

## Contributions to the knowledge of the genus *Astragalus* L. (Leguminosae) VII–X<sup>1</sup>

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### Abstract:

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VII. A survey of *Astragalus* L. sect. *Leucocercis*. The section, endemic in Iran with six species, is revised. Synonymy, descriptions, the investigated specimens and a key for the species are given. VIII. New typifications and changes of typification in *Astragalus*-species. 12 wrongly typified species are re-typified. 19 taxa are typified here. IX. Some new species in genus *Astragalus*: 27 new species, one subspecies and one section are described here. They belong to the following sections: Sect. *Caprini*: *A. behbahanensis*, *A. bozakmanii*, *A. spitzembergeri*. Sect. *Cenantrum*: *A. tecti-mundi* subsp. *orientalis*. Sect. *Chlorostachys*: *A. poluninii*, *A. rhododendrophila*. Sect. *Cystium*: *A. owirensis*. Sect. *Dissitiflori*: *A. argentocalyx*, *A. bingoellensis*, *A. doabensis*, *A. fruticosus*, *A. lanzhouensis*, *A. montis-karkasii*, *A. pravitzi*, *A. recurvatus*, *A. saadatabadensis*, *A. sata-kandaoensis*, *A. wakhanicus*. Sect. *Hemiphaca*: *A. sherriffii*, *A. tsangpoensis*. Sect. *Incani*: *A. olurensis*, *A. zaraensis*. Sect. *Komaroviella*: *A. damxungensis*. Sect. *Onobrychoidei*: *A. rasmontii*. Sect. *Polycladus*: *A. austrotibetanus*, *A. cobresiiphila*, *A. conaensis*. Sect. *Pseudotapinodes*, sect. nov.: *A. dickorei*. X. New names and combinations are given. Four illegitimate names are changed, two taxa have been raised in rank.

### Zusammenfassung:

VII. A survey of *Astragalus* L. sect. *Leucocercis*. Eine Revision von *Astragalus* L. sect. *Leucocercis* wird vorgestellt. Die Sektion ist endemisch im Iran und umfasst sechs Arten. Ausführliche Synonymie, Beschreibung der Arten, Aufzählung der untersuchten Belege und ein Bestimmungsschlüssel werden gegeben. VIII. New typifications and changes of typification in *Astragalus*-species. Neue Typifizierungen und Änderungen früherer Typifizierungen werden vorgestellt. 12 Arten waren bisher falsch typifiziert, 19 Taxa werden hier typifiziert. IX. Some new species in genus *Astragalus*: 27 neue Arten, eine neue Unterart und eine neue Sektion werden beschrieben. Sie gehören zu folgenden Sektionen: Sect. *Caprini*: *A. behbahanensis*, *A. bozakmanii*, *A. spitzembergeri*. Sect. *Cenantrum*: *A. tecti-mundi* subsp. *orientalis*. Sect. *Chlorostachys*: *A. poluninii*, *A. rhododendrophila*. Sect. *Cystium*: *A. owirensis*. Sect. *Dissitiflori*: *A. argentocalyx*, *A. bingoellensis*, *A. doabensis*, *A. fruticosus*, *A. lanzhouensis*, *A. montis-karkasii*, *A. pravitzi*, *A. recurvatus*, *A. saada-*

<sup>1</sup> PODLECH, D.: Beiträge zur Kenntnis der Gattung *Astragalus* I. Neue und bemerkenswerte Arten aus Afghanistan. Bot. Jahrb. Syst. 107: 55–73. 1985. – Beiträge zur Kenntnis der Gattung *Astragalus* L. (Leguminosae) II. *Astragalus renzianus* species nova aus dem Iran. Mitt. Bot. Staats. München 22: 1–3. 1986. – Beiträge zur Kenntnis der Gattung *Astragalus* L. (Leguminosae) III–VI. *Sendtnera* 1: 267–272. 1993.

*tabadensis*, *A. sata-kandaoensis*, *A. wakhanicus*. Sect. *Hemiphaca*: *A. sherriffii*, *A. tsangpoensis*. Sect. *Incani*: *A. olurensis*, *A. zaraensis*. Sect. *Komaroviella*: *A. damxungensis*. Sect. *Onobrychoidei*: *A. rasmontii*. Sect. *Polycladus*: *A. austrotibetanus*, *A. cobresiiphila*, *A. conaensis*. Sect. *Pseudotapinodes*, sect. nov.: *A. dickorei*. X. New names and combinations are given. Vier illegitime Namen werden geändert, zwei Sippen werden im Rang verändert.

## VII. A survey of *Astragalus* L. sect. *Leucocercis* Bunge.

The species of the small section *Leucocercis* are all endemic in Iran. They have all a characteristic habit and are all close together. It is a section with no closer allies within the genus. The section has been revised twice in recent years, but in both cases important characters especially in the indument structure have not been taken into consideration and several types have not been investigated. Therefore several changes of names and new circumscription of the species are offered here.

*Astragalus* sect. *Leucocercis* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 132. 1868. Lectotype (PODLECH 1990): *A. mucronifolius* Boiss.

Plants low, mostly densely cushion-like spiny shrublets with short growth in one year. Hairs merely white, mostly appressed, symmetrically to strongly asymmetrically medifixed, in part even basifixed. Stipules adnate to the petiole, free from each other. Leaves paripinnate, with thickly leathery, acuminate-cuspidate leaves with prominent nerves. Rhachis rigid, pungent, persistent, of variable length. Racemes with a mostly short peduncle, loosely 3–15-flowered. Bracts short. Bracteoles present, in upper part of the pedicel or at the base of the calyx. Calyx campanulate to shortly tubular, hairy, with slightly to distinctly pungent teeth. Petals glabrous, pink (always ?), deciduous. Standard blade elliptic to suborbicular, slightly retuse at the apex. Wings and keel as long or only slightly shorter than the standard. Staminal tube truncate at the mouth. Legumes sessile, short, unilocular; valves coriaceous, hairy. Seeds 1–8.

### Key to the species

Remark: The form of legumes is very characteristic in some species. If they are not available, it is necessary to compare carefully all the characters in the descriptions.

1. Bracts densely hairy; calyx teeth 1.5–2 mm long, often recurved; standard 9–10 mm long; legumes 5–8 mm long, with only one seed *A. curviflorus* Boiss.
- Bracts only ciliate at the margins; calyx teeth longer, not recurved; standard distinctly longer; legumes distinctly longer, with several seeds 2
2. Stems of the current year nearly glabrous; rhachis of the leaves covered with strongly asymmetrically medifixed hairs up to 1.5 mm long; legumes ovoid, 9–15 mm long, 7–11 mm high and wide, rounded ventrally and dorsally; leaflets with a cusp 1.5–3 mm long; peduncles 2–8 cm long *A. ovoideus* Sirj. & Rech.f.
- Stems of the current year densely hairy (hairs concealed by stipules); rhachis of the leaves covered with shorter and at least partly ± symmetrically medifixed hairs;

- peduncles short, at most up to 2.5 cm long, rarely up to 5 cm long (in *A. mucronifolius*); legumes elliptic or obliquely elliptic, carinate ventrally, if rounded (in *A. kentrophyllus*) than leaflets shortly acuminate with a cusp up to 0.5(–1) mm long 3
3. Calyx covered with basifixed to strongly asymmetrically medifixed hairs; standard blade elliptic to widely elliptic, gradually narrowed at the base into the claw 4
- Calyx covered with ± symmetrically medifixed hairs; standard blade suborbicular, subabruptly narrowed at the base into the claw 5
4. Stems of the current year with hairs protruding from the stipules; leaflets long acuminate-aristate, with a cusp up to 6 mm long; legumes with up to 8 seeds
- A. fischeri* Fisch.
- Stems of the current year with hairs nearly completely concealed by the stipules; leaflets shortly acuminate-aristate with a cusp up to 3 mm long; legumes with 2–3 seeds
- A. mucronifolius* Boiss.
5. Leaflets in 4–5 pairs, elliptic to obovate, 2–3 mm wide; legumes slightly compressed from dorsal side, ca. 6 mm high and 8 mm wide, rounded ventrally and dorsally
- A. kentrophyllus* Podlech
- Leaflets in 6–9 pairs; narrowly elliptic, 1–2 mm wide; legumes strongly compressed laterally, 6–6.5 mm high and 3 mm wide, subcarinate ventrally and dorsally
- A. talimansurensis* Sirj. & Rech.f.

*Astragalus curviflorus* Boiss., Diagn. pl. orient., ser. 1, 2: 67. 1843 ≡ *Tragacantha curviflora* (Boiss.) Kuntze, Revis. Gen. 2: 944. 1891. Syntypes: Persia australis, *P.M.R. Aucher-Eloy* 4388 (G!, G-BOIS!, K!, OXF!, W!); Persia australis, inter Jaroun [Jahrom] et Darab, *P.M.R. Aucher-Eloy* 4391. Lectotype (PODLECH 1998): *P.M.R. Aucher-Eloy* 4391 (G-BOIS!; iso: G!, K!, P!: foto MSB!).

