotocarpus TH. DURAND 2
guayanensis (KUNTH) J. G. SMITH .. 2
var. *Lappula* (D. DON) BUCHEN... 2
Sagittaria L. 1
Sect. **Lophiocarpus** BENTH. 2
Sect. **Sagittaria** 1
guayanensis KUNTH 2
subsp. **Lappula** (D. DON) BOGIN .. 2
Lappula D. DON 2
sagittifolia L. 1
subsp. *leucopetala* (MIQ.) DEN HARTOG 1
var. *leucopetala* MIQ. 1
sagittifolia sensu HOHEN. 1
sinensis SIMS. 1
trifolia L. 1

Butomaceae

auctore J. E. DANDY, London

Butomaceae L. C. RICH., Mém. Mus. Hist. Nat. Paris 1: 364 (1815) „*Butomeae*".

Herbae aquaticae vel paludigenae. Folia radicalia vel caulina, alterna, simplicia, basi vaginantia, margine integra. Flores hermaphroditi, actinomorphi, bracteati, umbellati vel fasciculati vel solitarii. Sepala 3, libera, interdum petaloidea. Petala 3, libera. Stamina 6 vel plura, libera, externa interdum sterilia; filamenta filiformia vel dilatata; antherae 2-thecae, longitudinaliter dehiscentes. Gynoecium superum; carpella 6 (—3) vel plura, verticillata, libera vel basi connata, multiovulata, ovulis parietalibus; styli terminales vel 0. Fructiculi intus dehiscentes; semina exalbuminosa, embryone recto vel hippocrepico.

1. *Butomus*

Butomus L., Spec. Plant. 372 (1753); Gen. Plant. ed. 5: 174 (1754).

Herbae perennes aquaticae scapigerae, rhizomate crasso. Folia radicalia, emersa, sessilia, linearia, inferne triquetra, apice acuta. Flores umbellati, longe pedicellati; umbellae multiflorae, bracteis acuminatis involucratae. Sepala petaloidea, petalis paulo minora. Stamina 9. Carpella 6, basi connata; styli terminales. Fructiculi stylo persistenti rostrati; seminum embryo rectus.

1. ***B. umbellatus*** L., Spec. Plant. 372 (1753).

Syn.: *B. junceus* TURCZ., Bull. Soc. Nat. Mosc. [11: 101 (1838), nom. nud.] 27 (2): 60 (1854).
Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 58 (1845).
Typus: „Habitat in Europae aquosis" (Suecia), Herb. L. folium 521.1!

Folia usque ad 150 cm longa et 1 cm lata. Scapi folia plerumque superantes. Sepala et petala 1—1,5 cm longa, alba, roseo-venosa, sepalis dorso per costam viridulis.

Iraq: Kurd.: Sul.: Horasian, prope Penjwin, SALIM 5501!
Talish: Lenkoran, C. A. MEY., HOHEN., RADDE 534!, 580! Prope Lenkoran versus Kunel, ALEXEENKO!
Persia: N: Maz.: Istgah-e Tir Tash, SHAR. 306! Gil.: Inter Rasht et Lahijan, RECH. 55! — W: Azerb.: Rezaiyeh, KNAPP! Kermansh.: Karand, Luh-e Nevoh, STR.! Saran-e Nilufar, STR. Arak: M. Rasvand, STR.! Abbasabad, STR.! Lur.: Dow Rud, 1500 m, KOELZ 15821!, 17717! Najiu, 1700 m, KOEIE 518! — S: Fars.: Ab Barik W lacus Kaftar, STAPF 1910! Prope Shiraz, STAPF 1909! Prope Sivand, BEHB. 1372-E! In palude Marv Dasht, 40 km N Shiraz, 1600 m, GRANT 17603! Ad fl. Pol-e Fasa, 18 km SE Shiraz, 1600 m, GRANT 15035! — E: Sistan: Sistan, AYAZI 5864!
Afghanistan: E: Kabul: Prope Kabul, GILLI 63!, NEUB. 166!, 770!, GRIFF.! — NE: Kataghan: 15 km E Kunduz ad viam versus Khanabad, 500 m, PODLECH 11340!

Distr. gen.: Europa, Asia temperata.

80

Hydrocharitaceae

auctore J. E. DANDY, London

Hydrocharitaceae JUSS., Gen. Plant. 67 (1789) „*Hydrocharides*".

Herbae aquaticae, interdum marinae, submersae vel natantes; caules abbreviati vel elongati. Folia alterna vel opposita vel verticillata, simplicia, basi vaginata vel evaginata. Flores hermaphroditi vel unisexuales, spatheati; spathae 1—2-phyllae vel ± tubulosae, 1—multi-florae. Sepala 3, libera. Petala 3, libera, vel 0. Stamina 2—15, libera vel basi connata; filamenta elongata vel 0; antherae 2-thecae, longitudinaliter dehiscentes. Ovarium inferum, saepe rostratum, 1-loculare; ovula numerosa vel pauca, placentis 3—15 parietalibus interdum profunde intrusis affixa; styli 3—15, simplices vel 2-ramosi. Fructus putrescens vel raro stellatim dehiscens; semina exalbuminosa, embryone recto.

1a. Folia petiolata. Spathae 1—2-phyllae 2
b. Folia sessilia. Spathae tubulosae 3
2a. Plantae aquae dulcis, plerumque natantes. Folia orbiculari-reniformia, basi cordata. Petala conspicua, sepalis multo majora. Ovarium e spatha longe pedicellatum, stylis 6 2-ramosis ..... 1. *Hydrocharis* L.
b. Plantae marinae, submersae. Folia elliptico-oblonga ad ovata, basi cuneata ad rotundata, 2-nata. Petala 0. Ovarium in spatha sessile, stylis 3 simplicibus ..... 5. *Halophila* THOUARS
3a. Folia verticillata secus caules elongatos disposita, linearia ad ovata, usque ad 4 cm longa. Spathae in foliorum axillis sessiles, 1-florae ..... 2. *Hydrilla* L. C. RICH.
b. Folia alterna radicalia, linearia, ultra 4 cm longa. Spathae pedunculatae .. 4
4a. Petala linearia sepalis longiora. Ovarium in rostrum longum filiforme attenuatum, stylis simplicibus basi connatis. Flores hermaphroditi vel unisexuales, non a planta liberati ..... 4. *Blyxa* NOR. ex THOUARS
b. Petala minuta sepalis breviora, vix obvia. Ovarium non in rostrum longum attenuatum, stylis 2-lobis liberis. Flores dioici, masculi a planta liberati super aquam natantes ..... 3. *Vallisneria* L.

1. *Hydrocharis*

Hydrocharis L., Spec. Plant. 1036 (1753); Gen. Plant. ed. 5: 458 (1754).

Plantae plerumque natantes; caules abbreviati, stoloniferi. Folia alterna, petiolata, ovata ad orbiculari-reniformia. Flores unisexuales, entomophili; spathae 1—2-phyllae, masculae 1—4-florae pedunculatae, femineae 1-florae sessiles. Petala 3, sepalis multo longiora et latiora. Stamina 9—12, saepe basi connata nonnullis sterilibus; filamenta crassa. Ovarium e spatha pedicellatum; styli 6, 2-ramosi, liberi.

1. ***H. Morsus-ranae*** L., Spec. Plant. 1036 (1753).

Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 62 (1845).

Typus: „Habitat in Europae fossis limosis".

Planta natans vel interdum subterrestris. Folia natantia orbiculari-reniformia, basi cordata, margine integra. Petala late obovata, alba, basi luteo-maculata.

Talish: Lenkoran prope Olchowka, ALEXEENKO!

Distr. gen.: Europa, Africa boreo-occidentalis, Asia temperata occidentalis.

2. *Hydrilla*

Hydrilla L. C. RICH., Mém. Cl. Sci. Math. Inst. Imp. France 1811 (2): 61, 75 (1812).

Plantae submersae; caules elongati, graciles. Folia 3—8-verticillata, sessilia, linearia ad ovata. Flores unisexuales, ephydrogamici, masculi a planta liberati super aquam natantes; spathae tubulosae, 1-florae, sessiles, axillares. Petala 3, spathulata. Stamina 3; filamenta brevissima. Ovarium in spatha sessile, in rostrum longum filiforme attenuatum; styli 3, simplices, liberi.

1. ***H. verticillata*** (L. f.) ROYLE, Ill. Bot. Himal. Mount. 376 (1839).

Syn.: *Serpicula verticillata* L. f., Suppl. 416 (1781).

Icon.: DEN HARTOG, Fl. Males, ser. 1, 5: 385—387, fig. 1—3 (1957).

Typus: India, Herb. L. folium 1106.1!

Folia linearia ad elliptica vel ovata, usque ad 40 mm longa et 5 mm lata, margine acute serrato-denticulata, apice acuta. Spathae masculae globosae, femineae cylindricae. Sepala 1,5—3 mm longa. Petala sepalis subaequilonga vel paulo longiora. Fructus cylindricus ad anguste conicus, 7 mm longus.

Persia: N: Maz.: Now Shahr, IRANSHAHR 12010-E! Gil.: Bandar-e Pahlavi, GRANT 16453!

Afghanistan: E: Kabul: Jalalabad, 650 m, PODLECH 17080!

Pakistan: Swat: Prope Saidu Sharif, 1050 m, RODIN 5432! — Peshawar: Peshawar, JOHNSTON!, BURTT B 689! Akbarpura, Pang Tireth, SUHAIL 204! — Sind: Dabeji, JAFRI 2436! — Baluchistan, STOCKS.

Distr. gen.: Europa centralis, Africa orientalis, Asia australis, Australia.

3. *Vallisneria*

Vallisneria L., Spec. Plant. 1015 (1753); Gen. Plant. ed. 5: 446 (1754).

Plantae submersae; caules abbreviati vel elongati. Folia alterna, sessilia, linearia. Flores dioici, ephydrogamici, masculi a planta liberati super aquam natantes; spathae tubulosae, masculae multiflorae breviter pedunculatae vel subsessiles, femineae 1-florae longe pedunculatae. Petala 3, vestigialia, minuta. Stamina 2—3; filamenta crassa. Ovarium in spatha sessile, lineare; styli 3, 2-lobi, liberi.

1. ***V. spiralis*** L., Spec. Plant. 1015 (1753).

Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 60 (1845).

Typus: „Habitat in Pisae & Florentiae fossis" (Italia).

Caules abbreviati, stoloniferi. Folia radicalia, taeniformia, usque ad 1 cm lata, margine apicem versus ± denticulata inferne integra, apice obtusa vel rotundata. Spathae masculae ovoideae breviter pedunculatae, femineae longe graciliter pedunculatae pedunculo post anthesin spiraliter torto. Fructus linearis.

Iraq: Kurd.: Mosul: Prope pontem ad Mindan ad viam inter Mosul et Aqrah, 260 m, CHAPMAN 26243! Nineveh, 250 m, BORNM. 1835! Diyala: Jabal Hamrin, SUTHERLAND 405!

Persia: N: Gil.: Bandar-e Pahlavi, HAUSSKN. — W: Esf.: Esfahan, HAUSSKN.! Khuz.: Ab-e Shur ad Shush (ruinas Susorum), NÁB. 253! — E: Sistan: Daryacheh-ye Sistan, CZERN.; SHAR. 1523-E!
Afghanistan: Afghanistan, GRIFF. 6040!
Pakistan: Peshawar: Prope Peshawar, 300 m, JOHNSTON 19! — Baluchistan, STOCKS.
Distr. gen.: Europa australis, Africa boreo-occidentalis, Asia austro-occidentalis.

4. *Blyxa*

Blyxa NOR. ex THOUARS, Gen. Nov. Madagasc. 4 (1806).

Plantae submersae; caules abbreviati vel elongati. Folia alterna, sessilia, linearia. Flores hermaphroditi vel unisexuales, ephydrogamici; spathae tubulosae, 1-florae vel masculae pluriflorae, pedunculatae vel sessiles. Petala 3, linearia, sepalis longiora. Stamina 3—9; filamenta filiformia. Ovarium in spatha sessile, in rostrum longum filiforme attenuatum; styli 3, simplices, basi connati.

1. ***B. ? octandra*** (ROXB.) PLANCH. ex THW., Enum Pl. Zeyl. 332 (1864).
Syn.: *Vallisneria octandra* ROXB., Plants of the Coast of Coromandel 2: 34 (1802).
Typus: India, ROXBURGH.