Plants horribly spiny, densely cushion-like shrublets 12–5(–30) cm tall. Main stem up to 6 cm long and up to 5 mm thick, branched, densely covered with remnants of old spines, densely covered with appressed to subappressed short white hairs. Stipules yellowish, 5–6 mm long, from wide base subabruptly narrowly triangular-acuminate, acute but not pungent, adnate to the petiole for 2–3 mm, densely covered at the base and at the margins with subappressed, extremely asymmetrically medifixed hairs, the top often glabrescent or glabrous. Leaves 2–4 cm long; petiole and rhachis stout, up to 1.5 mm thick, rigid, pungent, densely covered with appressed to subappressed, asymmetrically to extremely asymmetrically medifixed hairs up to 0.5 mm long and with much fewer, more ascending hairs up to 0.8 mm long. Leaflets in 4–6 pairs, thickish-leathery, elliptic to obovate, 4–5 × 1.5–2 mm, at the apex abruptly acutish or with a yellowish spine up to 1 mm long, densely covered on both sides with appressed, asymmetrically medifixed hairs up to 0.6 mm long. Peduncles 0.5–1.5 cm long, slender, hairy like the rhachis. Racemes loosely 2–5-flowered. Pedicels 1 mm long. Bracts narrowly triangular 1–2 mm long, densely hairy. Bracteoles ca. 0.5 mm long, in upper part of the pedicel or at the base of calyx. Calyx 5–6 mm long, tubular, attenuate at the base, densely hairy; teeth subulate, 1.5–2 mm long, often somewhat curved, not pungent. Petals pink? Standard 9–10 mm long; blade upcurved above the claw, widely elliptic to nearly circular, 5.5–6 mm wide, slightly retuse at the apex, gradually narrowed into the cuneate short

claw. Wings ca. 9 mm long; blades slightly curved, oblong, obtuse at the apex, 6 × 2 mm; auricle ca. 0.5 mm long, claw curved, ca. 3.5 mm long. Keel 9 mm long; blades elliptic-triangular, with widely curved lower edge and nearly straight upper edge, long acuminate at the apex, 5 × 2.5 mm; auricle short, claw 4.5 mm long. Ovary sessile, pilose, with 4 ovules. Pods sessile, widely elliptic seen from the side, laterally strongly compressed, 5–8 mm long, 4–5 mm high and 2–3.5 mm wide, carinate ventrally, rounded dorsally but with prominent midnerve, at the apex minutely acuminate, unilocular; valves pale brownish, thin but tough, loosely covered with medifixed to subbasifixed, tangled, subappressed hairs 0.1–1 mm long, soon glabrescent. Seed only one.

Distribution: in southwest Iran (Prov. Fars).

Specimens seen:

**Iran.** Fars: 2 km after Sivand on the road to Abadeh, 1350–1400 m, 14.7.1994, *Chehregani & Zarre 17904* (MSB); circa Kaserun, *Stapf 1071* (WU) – Kuh-i-Bamu, NE of Shiraz, 1830 m, 28.7.1966, *Archibald 2939* (K); 32 km W Shiraz, 1820 m, *Zohary 477* (HJ) – prope urbem Shiras, 1842, *Kotschy 58a* (W) – dto.bei Schiras, 16.6.1885, *Stapf* (K, WU) – dto. 23.8.1985, *Stapf* (K) – dto., 27.8.1960, *Zohary 453* (HJ) – Persepolis, 12.7.1985, *Stapf* (K) – Hadchiabad [Hajiabad], 12.7.1885, *Stapf 1070* (WU) – near Fasa, ca. 150 km SE Shiraz, 7.6.1965, *Ledingham & Assefi 4132* (W) – inter Jaroun [Jahrom] et Darab, *Aucher-Eloy 4391* (G, G–BOIS, K, P) – Lake Maharlou, 35 km SE of Shiraz, 1500 m, 18.11.1963, *Grant 15082* (W) – Takht-e Jamshid, above the ruins, 22.5.1959, *Wendelbo 786* (BG) – in montibus 12 km NW Hoseynabad, 37 km ab opp. Darab, 30.5.1973, *Soják 5043, 5047* (PR) – Kotal Komared, 4.5.1885, *Stapf 685* (K).

*Astragalus fischeri* Fisch., Bull. Soc. Imp. Naturalistes Moscou 26(2): 429. 1853. Type: [bei Gäsnaabad, 12.5.1849], *F.A. Buhse 1413* (H!).

= *A. phyllokentrus* Hausskn. & Bornm., Mitth. Thüring. Bot. Vereins, n.s. 23: 11. 1908. Syntypes: Persia occ., in monte Latetar, 10.6.1895, *Th. Strauss* (B!: foto K!, JE!); et ad Gulpaigan, vi.1899, *Th. Strauss*; Tschchar-Khatun, ditionis montis Raswend, vi.1902, *Th. Strauss* (B!, G!, K!, W!). Lectotype (PODLECH, designated here): In dit. urbis Sultanabad, Gulpaigan, vi.1899, *Th. Strauss* (JE!; iso: B!, K!, W!, Z!).

= *A. cornu-caprae* Sirj. & Rech.f., Anz. Österr. Akad. Wiss., Math.–Naturwiss. Kl. 1954 (91): 171. 1954. Holotype: [Iran] entre Gomsche et Yezd-i Khast, route d'Ispahan à Chiraz, à 200 km SE de Ispahan, 1800 m, 11.6.1930, *J. Gautier 14* (P!: foto MSB!).

Plants spiny, cushion-like shrublets up to 30 cm tall, with only white hairs. Caudex up to 10 mm in diameter, with short, dark brown branches, in upper part covered with remnants of old leaves. Stems of the year 1–2 cm long, densely covered with ascending, fine, subbasifixed white hairs up to 2.5 mm long, protruding well from the upper stipules. Stipules membranous, 8–12 mm long, triangular-acuminate, not spiny, distinctly reticulately nerved, adnate to the petiole for 2–4 mm, sometimes only densely ciliate at the margins with basifixed hairs up to 1 mm long, otherwise glabrous or hairy also on the outer surface. Leaves 4–25 cm long, in the lower 2.5–6 cm without leaflets; petiole and rhachis up to 2.5 mm thick, rigid, pungent, sparsely to rather densely covered with appressed short, ± medifixed hairs 0.2–0.3 mm long and with asymmetrically medifixed to subbasifixed hairs up to 1 mm long, often soon glabrescent or glabrous. Leaflets in 3–6 pairs, thickish-leathery, elliptic to obovate, at the apex abruptly acuminate into a spine 1.5–6 mm long, 8–15 × 5–9 mm, prominently nerved, on

upperside densely, on underside sparsely to loosely covered with appressed  $\pm$  medifixed hairs 0.4–0.8 mm long. Peduncles 1–2 cm long, sparsely hairy or glabrous. Racemes loosely 2–15-flowered, later on often elongated and up to 9 cm long. Bracts membraneous, narrowly triangular to linear, 1–3 mm long, ciliate. Pedicels 1 mm long. Bracteoles ca. 1 mm long, in upper part of the pedicel or at the base of calyx. Calyx campanulate, 6–7 mm long, glabrous or very sparsely hairy; teeth narrowly triangular to subulate, 2–4 mm long, acuminate-pungent. Petals pink. Standard 12–14 mm long; blade upcurved above the claw, widely elliptic, 8 mm wide, slightly retuse at the apex, gradually narrowed into the cuneate, short claw. Wings 10–14 mm long, slightly curved; blades oblong, rounded at the apex,  $8.5 \times 3$  mm; auricle ca. 0.5 mm long, claw curved, ca. 5.5 mm long. Keel 9–12 mm long; blades elliptic-triangular, with widely curved lower edge and straight upper edge, acute at the apex,  $5.5-6 \times 3.5$  mm; auricle short, claw 6.5 mm long. Ovary sessile, hairy. Pods sessile, obliquely elliptic, straight to slightly curved, 10–20 mm long, 3.5–6.5 mm high and 3–4 mm wide, obtusely carinate by the thick median nerve ventrally, carinate or rounded dorsally but with prominent midnerve, at the apex shortly acuminate, unilocular; valves brownish, thick, with obliquely transverse-reticulate nerves, loosely covered with extremely asymmetrically medifixed to subbasifixed ascending hairs 0.8–1(–2) mm long, becoming glabrescent. Seeds up to 8, irregularly triangular to rectangular,  $3.5 \times 3$  mm, brown, slightly pitted.

Distribution: In southwest and central Iran.

Specimens seen:

**Iran.** Markazi: in ditone urb. Sultanabad [Arak], Gulpaigan, vi.1899, *Strauss* (B, JE, K, W, Z) – near Arak, 1520 m, 2.4.1963, *Bowles sholarship Bot. Exp. 610* (K) – 60 km from Delijan to Qum, 1140 m, 23.5.1972, *Amin & Mousavi 16119* (W) – in monte Tschchar Khatun (dit. Raswend), VI.1902, *Strauss* (W) – inter Teheran et Dilijan, 500–1000 m, 23.4.1956, *Schmid 5158* (M) – 10 miles W Qom, 27.4.1961, *Stutz 747* (W) – 15 km S Qom, 1130 m., 22.4.1961, *Pabot 12436-E* (W) & 5669 (G). – Esfahan: Julfa, Armenia cemetry, 29.5.1959, *Wendelbo 909* (BG) – dto., 20.4.1948, *Rechinger, Aellen & Esfandiari 2688* (K, M, W) – 60–70 km ab Ardestan boreo-occidentem versus inter Ab-i Azan (Abyazan) et Rahmatabad, 1150 m, 26.5.1974, *Rechinger 46504* (M, W) – Iahabad, 20 km NW Najafabad, 45 km W Esfahan, 1900 m, 12.6.1965, *Ledingham & Assefi 4140* (W) – 2 km N Najafabad, 12.6.1965, *Ledingham & Assefi 4134* (W) – 14 km SE Natanz, 1480 m, 12.5.1961, *Pabot 7175* (G, W) – road from Natanz to Ardestan, near Emamzade Abyazan, 1380 m, 15.5.1974, *Wendelbo & Foroughi 11462* (W) – 24 km NE Murcheh Khvort, 1750 m, 27.5.1974, *Rechinger 46638* (M, W) – 70 km NW Nain versus Ardestan, 1700 m, 18.5.1975, *Rechinger 52022* (M, W) – Ardestan to Nain, 29.11.1956, *Sabeti 12085-E* (W) – Isfahan district, 1500–1800 m, *Trott* (K) – Kuh-i-Shir, 7 km SW Isfahan, 1650 m, 27.4.1953, *Soder 216* (W) – Ispahan, *Aucher-Eloy 4400* (K) – 10 km W Esfahan, 1600 m, 28.5.1960, *Pabot 3465* (G) – 27 km S Esfahan, 1700 m, 24.4.1961, *Pabot 5753* (G) – 65 km SW of Esfahan, 1400 m, 22.4.1929, *Cowan & Darlington 1166* (K) – 10 km SE Nain, 1530 m, 11.5.1961, *Pabot 7104* (G, W) – 70 km NE Nain, 1700 m, 18.5.1975, *Iranshahr 41057-E* (W) – 43 km NW Nain, 1970 m, 11.5.1961, *Pabot 7112* (G). – Yazd: ad pagum Seinudin, 1600–1700 m, 11.4.1892, *Bornmüller 3710* (K, W) – 54 km S Mahallat to Golpaegan, 1750 m, 16.5.1973, *Babakanlu & Amin 15271*(W). – Fars: entre Gomsche et Yezd-i Khast, route d'Ispahan à Chiraz, à 200 km SE de Ispahan, 1800 m, 11.6.1930, *J. Gautier 14* (P) – zwischen Jezdikhast und Aminabad, 11.9.1885, *Stapf 1008* (WU) – bei Jezdikhast, 11.9.1985, *Stapf 1008* (WU) – 16 km W of Abarqu, 1600 m, 3.4.1964, *Grant 15410* (W) – N of Abadeh, 2100 m, 22.4.1966, *Archibald 1473* (K) – Abadeh, 1800 m, 12.5.1915, *Pravitz 727* (W) – entre Abadeh et Daulatabad, 1500–2000 m, 26.4.1956, *Schmid 5235* (G) – 30 km SE Abadeh, 1810 m, 26.4.1961, *Pabot 5814* (G).

*Astragalus kentrophyllus* Podlech, Sendtnera 6: 156, 1999. Holotype: Iran, Prov. Khuzestan: 25 km N of Haftgel towards Izeh, 550 m, 25.5.1973, *Iranshahr & Mousavi 15593-E* (W!).

Plants spiny, cushion-like shrublet up to 15 cm tall, in most parts densely covered with appressed,  $\pm$  symmetrically medifixed, white hairs. Caudex up to 10 mm in diameter, with short, dark brown branches, in upper part covered with remnants of old leaves. Stems of the year 1–3 cm long, the dense indumentum of fine, basifixed white hairs up to 1 mm long is not visible because of the very dense cover of leaves with their stipules. Stipules pale yellowish, 5–8 mm long, triangular-acuminate, shortly spiny, distinctly reticulately nerved, adnate to the petiole for 3–5 mm, sparsely ciliate at the margins with basifixed hairs up to 0.3 mm long, otherwise glabrous. Leaves 5–12 cm long, in the lower half to two third without leaflets; petiole and rachis up to 1 mm thick, rigid, pungent, densely covered with appressed hairs 0.2–0.6 mm long. Leaflets in 4–5 pairs, thickish-leathery, elliptic to obovate, 4–7  $\times$  2–3 mm, at the apex abruptly acuminate into a minute spine up to 0.5(–1) mm long, on upperside densely, on underside loosely to rather densely covered with appressed, symmetrically medifixed hairs 0.3–0.5 mm long. Peduncles 1–1.5 cm long, curved, hairy like the rachis. Racemes loosely 3-flowered. Bracts whitish-hyaline, narrowly triangular, 2 mm long, ciliate. Pedicels at fruiting time thickish, 3–4 mm long, rather densely hairy. Bracteoles 0.5–1.5 mm long, linear, in the upper part of the pedicel. Calyx campanulate, ca. 7 mm long, obliquely cut at the mouth, rather densely covered with short,  $\pm$  symmetrically medifixed hairs, at the upper margins and teeth with basifixed cilia; teeth narrowly triangular, 3–3.5 mm long, acuminate but not pungent, with elevated midnerve. Standard 13 mm long; blade upcurved above the claw, suborbicular, 7 mm wide, emarginate at the apex, subabruptly narrowed into the wide claw. Wings 11–12 mm long, slightly curved; blades oblong-obovate, rounded at the apex, 6  $\times$  3 mm; auricle ca. 1 mm long, claw curved, 5–6 mm long. Keel 11–12 mm long; blades strongly obliquely elliptic-curved, with very widely rectangular-curved lower edge and concave upper edge, acute at the apex, 5–6  $\times$  3–3.5 mm; auricle 0.5 mm long, claw 6 mm long. Pods sessile, elliptic, straight, 12–15 mm long, 6 mm high and 8 mm wide, flat ventrally, widely rounded dorsally, at the apex very shortly acuminate, unilocular; valves pale brownish, thick, slightly rugulose, covered with appressed, very short,  $\pm$  symmetrically medifixed hairs and with distinctly longer, strongly asymmetrically medifixed hairs up to 0.8 mm long, soon glabrescent and nearly glabrous with age. Seeds 3, nearly globular, 5  $\times$  4  $\times$  3 mm, pale brownish, smooth. Distribution: S.W. Iran, endemic. Occurrence: on gypsaceous soil

Specimens seen:

**Iran.** Illam: 10 km S of Zarrin-Abad, Anaran Mountain, 1200–1300 m, 6.8.1989, *Akhani 5540* (MSB). – Khuzestan: 11 km W Haft-Kel, 300 m, 13.3.1959, *Pabot 315* (G) – 25 km N of Haftgel towards Izeh, 550 m, 25.5.1973, *Iranshahr & Mousavi 15593-E* (W) – 8 km W Behbahan, 15.4.1959, *Pabot 12435-E* (W) & 621 (G) – Zeydoun, 65 km SE Soveyreh, road from Mahshahr to Genaveh, 350 m, 29.2.1972, *Iranshahr & Termeh 14957-E* (W) – Anhal, 47 km from Masdjed-Suleiman to Lali, 16.3.1978, *Iranshahr & Termeh 14964-E* (W). – Boyer Ahmadi: 45 km from Dogonbadan to Behbahan, 500 m, 3.3.1972, *Iranshahr & Termeh 40843-E* (W). – Fars: 4 km S Fahlian, 900 m, 10.5.1959, *Pabot s.n.* (G) – bei Kaserun, 8.5.1885, *Stapf 1068* (K, WU) – Kazerun to Rudak, 800 m, 10.4.1974, *Davis & Bokhari D.56516* (K) – Kotal Komarech, 4.5.1885, *Stapf 1143* (WU).

- Astragalus mucronifolius* Boiss., Diagn. pl. orient., ser. 1, 2: 68. 1843 ≡ *Tragacantha mucronifolia* (Boiss.) Kuntze, Revis. Gen. 2: 946. 1891. Holotype: [Iran] Persia prope Ispahan, P.M.R. Aucher-Eloy 4400 (G-BOIS!; iso: BM!, G!, LE!, OXF!, P!, W!).
- = *A. mucronifolius* var. *brevidentatus* Sirj. & Rech.f., Ann. Naturhist. Mus. Wien 58: 72. 1951 ≡ *A. mucronifolius* f. *brevidentatus* (Sirj. & Rech.f.) Parsa, Fl. Iran 9: 132. 1966. Holotype: [Iran] Inter Jezd et Kermanshahan, 22.–23.4.1948, K.H. Rechinger, P. Aellen & E. Esfandiari 2842 (W!; iso: B!, E!, G!, IRAN, K!).
- = *A. taftanicus* Parsa, Kew Bull. 1948: 195. 1948. Holotype: [Iran] S. Persia, Taftan (South), 2200 m, 9.5.1939, A. Parsa 658 (K!).
- = *A. taftanicus* var. *multiflorus* Parsa, Kew Bull. 1948: 196. 1948. Holotype: [Iran] S. Persia, Shiraz, Khafz, 12.4.1939, A. Parsa (K!).

Plants spiny, cushion-like shrublet up to 12 cm tall, with appressed to subappressed, symmetrically to strongly or extremely asymmetrically medifixed or subbasifixed, merely white hairs. Caudex up to 10 mm in diameter, with short, dark brown branches, in upper part covered with remnants of old leaves. Stems of the year 1–2 cm long, the dense indumentum of fine, subbasifixed white hairs up to 2 mm long is not visible because of the very dense cover of leaves with their stipules. Stipules pale yellowish, 5–11 mm long, triangular-acuminate, shortly spiny, distinctly reticulately nerved, adnate to the petiole for 3–5 mm, densely ciliate at the margins with basifixed hairs up to 0.5(–1) mm long, otherwise mostly glabrous. Leaves 6–15 cm long, in the lower half without leaflets; petiole and rachis up to 2 mm thick, rigid, pungent, sparsely to loosely covered with appressed, irregularly medifixed hairs 0.4–0.7 mm long, often soon glabrescent to glabrous. Leaflets in 3–6 pairs, thickish-leathery, narrowly elliptic or elliptic to obovate, 6–10 × 2–7 mm, at the apex abruptly to subabruptly acuminate into a spine 1.5–3 mm long, prominently nerved, on upper side rather densely, on underside sparsely to loosely covered with subappressed, symmetrically to strongly asymmetrically medifixed hairs up to 1 mm long. Peduncles 1–2.5 cm long, sparsely to rather densely hairy. Racemes loosely 3–10-flowered. Bracts whitish-hyaline, narrowly triangular, 1–2 mm long, ciliate. Pedicels 1–1.5 mm long, sparsely hairy. Bracteoles 0.5–1.5 mm long, linear, at the base of calyx. Calyx campanulate, 6–7 mm long, sparsely covered with extremely asymmetrically medifixed and basifixed hairs 0.2–0.5 mm long; teeth narrowly triangular, ca. 3 mm long, acuminate-pungent, with elevated midnerve. Petals pink, the keel whitish. Standard 12–14 mm long; blade upcurved above the claw, elliptic, 7 mm wide, slightly retuse at the apex, gradually narrowed into the cuneate short claw. Wings 11–13 mm long, slightly curved; blades oblong, rounded at the apex, 7 × 3 mm; auricle ca. 1 mm long, claw curved, 5–6 mm long. Keel 10–12 mm long; blades obliquely elliptic-triangular, with widely curved lower edge and straight upper edge, acute at the apex, 5 × 3 mm; auricle 0.5 mm long, claw 6–7 mm long. Ovary sessile, villous; style glabrous. Pods sessile, obliquely elliptic to elliptic, straight, 10–12(–15) mm long, 4–6(–9) mm high and 3.5–5(–6) mm wide, obtusely carinate by the thick median nerve ventrally, carinate or rounded dorsally but with prominent midnerve, at the apex shortly acuminate, unilocular; valves brownish, thick, slightly transversely rugulose-nerved, covered with very fine subappressed to ascending hairs up to 1 mm long, soon glabrescent and often glabrous when ripe. Seeds 2–3, rectangular, 3 × 2 mm, brown, irregularly pitted.

Distribution: In southwest, southeast and central Iran.