Planta acaulis. Folia radicalia, usque ad 1,25 cm lata, margine minute denticulata, apice attenuata. Sepala 7—15 mm longa. Petala 10—25 mm longa. Fructus linearis.

Persia: W: Khuz.: Shush, in oryzetis, HAUSSKN. (ex ASCHERSON in litt.).

Distr. gen.: Asia austro-orientalis, Australia, ? Persia.

No material from Persia has been seen to substantiate this record, which was published by BOISSIER, Fl. Or. 5: 4 (1882) on the strength of a communication from ASCHERSON. If the plant was correctly referred to *Blyxa* it may well have been *B. Aubertii* L. C. RICH., Mém. Cl. Sci. Math. Inst. Imp. France 1811 (2): 19 (1812), which was originally described from Madagascar and is a common rice-field weed of wider distribution than *B. octandra*. *B. Aubertii* and *B. octandra* are very similar, except that *B. Aubertii* has hermaphrodite flowers in 1-flowered spathes, whereas in *B. octandra* the flowers are dioecious, the female spathes being 1-flowered while the male spathes are 5—10-flowered.

5. *Halophila*

Halophila THOUARS, Gen. Nov. Madagasc. 2 (1806).
Lit.: C. DEN HARTOG, Sea-grasses of the World: 238 (1970).

Plantae marinae, submersae, rhizomate repenti gracili, caulibus lateralibus 2—multi-foliatis. Folia opposita, petiolata vel sessilia. Flores unisexuales, hyphydrogamici; spathae 2-phyllae, plerumque 1-florae, sessiles. Petala nulla. Stamina 3; antherae sessiles, polline moniliformi. Ovarium in spatha sessile, in rostrum longum attenuatum; styli 3—5, simplices, filiformes, liberi.

1. ***H. ovalis*** (R. BR.) HOOK. f., Bot. Antarct. Voy. 3 (2): 45 (1858).
Syn.: *H. Kotschyana* FENZL ex ZANARD, Mem. Ist. Veneto 7: 225 (1858), in syn. *Caulinia ovalis* R. BR., Prodr. Fl. Nov. Holl. 339 (1810).
Icon.: DEN HARTOG, Fl. Males. ser. 1, 5: 409, fig. 16 (1957); Sea-grasses of the World: 242, fig. 62 (1970).
Typus: Australia tropica, R. BROWN, BM!

Folia 2-nata, petiolata, oblongo-elliptica ad ovata, usque ad 4 cm longa et 2 cm lata, basi cuneata ad truncata vel rotundata, margine integra, apice obtusa

vel rotundata. Flores dioici. Sepala in floribus masculis 4 mm longa, in femineis minuta. Fructus globosus.

Persia: S: Fars.: Ins. Khark et prope Bushehr, Ky. Bushehr, Koeie 1732! Deyyer, Grant 17009!

Distr. gen.: Litora Maris Rubri, Oceani Indici, Sinus Persici, Oceani Pacifici austro-occidentalis.

Blyxa Nor. ex Thouars 3
Aubertii L. C. Rich. 3
octandra (Roxb.) Planch. ex Thw. . 3
Caulinia
ovalis R. Br. 3
Halophila Thouars 3
Kotschyana Fenzl ex Zanard 3
ovalis (R. Br.) Hook. f. 3
Hydrilla L. C. Rich. 2
verticillata (L. f.) Royle 2
Hydrocharis L. 1
Morsus-ranae L. 1
Serpicula
verticillata L. f. 2
Vallisneria L. 2
octandra Roxb. 3
spiralis L. 2

Zosteraceae

auctore J. E. Dandy, London

Zosteraceae Dumort., Anal. Fam. 65, 66 (1829).

Herbae aquaticae marinae submersae, rhizomate repenti vel suberecto; caules breves vel elongati. Folia alterna, simplicia, linearia, basi vaginata, vagina auriculata. Flores hermaphroditi vel unisexuales, parvi, ebracteati, spicati, hyphydrogamici; spicae unilaterales, folii vagina spatheatae. Perianthium 0 vel 1-phyllum. Stamen 1; anthera sessilis, 2-theca, thecis separatis, longitudinaliter dehiscens, polline confervoideo. Gynoecium monocarpellatum; ovulum 1, pendulum; stylus in stigmata 2 filiformia divisus. Fructus indehiscens; semina exalbuminosa.

1. *Zostera*

Zostera L., Spec. Plant. 968 (1753); Gen. Plant. ed. 5: 415 (1754).

Lit.: C. den Hartog, Sea-grasses of the World: 42 (1970).

Flores hermaphroditi; stamina et carpella in series 2 longitudinales spicae rhachidi affixa, 1 stamen et 1 carpellum in altitudine aequa. Carpellum ovarii medium versus insertum.

1. ***Z. Noltii*** Hornem., Fl. Dan. 12 (35): 3 (1832).

Syn.: *Z. nana* Roth, Enum. Pl. Phaen. 1 (1): 8 (1827), nom. illeg. p. p. et sensu Boiss., Fl. Or. 5: 25 (1882).

Icon.: Reichenb., Icon. Fl. Germ. 7: t. 2 (1845); Den Hartog, Sea-grasses of the World: 66—67, fig. 12—14 (1970).

Typus: Dania, Nolte.

Rhizoma breviter repens; caules graciles, simplices vel parce ramosi. Folia anguste linearia, usque ad 2 mm lata, margine integra, apice emarginata; vaginae apertae. Spicae 4—5-florae. Perianthium 1-phyllum. Fructus anguste ellipsoideus, rostratus, 1,5—2 mm longus; semen laeve.

Talish: Lenkoran, Haussk.!

Persia: N: Gil.: Bandar-e Pahlavi, in Mare Caspio, Haussk.!

Distr. gen.: Litora Europae, Africae borealis, etiam Asiae temperatae occidentalis in Maribus Mediterraneo, Nigro, Caspio et Aral.

Juncaginaceae

auctore J. E. DANDY, London

Juncaginaceae L. C. RICH., Démonstr. Bot. IX (1808) „*Juncagines*".

Herbae paludigenae vel aquaticae, scapigerae, Folia radicalia, alterna, simplicia, linearia, basi vaginantia, margine integra. Flores hermaphroditi vel unisexuales, actinomorphi, parvi, ebracteati, racemosi vel spicati. Perianthium 2—6-phyllum, tepalis liberis sepaloideis. Stamina 4—6, libera, basi saepe tepalis adnata; antherae sessiles, 2-thecae, longitudinaliter dehiscentes. Gynoecium superum; carpella 3—6, libera vel ± connata, 1-ovulata, ovulo basali vel pendulo; styli 0 vel breves terminales. Fructus apocarpus vel syncarpus, fructiculis secedentibus indehiscentibus; semina exalbuminosa vel albuminosa, embryone recto.

1. *Triglochin*

Triglochin L., Spec. Plant. 338 (1753); Gen. Plant. ed. 5: 157 (1754).

Herbae paludigenae. Flores hermaphroditi. Tepala 6. Stamina 6. Carpella 6, connata, omnia fertilia vel 3 exteriora sterilia; ovula basalia. Fructus syncarpus, fructiculis secedentibus; semina exalbuminosa.

1 a. Carpella 6, omnia fertilia. Fructus oblongo-ovoideus, basi rotundatus non attenuatus, fructiculis omnino secedentibus ..... 1. *T. maritima* L.
b. Carpella 3 fertilia et 3 sterilia. Fructus clavatus, basi attenuatus substipitatus, fructiculis a basi sursum secedentibus ..... 2. *T. palustris* L.

Sect. *Hexaglochin* DUMORT., Fl. Belg. 141 (1827).

Carpella 6, omnia fertilia.

1. ***T. maritima*** L., Spec. Plant. 339 (1753).

Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 52 (1845).

Typus: „Habitat in Europae maritimis" (Suecia); Herb. L. folium 466. 2!

Herba perennis usque ad 60 cm alta, rhizomate crasso. Folia anguste linearia vel subulata, semi-teretia, usque ad 4 mm lata. Flores racemosi, 3—4 mm longi. Carpella 6, omnia fertilia. Fructus oblongo-ovoideus, basi rotundatus, 3—4 mm longus, fructiculis omnino secedentibus.

Persia: W: Azerb.: Rezaiyeh, GILL.-SM. 2267/a! Yam, GILL.-SM. 2394! E Tabriz, 1350—1800 m, FURSE & SYNGE 323!, BOWLES Scholarship Exp. 2510! Senjanab, KNAPP! Marand, 1950 m, BOWLES Scholarship Exp. 1504! Kuh-e Sahand N Liqvan, 2400—3000 m, FURSE 2345! 24 km SE Mahabad, 1500 m, FURSE 2168! Ahmadabad, distr. Afshar, KNAPP! Ham.: Aq Bolagh-e Aqdaq, 100 km N Hamadan, RIOUX & GOLV. 2! — C: Tehr.: M. Elburz prope Ask, 1800 m, BUHSE. Shahr.-Bust.: Sefid Khok, SCHMID 5924! Afghanistan: NE: Wakhan: Ptuch, 3100 m, ROEMER 327! — C: Bamian: Bareki Cheidan, 2800 m,. HDG. & WDB. 4720! — Afghanistan, GRIFF. 5412/1!
Pakistan: Chitral: In jugo Baroghil, 3900 m, STAINTON 2996!

Distr. gen.: Regiones temperatae et arcticae hemisphaerae borealis et America australis temperata.

Sect. *Triglochin*

Carpella 3 exteriora sterilia, tantum 3 interiora fertilia.

2. ***T. palustris*** L., Spec. Plant. 338 (1753).

Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 51 (1845).
Typus: „Habitat in Europae inundatis uliginosis" (Suecia).

Herba perennis usque ad 70 cm alta, rhizomate gracili. Folia anguste linearia, semi-teretia, supra basin versus canaliculata, usque ad 2 mm lata. Flores racemosi, 2—3 mm longi. Carpella 3 exteriora sterilia, 3 interiora fertilia. Fructus clavatus, basi attenuatus substipitatus, 7—10 mm longus, fructiculis a basi sursum secedentibus.

Iraq: Kurd.: Arbil: Haji Omran, 1700 m, Gillett 12440!
Talish: Prope Tatuni, Hohen.
Persia: N: Maz.: Supra Ileka, 2250 m, Furse 2808! In declivibus borealibus jugi Kandavan, 2800 m, Gilli; 2500 m, Wdb. 2149! — W: Azerb.: Kuhha-ye Sabalan, 2700 m, Harrington 305! Prope Darband, 25 km W Rezaiyeh, Jardine 637! Senjanab, prope Tabriz, Knapp! Merdise, W Tabriz, Knapp! Karachal, prope Khvoy, Knapp! Ahmadabad, distr. Afshar, Knapp! Ad ripas occidentales lacus Rezaiyeh, 1300 m, Gauba & Sab. 1537! Kurd.: Sanandaj, 1800 m, Jacobs 6934! Ham.: Ab-e Garm, Sab. in Gauba 1536! — S: Kerm.: Kuh-e Laleh Zar, 3000—3400 m, Bornm. 4718. Kerman, 1800—2000 m, Parsa 364! — E: Khor.: Kuh-e Bezg, 1900 m, Rech. 1483! → C: Tehr.: Ad radices M. Damavand prope Larin, Ky. 615! M. Damavand, Larijan, ad ripas fl. Lar, 2450 m, Bornm. 8267. 19 km W Firuzkuh Arjomand, 1350 m, Bowles Scholarship Exp. 2065! Shahr.-Bust.: In declivibus australibus M. Shahvar ad Nokarman, 2000 m, Rech. 6264! Sefid Khok, 2400 m, Schmid 5930! Damgh.-Semn.: Kuh-i Nizwa, Kherseh, 2700 m, Wdb. 1253! Kashan: Inter Soh et Qohrud, Bunge!
Turcomania: Prope Suluklü, Sint. 1052!
Afghanistan: NW: Maimana: Naranj, 1050 m, Hdg. & Wdb. 3657! Herat: Sauzak, 2000 m, Koeie 2202! — SW: Herat: Prope Herat, Bunge! Prope Ribat, 1500 m, Chamberlain 7! — E: Kabul: Gandamak, Griff.! In jugo Lataband, 2500 m, Volk 615!, 829! Charasiah, 1740 m, Gilli 64! In valle fl. Kabul prope Tang-i Saidan, 1810 m, Gilli 65! Prope Kabul, Griff.!, Neub. 179! In valle Logar, Neub. 3394! In jugo Unai, 2800—3100 m, Rech. 36012!, Hdg. & Wdb. 4568! Inter Hauz-i Mahiha et Farakulum, 2900 m, Koeie 2503! Ghazni: Okak NE altoplanitiei Dasht-i Nawar, 3000 m, Rech. 17747! Ad lacum Djalgah-Shahr-Kawat inter Okak et Behzud, 2800 m, Rech. 17879! Ad lacum Sabzab inter Okak et Behzud, 2800 m, Rech. 17889! Ghazni, Griff.! Ad fl. Rod, 2800 m, Lalande R 534—E 12! Jaji: Prope Bian Khel, Aitch. 882! Urgun, Neub. 653! Nuristan: Supra Pushol, 2250 m, Kerst. 1117! Garm Chashmah prope Narer, Rasoul in Breckle 3692! Kantivo, 2200 m, Edelb. 664! — NE: Munjan: Miyan Deh, 2250 m, Edelb. 2080! Wakhan: Sar-i Skhaur, 2650 m, Roemer 7! Kataghan: Khost-o Fereng, in parte superiore vallis Kala, 2800 m, Podlech 11771! Pul-e Khumri, Neub. 241! Badakhshan: Inter Mashhad et Faizabad, in valle Kokcha, 900 m, Furse 6120! Distr. Khash, 2400 m, Koelz 12942! — C: Bamian: Band-i Amir, 2850 m, Podlech 12171! Darreh Kalou, 2800 m, Hdg. & Wdb. 4676! Shar-e Shak, Neub. 4351!, Gilli 66! Kuh-i Baba, Said Darrah, 3350 m, Gilli 67! Bamian, in montibus, Neub. 407! Doab: Kamard, 1800 m, Koelz 13610! Doab, 1500 m, Koelz 13519! Ghorband: Inter Bulola et jugum Shibar, 2600—2800 m, Rech. 16792! Panjao: In valle 12 km W Panjao, 2650—2800 m, Rech. 36237! Behzud: Siah Sang, prope Farakulum, ad fl. Helmand, 2900 m, Rech. 36085! — Afghanistan, Neub. 449!