## Specimens seen:

**Iran.** Esfahan: inter Ab-i Azan (Abyazan) et Rahmatahad, 60–70 km NW Ardestan, 1150 m, 26.5.1974, *Rechinger 46504* (M, W) – 15 km SW of Isfahan, 4.6.1974, *Alava 13536* (TUR) – Kauhaye Kolah-Ghazi, 40 km from Esfahan to Shiraz, 1700–2000 m, 6.6.1984, *Termeh & Tehrani 41408-E* (W) – Natanz, 1500 m, 19.5.1975, *Rechinger 52058* (M, W) – 20° SE of Esfahan, 1730 m, 11.4.1962, *Furse 1361* (K, W) – prope Ispahan, *Aucher-Eloy 4400* (BM, G, G-BOIS, LE, OXF, P, W) – between Aran and Kashan, 850 m, 28.4.1974, *Dinie & Bazargan 7972* (W). – Fars: pr. Schiras, 10.5.1842, *Kotschy 354* (MSB, WU) – pr. Gere inter Abuschir et Schiras, 18.3.1842, *Kotschy 58* (MSB, WU) – Shiraz, Khafr, 12.4.1939, *Parsa* (K)! Jahrom, *Koelz 14606* (W) – Sarvestan, *Gaub 525* (W). – Kerman: entre Bam et Jiroft, 1450 m, 19.4.1972, *Léonard 5617* (K, M, MSB, W) – 9 km N Kerman, 1790–1900 m, 8.5.1961, *Pabot 6952* (G) – 3 km NE Sirjan, 1720 m, 7.5.1961, *Pabot 6852* (G) – Bashagard, Ghorichi, 1000 m, 20.2.1973, *Iranshah & Mousavi 15466-E* (W) – 150 km SE Kerman versus Bam, 26.3.1965, *Rechinger 27152* (W) – Mahan, entre Kerman et Bam, 13.6.1960, *Dadashzadeh DK430* (G) – 24 km S Mahan, 26.3.1965, *Rechinger 27147* (K, M, W) – inter Mashiz et jugum Khan-e Sorck (inter Kerman et Sirdjan), 2000–2580 m, 27.4.1948, *Rechinger, Aellen & Esfandiari 3031* (W) – 6 km from Darzin on the road to Jiroft, 1450 m, 14.4.1975, *Foroughi 15908* (W) – prope Kerman, IV.1859, *Bunge* (K) – S. of Kerman, 26.3.1965, *Lamond 75* (M) – hills S of Deh Bakri, 1150–1700 m, 1.5.1975, *Parris 74.264* (K) – 4 km SW of Baft, 2000 m, 2.5.1975, *Parris 75.319* (K). – Markasi: 42 km from Qum to Arak, 1360 m, 21.5.1972, *Amin & Mousavi 15961* (W). – Semnan: 30 km SW of Damghan, 1200 m, 5.5.1974, *Wendelbo & al. 11217* (H, W) – 20 km E of Damghan, 1100 m, 5.5.1974, *Wendelbo & al. 11191* (W). – Sistan: Khash, Karavandar Gebirge, 1.4.1949, *Mirzajan 583-E* (W) – Gebirge bei Khash, 26.3.1949, *Mirzajan 581-E* (W) – Sangan, Ladis road, 1550 m, 15.3.1974, *Foroughi 10819* (W) – Sangan, between Khash and Ladis, 1500 m, 15.3.1974, *Iranshahr & Ershad 16332-E* (W) – 76 km NE from Zarbaz versus Qale Zaboli, 1200 m, 11.3.1974, *Iranshahr & Ershad 16357-E* (W) – prope pag. Deh Pabid, 1420 m, 28.3.1973, *Soják 307* (PR) – prope opp. Khash, 28.3.1973, *Soják 461* (PR) – in declivibus australibus vulcani Taftan prope Torshab, 1900–2300 m, 26.4.1977, *Rechinger 54782* (W) – dto., 2500–2700 m, *Assadi* in Hb. *Rechinger 54838* (M, W), *54839* (M, W). – Yazd: inter Yezd et Kermanshahan, 22.–23.4. 1948, *K.H. Rechinger, P. Aellen & E. Esfandiari 2842* (B, E, G, IRAN, K, W).

*Astragalus ovoideus* Sirj. & Rech.f., Ann. Naturhist. Mus. Wien 58: 72. 1951 ≡ *A. mucronifolius* Boiss. var. *ovoides* (Sirj. & Rech.f.) Parsa, Fl. Iran 9: 131. 1966. Holotype: [Iran] Prov. Kerman, Montes Djamal Bariz inter Bam et Djiroft, infra Deh Bakri, ca. 1800 m, 8.–10.5.1948, *K.H. Rechinger, P. Aellen & E. Esfandiari 3865* (W!; iso: E!, G!).  
= *A. mucronifolius* Boiss. subsp. *robustus* Sirj. & Rech.f., Ann. Naturhist. Mus. Wien 58: 71. 1951 ≡ *A. mucronifolius* var. *robustus* (Sirj. & Rech.f.) Parsa, Fl. Iran 9: 131. 1966. Holotype: [Iran] Prov. Kerman, inter Saidabad et jugum Chah Choghuk, 1700–1900 m, 28.4.1948, *K.H. Rechinger, P. Aellen & E. Esfandiari 3172* (W!; iso: B!, E!, G!, K!, M!).

Plants nearly acaulescent, caespitose-spiny, up to 25 cm tall, sparsely covered with appressed to subappressed, partly asymmetrically to extremely asymmetrically or even subbasifixed white hairs 0.3–1(–1.5) mm long. Caudex branched with short to elongated branches up to 6 cm long, densely covered with remnants of old stipules and rhachides. The very short stems densely hairy. Stipules thickish, whitish to straw-coloured, 5–10 mm long, narrowly triangular, with distinct longitudinal nerves, adnate to the petiole for 1–3 mm, ciliate at the margins, at the base covered with long basifixed white hairs, otherwise glabrous, more rarely appressed hairy. Rhachis strong, at the base up to 2 mm thick, pale greenish, (4–)6–18 cm long, pungent, finely striate-sulcate, sparsely hairy to glabrescent, with fine, extremely asymmetrically medifixed hairs up to 1.5 mm long, the lower half or 2/3 without leaflets, the

free apex 1–3 cm long. Leaflets in 3–5 pairs, remote, rigidly thickish, narrowly to widely elliptic or obovate, 5–10 × 2–6 mm, shortly acuminate and with a yellowish cusp 1.5–3 mm long, the midvein on underside prominent, yellowish, both sides loosely to rather densely covered with appressed, asymmetrically to more rarely symmetrically medifixed hairs up to 1 mm long. Peduncles 2–8 cm long, curved, hairy like the rhachis. Racemes 3–12-flowered, at fruiting time elongated and up to 8 cm long. Bracts whitish-hyaline, 1–2 mm long, narrowly triangular, ciliate with basifixed hairs. Pedicels ca. 1 mm long, hairy. Calyx 5–7 mm long, campanulate-tubular, sparsely covered with subbasifixed hairs up to 1 mm long; teeth from the narrowly triangular base long acuminate, somewhat pungent, 2–4 mm long. Petals pink, the standard with darker longitudinal stripes. Standard 10–13 mm long; blade obovate to nearly orbicular, 6–8 mm wide, slightly retuse at the apex, gradually narrowed into the short claw. Wings 10–12 mm long; blades narrowly obovate, slightly curved, rounded at the apex, 8 × 3 mm; auricle ca. 1 mm long, claw 4.5 mm long. Keel 9–10 mm long; blades triangular, with widely rectangular-curved lower edge and ± straight upper edge, acutish at the apex, 5 × 3 mm; auricle short, claw 5 mm long. Pods sessile, ovoid, 9–15 mm long, 7–11 mm high and 7–10 mm wide, ventrally and dorsally with prominent flat vein, at the apex with a minute beaklet, unilocular; valves hard, brownish, finely and densely transversely rugulose-veined, rather densely covered with fine, ascending, basifixed hairs up to 2 mm long and with few very short, medifixed, appressed hairs, soon glabrescent and mostly completely glabrous when fully ripe. Seeds 4–5, nearly quadrangular, 3 × 3 mm, greyish, densely irregularly rugulose-pitted. Distribution: In southwest, south and central Iran.

Specimens seen:

**Iran.** Fars: 25 km W of Shiraz, 28.8.1960, *Zohary 583* (HUJ) – Dudehak, 25 km NW of Shiraz, 1900 m, 8.6.1965, *Grant 17668* (W) – 20 km N Shiraz, 1760 m, 28.4.1961, *Pabot 6013* (G) – 27 km N Shiraz, 1630 m, 28.4.1961, *Pabot s.n.* (G) – 10 km SW of Shiraz, 1600 m, 12.4.1964, *Grant 15498* (W) – entre Shiraz et Persepolis, 800–1000 m, 2.5.1956, *Schmid 5513* (W) – 53 km NW Jahrom vers Shiraz, ca. 1100 m, 30.4.1961, *Pabot 6292* (G) – 75 km SE Shiraz, 1450 m, 30.4.1961, *Pabot 6240* (G, W) – 80 km SE Shiraz, 1430 m, 30.4.1961, *Pabot 6249* (G) – 12 km N Shiraz, 30.5.1965, *Ledingham & Assefi 4075* (W) – 25 km E Lar, 660 m, 2.5.1961, *Pabot 6442* (G). – Hormozgan: Hajiabad, 134 km S Sirjan, 1290 m, 6.5.1961, *Pabot 40815-E* (W) & *6795* (G). – Kerman: 3 km NE Sirjan, 1720 m, 7.5.1961, *Pabot 6851* (G) – 20 km NE Sirjan, 1820 m, 7.5.1961, *Pabot 6861* (G) – inter Saidabad et jugum Chah Choghuk, 1700–1900 m, 28.4.1948, *Rechinger, Aellen & Esfandiari 3172* (B, E, G, K, M, W) – zwischen Sirjan und Hajjiabad, 5.6.1976, *Manutshehri 508* (MSB) – Djiroft, 2.4.1965, *Soltan 6390-E* (W) – Montes Djamal Bariz inter Bam et Djiroft, infra Deh Bakri, ca. 1800 m, 8.–10.5.1948, *Rechinger, Aellen & Esfandiari 3865* (E, G, W) – 40 km S Kerman, 1500 m, 1.4.1964, *Grant 15393* (W) – prope Mahan, 1800 m, 6.5.1977, *Rechinger 55242* (M, W) – prope opp. Mahan, 1700 m, 24.3.1973, *Soják 177* (PR) – inter Chabbis [Shahdab] et Kerman, 1V.1859, *Bunge* (K). – Khuzestan: N of Dezful, above Damsite, 600 m, 28.3.1959, *Wendelbo 55* (BG) – Near the big Dez dam [N Dezful], 600 m, 28.3.1959, *Wendelbo 55* (BG). – Sistan: 12 km SE a vico Bazman, 13.4.1973, *Soják 1910* (PR) – inter Khash et Iranshahr, 1600 m, 17.5.1948, *Rechinger, Aellen & Esfandiari 4041* (W) – Iranshahr, 25.2.1949, *Sharif 592-E* (W) – Iranshahr to Bam, Kuh-e Pansareh, 25 km N Bazman, 900–1300 m, 27.4.1983, *Termeh, Moussavi & Tehrani 41101-E* (W) – Kahnouk, btween Zahedan and Khash, 1700 m, 22.4.1983, *Termeh, Moussavi & Tehrani 41108-E* (W).