Pakistan: Chitral: Inter Chapalli et Brep, fl. Yarkhun, 2500 m, STAMM & WÖHRL 249! In valle Yarkhun prope Mastuj, 2000 m, KERST. 2048! Khot An, N Mastuj, 3300 m, STAINTON 2859! Gohkir, 3000 m, BOWES LYON 901! Harchin, 2700 m, TOPPIN 648! — Quetta: Ziarat, 2010 m, JAFRI & AKBAR 1951! In valle Hanna, 2100 m, LACE! — Kalat: Harboi, 2600 m, HOTSON 70-A.

Distr. gen.: Regiones temperatae et arcticae hemisphaerae borealis, et America australis temperata.

Potamogetonaceae

auctore J. E. Dandy, London

Potamogetonaceae Dumort., Anal. Fam. 59, 61 (1829) „*Potamogetoneae*".

Herbae aquaticae submersae vel foliis natantibus, interdum subterrestres; caules elongati. Folia alterna vel opposita, simplicia, basi vaginantia, vagina folii basi adnata vel ab ea libera. Flores hermaphroditi, parvi, actinomorphi, ebracteati, spicati; spicae multi—pauci-florae, pedunculatae, foliis 2 oppositis involucratae. Perianthium 4-phyllum, tepalis liberis unguiculatis sepaloideis. Stamina 4, libera, basi tepalis adnata; antherae sessiles, 2-thecae, longitudinaliter dehiscentes. Gynoecium superum; carpella 4 (—1), libera vel ima basi connata, 1-ovulata, ovulo ventrali; styli breves vel modice elongati. Fructiculi indehiscentes; semina exalbuminosa, embryone unciformi vel spirali.

1a. Folia opposita, sessilia, ovata ad lanceolata, submersa. Fructiculi achenia-les, pericarpio tenui, embryone spirali ..... 2. *Groenlandia* Gay
b. Folia alterna vel involucralia tantum opposita. Fructiculi drupacei, exocarpio carnoso, endocarpio osseo, embryone unciformi ..... 1. *Potamogeton* L

1. *Potamogeton*

Potamogeton L., Spec. Plant. 126 (1753); Gen. Plant. ed. 5: 61 (1754).

Folia submersa vel natantia vel interdum in plantis subterrestribus emersa, alterna vel involucralia tantum opposita, sessilia vel petiolata, basi vaginata, vagina folio basi adnata ligulata vel ab ea libera stipulam intrapetiolarem formante. Flores anemophili vel hydrophili; spicae multi—pauci-florae. Carpella 4(—1). Fructiculi drupacei, exocarpio carnoso, endocarpio osseo; embryo unciformis vel spiralis.

1a. Vaginae foliorum basibus adnatae. Flores hydrophili, spicis supra aquam non elevatis. Folia submersa, anguste linearia vel filiformia, margine integra 2
b. Vaginae a foliorum basibus liberae vel fere liberae, stipulas intrapetiolares formantes. Flores anemophili, spicis sub anthesi supra aquam elevatis ... 4
2a. Vaginae apertae convolutae. Folia apice acuta vel mucronata. Fructiculi 3—5 mm longi, rostro brevi subventrali..... 12. *P. pectinatus* L.
b. Vaginae primum basin versus clausae tubulosae. Folia apice obtusa vel rotundata. Fructiculi 2—3,5 mm longi, rostro verruciformi subapicali .. 3
3a. Fructiculi 3—3,5 mm longi. Spicae primum densae deinde ± interruptae. Folia usque ad 2,5 mm lata sed saepe angustiora .... 10. *P. amblyphyllus* C. A. Mey.
b. Fructiculi 2—2,75 mm longi. Spicae ab initio interruptae. Folia plerumque infra 1 mm lata ..... 11. *P. filiformis* Pers.
4a. Folia omnia longe vel breviter petiolata, submersa interdum ad petiolos elaminatos reducta 5
b. Folia omnia vel inferiora sessilia; superiora sessilia vel petiolata..... 8

5a. Folia submersa, translucentia, margine ± serrulata, apice acuta vel mucronata vel cuspidata, petiolo plerumque brevi. Pedunculi apicem versus incrassati ..... 3. *P. lucens* L.
b. Folia natantia et/vel submersa, interdum emersa, margine integra vel subintegra, apice obtusa vel rotundata interdum apiculata; natantia et emersa opaca. Pedunculi apicem versus plerumque non incrassati 6
6a. Petiolus foliorum natantium ad apicem sub lamina articulum flexilem discolorem formans. Folia submersa ad petiolos elaminatos anguste lineares opacos reducta, plerumque evanescentia ..... 1. *P. natans* L.
b. Petiolus absque articulo flexili discolori. Folia submersa lamina translucenti instructa 7
7a. Folia natantia longe petiolata petiolo ultra 1 cm longo, apice obtusa vel rotundata interdum apiculata; submersa lanceolata, saepe evanescentia ..... 2. *P. nodosus* Poir.
b. Folia natantia vel emersa breviter petiolata petiolo usque ad 1 cm longo, apice ± apiculata; submersa nulla. Plantae subterrestres .... 4. *P. gramineus* L.
8a. Carpella ima basi connata, in fructu longe rostrata rostro ovario subaequali vel longiore. Folia linearia vel lineari-oblonga, sessilia, 3—5-nervia, margine serrulata saepe crispata, submersa. Caules compressi..... ..... 9. *P. crispus* L.
b. Carpella libera, in fructu breviter rostrata rostro ovario breviori. Folia margine integra vel minute denticulata 9
9a. Folia infra 3 mm lata, anguste linearia, sessilia, 3(—5)-nervia, margine integra, submersa 10
b. Folia ultra 3 mm lata, anguste elliptico-oblonga ad ovata, 7—pluri-nervia.. 11
10a. Stipulae apertae convolutae. Nodi glandulis 2 conspicuis instructi. Foliorum costa saltem basin versus lacunis marginata. Hibernacula ramulos terminantia ..... 8. *P. Berchtoldii* Fieb.
b. Stipulae primum basin versus clausae tubulosae. Nodi eglandulosi vel glandulis 2 inconspicuis instructi. Foliorum costa plerumque non lacunis marginata. Hibernacula plerumque axillaria gracilia ..... 7. *P. pusillus* L.
11a. Folia omnia submersa translucentia, basi cordata amplexicaulia, apice obtusa vel rotunda, ovata ad lanceolata. Stipulae inconspicuae, parvae, evanescentes ..... 6. *P. perfoliatus* L.
b. Folia omnia submersa vel superiora natantia; submersa translucentia, basi cuneata vel rotundata interdum semi-amplexicaulia; natantia petiolata, opaca. Stipulae conspicuae, diu persistentes 12
12a. Folia submersa anguste elliptico-oblonga ad anguste elliptica vel oblanceolato-oblonga, margine minute denticulata, apice acuta vel acuminata ..... 4. *P. gramineus* L.
b. Folia submersa lanceolata vel lineari-lanceolata ad elliptico-oblonga, margine integra, apice obtusa vel rotundata..... 5. *P. alpinus* Balb.

Subgen. ***Potamogeton***

Vaginae foliorum basibus adnatae vel ab eis liberae. Flores anemophili; spicae sub anthesi super aquam elevatae, pedunculo crasso vel gracili sed satis rigido.

Sect. *Potamogeton*

Plantae perennes; caules teretes. Folia submersa vel natantia, interdum emersa, sessilia vel petiolata, margine integra vel denticulata; vaginae a foliorum basibus liberae, stipulas formantes. Carpella libera. Fructiculi breviter rostrati.

1. ***P. natans*** L., Spec. Plant. 126 (1753).

Icon.: Tab. 3; REICHENB., Icon. Fl. Germ. 7: tab. 50 (1845).

Typus: „Habitat in Europae lacubus & fluviis", Herb. L. folium 175.1!

Folia natantia vel submersa; natantia opaca, longe petiolata, ovata ad elliptica vel lanceolata, basi cuneata vel obtusa ad subcordata, multinervia, petiolo ad apicem sub lamina articulum flexilem discolorem formanti; submersa ad petiolos elaminatos anguste lineares opacos reducta, plerumque evanescentia; stipulae conspicuae. Fructiculi 3,5—4 mm longi.

Afghanistan: E: Ghazni: In lacu Sabzab inter Okak et Behzud, 2800 m, RECH. 17926! — C: Bamian: Band-i Amir in lacu Band-i Zolfikar, 2900 m, RECH. 18417!

Distr. gen.: Regiones temperatae et arcticae Europae, Asiae, America borealis.

2. ***P. nodosus*** POIR., Encycl., Suppl. 4: 535 (1816).

Syn.: *P. fluitans* ROTH, Tent. Fl. Germ. 1: 72 (1788) p. p. et auct. mult. *P. indicus* ROXB., Fl. Ind. ed. Carey, 1: 471 (1820), non ROTH (1818). *P. natans* sensu HOHEN., Bull. Soc. Nat. Mosc. 11: 241 (1838) et auct. plur., non L. (1753). *P. oblongus* sensu AITCH., Journ. Linn. Soc. Bot. 18: 99 (1880), non VIV. (1804). *P. heterophyllus* sensu JUZ., Fl. URSS. 1: 256 (1934) p. p., non SCHREB. (1771).

Icon.: Tab. 4; REICHENB., Icon. Fl. Germ. 7: tab. 48 (1845).

Typus: Insulae Canarienses, BROUSSONET.

Folia natantia vel submersa; natantia opaca, longe petiolata, elliptica vel ovato-elliptica, basi cuneata vel obtusa, multinervia; submersa translucentia, petiolata, lanceolata, margine integra vel subintegra, apice obtusa, 9—pluri-nervia, saepe evanescentia; stipulae conspicuae. Fructiculi 3—4 mm longi.

Iraq: Kurd.: Sul.: Ad viam versus Qara Dagh, 900 m, HAINES W-1148! Sarchinar, EIG & FEINBRUN 22324! Khurmal, 700 m, RAWI, ALIZZI & NURI 29451! Prope pontem trans fl. Tanjaro, HAINES! Arbil: Haruna, 700 m, GILLETT 9639! Harir, HAINES! Inter Arbil et Altin Köprü, HAUSSKN.! Kirkuk: Hawija, 200 m, RAWI 15155! Diyala: Jabal Hamrin, SUTHERLAND 406!

Talish: Lenkoran, HOHEN!, PASTUCHOV!

Persia: N: Gil.: „Siah Kahl", LINDS. 1042! — W: Lur.: Gilan-e Gharb, BEHB. 191! Borujerd, KOELZ 18214! Bakht.: Saridasht, KOELZ 15070! Khuz.: Ab-e Shur ad Shush (ruinas Susorum), NÁB. 246! — S: Fars.: Prope Shiraz, KY. 300!, STAPF 1821! Inter Shiraz et Maregun, HAUSSKN.! Barm-e Delak, 15 km E Shiraz, 1700 m, GRANT 15138!

Turcomania: Ashkhabad, in rivulo prope Bagir, SINT. 627!

Afghanistan: SW: Sistan: Khash Rud, 600 m, GABR. 2. — Khash Rud 32 km SW Lokhi, 545 m, PODLECH 17161! — SE: Kandahar: In valle fl. Helmand inter Qala Bist et Darweshan, 700—800 m, RECH. 34553! Inter Tirin et Orozgan, RECH. 35130! — E: Jaji: Patan, VOLK 1127! — NE: Kataghan: 15 km E Kunduz ad viam versus Khanabad, 500 m, PODLECH 11337! Taliqan, 600 m, KOELZ 13159!, 13160! Badakhshan: Ishkamish, 1180 m, PODLECH 10728! — C: Doab: Dasht-i Safed, 1800 m, KOELZ 13543!

Pakistan: Swat: Madyan, 1200 m, R. R. STEWART 24451!; 1500 m, RODIN 5545! — Peshawar: Prope Peshawar, 300 m, JOHNSTON 26!, 28!, 29! — Kurram: Shalozan, AITCH. 867! — S. Wazir.: Wana, FZ. 3522, 3565. Jandola, ad fl. Tank, FZ. 749. — Makran: Chib, 500 m, MCCANN 126. — Baluchistan, LACE.

Distr. gen.: Regiones calidiores Europae, Africae, Asiae, Americae.

3. ***P. lucens*** L., Spec. Plant. 126 (1753).

Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 36, 40 (1845).
Typus: „Habitat in Europae lacubus, stagnis, fluviis argillosis".

Folia submersa, translucentia, petiolata petiolo plerumque brevi, elliptica vel obovato-elliptica ad lanceolata, basi cuneata, margine ± serrulata, apice acuta vel mucronata vel cuspidata, 7—pluri-nervia, interdum ad petiolos ± elaminatos reducta; stipulae conspicuae. Pedunculi apicem versus incrassati. Fructiculi 2,5—4 mm longi.

Iraq: Kurd.: Mosul: In tributario fl. Greater Zab, 40 km E Mosul, BARKLEY 8306! Arbil: In tributario fl. Greater Zab, 35 km NW Arbil, BARKLEY 33Ir4596!
Persia: W: Khuz.: In paludosis Rudkhaneh-ye Karkheh, 40 km W Ahvaz, 2 km S Said Arab, BENT & WR. 501—105! — E: Sistan: Daryacheh-ye Sistan, SHAR. 1518-E! Lab-e Bareng, ANNANDALE 46. Sistan, AYAZI 5607! Kuh-i Khaja, ad lacum Daryacheh-ye Sistan, 45 km SW Zabol, 500 m, GRANT 15346!
Afghanistan: E: Ghazni, GRIFF.!

Distr. gen.: Europa, Africa borealis et orientalis, Asia temperata.

4. ***P. gramineus*** L., Spec. Plant. 127 (1753).

Syn.: *P. heterophyllus* SCHREB., Spic. Fl. Lips. 21 (1771).
Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 41—43 (1845).
Typus: „Habitat in Europae fossis & paludibus" (Suecia), L., P!

Folia natantia vel submersa, vel in plantis subterrestribus emersa; natantia et emersa opaca, petiolata, elliptica vel ovato-elliptica, basi cuneata vel rotundata, multinervia; submersa translucentia, sessilia, anguste elliptico-oblonga ad anguste elliptica vel oblanceolato-oblonga, margine minute denticulata, apice acuta vel acuminata, 7—pluri-nervia; stipulae conspicuae. Pedunculi saepe apicem versus incrassati. Fructiculi 2—3 mm longi.

Persia: W: Azerb.: Gol, inter Maragheh et Miandow-Ab, KNAPP!
Pakistan: Chitral: In lacu ad jugum Baroghil, 3900 m, STAINTON 2988!

Distr. gen.: Regiones temperatae et arcticae Europae, Asiae, America borealis.

KNAPP's Persian plant was collected "in stagnis exsiccatis" and is evidently a subterrestrial state of the species.

5. ***P. alpinus*** BALB., Mém. Acad. Sci. Turin, Ann. 10—11, Sci. Phys. Math. 1: 329 (1804).

Syn.: *P. rufescens* SCHRAD. in CHAM., Adnot. 5 (1815). *P. stylatus* HAGSTR., Bot. Not. 1908: 98 (1908).
Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 32 (1845).
Typus: Italia.

Folia submersa vel superiora natantia, saepe rufescentia; natantia opaca, elliptica ad oblanceolata, basi cuneata in petiolum lamina breviorem attenuata, multinervia; submersa translucentia, sessilia, lanceolata vel lineari-lanceolata ad elliptico-oblonga, basi cuneata vel rotundata interdum semi-amplexicaulia, margine integra, apice obtusa vel rotundata, 7—pluri-nervia; stipulae conspicuae. Fructiculi 2,5—3 mm longi.

Pakistan: Quetta: In jugo Bolan, GRIFF. 5605/5!

Distr. gen.: Regiones temperatae et arcticae Europae, Asiae, America borealis.

This is known in Flora Iranica area only from GRIFFITH's gathering, which has flowering spikes but lacks fruit. It was referred to *P. rufescens* (i. e. *P. alpinus*) by BOISSIER, Fl. Or. 5: 16 (1882). HAGSTRÖM, however, separated it on anatomical grounds from *P. alpinus* and described it as a new species (from „Affghanistan") under the name *P. stylatus*; this was treated as the second species of Subsect. *Alpini* as emended by HAGSTRÖM, K. Svenska Vetenskapsakad. Handl., Ny Följd, 55 (5): 151 (1916). The existence of an endemic species of *Potamogeton* in this part of the world seems unlikely, and in the absence of further material the validity of HAGSTRÖM's species must remain in doubt. GRIFFITH's material, so far as it goes, agrees well with some European specimens of *P. alpinus* and is here accepted as belonging to that species, as BOISSIER had it. *P. alpinus* is a widely distributed circumboreal species which in SW Asia has been recorded also from Transcaucasia and the Aral-Caspian region; it may possibly occur in the mountainous regions of Afghanistan and north Iran.

6. ***P. perfoliatus*** L., Spec. Plant. 126 (1753).

Syn.: *P. densus* sensu A. BENN., Journ. Bot. (London) 33: 371 (1895) p. p., non L. (1753).
Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 29 (53, 54) (1845).
Typus: „Habitat in Europae lacubus fluviisque argillosis" (Suecia), Herb. L. folium 175. 3!

Folia submersa, translucentia, sessilia, ovata ad lanceolata, basi cordata amplexicaulia, margine minute denticulata, apice obtusa vel rotundata, 11—plurinervia; stipulae inconspicuae, parvi, evanescentes. Fructiculi 2—3,5 mm longi.

Iraq: Kurd.: Kirkuk: Hawija, 200 m, LYMAN & RAWI 15157!
Persia: N: Gil.: Bandar-e Pahlavi, HOHEN. — W: Esf.: Prope Esfahan, HAUSSKN.! Lur.: Kuh Giluye, in lacu "Delli Bau" prope Kuh-e Dalan, HAUSSKN.! Khuz.: Khorramshahr, NOË 229! — S: Kerm.: Kerman, 1900 m, BORNM. 4714! — E: Sistan: Daryacheh-ye Sistan, SHAR. 6194-E! Prope Lab-e Bareng, 480 m, ANNANDALE 31, 64. Zabol, DALY S 14! Kuh-i Khaja, ad lacum Daryacheh-ye Sistan, 45 km SW Zabol, 500 m, GRANT 15345!
Afghanistan: NW: Bala Murghab, 470 m, JAKEŠ! — SW: Herat: Prope Herat, BUNGE! 940 m, PODLECH 16933! — SE: Kalat-i Ghilzai: Tazi, ad fl. Tarnak, GRIFF.! — E: Kabul: Prope Kabul, 1780 m, AKHTAR!, GILLI 74!, NEUB. 656! Hauz-i Mahiha, 2500 m, KOEIE 3355! E Charasiah, 1740 m, GILLI 73! Band-i Kargha, REINER 790! Barfak, NEUB. 4340! 76 km a Kabul versus Gardez, 2050 m, RECH. 31499!, LINDB. 92/1962! — NE: Kataghan: 15 km E Kunduz ad viam versus Khanabad, 500 m, PODLECH 11336! Khost-o Ferong, in valle Kala prope Daanah, PODLECH 11979! In valle Farkhar 5 km N Farkhar, 1200 m, PODLECH 12714! — C: Doab: In valle Ajar W Doab, HDG. & WDB. 4129!, 1500 m, RECH. 16626! Dasht-i Sufed, 1800 m, KOELZ 13550!
Pakistan: Swat: Fl. Swat prope Mingora, RECH. 30672! — Kohat: Ad font. Khawaga Khezar, Ustarzai, SUHAIL 284! Inter Kohat et Hangu, 32 km W Kohat, BURTT B 707! Kohat, SUHAIL 278! — Kalat: Dadhar, GRIFF.! — Sind: Khadeji, 46 km ENE Karachi, RECH. 28560!, LAMOND 753! — Baluchistan, STOCKS!, LACE.

Distr. gen.: Europa, Africa borealis, Asia, Australia, America borealis.

Sect. *Graminifolii* FRIES, Nov. Fl. Suec. ed. 2: 43 (1828).

Plantae plerumque annuae, hibernaculis perennantes; caules teretes gracilesque vel compressi. Folia submersa vel superiora natantia; submersa sessilia, linearia, margine integra, plerumque 3—5-nervia; vaginae foliorum basibus adnatae vel plerumque ab eis liberae, stipulas formantes. Carpella libera. Fructiculi breviter rostrati.

7. ***P. pusillus*** L., Spec. Plant. 127 (1753).

Syn.: *P. panormitanus* Biv., Nuov. Pi. 6 (1838).
Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 22 (38) (1845).
Typus: „Habitat in Europae paludibus" (Suecia), Herb. L. folium 175. 15!

Caules ad nodos eglandulosi vel obscure 2-glandulosi; hibernacula plerumque axillaria gracilia. Folia submersa, anguste linearia, usque ad 3 mm lata sed plerumque angustiora, apice acuta vel mucronata, 3(—5)-nervia; stipulae primum basin versus clausae tubulosae. Fructiculi 2 mm longi.

Iraq: Kurd.: Arbil: Inter Arbil et Altin Köprü, Haussknecht! Kirkuk: Hawija, 200 m, Lyman & Rawi 15161!
Persia: N: Gil.: Prope Rasht, Schmid 6605 p. p.! — W: Esf.: Esfahan, Haussknecht! — E: Sistan: Daryacheh-ye Sistan, Shar. 6195-E! Khor.: Tabas, Koelz 16856!
Afghanistan: E: Kabul: In valle Nijrao, Neub. 236! Prope Kabul, Neub. 246! = 655!, Gilli 81! Ad ripas fl. Logar prope Charasiah, 1780 m, Gilli 77! Inter Ghazni et Kabul, Griff.! — NE: Kataghan: Khost-o Fereng, in valle Kala prope Daanah, Podlech 11980! — C: Ghorat: Lal-i Sar Jangal, 2500 m, Koeie 2765!
Pakistan: Peshawar: Prope Peshawar, 300 m, Johnston 30! — Quetta: Ziarat, 2100 m, Jafri & Akbar 1935!

Distr. gen.: Europa, Africa, Asia temperata, America borealis.

8. ***P. Berchtoldii*** Fieb., Oek.-techn. Fl. Böhm. 2 (1): 277 (1838).

Syn.: *P. obtusifolius* sensu Boiss., Fl. Or. 5: 18 (1882), non Mert. & Koch (1823).
P. pusillus sensu Boiss., l. c. (1882) p. p. et auct. mult., non L. (1753).
Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 22 (37) (1845).
Typus: Czechoslovakia (Bohemia).

Caules ad nodos conspicue 2-glandulosi; hibernacula ramulos terminantia. Folia submersa, anguste linearia, usque ad 2,75 mm lata sed plerumque angustiora, apice acuta vel mucronata, 3(—5)-nervia, costa saltem basin versus lacunis marginata; stipulae apertae, convolutae. Fructiculi 2—2,5 mm longi.