*Astragalus talimansurensis* Sirj. & Rech.f., Anz. Österr. Akad. Wiss., Math.-Naturwiss. Kl. 1953 (90): 180. 1953 ≡ *A. mucronifolius* Boiss. var. *talimansurensis* (Sirj. & Rech.f.) Parsa, Fl. Iran 9: 131. 1966. Holotype: [Iran] Bakhtiari, Talimansur, 28.4.1940, *W. Koelz 15090* (W!: foto K!).

**Plant** spiny, cushion-like shrub up to 15 cm tall (up to 45 cm tall according to the collector), in most parts densely covered with appressed to subappressed, ± symmetrically to more rarely asymmetrically medifixed white hairs 0.3–1 mm long. Old stems thick, blackish, covered with remnants of old leaves, the stems of the year 1–2 cm long, the dense indumentum of fine, subbasifixed white hairs up to 1 mm long is not visible because of the very dense cover of leaves with their stipules. Stipules pale yellowish, 6–8 mm long, triangular-acuminate, not spiny at the tip, adnate to the petiole for ca. 3 mm, densely ciliate at the margins with basifixed hairs up to 0.5 mm long, otherwise mostly glabrous. Leaves 3–7 cm long, in the lower half without leaflets; petiole and rhachis up to 1 mm thick, pungent, densely covered with appressed to subappressed, irregularly medifixed hairs 0.2–0.6 mm long. Leaflets in 6–9 pairs, narrowly elliptic to elliptic, 4–6(–7.5) × 1–2 mm, at the apex subabruptly acuminate into a spine 0.5–1 mm long, on both sides densely covered with appressed to subappressed, mostly ± symmetrically medifixed hairs up to 0.5(–0.8) mm long. Peduncles 1–2 cm long, densely hairy. Racemes loosely 2–4-flowered. Bracts whitish, narrowly triangular, ca. 2 mm long, ciliate. Pedicels at fruiting time thickish, ca. 3 mm long, hairy. Bracteoles 1.5 mm long, linear, in upper part of the pedicel. Calyx campanulate, ca. 7 mm long, loosely covered with ± symmetrically medifixed, short hairs; teeth narrowly triangular, ca. 3 mm long, acuminate, scarcely pungent, with elevated midnerve. Petals pink. Standard ca. 12 mm long; blade suborbicular, ca. 8 mm wide, subabruptly narrowed into the short claw. Wings ca. 11 mm long, blades narrowly oblong, rounded at the apex, 5 × 1.5 mm; auricle ca. 1 mm long, claw 6 mm long. Keel 10 mm long; blades obliquely elliptic-triangular, with widely curved lower edge and nearly straight upper edge, acute at the apex, 5 × 2 mm; auricle 0.5 mm long, claw 5 mm long. Pods sessile, elliptic, straight, 15–17 mm long, 6–6.5 mm high and 3 mm wide, carinate ventrally and dorsally, at the apex shortly acuminate, unilocular; valves pale brownish, thick, slightly transversely rugulose, rather densely covered with very short subappressed hairs.

Distribution: Iran, endemic; known only from the type.

Specimen seen:

**Iran.** Chahar Mahal Bakhtiari: Talimansur, 26.4.1940, *Koelz 15090* (W).

Excluded species:

The following species, which are included into the section by RECHINGER, DULFER & PATZAK do not belong to *Leucocercis*:

*Astragalus semnanensis* Bornm. & Rech.f. has only basifixed hairs, persistent petals in fruit and hairy standard. It is the representant of the monotypic sect. *Semnanenses* Podlech & Zarre.

*Astragalus crassispinus* Bunge was described by the author based on a plant without flowers and fruits. Because of superficial similarities it was erroneously assigned to section *Leucocercis*. It has only basifixed hairs and clearly belongs to the plant which was later on described as *A. noziensis* Sirj. & Rech.f. of sect. *Anthylloidei* (RECHINGER 1958).

## VIII. New typifications and changes of typification in *Astragalus*-species.

- A. angarensis* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 126 in clave [et l.c. 15(1): 222. 1869]. – **Lectotype** (Flora USSR 1946): [Russia] Sibiria baicalensis ad Angaram prope Balagansk, [1830], *P.K.N.S. Turczaninow* (LE!; iso: BR!, C!, G!, H!, HAL!, K!, LE!, M!, OXF!, P!, W!, WAG!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. coronilloides* Ulbr. 1913, Bot. Jahrb. Syst. **1**, Beibl. 110: 14. – **Lectotype** (designated here): Zentral-China, West-Hupeh, Fang, vii.1901, *E.H. Wilson 2386* (K!; iso: E!, P!, W!).
- A. crassispinus* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 132(1868) in clave [et l.c. 15(1): 230. 1869]. Holotype: Afghanistan, *W. Griffith* distr. no. 1592 (K). Although the type of *A. crassispinus* has no flowers and fruits there can be no doubt about the identity with *A. noziensis* Sirj. & Rech.f., Dansk Biol. Skr. 9(3): 124. 1958. An epitype has to be chosen to show the important characters of the flowers and fruits. – **Epitype** (designated here): Afghanistan, Prov. Ghazni, Okak, NE altoplanitieí Dasht-e Nawar, ca. 3000 m, ca. 33°50' N, 67°55' E, 4.7.1962, *K.H. Rechinger 17760* (as *A. noziensis*) (M; iso: W).
- A. cuscutae* Bunge var. *pulcher* Beck 1886, Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 51: 339. Syntypes: [Iran] prope Kaebuterchan, 1882, *Th. Pichler*, ac inter Hamadan et Tschitschian. – **Lectotype** (designated here): near Kábuterchan [Kabutarahang], 2130 m, 14.5.1982, *Pichler* (W!; iso: K!).
- A. cytisoides* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 128 in clave [et l.c. 15(1): 224. 1869]. – **Lectotype** (Flora USSR 1946): [Kazakhstan] Karatau occ. Turkestanicae, 5000', 11.5.1866, *N.A. Sewerzow* (LE!; iso: G-BOIS: fragment!, P!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. dilutus* Bunge, Del. Sem. Dorpat. 1840: 7. 1840. – **Lectotype** (Fl. URSS 1946): ad rivulum Tuktugem in deserto Tschujae, 10.7.1839, *A. Politov* (LE!; iso: K!, P!, TUB!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. feddei* Sirj. 1943, Repert. Spec. Nov. Regni Veg. 52: 229. – **Lectotype** (designated here): Armenia turcica, Egin, Kota, 6.6.1890, *P.E.E. Sintenis 2568* (W!; iso: B!, BR!, K!, LE!, M!, MSB!, WU!).
- A. gypsaceus* Beck var. *angustifolius* Bornm. 1910, Beih. Bot. Centralbl. 27(2): 332. – **Lectotype** (designated here): [Iran] in monte Elwend, *Th. Strauss* (JE!; iso: B!). The lectotype has been named holotype in PODLECH 1988. Because there is a specimen seen by Bornmüller also in B, a lectotypification is necessary.
- A. kadschorensis* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 103 in clave [et l.c. 15(1): 182. 1869]. – **Lectotype** (Flora USSR 1946): Iberia caucasica prope Tiflis, Kadshory, supra ruinas Ker-ogly, 5.6.1866, *A.P. Owerin* LE!; iso: G-BOIS!, P!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. leansanicus* Ulbr., Bot. Jahrb. Syst. 36, Beibl. 82: 62. 1905. Type: [China] Shaanxi merid., in monte Lean shan, *Giraldi 4241* (B: destroyed: at K a good drawing and fragment). – **Lectotype** (designated here): *Giraldi 4241*: the drawing in connection with the fragment at K!; iso: W!: fragment.