Iraq: Kurd.: Sul.: Sarchinar, 750 m, Eig & Feinbrun 22366!, 22367!
Persia: W: Azerb.: Digele, prope Rezaiyeh, Knapp! Kermansh.: Prope Kermanshah, Haussknecht! Taq-e Bostan, Grant 16024! Lur.: Dow Rud, 1500 m, Koelz 15834! Borujerd, Koelz 18215! — S: Fars.: Inter Shiraz et Maregun, Haussknecht! Inter Shiraz et Sch Gaveh, Haussknecht! — E: Khor.: Prope Mashhad, Bunge!

Distr. gen.: Regiones temperatae et arcticae Europae, Asiae, America borealis.

Sect. *Batrachoseris* Irmisch, Abh. Naturwiss. Ver. Sachs. Thüring. Halle 2: 17 (1858)

Plantae perennes; caules compressi. Folia submersa, sessilia, linearia vel lineari-oblonga, margine serrulata; vaginae a foliorum basibus liberae vel fere liberae, stipulas formantes. Carpella ima basi connata. Fructiculi longe rostrati.

9. ***P. crispus*** L., Spec. Plant. 126 (1753).

Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 29 (50), 30 (1845).
Typus: „Habitat in Europae fossis & rivulis".

Folia linearia vel lineari-oblonga, 5—10 mm lata, margine serrulata saepe crispata, apice obtusa vel acuta, 3(—5)-nervia. Fructiculi 4—5 mm longi, rostro ovario subaequali vel longiore.

Talish: In lacu ad ostium fl. Astara, Hohen. Astara in lacu parvo prope „Avrora", SE Pensar, Bobrov & Tsvelev 58! Lenkoran ad ostium fl. Nyuada, Grossh.!

Persia: N: Gil.: Rasht, BORNM. 8262. Cult. in horto bot. Karaj, e Lahijan, GAUBA 1535! — W: Khuz.: Khorramshahr, KOEIE 1699!
Afghanistan: E: Prope Kabul, 1780 m, NEUB. 657!, GILLI 75!
Pakistan: Swat: In fl. Swat prope Mingora, 800 m, RECH. 30671!, LAMOND 1741! — Peshawar: Prope Peshawar, 300 m, JOHNSTON 21!

Distr. gen.: Europa, Africa, Asia, Australia.

Subgen. ***Coleogeton*** REICHENB., Icon. Fl. Germ. 7: 10 (1845)

Vaginae foliorum basibus adnatae; folia submersa, linearia, margine integra. Flores hydrophili; spicae supra aquam non elevatae, pedunculo gracili flaccido.

10. ***P. amblyphyllus*** C. A. MEY., Beitr. Pflanzenk. Russ. Reich. 6: 10 (1849) „*amblyophyllus*".

Syn.: *P. pectinatus* sensu BORNM., Bull. Herb. Boissier Sér. 2, 8: 725 (1908), non L. (1753).
Icon.: Tab. 1.
Typus: Georgia Caucasica: Kasbek, KOLENATI, LE!

Caules graciles, teretes. Folia anguste linearia, usque ad 2,5 mm lata sed saepe angustiora, apice obtusa vel rotundata; vaginae primum basin versus clausae tubulosae. Spicae primum densae cylindricae, deinde ± interruptae. Fructiculi 3—3,5 mm longi, breviter verruciformi-rostrati.

Persia: S: Fars.: Dasht-e Arzhan, STAPF! — C: Tehr.: M. Damavand in valle Lar, 2400—2500 m, BORNM. 8261!

Afghanistan: E: Ghazni: Okak, 3000 m, RECH. 17697! In lacu Sabzab, 2800 m, RECH. 17965! Dahan-i Barikak inter Okak et Behzud, 2800 m, RECH. 17977! Dasht-i Nawar NW Ghazni, 3000 m, KASY 33! — NE: Wakhan: Yamit, 2800 m, ROEMER 268! — C: Bamian: Prope Mandigak, 2800—3280 m, RECH. 18697! Koh-i Baba, 3000 m, RECH. 18530! In lacu ad Band-i Amir, 2900 m, GILLI 78!, HDG. & WDB. 4745! Band-i Amir in lacu Band-i Zolfikar, 2900 m, RECH. 18409! Doab: Doab, 1500 m, KOELZ 13537! Ghorband: Ad latus occidentale jugi Shibar, 2600 m, HDG. & WDB. 3336! Panjao: Panjao, 2800 m, KOEIE 2745! Behzud: Siah Sang, GRIFF. 5605/10!

Distr. gen.: Montes Asiae temperatae a Caucasia et Turcia orientali ad Sinam boreo-occidentalem.

This species is very closely allied to *P. filiformis* but has denser spikes and larger fruitlets, and usually broader leaves. HAGSTRÖM, K. Svenska Vetenskapsakad. Handl., Ny Följd 55 (5): 29 (1916), placed it in a separate subsection *Amblyophylli* characterized by "Fructus rostro acuto subincurvato"; but this character is a false one, arising from the fact that HAGSTRÖM in his description and figure had the fruitlets inverted, his "rostro" being in fact the tapered base of the fruitlet. The subsection *Amblyophylli* is therefore imaginary.

11. ***P. filiformis*** PERS., Syn. Pl. 1: 152 (1805).

Syn.: *P. setaceus* SCHUM., Enum. Pl. Saell. 1: 51 (1801), non L. (1753). *P. pamiricus* BAAGÖE, Vid. Meddel. Naturh. Foren. Kjöbenhavn 1903: 182 (1903).
Icon.: Tab. 2; REICHENB., Icon. Fl. Germ. 7: tab. 18 (1845).
Typus: Dania: Saellandia.

Caules graciles, teretes. Folia anguste linearia vel filiformia, plerumque infra 1 mm lata, apice obtusa vel rotundata; vaginae primum basin versus clausae tubulosae. Spicae ab initio interruptae. Fructiculi 2—2,75 mm longi, breviter verruciformi-rostrati.

Talish: sec. Fl. URSS. 1: 237 (1934).
Afghanistan: NW: Bala Murghab, 470 m, Jakeš! — E: Panjshir: In jugo Anjuman, 3400 m, Hdg. & Wdb. 5478! — NE: Badakhshan: Pul-i Khumri, Neub. 242! — C: Bamian: Band-i Amir, 2800 m, Koeie 3354! In lacu ad fl. Bamian prope Shar-e Shak, 2320 m, Gilli 76! Ghorat: Lal-i Sar Jangal, 2500 m, Koeie 2761! Behzud: Farakulum, 2700 m, Koeie 2680!
Pakistan: Chitral: In lacu ad jugum Baroghil, 3600—3900 m, Stainton 2993!, 3028!

Distr. gen.: Regiones temperatae et arcticae Europae, Asiae, Americae borealis.

12. ***P. pectinatus*** L., Spec. Plant. 127 (1753).

Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 19, 20 (1845).
Typus: „Habitat in Europae fossis & paludibus" (Suecia).

Caules graciles, teretes. Folia anguste linearia vel filiformia, plerumque infra 2 mm lata sed interdum latiora, apice acuta vel mucronata; vaginae apertae convolutae, plerumque albo-marginatae. Spicae primum densae cylindricae, deinde ± interruptae. Fructiculi 3—5 mm longi, breviter rostrati rostro subventrali.

Iraq: Kurd.: Kirkuk: Hawija, 200 m, Lyman & Rawi 15156!
Talish: Lenkoran, Radde 564!
Persia: N: Maz.: Bagh-e Shah prope Babol, Bruns. Now Shahr, Iranshahr 12019-E! Gil.: Rasht, Lipsky. Bandar-e Pahlavi, Hohen. — W: Azerb.: Gol, inter Maragheh et Miandow-Ab, Knapp! Ham.: Aq Bolagh-e Aqdaq, Rioux & Golv. 1! Esf.: Prope Esfahan, Haussk.! Lur.: Kuh Giluye, in lacu "Delli Bau" prope Kuh-e Dalan, Haussk.! Khuz.: In fl. Kheyrabad 20 km E Behbehan, 400 m, Grant 15888! — S: Fars.: Shiraz, prope Fasa, 1230 m, Brown 3514! In fl. Band-e Amir, Shiraz, 1550 m, Brown 3527! Sarvestan, 1600 m, Bornm. 4780! Ad fl. Pol-e Fasa, 18 km SE Shiraz, 1600 m, Grant 15033! In palude Marv Dasht, 40 km N Shiraz, 1600 m, Grant 17576!, 17602! Kerm.: Kerman, 1900 m, Bornm. 4715! In deserto Lut ad fl. Rud-e Siya supra Keshit, Monod 14189! Deh Salm, Monod 14502! — E: Sistan: Daryacheh-ye Sistan, Shar. 1522-E!, 6196-E! Prope Lab-e Bareng, 480 m, Annandale 29. Khor.: In fl. Atrek, Rech. 1834! Tabas, Deh Mahmad in fl. Qanat, Ruttner 539! — Prope Chadsit-Arabi, Bunge!
Turcomania: Ashkhabad prope Babushkina-Saad, Sint. 1230!
Afghanistan: SW: Sistan: Khash Rud 32 km SW Lokhi, 545 m, Podlech 17160! — SE: Kandahar: Daman, 15 km E Kandahar versus Ghazni, 1045 m, Podlech 16867! Kalat-i Ghilzai: Tazi, Lindb. 118/1962! — C: Bamian: Band-i Amir in lacu Band-i Panir, 2800 m, Podlech 16021! — Afghanistan, Griff 5605/9!, 5606!
Pakistan: Peshawar: Prope Peshawar, 300 m, Johnston 4!, Suhail 241! — Sind: Khadeji, 46 km ENE Karachi, Rech. 28563!, Lamond 752!

Distr. gen.: Regiones temperatae et tropicae Europae, Africae, Asiae, Americae, Australiae.

2. *Groenlandia*

Groenlandia Gay, Compt. Rend. Acad. (Paris) 38: 703 (1854).

Folia submersa, opposita, sessilia, vaginantia, vagina in foliis involucralibus auriculata sed in foliis aliis exauriculata. Flores anemophili; spicae pauciflorae. Carpella 4, libera. Fructiculi acheniales, pericarpio tenui; embryo spiralis.

1. ***G. densa*** (L.) Fourr., Ann. Soc. Linn. Lyon, Nouv. Sér. 17: 169 (1869).

Syn.: *Potamogeton densus* L., Spec. Plant. 126 (1753).
Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 28 (1845).

Typus: „Habitat in Gallia", GUETTARD, Obs. Plant. 1: 102, nr. 6 (1747).

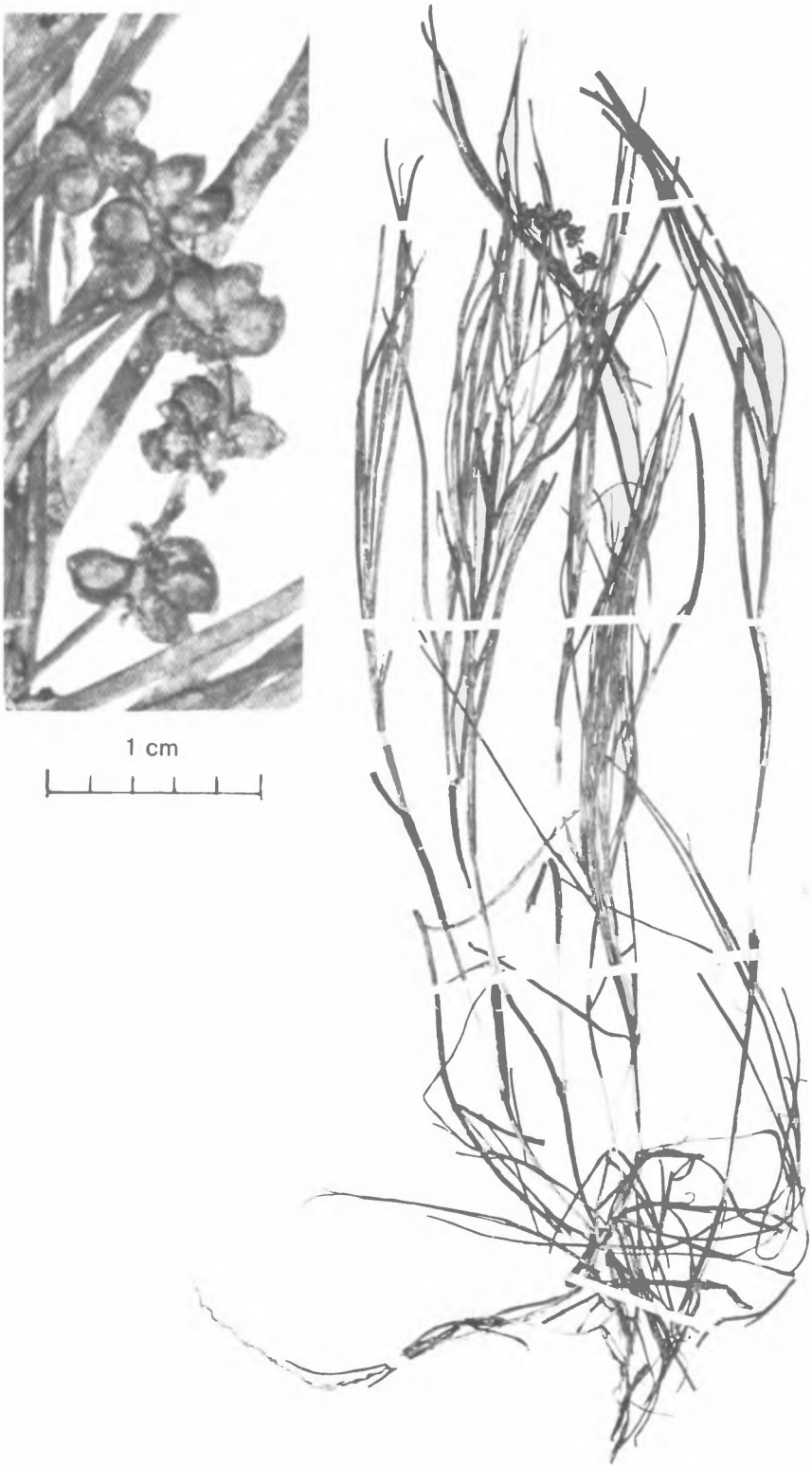
Caules teretes. Folia ovata ad lanceolata, usque ad 4 cm longa et 1,5 cm lata, margine minute denticulata, apice obtusa, 3—5-nervia. Fructiculi 3 mm longi, breviter rostrati.

Persia: W: Azerb.: Digele, prope Rezaiyeh, KNAPP! Chahriq, SW Shahpur, KNAPP! Malham, KNAPP!

Distr. gen.: Europa, Africa boreo-occidentalis, Asia temperata occidentalis.

This species is not known from east of Persia. It was, however, recorded erroneously from the Himalaya and Afghanistan by A. BENNETT, Journ. Bot. (London) 33: 371 (1895); the Afghanistan specimen, in the Munich Herbarium (M), was collected by GRIFFITH and is *Potamogeton perfoliatus* L.

Groenlandia GAY 8
densa (L.) FOURR. 8
Potamogeton L. 1
Subgen. **Coleogeton** REICHENB. 7
Subgen. **Potamogeton** 2
Sect. **Batrachoseris** IRMISCH 6
Sect. **Graminifolii** FRIES 5
Sect. **Potamogeton** 3
Subsect. **Alpini** HAGSTR. 5
Subsect. *Amblyophylli* HAGSTR. 7
alpinus BALB. 4
amblyphyllus C. A. MEY. 7
Berchtoldii FIEB. 6
crispus L. 6
densus L. 8
densus sensu A. BENN. 5
filiformis PERS. 7
fluitans ROTH 3
gramineus L. 4
heterophyllus SCHREB. 4
heterophyllus sensu JUZ. 3
indicus ROXB. 3
lucens L. 4
natans L. 3
natans sensu HOHEN. 3
nodosus POIR. 3
oblongus sensu AITCH. 3
obtusifolius sensu BOISS. 6
pamiricus BAAGÖE 7
panormitanus BIV. 6
pectinatus L. 8
pectinatus sensu BORNM. 7
perfoliatus L. 5
pusillus L. 6
pusillus sensu BOISS. 6
rufescens SCHRAD. 4
setaceus SCHUM. 7
stylatus HAGSTR. 4



Potamogeton amblyphyllus C. A. Mey. — Rech. 17977

Potamogeton filiformis Pers. — Koeie 2761

Potamogeton natans L. — Rech. 17926

Potamogeton nodosus Poir. — Koelz 13160

Ruppiaceae

auctore J. E. DANDY, London

Ruppiaceae HUTCH., Fam. Fl. Pl. 2: 48 (1934).

Herbae aquaticae salsuginosae submersae; caules elongati, graciles. Folia alterna vel involucralia tantum opposita, simplicia, linearia, basi vaginata, margine ad apicem minute denticulata alibi integra; vaginae breviter auriculatae. Flores hermaphroditi, parvi, ebracteati, spicati; spicae 2-florae, foliis 2 oppositis involucratae, pedunculo filiformi post anthesin ± elongato interdum spiraliter torto. Perianthium vestigiale, 2-phyllum, tepalis oppositis minutis. Stamina 2, libera; antherae sessiles, 2-thecae, longitudinaliter dehiscentes. Gynoecium superum; carpella 4 vel plura, libera, primum sessilia, demum in fructu longe stipitata, 1-ovulata; styli 0, stigmatibus sessilibus. Fructiculi indehiscentes; semina exalbuminosa.

1. *Ruppia*

Ruppia L., Spec. Plant. 127 (1753); Gen. Plant. ed. 5: 61 (1754).

Characteres familiae.

1. ***R. maritima*** L., Spec. Plant. 127 (1753).
Syn.: *R. rostellata* KOCH in REICHENB., Pl. Crit. 2: 66 (1824).
Icon.: REICHENB., Icon. Fl. Germ. 7: tab. 17 (25) (1845).
Typus: „Habitat in Europae maritimis".

Folia anguste linearia vel filiformia, infra 1 mm lata, apice plerumque acuta. Pedunculi in fructu usque ad 5 cm longi, ± recurvi vel flexuosi. Fructiculi stipite excluso oblique ovoidei 2—3 mm longi.

Persia: W: Khuz.: Ahvaz, KOEIE 1217! — S: Fars.: In lacu Neyriz, MIRZAJAN 1393-E!; 1400 m, STARM. 303!
Pakistan: N. Wazir.: Miram Shah, Fz. 350. Boya, ad fl. Tochi, Fz. 524.

Distr. gen.: In aquis salsis fere cosmopolita.

Zannichelliaceae

auctore J. E. DANDY, London

Zannichelliaceae DUMORT., Anal. Fam. 59, 61 (1829).

Herbae aquaticae submersae, saepe marinae; caules breves vel elongati. Folia alterna vel opposita, simplicia, linearia, basi vaginata, vagina folii basi adnata vel ab ea libera. Flores unisexuales, parvi, solitarii vel in drepania dispositi, masculi pedunculati, feminei sessiles vel pedunculati. Perianthium 3-phyllum vel cupulare vel 0. Stamina 1—3, antheris connatis; antherae sessiles sed pedunculus in absentia perianthii filamentum simulans, 1—2-thecae, longitudinaliter dehiscentes. Gynoecium superum; carpella 1—9, libera, 1-ovulata, ovulo pendulo; styli simplices vel in stigmata 2 filiformia divisi. Fructiculi indehiscentes, interdum vivipari; semina exalbuminosa.

1a. Plantae marinae. Folia apice 2-cuspidata vel denticulata. Flores dioici, perianthio 0 2
b. Plantae aquae dulcis vel salsugineae, non marinae. Folia apice acuta integra. Flores monoici, feminei perianthio cupulari vel 3-phyllo cincti 3
2a. Folia late linearia, 5—15 mm lata, apice rotundato vel retuso multidenticulata. Antherae 2 connatae, eadem altitudine insertae. Styli in stigmata 2 filiformia divisi ..... 3. *Thalassodendron* DEN HARTOG
b. Folia anguste linearia, usque ad 1 mm lata, apice 2-cuspidata. Antherae 2 connatae, altera altius inserta alteram superans. Styli simplices, filiformes ..... 4. *Halodule* ENDL.
3a. Perianthium in floribus masculis cupulare 3-dentatum, in femineis 3-phyllum. Carpella 3, in fructu recta laevia. Folia plerumque alterna, setacea, vagina basi adnata ..... 1. *Althenia* PETIT
b. Perianthium in floribus masculis 0, in femineis cupulare. Carpella 1—9, in fructu obliqua praesertim ad dorsum ± muriculata. Folia plerumque opposita, vagina libera stipuliformi ..... 2. *Zannichellia* L.

1. *Althenia*

Althenia PETIT in SAIGEY & RASPAIL, Ann. Sci. Obs. 1: 451 (1829).

Caules elongati, graciles. Folia alterna vel suprema opposita, angusta, vagina auriculata. Flores monoici vel dioici, axillares, solitarii. Perianthium in floribus masculis cupulare 3-dentatum, in femineis 3-phyllum. Antherae 1—3 connatae, 1—2-thecae. Carpella 3; styli simplices, stigmate infundibulari vel oblongo. Fructiculi recti.

1. ***A. filiformis*** PETIT in SAIGEY & RASPAIL, Ann. Sci. Obs. 1: 452 (1829).
Icon.: DUVAL-JOUVE, Bull. Soc. Bot. France 19: tab. 5 (1872).
Typus: Gallia, PETIT.

Folia angustissima, setacea, infra 0,5 mm lata, margine integra, apice acuta; vaginae longe auriculatae. Flores monoici. Anthera 1, 1-theca. Styli longi, fili-

formes, stigmate infundibulari. Fructiculi stipitati, ellipsoidei vel oblongo-ellipsoidei, laeves, stylo filiformi coronati, stylo excluso 2—3 mm longi.

Persia: S: Fars.: In lacu Neyriz, Starm. 301!, 302!

Distr. gen.: Europa australis, Africa borealis et australis, Persia.

The Persian locality is a long way distant from the known stations of this species in Europe and Africa. Possibly the plant has been overlooked in intervening areas.

2. *Zannichellia*

Zannichellia L., Spec. Plant. 969 (1753); Gen. Plant. ed. 5: 416 (1754).

Caules elongati, graciles. Folia alterna vel opposita, anguste linearia vel filiformia, vagina auriculata vel a folii basi libera stipuliformi. Flores monoici, axillares, solitarii. Perianthium in floribus masculis 0, in femineis cupulare. Antherae 1 vel 2 connatae, 2-thecae. Carpella 1—9; styli simplices, stigmate peltato. Fructiculi obliqui vel subrecti, ± muriculati.

1. ***Z. palustris*** L., Spec. Plant. 969 (1753).

Syn.: *Z. palustris* var. *pedicellata* Wahlenb. & Rosén, Nov. Act. Soc. Sci. Upsal. 8: 254 (1821). *Z. repens* Boenn., Prodr. Fl. Monast. 272 (1824). *Z. pedunculata* Reichenb. in Moessler, Handb. ed. 2, 3: 1591 (1829). *Z. major* Boenn. ex Reichenb., l. c. (1829). *Z. pedicellata* (Wahlenb. & Rosén) Fries, Nov. Fl. Suec., Mant. 3: 133 (1842). *Z. Haussknechtii* Boiss. ex Graebn. in Engler, Pflanzenr. IV. 11: 155 (1907), in syn.

Icon.: Reichenb., Icon. Fl. Germ. 7: tab. 16 (1845).

Typus: „Habitat in Europae, Virginiae fossis, fluviis" (Suecia), Herb. L. folium 1085.1!

Folia plerumque opposita vel in ramis sterilibus alterna, usque ad 2 mm lata sed plerumque angustiora, margine integra, apice acuta; vaginae a foliorum basibus liberae, stipuliformes, primum tubulosae. Carpella 2—9, plerumque 4. Fructiculi sessiles vel stipitati, obliqui, saepe curvati, 3—6 mm longi, praesertim ad dorsum ± muriculati, rostrati.

Iraq: Kurd.: Sul.: Sarchinar, 750 m, Radhi 5293!, Eig & Feinbrun 22396! Penjwin, 1200 m, Rawi 12166! Kirkuk: Kirkuk, Bornm. 1837!

Talish: Lenkoran, Hohen.