- A. lepsensis* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 25 in clave [et l.c. 15(1): 29. 1869]. – **Lectotype** (Flora USSR 1946): [Kazakhstan] jugo Alatau ad fl. Lepsa et Sarchan, *G.S. Karelin & I.P. Kirilov 1362* (LE!; iso: BM!, K!, LE!, M!, P!, W!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. leptothalamus* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 135. 1868 [et l.c. 15(1): 232. 1869]. – **Holotype**: [Turkey] ad ripas Sari prope Karakoi ad montem Argaeum Ciliciae, 4500', 26.5.1859 *Th. Kotschy suppl. 198* (G-BOIS!; iso: HUJ!, P!: foto MSB!, W!). The lectotypification by PODLECH 1998 with the type in P is superfluous, because BUNGE quotes the specimen in hb. Boissier only.
- A. leucophanus* Bornm. 1906, Beih. Bot. Centralbl. 19(2): 242. – **Lectotype** (designated here): [Iran] Hamadan, in monte Elwend, v.1897, *Th. Strauss* (B!; iso: JE!).
- A. macropus* Bunge 1847, Arbeiten Naturf. Vereins Riga 1: 238. Syntypes: im Gouvern. Orenburg bei Spaskoje, 4.6.1839 (K!); am Flusse Ilek, 22.5.1841, *A. Lehmann*. – **Lectotype** (designated here): am Flusse Ilek, 22.5.1841, *A. Lehmann* (LE!; iso: K!). No specimen at P. Syntypes have been distributed as Rel. A. Lehmann. no. 351 (K!).
- A. macrotopis* Bunge 1868, Mém. Acad. Imp. Sci. Saint Petersburg 11(16): 127 in clave [et l.c. 15(1): 223. 1869]. – **Lectotype** (Flora USSR 1946): [Kazakhstan] Songaria, inter Arganaty et Keyssyk-auss, 3.5.1857, *P.P. Semenov* (LE!; iso: P!: foto MSB!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. macrourus* Hohen. subsp. *pseudotauricola* ('*pseudotauricolus*') Ponert, Feddes Repert. 83: 620. 1973. – **Lectotype** (designated here): [Turkey] Prov. Antalya, Elmali, 9.6.1860, *Bourgeau* (sub *A. tauricolus*) (E!: foto MSB; iso: W!). The author cites only the data of the type collection but gives no reference, where the type is housed. A. lectotypification is therefore necessary.
- A. monozyx* Bornm. 1908, Mitth. Thüring. Bot. Vereins, n.s. 23: 18. – **Lectotype** (designated here): [Iran] Hamadan in montibus Wafs, 10.6.1905, *Th. Strauss* (B!; iso: B!, LE!).
- A. oreades* C.A.Mey. 1831, Verz. Pfl. Cauc.: 141. – **Lectotype** (Podlech & Sytin, designated here): in regione alpina mt. Kasbek, 7200–8600', 27.9.1829, *C.A. Meyer* (LE!; iso: LE!).
- A. pullus* N.D.Simpson 1913, Notes Roy. Bot. Gard. Edinburgh 8: 125. – **Lectotype** (designated here): [China] Lichiang Range, Yunnan, 10000–10500', vi.1906, *Forrest 2379* (K!; iso: E!, LE!).
- A. salatavicus* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 117 [et l.c. 15(1): 201. 1869]. – **Lectotype** (Flora USSR 1946): [Russia] in alpe Chanakoi-tau Salataviae, i.e. Daghestaniae borealis, 8800', 24.7.1861, *A.P. Owerin* (LE!; iso: G-BOIS!, P!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. semenovii* Bunge 1866, Bull. Soc. Imp. Naturalistes Moscou 39(2): 22. – **Lectotype** (Flora USSR 1946): in der Nähe von Mai-tübe [in valle Ili], 11.5.1857, *P.P. Semenov* (LE!; iso: P!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. semibilocularis* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 103 in clave [et l.c. 15(1): 183. 1869]. Syntypes: Altai, *Ledebour, Meyer, Bunge et alii*. [Riddersk, *Bunge* (LE!)]. – **Lectotype**: Riddersk (LE!). The lectotypification by PODLECH 1998 with the type in P (hb. Bunge: Fl. orient. Altaica 1839, *A. von Bunge*: with flower dissection) is

- superfluous because the type is indicated in Fl. USSR as to come from Ridders and to be in LE.
- A. sesbanoides* Benth. 1835, in Royle, Illustr. Bot. Himal. Mount.: 199. – **Lectotype** (designated here): Mussooree, *J.F. Royle* (LIV!; iso: K!, LIV!).
- A. sungpanensis* E.Peter 1938, Acta Horti Gothob. 12: 34. – **Lectotype** (designated here): China, Szechuan, Sungpan, 6.7.1922, *H. Smith 2238* (W!; iso: LD!, PE!).
- A. thionanthus* Bormm. 1906, Beih. Bot. Centralbl. 19(2): 243. Syntypes: Luristan, in monte Schuturunku, vi.1899, *Th. Strauss*; inter Sultanabad et Kum in districtu Chaladschistan, v.1899, *Th. Strauss* (B!, JE!). – **Lectotype** (designated here): Luristan, in monte Schuturunku, vi.1899, *Strauss* (JE!; iso: B!).
- A. tschujensis* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 22 in clave [et l.c. 15(1): 24. 1869]. – **Lectotype** (Flora USSR 1946): in lapidosis alpinis ad Tschujam, *A. Politov* (LE!; iso: G!, LE!, MSB!, P!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. tumbatsicus* C.Marquand & Airy Shaw 1929, J. Linn. Soc., Bot. 48: 171. – **Lectotype** (here designated): SE. Tibet, Tumbatse, 3400 m, 5.8.1924, *F.F. Kingdon Ward 6057* (K!; iso: E!).
- A. umbellatus* Bunge 1868, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 24 in clave [et l.c. 15(1): 29. 1869]. – **Lectotype** (Flora USSR 1946): [Russia] insula Nowaja-Semlia ad sinum Kostin-schar, 11.8.1837, *A. Lehmann* (LE!; iso: P!). The lectotypification by PODLECH 1998 with the type in P is superfluous because the type is indicated in Fl. USSR 1946 as to be in LE.
- A. variegatus* Franch. var. *koksuensis* Popov 1928, Trudy Sredne-Aziatsk. Gosud. Univ., ser. 8b, Bot. 3: 38. – **Lectotype** (designated here): Tianschan occid., ad cacumina montis Tschimgan minoris, 4.7.1926, *M. Popov & A.I. Vvedensky* in Herb. Fl. As. Med. 373 (LE!; iso: B!, BR!, BRNU!, E!, K!; LE!, MA!, MSB!, MW).
- A. xanthomeloides* Korovin & Popov 1928, Trudy Sredne-Aziatsk. Gosud. Univ., Ser. 8b, Bot. 3: 57. – **Lectotype** (designated here): ad cacumina montium Samarkandicorum prope Sazagan, 13.5.1925, *M. Popov* in Herb. Fl. As. Med. 400 (LE!; iso: BRNU!, LE!, MA!, MW, PR!, TASH).
- A. xiphobolus* Popov 1928, Trudy Sredne-Aziatsk. Gosud. Univ., Ser. 8b, Bot. 3: 39. – **Lectotype** (designated here): Tian-schan occ., prope stat. Sary-agatsch, 28.5.1928, *Granitov* in Herb. Fl. As. Med. 374 (LE!; iso: B!, BP!, BRNU!, E!, K!, LE!, MA!, MW, P!, PR!, W!).

## IX. Some new species in genus *Astragalus*:

*Astragalus behbahanensis* Podlech, spec. nov. (Sect. *Caprini*).

Holotypus: Iran, Kuhzestan, Behbahan, 400 m, 3.3.1972, *H. Foroughi 3278* (MSB; iso: HUI).

Differt ab *A. akhanii* Podlech rhachide pilis ad 3 mm longis (nec 0,3–1 mm longis) obtecto, foliis 11–15-jugis (nec 7–9-jugis), foliolis 6–8 × 4–6 (nec 10–22 × 8–17) mm, apice late rotundatis (nec acutiusculis vel breviter acuminati-mucronulatis), supra glabris (nec laxe pilosis), subtus densiuscule pilis oblique patentibus ad 2,5 mm longis obtectis, racemis 7–10 (nec 2–3)-floris, pedicellis 3–4 (nec 5–8) mm longis, calyce 13–14 (nec ca. 17) mm longo,

pilis longioribus oblecto, dentibus 2,5–3 (nec 4–6) mm longis. Lamina alarum auricula 2,5–3 (nec ca. 1) mm longa provisa.

Plants acaulescent, ca. 20 cm tall, with white hairs up to 3 mm long. Caudex up to 8 mm thick, at the apex shortly branched. Stipules whitish-membranous, oblong, 10–15 mm long, the lower ones obtuse, the upper ones acute, adnate to the petiole for 2–5 mm, ciliate at the margins with spreading hairs 0.8–1.5 mm long and very sparsely furnished with minute sessile glands, otherwise glabrous. Leaves 12–20 cm long; petiole 2–6 cm long, like the rachis striate-sulcate, loosely covered with  $\pm$  spreading hairs 1.5–2.5(–3) mm long. Leaflets in 11–15 pairs, elliptic to widely elliptic, 6–8  $\times$  4–6 mm, at the apex widely rounded to slightly emarginate, on upper side glabrous, on underside and at the margins loosely to rather densely covered with ascending hairs 1.8–2.5 mm long. Peduncles 5–8 cm long, hairy like the rachis. Racemes 7–10-flowered. Bracts whitish-hyaline, 6–9 mm long, very narrowly triangular, long hairy. Pedicels 3–4 mm long, spreadingly hairy. Calyx 13–14 mm long, tubular, at the base slightly gibbous, slightly obliquely truncate at the mouth, straw-colored, rather densely covered with very thin, tangled, spreading hairs 1.5–2 mm long; teeth unequal, the upper two from triangular base attenuate, ca. 2.5 mm long, the lower three narrowly triangular, ca. 3 mm long, all densely hairy on innerside. Petals yellow. Standard 22–23 mm long; blade slightly recurved, obovate, 9–11 mm wide, at the apex emarginate, at the base subangularly narrowed into the rather short claw. Wings 21–23 mm long; blade narrowly oblong, rounded at the apex, 9–10  $\times$  3 mm; auricle 2.5–3 mm long, claw 12–14 mm long. Keel 20–22 mm long; blade obliquely elliptic-curved, with widely and nearly rectangular-curved lower edge and distinctly concave upper edge, at the apex obtuse, 8  $\times$  4 mm; auricle ca. 1 mm long, claw 11–13 mm long. Staminal tube very oblique at the mouth. Ovary with a stipe 1–2 mm long, narrowly elliptic, white-hairy; style glabrous. Legumens unknown.

Remark: This new species clearly belongs to the *A. caprinus*-group (see PODLECH 1988) because of the long spreading hairs and the long auricles of wing blades. It is somewhat isolated here by the leaflets glabrous on upper side and by the rather short calyx teeth.

*Astragalus bozakmanii* Podlech, spec. nov. (Sect. *Caprini*).

Holotypus: Türkei, Prov. Ankara, zwischen Kizilcahamam und Çeltikçi Yolu, 6.6.1970, I. Bozakman & K. Fitz 906 (W).