Persia: N: Gorg.: Bandar-i Gaz, Sint. 1375!, 1420. — W: Azerb.: Khvoy, Knapp! Karachal, prope Khvoy, Knapp! Digele, prope Rezaiyeh, Knapp! Daryacheh-ye Rezaiyeh, Golmankhaneh, 1300 m, Grant 16158! Chahriq, SW Shahpur, Knapp! Kurd.: Divandarreh, 1890 m, Brown 3371! Kermansh.: Taq-e Bostan, Haussk.! Esf.: Ad fl. prope Hashtijan, 150 km N Esfahan, Ruttner 645! Prope Esfahan, Haussk.! Prope Murcheh Khvort, Haussk.! Lur.: Kharon, 1800 m, Koeie 757! Najiu, 1700 m, Koeie 1700! Khuz.: Ad Shush (ruinas Susorum), Náb. 248! — S: Fars.: In palude Marv Dasht, 40 km N Shiraz, 1600 m, Grant 17577! Ad fl. Pol-e Fasa, 18 km SE Shiraz, 1600 m, Grant 16963! Prope Zarqan, Haussk.! Ins. Khark, Ky. 13! Bushehr, Koeie 1698! Kerm.: Kuh-e Laleh Zar prope Shirinak, 2900 m, Bornm. 4717! Nehbid, inter Kerman et Bam, 2250 m, Rech. 3558! — E: Sistan: Zabol, 480 m, Annandale 18. Kuh-i Khaja, ad lac. Daryacheh-ye Sistan, 45 km SW Zabol, 500 m, Grant 15347! Khor.: Ozbagu, Ruttner 136! — In rivulo Khacbolagh, Szov.!

Turcomania: Ashkhabad, Sint. 30!

Afghanistan: NW: Maimana: Belchiragh, 1150 m, Hdg. & Wdb. 3762! Bala Murghab, 470 m, Jakeš! — SW: Kandahar: Dilaram, 1100 m, Koeie 3356! — E: Kabul: Prope Kabul, 1780 m, Neub. 164!, 270 = 16!, 654 = 193!, Gilli 68!, 69!, 70!, 71!, Griff.!,

HDG. & WDB. 3213!, VOLK 2642! Hauz-i Mahiha, 2500 m, KOEIE 2479!; 2800 m, RECH. 18546! Band-e Kargha, 2000 m, RECH. 19321! In jugo Unai, 2500 m, NEUB, 4468! 76 km a Kabul versus Gardez, 2050 m, RECH. 31511! Ghazni: Ad marginem orientalem altoplanitici Dasht-i Nawar, 3000 m, RECH. 17792!, 17804!, 37271! In lacu Sabzab inter Okak et Behzud, 2800 m, RECH. 17952! Ghazni, GRIFF.! — C: Bamian, Shar-e Shak, 2320 m, GILLI 72! Bamian, GRIFF.!; 2950 m, HDG. & WDB. 4599! Doab: Kamard, 1800 m, KOELZ 13600!, 13624!, 13625! Ghorat: Lal-i Sar Jangal, 2500 m, KOEIE 3357! Behzud: Siah Sang, 3300 m, GRIFF.!

Pakistan: Peshawar: Peshawar, GRIFF.!; 300—350 m, JOHNSTON! — N. Wazir.: Boya, ad fl. Tochi, FZ. 1419, 1421. Miram Shah, 950 m, BLATT. & FZ. 512. Prope fl. Chasmai, 950 m, BLATT & FZ. 331. — Quetta: Quetta, GRIFF.!

Distr. gen.: Fere cosmopolita.

3. *Thalassodendron*

Thalassodendron DEN HARTOG, Sea-grasses of the World: 186 (1970).

Plantae marinae, rhizomate lignoso robusto repenti; caules foliorum delapsorum cicatricibus annulati. Folia alterna, apice denticulata, vagina auriculata. Flores dioici, solitarii, subsessiles, 4-bracteati. Perianthium 0. Antherae 2 connatae, 2-thecae, polline confervoideo. Carpella 2; styli in stigmata 2 filiformia divisi. Fructiculi 1—2, in bractea intima carnosa inclusi, saepe vivipari.

1. ***T. ciliatum*** (FORSSK.) DEN HARTOG, Sea-grasses of the World: 188 (1970).
Syn.: *Zostera ciliata* FORSSK., Fl. Aegypt.-Arab. CXX, 157 (1775). *Cymodocea ciliata* (FORSSK.) EHRENB. ex ASCHERS., Sitz.-Ber. Ges. Naturf. Freunde Berlin 1867: 3 (1867).
Icon.: DEN HARTOG, l. c. fig. 52 (1970).
Typus: Yemen: Mocha, FORSSKÅL, C!

Caules crebro foliati, inferne annulis clausis notati. Folia late linearia, falcata, 5—15 mm lata, apice rotundata vel retusa multidenticulata.

Persia: S: Makran: Chah Bahar, MANUCH. 1521-E p. p.!

Distr. gen.: Litora Maris Rubri, Oceani Indici, Oceani Pacifici austro-occidentalis.

4. *Halodule*

Halodule ENDL., Gen. Plant., Suppl. 1: 1368 (1841).

Syn.: *Diplanthera* THOUARS, Gen. Nov. Madagasc. 3 (1806), non GLED. (1764).
Lit.: C. DEN HARTOG, Sea-grasses of the World: 146 (1970).

Plantae marinae, rhizomate repenti; caules breves, paucifoliati. Folia alterna, apice 2—3-cuspidata vel varie dentata, vagina auriculata. Flores dioici, solitarii. Perianthium nullum. Antherae 2 connatae, altera altius inserta et alteram superans, 2-thecae, polline confervoideo. Carpella 2; styli simplices, filiformes. Fructiculi ovoidei ad globosi, laeves.

1. ***H. Wrightii*** ASCHERS., Sitz.-Ber. Ges. Naturf. Freunde Berlin 1868: 19 (1868).
Syn.: *Diplanthera Wrightii* (ASCHERS.) ASCHERS. in ENGLER & PRANTL, Nat. Pflanzenfam., Nachtr. zum 2—4: 37 (1897).
Icon.: DEN HARTOG, Blumea 12: 306, fig. 6, 7 (1964).
Typus: Cuba, C. WRIGHT 84.

Folia anguste linearia, usque ad 1 mm lata, apice 2-cuspidata. Fructiculi ovoidei, 1,5—2 mm longi.

Persia: S: Fars.: Bushehr, KOEIE 1731!, GRANT 15114!

Distr. gen.: Litora Oceani Indici occidentalis, Sinus Persici, Oceani Atlantici tropici.

The Persian plant is referred to *H. Wrightii* on the authority of DEN HARTOG, Blumea 12: 308 (1964). In his more recent publication Sea-grasses of the World: 156 (1970), however, the same author remarks that it is not impossible that the populations of *H. Wrightii* from the Atlantic and those from the Indian Ocean will be proved in future to belong to separate taxa; and he gives separate descriptions of their flowers and fruits. The name *H. Wrightii* belongs strictly to the Atlantic plants.

Althenia PETIT 1
filiformis PETIT 1
Cymodocea
ciliata (FORSSK.) EHRENB. ex ASCHERS. 3
Diplanthera THOUARS 3
Wrightii ASCHERS. 3
Halodule ENDL. 3
Wrightii ASCHERS. 3
Thalassodendron DEN HARTOG 3
ciliatum (FORSSK.) DEN HARTOG ... 3
Zannichellia L. 2
Haussknechtii BOISS. ex GRAEBN. ... 2
major BOENN. ex REICHENB. 2
palustris L. 2
var. *pedicellata* WAHLENB. & ROSÉN 2
pedicellata (WAHLENB. & ROSÉN) FRIES 2
pedunculata REICHENB. 2
repens BOENN. 2
Zostera
ciliata FORSSK. 3

Najadaceae

auctore J. E. DANDY, London

Najadaceae JUSS., Gen. Plant. 18 (1789) „*Naiades*".

Herbae aquaticae submersae; caules elongati, graciles. Folia opposita vel subverticillata, simplicia, linearia, margina dentata, basi vaginata. Flores unisexuales, parvi, axillares, solitarii vel pauci aggregati, ebracteati vel bractea spathacea cincti, pedunculati vel subsessiles. Perianthium in floribus masculis 2-labiatum antherae arcte applicitum, in femineis nullum. Stamen 1; anthera subsessilis, 1—4-theca, apice dehiscens. Ovarium 1-loculare, 1-ovulatum, ovulo basali; stylus in stigmata 2—4 linearia divisus. Fructus indehiscens; semina exalbuminosa, embryone recto.

1. *Najas*

Najas L., Spec. Plant. 1015 (1753); Gen. Plant. ed. 5: 445 (1754).

Characteres familiae.

1 a. Flores dioici. Folia valde spinoso-dentata, 1—6 mm lata dentibus inclusis. Caules laeves vel spinoso-dentati ..... 1. *N. marina* L.
b. Flores monoici. Folia minute spinoso-dentata, infra 1 mm lata dentibus inclusis. Caules laeves 2
2 a. Flores masculi spatheati, anthera 1-theca. Folia utroque margine dentibus 5—17 minutis subpatentibus munita; vaginae breviter auriculatae, auriculis rotundatis vel subtruncatis ..... 2. *N. minor* ALL.
b. Flores masculi espatheati, anthera (2—) 4-theca. Folia utroque margine dentibus 30 vel pluribus minutissimis ascendentibus munita; vaginae longe auriculatae, auriculis anguste triangularibus ..... 3. *N. graminea* DELILE

Sect. *Najas*

Flores dioici. Caules laeves vel spinoso-dentati.

1. ***N. marina*** L., Spec. Plant. 1015 (1753).

Syn.: *N. major* ALL., Auct. Syn. Meth. Stirp. Hort. Taurin. 3 (1773). *N. fucoides* GRIFF., Not. Plant. Asiat. 3: 182 (1851).
Icon.: FIORI & PAOLETTI, Icon. Fl. Ital. 65, fig. 559 (1895).
Typus: „Habitat in Europae maribus".

Caules laeves vel ± spinoso-dentati. Folia usque ad 4,5 cm longa, 1—6 mm lata dentibus inclusis, margine et saepe dorso valde spinoso-dentata; vaginae exauriculatae vel brevissime auriculatae. Flores dioici, masculi spatheati, feminei espatheati. Anthera 4-theca. Fructus 3—8 mm longus.

Iraq: Kurd.: Mosul: Nineveh, BORNM. 1838! Kirkuk: 30 km S Darbandikhan, fl. Diyala, HAINES!
Talish: Lenkoran prope Port Il'ich, BOBROV & TSVELEV 363!

Persia: N: Gorg.: Gorgan, Karelin. Gil.: Prope Rasht, Schmid 6606! — S: Kerm.: Saidabad (Sirjan), 1660 m, Brown 3477! — E: Sistan: Daryacheh-ye Sistan, Czern. Prope Lab-e Bareng, 480 m, Annandale 30.
Turcomania: Ashkhabad prope Batushkina-Tsar, Sint. 1231!
Pakistan: Quetta: In jugo Bolan, Gurmab, Griff. 5609!

Distr. gen.: Fere cosmopolita.

Sect. *Hyas* Dumort., Fl. Belg. 164 (1827).

Syn.: Sect. *Caulinia* (Willd.) A. Braun, Journ. Bot. (Lond.) 2: 276 (1864).
Caulinia Willd. Mém. Acad. Berl. 1798, Cl. Phil. Expér.: 87 (1801).
Flores monoici. Caules laeves.

2. ***N. minor*** All., Auct. Syn. Meth. Stirp. Hort. Taurin. 3 (1773).

Syn.: *Caulinia fragilis* Willd., Mém. Acad. Berl. 1798, Cl. Phil. Expér.: 88 (1801).
N. fragilis (Willd.) Delile, Descr. de l'Egypte, Hist. Nat. 2: 175 (1813).
Icon.: Fiori & Paoletti, Icon. Fl. Ital. 65, fig. 560 (1895).
Typus: Italia, Micheli, Nov. Pl. Gen. tab. 8, fig. 3 (1729).

Caules laeves. Folia usque ad 3 cm longa, infra 1 mm lata dentibus inclusis, margine et interdum dorso minute spinoso-dentata, dentibus utrinsecus 5—17 subpatentibus; vaginae breviter auriculatae, auriculis rotundatis vel subtruncatis. Flores monoici, masculi spatheati, feminei espatheati. Anthera 1-theca. Fructus 2—3 mm longus.