Differt ab *A. multijugo* DC. indumento e pilis ad 3 mm (nec 0,2–0,5(–1) mm) longis consistente, stipulis a petiolo fere liberis (nec per 4–5 mm adnatis), foliis ca. 15-jugis (nec 20–30-jugis), foliolis utrinque subappresse (nec oblique patenter ad patenter) pilosis, pedunculis 2–4 cm (nec 7–17 cm) longis, bracteis 5–9 (nec 2–4) mm longis.

Plants ca. 15 cm tall, subacaulescent, covered with spreading, white to reddish hairs up to 3 mm long. Caudex slender. Stems up to 3 cm long, sparsely hairy. Stipules whitish-membranous, 10–12 mm long, narrowly triangular, nearly free from the petiole, sparsely to loosely hairy. Leaves 15–20 cm long; petiole 4–6 cm long, like the rachis striate-sulcate, rather

densely covered with fine, spreading hairs 1–3 mm long. Leaflets in ca. 15 pairs (in first leaves in ca. 10 pairs), elliptic, 10–13(–18) × 5–6(–8) mm, at the apex minutely acuminate-mucronulate, on both sides loosely to rather densely covered with subappressed hairs up to 2 mm long. Peduncles 2–4 cm long, hairy like the rhachis. Racemes loosely 15–20-flowered. Bracts whitish, narrowly ovate to narrowly triangular, 5–9 mm long, loosely hairy. Pedicels 3–5 mm long, spreadingly hairy. Calyx 12–13 mm long, tubular, slightly obliquely gibbous at the base, slightly obliquely cut at the mouth, loosely to rather densely covered with fine spreading hairs up to 3 mm long; teeth 5–6 mm, unequal, the upper two from triangular base attenuate, the lower three narrowly triangular, all densely hairy on innerside. Petals glabrous, yellow, the standard slightly reddish-suffused. Standard 18–20 mm long; blade ca. 9 mm wide, obovate, slightly emarginate at the apex, at the base gradually narrowed into the cuneate claw. Wings 17–19 mm long; blades narrowly oblong, rounded at the apex, 9–10 × 3 mm; auricle ca. 1 mm long, claw 7–9 mm long. Keel ca. 15 mm long; blades obliquely triangular, with widely, nearly rectangular-curved lower edge and slightly curved upper edge, acutish at the apex, 6 × 4 mm; auricle very short, claw 9 mm long. Staminal tube oblique at the mouth. Ovary with a stipe ca. 2 mm long, densely hairy; style hairy up to the middle, below the stigma with a dorsal line of short spreading hairlets. Legumes unknown.

*Astragalus spitzembergeri* Podlech, spec. nov. (Sect. *Caprini*).

Holotypus: Türkei, Prov. Antalya, Kuhu Dag S von Elmali, Gebiet von Çiglikara, 16.6. 1969, K. Fitz & F. Spitzemberger 875 (W).

Differt ab *A. antalyensis* Podlech planta sparse pilosa (nec glaberrima), stipulis per 1–2 (nec 3–7) mm petiolo adnatis, foliis 18–22 (nec 7–15)-jugis, calyce 12–13 (nec 10) mm longo dentibus 5–7 (nec 2–3) mm longis, leguminibus semibilocularibus (nec fere complete bilocularibus, pilis tenuibus 2–3 mm long obtectis (nec glabris).

Plants 20–30 cm tall, subcaulescent, sparsely covered with white spreading hairs. Caudex strongly divided, with many short, subterranean branches. Stems up to 6 cm long, angular-sulcate, glabrous. Stipules whitish-membranous, 9–12 mm long, narrowly triangular, adnate to the petiole for 1–2 mm, ciliate at the margins with hairs 0.5–1 mm long, otherwise glabrous. Leaves 12–30 cm long; petiole 4–10 cm long, like the rhachis sparsely to loosely furnished with spreading hairs 1–1.5 mm long. Leaflets in 18–22 pairs, narrowly elliptic to elliptic, obtuse or more rarely acutish at the apex, 6–15 × 3–6 mm, glabrous on upper side or with few scattered hairs only, at the margins and on underside especially at the midvein sparsely to loosely furnished with subappressed hairs up to 1 mm long. Peduncles 0.5–1.5 cm long, glabrous. Racemes loosely 5–9-flowered, several at the base of leaves, sometimes forming a dense, globular head up to 6 cm in diameter in fruit. Bracts whitish, narrowly triangular to linear-acute, 5–7 mm long, sparsely hairy. Pedicels 6–10 mm long, often flexuose. Calyx shortly tubular, 12–13 mm long, sparsely hairy, especially toward the teeth; teeth subulate, 5–7 mm long. Petals yellow. Standard 20 mm long; blades slightly recurved, elliptic to obovate, ca. 10 mm wide, slightly retuse at the apex, at the base gradually narrowed into the cuneate claw. Wings 18 mm long; blades narrowly oblong, rounded at the apex, 9–10 × 3 mm;

auricle ca. 1 mm long, claw 9 mm long. Keel 15 mm long; blades obliquely elliptic, with widely rectangular-curved lower edge and slightly curved upper edge, acute at the apex, 5.5 × 4 mm; auricle short, claw 9 mm long. Staminal tube slightly oblique at the mouth. Ovary sessile, elliptic, densely hairy; style below the stigma with a line of short spreading hairlets. Pods sessile, elliptic to obliquely elliptic seen from the side, 10–15 mm long, 5–6 mm high and 2.5–3 mm wide, strongly carinate ventrally, slightly grooved dorsally, subabruptly attenuate at the apex into a beak 2–3 mm long, semibilocular; valves straw-colored, thin, rather densely covered with very fine, ascending to spreading hairs 2–3 mm long. Seeds ca. 5 in each locule, 3.5–4 × 2–2.5 mm, brown.

*Astragalus tecti-mundi* Freyn subsp. *orientalis* Podlech, subsp. nov. (sect. *Cenantrum*).

Holotype: Pakistan, Hunza- und Nagar-Gebiet, Daintar, 3300–3900 m, 1959, *F. Lobbichler 115* (M; iso: MSB).

Differt a subsp. *tecti-mundi* foliis 5–7-jugis (nec 4–5-jugis), foliolis minoribus, subtus sparse ad laxe appresse ad subappresse pilosis (nec glabris vel subglabris).

Other specimens seen:

**Pakistan.** Gilgit: Tal NE von Chalt, 3270 m, 27.7.1989, *Bosshard, Klötzli & Schaffner 053.10* (MSB) – Gilgit, 1880, *Tanner 148* (K) – Karakorum, Shinghai Gah to Pahot Gali, 35°48–55 N, 74°10–17° E, 3840 m, 31.7.1990, *G. & S.Miehe 1302* (MSB) – Hunza- und Nagar-Gebiet, Baltar, 4200 m, *Lobbichler 575* (M) – Gharesa Glacier 12 miles E of Nagar, 3890 m, 14.8.1960, *Polunin 6239* (E). – Baltistan: Tibet, Balti, 17.7.1856, *Schlagintweit cat. 6077* (M) – Shagarthang Valley, 3360 m, 18.7.1892, *Duthie 12109* (E) – Ahane Rama, Astor Distr., 3360 m, 5.7.1946, *R.R. Stewart 22906* (K).

**India.** Kashmir: Ladak, Tsukse, 3960 m, 26.7.1931, *Koelz 2453* (E, W) – Rungdum, 4 km NW of Zuido, 4130 m, 1980, *Southampton University 145* (K) – Khardang La above Leh, *Heyde* (K) – Zanskar, NW of the Pensi-la, 3650–4270 m, *Stolitzka* (K) – Suru-Siriwang, Ladak side, really Zanskar, 1.9.1912, *R.R. Stewart 290* (K). – Himachal Pradesh: Lahul, Rangcha Galli, 4420 m, 8.7.1941, *Bor 14018* (E, K) – Kulu-Lahaul, near Pasparag, 6.7.1888, *Drummond 23484* (E, K).

**China.** Xinjiang: Distr. Taxkorgan, 2.7.1978, *Xinjian Exped. 1160* (WUK). – Xizang: SE. Tibet, Gyamda Chu, NE tributary, Pasum Tso NE, 4700–4800 m, 30°03' N, 93°59' E, 31.8.1994, *Miehe & Wündisch 94-250-2* (MSB) – Tibetan Himalaya, Everest E, Kama Chu, N bank of upper Kangchung Gl., 5130 m, 28°59' N, 87°03' E, 14.10.1989, *Dickoré 6383* (Hb. Dickoré).

*Astragalus poluninii* Podlech, spec. nov. (sect. *Chlorostachys*).

Holotypus: Nepal, Gum, near Rara, 7.000 ft, 27.8.1952, *O. Polunin, W.R. Sykes & L.H.J. Williams 3049* (E!).

Differt ab *A. chlorostachyde* Lindl. cui similis sparsissime ad sparse pilosus (nec partim laxe ad densiuscule vel ipse dense pilosus), bracteis 1,5–3 (nec 3–8) mm longis, caducissimis, vexillo 15–16 mm (nec 10–13 mm) longo.

Plants more than 40 cm tall (basal parts missing), very sparsely to sparsely furnished with ± appressed hairs 0.3–0.5 mm long. Stem more than 40 cm long, angular-sulcate, in middle part 3–4 mm in diameter, erect, glabrous. Stipules green, 3–6 mm long, narrowly triangular, free, sparsely black and white ciliate, at the base and the base of petiole with minute, sessile

glands. Leaves 6–20 cm long; petiole 1–2.5 cm long, like the rhachis distinctly grooved on upper side, sparsely hairy or with scattered hairs only. Leaflets in 9–13 pairs, narrowly elliptic, 8–20 × 3–7 mm, acute to shortly acuminate at the apex, on upper side glabrous or with few scattered hairs only, on underside sparsely white hairy. Peduncles several in one stem, in the axils of the middle and upper leaves, 6–10 cm long, striate, glabrous or subglabrous. Racemes 4–11 cm long, loosely many-flowered, later on elongating and up to 25 cm long. Bracts falling at the beginning of anthesis, greenish to whitish-membranous, narrowly triangular, 1.5–3 mm long, black and white ciliate with hairs up to 1 mm long, near the base with few minute sessile glands. Pedicels at the beginning of anthesis 1–2 mm long, sparsely hairy, in fruit up to 5 mm long. Bracteoles absent. Calyx campanulate, 6–7 mm long, at the base slightly oblique, slightly obliquely cut at the mouth, subglabrous or sparsely black hairy, at the upper margin and teeth sparsely ciliate; teeth unequal, the lower three subulate, 1–1.5 mm long, the upper two remote, triangular, 0.4–0.5 mm long. Petals pale yellow, with age or dry sometimes pink-suffused. Standard 15–16 mm long; blade elliptic, 6–7 mm wide, emarginate at the apex, gradually narrowed at the base into the rather long claw. Wings ca. 15 mm long; blades narrowly oblong, rounded at the apex, ca. 7 × 2 mm; auricle ca. 2 mm long, claw ca. 8 mm long. Keel ca. 14 mm long; blades obliquely elliptic-triangular, with in the middle widely curved lower edge and ± straight upper edge, obtuse at the apex, ca. 6 × 3 mm; auricle 0.5–1 mm long, claw ca. 8 mm long. Staminal tube oblique at the mouth. Ovary on a stipe 5–7 mm long, glabrous; stigma glabrous. Legumes (immature) on a stipe 8–10 mm long, narrowly elliptic to oblong, 15–17 mm long, ca. 6–7 mm high and wide, at the apex subabruptly narrowed into the straight beak 3–4 mm long; valves thin, pale yellowish, glabrous.