Iraq: Kurd.: Arbil: Inter Arbil et Altin Köprü, Haussknecht! Kirkuk: Hawija, 200 m, Lyman & Rawi 15158!
Talish: Lenkoran, Suta-Murdov ad ostium rivuli, Pastuchov! Astara in fl. Tenkera prope Mashkhan, Bobrov & Tsvelev 728!
Persia: N: Gorg.: Gorgan, Baer. Gil.: Prope Rasht, Schmid 6605 p. p.! — W: Kermansh.: Sarab-e Nilufar in planitie Mahi Dasht, Haussknecht! Esf.: Prope Esfahan, Haussknecht! Bakht.: Belu, Koelz 15230! — E: Sistan: Daryacheh-ye Sistan, Czern.
Afghanistan: SW: Kandahar: Dilaram, 1100 m, Koeie 3358! — Afghanistan, Griff.!

Distr. gen.: Europa australis, Africa borealis, Asia australis.

3. ***N. graminea*** Delile, Descr. de l'Egypte, Hist. Nat. 2: 282 (1813).

Icon.: Fiori & Paoletti, Icon. Fl. Ital. 65, fig. 561 (1895).
Typus: Aegyptus, Delile.

Caules laeves. Folia usque ad 4 cm longa, infra 1 mm lata dentibus inclusis, margine minutissime spinoso-dentata, dentibus utrinsecus 30 vel pluribus ascendentibus; vaginae longe auriculatae, auriculis anguste triangularibus. Flores monoici, masculi et feminei espatheati. Anther (2—) 4-theca. Fructus 1,75—2,25 mm longus.

Persia: W: Khuz.: Shush, Haussknecht!
Afghanistan: E: Kabul: Sarobi, Volk 219! Jaji: Patan, Volk 1127-a!

Distr. gen.: Africa borealis et orientalis, Asia australis, Australasia.

Caulinia Willd. 2
fragilis Willd. 2
Najas L. 1
Sect. *Caulinia* (Willd.) A. Braun . 2
Sect. **Hyas** Dumort. 2
Sect. **Najas** 1
fragilis (Willd.) Delile 2
fucoides Griff. 1
graminea Delile 2
major All. 1
marina L. 1
minor All. 2

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 87 / 1. 4. 1971

Staphyleaceae

auctore K. Browicz, Kornik

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Printed in Austria

Staphyleaceae

auctore K. Browicz, Kornik

Staphyleaceae Lindl., Syn. Brit. Fl. 75 (1829).

Frutices vel arbores foliis oppositis vel rarius alternis imparipinnatis vel interdum simplicibus. Stipulae membranaceae, deciduae. Inflorescentia racemosa vel paniculata. Flores bisexuales; calyx, corolla, androeceum pentameri, gynoeceum plerumque trimerum; discus intrastaminalis evolutus; calycis et corollae segmente imbricata. Ovula plerumque 6—10, anatropa; raphis ventralis; placentatio centrali-angularis. Capsula inflata. Semina globosa, testa dura.

1. *Staphylea*

Staphylea L., Spec. Plant. 270 (1753).

Lit.: C. K. Schneider, Staphylea, Illustriertes Handbuch der Laubholzkunde 2: 187—192 (1907). J. Krause, Staphylea in Engler & Prantl, Die natürlichen Pflanzenfamilien 20b: 293—306 (1942).

Frutices decidui vel arbores parvae. Cortex ramorum laevis, striatus. Gemmae ovoideae, squamis 2—4. Folia opposita, petiolata, imparipinnata, 3—7-foliolata. Stipulae membranaceae, mox deciduae. Flores bisexuales, regulares, in paniculas terminales vel racemos umbelliformes dispositi, erecti vel nutantes. Bracteae et bracteolae membranaceae, deciduae. Sepala et petala 5, erecta, aequalia, imbricata, albida vel rosacea, plerumque subaequilonga. Stamina 5, cum petalis alternantia, in margine disci inserta. Styli 2—3, liberi vel apice connati. Ovarium 2—3-cellulare, multiovulatum. Capsula inflata, membranacea, secus suturam interiorem dehiscens. Semina majuscula, globoso-obovoidea; testa callosa, lucida, exarillata.

1. **S. *Emodi*** Wall. ex Brandis, Forest Fl. 114 (1874). — Wall., Numer. List 150, no. 4275 (1831), nom. nud.

Typus: Srinaghur, Wallich, K.

Frutex vel arbor parva. Cortex ramorum olivaceo-viridis, longitudinaliter albo-striatus. Ramuli juveniles glabri, ± pruinosi. Folia trifoliata. Petiolus usque ad 16 cm longus; foliola tenuia, subaequalia, elliptica vel ovato-elliptica, basi rotundata vel latiuscule cuneata, apice acuminata, regulariter serrulata, (5—) 7—15×3—7 cm, subtus pallidiora, glabra vel subglabra secus costam medianam pubescentia; foliolum terminale petiolulo usque ad 4 cm longo suffultum, laterale sessile. Stipulae lineares, stipes setaceus. Flores albi, c. 12 mm longi, in paniculas pendulas dispositi; paniculae 5—10 cm longae, quam folia breviores, cum foliis coëtaneae. Bracteae stipuliformes. Stamina petalis aequilonga vel paulo longiora. Antherae breviter apiculatae. Styli 3, petala aequantes; stigmata capitata. Capsula 5—7,5 cm longa, late ovoidea, basi attenuata, apice tricuspidata, flavescens, in pedicello 12—25 mm longo pendula. Semina compressa, laete brunnescenti-grisea.

Afghanistan: E: M. Safed Kuh sec. BRANDIS, l. c.
Pakistan: Swat: Bahrain, Sho Nullah, R. R. STEWART — Kurram: In faucibus Shend Toi, 2400—2700 m, AITCH. 396, 400!

Distr. gen.: In montibus Himalaya (Kasmir, Punjab, Himachal Pradesh, Kumaun usque ad Nepal), Pakistan borealis, Afghanistan orientalis.

Eine isolierte Art mit disjunkter Verbreitung, meistens einzeln zerstreut in Misch- und Nadelwäldern. C. K. SCHNEIDER, l. c. erwähnt, daß die Blätter an der unteren Seite „... nur an der Rippe oder durchaus ± behaart sind", während laut BRANDIS, l. c., die Blätter kahl sein sollen; nur auf den jungen Blättern tritt "... slight farinose pubescence beneath" auf. COLETT, Flora Simlensis (1902) schreibt, daß die Blätter kahl sind und KRAUSE, l. c., bemerkt, daß diese „unterseits weißlich, mindestens längs der Hauptnerven weichhaarig" sind und HOOKER f., Fl. Brit. Ind. 1: 698 (1875) "... glabrescent or thinly pubescent beneath". Demnach mangelt es in der Literatur an Übereinstimmung der Ansichten bezüglich des Grades der Behaarung des Blattes. Einzig und allein aus Pakistan habe ich Exemplare von *S. Emodi* gesehen, AITCHISON 396, 400, bei welchen die jungen wie auch die älteren Blätter unterseits nur längs der Hauptnerven behaart sind. Es scheint also, daß die Behaarung der Blätter bei *S. Emodi* an den einzelnen von einander isolierten Standorten ziemlich veränderlich sein kann.

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 88 / 1. 4. 1971

Sphenocleaceae

auctore D. PODLECH, München

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Sphenocleaceae

auctore D. PODLECH, München

Sphenocleaceae DC., Prodr. 7, 2: 548 (1839).

Lit.: H. K. AIRY-SHAW, Sphenocleaceae et Pentaphragmataceae, in Flora Malesiana I, 4: 27—28 (1948) et I, 4: 517—528 (1954). K. SUBRAMANYAM, Systematic position of the Sphenocleaceae, Proceedings of the Indian Academy of Science Sect. B 31: 60—65 (1950).

Flores hermaphroditi, 5-meri; corolla gamopetala aestivatione imbricata; stamina libera; stylus brevis, apice non pilosus; ovarium 2-loculare; capsula bilocularis circumscissilis.

1. *Sphenoclea*

Sphenoclea GAERTN., Fruct. Sem. Pl. 1: 113 (1788).

Genus monotypicum:

1. ***Sph. zeylanica*** GAERTN., Fruct. Sem. Pl. 1: 113 (1788).

Syn.: *Sph. Pongatium* DC., Prodr. 7, 2: 548 (1839). *Pongatium indicum* LAM., Tabl. Encycl. 1, no. 1991 (1791). *Schrebera Pongati* RETZ., Obs. Bot. 6: 24 (1791). *Rapinia herbacea* LOUR., Fl. Cochin. 1: 156 (1793).

Icon.: Fl. URSS. 24: 445, tab. XXVII, fig. 3 (1957).

Typus: „Planta culta e seminibus verosimiliter e Ceylania provenientibus".

Herba annua, palustris, glabra. Caulis 10—70 cm altus, erectus, simplex vel in parte superiore ramosus, foliatus. Folia alterna, breviter petiolata, oblonga vel lanceolati-oblonga usque ad 7 cm longa et 1,5 cm lata. Flores parvi, in spicis terminalibus dense congesti. Corolla gamopetala, urceolata, quinquelobata. Stamina 5, libera, basi corollae affixa. Ovarium semiinferum, biloculare, multiovulatum. Stylus brevis, apice breviter bilobatus. Capsula depressi-globosa, bilocularis. Semina numerosa, minuta.

Persia: W: Khuz.: Shush, HAUSSKN.

Afghanistan: E: Nuristan: Chigha Serai, 890 m, in oryzetis, PODLECH 16801! Laghman, ad fluvium Alishang 4 km S Metarlam, PODLECH, 19880!

Distr. gen.: In regione tropicali late dispersa; Afghanistan, Pamir-Alaj.

Die Art wird bei BOISSIER, Flora orientalis 3: 963 (1875) und in der Fl. URSS. 24: 250 (1954) auch für den Iran angegeben. Wir haben keine Belege aus dem erwähnten Gebiet gesehen.

FLORA IRANICA
K. H. RECHINGER

Lfg. Cont. No. 89/1. 4. 1971

Eriocaulaceae

auctore D. PODLECH, München

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Eriocaulaceae

auctore D. PODLECH, München

Eriocaulaceae DESV., Ann. Scienc. Nat. 13: 47 (1828).

Lit.: J. D. HOOKER f., The Flora of British India 6: 571 (1893). W. RUHLAND, Eriocaulaceae in A. ENGLER, Das Pflanzenreich 13, IV—30 (1903). E. I. SHTEINBERG, Eriocaulaceae in Flora URSS. 3: 494—498 (1935).

Flores unisexuales, in capitulis dense congesti. Perianthium biseriale, phylla interiora interdum nulla. Stamina 4 vel 6. Ovarium unicum, superius. Stylus stigmatibus 2 vel 3. Capsula 2- vel 3-locularis. Semina pro loculo solitaria.

1. *Eriocaulon*

Eriocaulon L., Gen. Plant. ed. 5: 38 (1754).

Flores 2-vel 3-meri; perianthii lobi interiores liberi, facie interna saepe glandula provisa. Stamina 6 vel 4, interdum abortu minus numerosi. Antherae dithecae. Involucri squamae interiores capitulorum non radiantes.

1. ***E. Sieboldianum*** SIEB. & ZUCC. ex STEUD., Syn. Pl. Glum. 2: 272 (1855) „*Sieboldtianum*".

Syn.: *E. sexangulare* MART. in WALL., Pl. Asiat. Rar. 3: 28 (1832), non L. (1753). Icon.: RUHLAND, l. c.: 112, fig. 15a—g. Fl. URSS. 3: 499 tab. XXVII, fig. 3a—d. Typus: „Japonia".

Planta monoica, annua, glabra. Folia omnia basalia, rosulata, angustilinearia, usque ad 6 cm longa et 1—2 mm lata, pellucida. Pedunculi numerosi, 5-angulati, foliis 2—3-plo longiores. Capituli solitarii, ovoidei-globosi, ad 4 mm diametro. Involucri phylla oblonga vel lanceolati-oblonga, obtusa, capitulo multo breviora. Bracteae acuminatae. Flores masculini perianthio exteriore e phyllis 3 unilateraliter coalito apice tridentato, perianthio interiore tubiforme apice irregulariter tridentato, dentibus apice glandula nigra provisis. Stamina 6, antheris globosis albidis. Flores feminei perianthio exteriore phyllis 2 anguste linearibus, acuminatis, liberis, perianthio interiore nullo. Ovarium 3-loculare. Stylus longus stigmatibus 3 filiformibus.

Afghanistan: E: Nuristan: Chigha Sarai, 890 m, in orycetis, BRECKLE A-3303!, PODLECH 16790!, RASOUL 392!

Distr. gen.: Afghanistan, Pamir-Alaj, Africa, India, Japonia, Sina, Australia.