*Astragalus rhododendrophila* Podlech & L.R.Xu, spec. nov. (sect. *Chlorostachys*).

Holotypus: China, Xizang, S. Tibet, N of Lhünze, Subansiri tributary, Xezar W of Sanggagqoiling, 4070 m, 28°36' N, 92°32' E, *Betula-Rhododendron*-forest, 27.7.1994, G. Miede & U. Wündisch 94-107-7 (MSB!).

Differt ab *A. tumbatsico* C.Marquand & Airy Shaw caulibus in parte basali densiuscule pilis albis confuse patentibus ad 1,5 mm longis instructis (nec glabris vel pilis nigris brevibus appressis tantum instructis), foliolis 10–14 (nec 7–9)-jugis, bracteis albi-membranaceis, anguste triangularibus, 3 mm longis (nec viridibus late ovatis, 4–7 mm longis), lamina carinae distincte majore, 7 × 3,5 (nec 4 × 2,5) mm, leguminibus dense praecipue nigri-pilosis (nec glabris).

Plants 50–60 cm tall. Stem 45–52 cm long, 1–3 mm in diameter, hollow, striate, in lower parts rather densely covered with tangled, spreading, white hairs 0.5–1 mm long and with few appressed black hairs 0.3–0.4 mm long, more rarely partly glabrescent and with age also completely glabrous, in upper parts sparsely to loosely covered with short appressed black hairs 0.3–0.5 mm long. Stipules greenish, narrowly triangular, 5–9 mm long, free from the petiole and from each other, sparsely black and white hairy. Leaves 5–8 cm long, subsessile; rhachis slender, loosely furnished with subappressed to ascending, predominantly black hairs 0.1–0.3 mm long. Leaflets in 10–14 pairs, of thin texture, narrowly elliptic, rounded at the apex, 5–13 × 1–3.5 mm, on upper side glabrous, on underside loosely, in the youth more

densely covered with appressed white hairs 0.3–0.5 mm long. Peduncles 6–8 cm long, angular-sulcate, hairy like the upper part of stem. Racemes 4–6 cm long, loosely many-flowered; axis hairy like the peduncle, flowers  $\pm$  spreading. Bracts whitish-membranous, narrowly triangular, ca. 3 mm long, black hairy, at the margins with minute, sessile glands. Pedicels 3–5 mm long, densely black hairy. Calyx campanulate, 4–5 mm long, strongly obliquely gibbous at the base, obliquely cut at the mouth, loosely to rather densely covered with subappressed black hairs 0.3–0.6 mm long and sometimes also with a few somewhat longer white hairs; teeth slightly unequal, the three abaxial near together, narrowly triangular, ca. 1.5 mm long, the two adaxial remote, triangular, ca. 1 mm long, all densely black hairy on inner side. Petals cream (?), sometimes flushed with violet, all of nearly the same length. Standard ca. 13 mm long; blade ca. 5 mm wide, elliptic, with slightly distinct short tongue-like, widely emarginate apex, below the middle slightly constricted and narrowed into the widely cuneate claw. Wings ca. 12 mm long; blades narrowly oblong, obtuse at the apex,  $7 \times 2$  mm; auricle ca. 2 mm long, claw ca. 5 mm long. Keel ca. 12 mm long; blades obliquely obovate, with widely curved lower edge and slightly concave upper edge, obtuse at the apex,  $7 \times 3.5$  mm; auricle ca. 1 mm long, claw ca. 6 mm long. Staminal tube  $\pm$  truncate at the mouth. Ovary on a slender stipe ca. 5 mm long, spindle like, densely white hairy; style and stigma glabrous. Legumes (immature) with a slender stipe ca. 5 mm long, densely covered with ascending white and predominantly black hairs.

*Astragalus owirensis* [Ali ex] Podlech, spec. nov. (sect. *Cystium*).

Holotype: Pakistan, Chitral, Owir (Nichagh), 11.000 ft,  $36^{\circ}7' N$ ,  $71^{\circ}55' E$ , 11.6.1958, S.A. Bowes Lyon 874 (BM!; iso: L!).

Differt ab *A. skorniakovii* B.Fedtsch. foliis brevibus, 3–4 cm longis (nec 5–20 cm longis) 4–6-jugis (nec 10–20-jugis), pedunculis brevibus, calyce saltem partim pilis arcte asymmetricice medifixis oblique patentibus ad patentibus nigris vel griseis obtecto (nec pilis appressis nigris albisque,  $\pm$  symmetricice medifixis) obtecto, petalis dilute flavis violacei-suffusis (nec violaceis) vexillo obovato apice breviter lingulatim angustato.

Plants 10–30 cm tall, acaulescent or nearly so, covered in vegetative parts with  $\pm$  appressed to subappressed, mostly  $\pm$  symmetrically medifixed, white hairs. Caudex up to 10 mm in diameter, slightly to strongly divided, with short branches, covered with remnants of old leaves. Stems, if present, up to 1 cm long, hairy, hidden by the dense stipules. Stipules whitish-hyaline to membranous, 5–8 mm long, adnate to the petiole for 3–4 mm, connate behind the stem up to 1/3 to 1/2 of the length, the free tips often greenish, triangular in the lower stipules, narrowly triangular to subulate-acuminate in the upper ones, glabrous or with few asymmetrically medifixed to basifixed hairs at the margins, especially toward the tips. Leaves 3–4 cm long; petiole 1–2 cm long, like the rhachis rather densely covered with appressed to subappressed, often somewhat flexuose hairs 0.8–1 mm long. Leaflets in 4–6 pairs, narrowly ovate to narrowly obovate, acute to shortly acuminate at the apex,  $5\text{--}9 \times 1.5\text{--}4$  mm, on both sides loosely to rather densely covered with appressed hairs 0.8–1.5 mm long. Peduncles 2.5–4.5 cm long, angular-sulcate, sparsely to loosely hairy like the rhachis but in upper part often with mixed black and white hairs. Raceme ovoid, 2.5–4 cm long, rather densely few to many-flowered; axis with black hairs. Bracts whitish-membranous, ovate to narrowly triangular, 4–5 mm long, sparsely to loosely black hairy, at the margins also with

basifixed hairs. Pedicels 3–4 mm long, densely covered with tangled, ascending black hairs. Calyx 11–13 mm long, tubular to slightly inflated, scarcely oblique at the base, strongly obliquely cut at the mouth, rather densely covered with strongly asymmetrically medifixed, appressed to ascending, partly even spreading black or black and greyish hairs 0.5–1 mm long; teeth narrowly triangular to linear-acute, 2.5–4 mm long, on innerside black hairy. Petals pale yellow, tinged with violet. Standard 21 mm long; blade 9 mm wide, obovate, at the apex shortly but distinctly tongue-like narrowed, widely retuse, at the base gradually cuneately narrowed. Wings 18 mm long; blades narrowly oblong, shortly narrowed toward the obtuse apex, 7.5 × 2.5 mm; auricle ca. 1 mm long, claw 10–11 mm long. Keel 16 mm long; blades obliquely elliptic with widely rounded lower edge and ± straight upper edge, obtusish at the apex, 7 × 3.5 mm. Staminal tube truncate at the mouth. Ovary with a stipe 1.5–2 mm long, linear, glabrous. Legumes unknown.

The type collection was first named *A. owirensis* by Ali but later on he thought it to be identical with *A. skorniakovii* B.Fedtsch. The description of the latter species in Fl. Pakistan 100 (Papilionaceae) fits well the description of that species in Fl. USSR but not that of the cited specimen. This is in fact a new species described here.

*Astragalus argentocalyx* [Ali ex] Podlech, spec. nov. (sect. *Dissitiflori*).

Holotype: Pakistan, Chitral, Yarkhun, between 36°30' N, 72°40' E and 36°48' N, 73°05' E, 3050 m, 19.6.1958, *S.A. Bowes Lyon 965* (BM).

Differt ab *A. urgutinus* Lipsky foliis 4–5 (nec 6–10) cm longis; foliolis ca. 5-jugis (nec 5–9-jugis), linearibus 10–17 × 1.5–2 (nec 7–10 × 1.5–3) mm, complicatis (nec planis); racemis tantum 5–7-floribus (nec multi-floribus), axi eorum pilis ± symmetrice medifixis subappressis albis 0.4–0.5 mm longis et pilis basifixis, patentibus albis et praecipue nigris ca. 1(–1.5) mm longis obtecto (nec pilis symmetrice ad asymmetrice bifurcatis ascendentibus nigris 0.3–0.4 mm longis et pilis basifixis albis tantum ad 1 mm longis obtecto); bracteis ovatis (nec anguste triangularibus), densissime villosis pilis basifixis praecipue nigris obtectis (nec densiuscule pilis partim asymmetrice medifixis albis nigrisque obtectis); calycis tubo late cylindraco ad leviter ventricosus (nec cylindraco), densiuscule pilis asymmetrice medifixis ad basifixis subappressis ad fere patentibus nigris 0.3–0.5 mm longis et densiuscule ad dense pilis basifixis, ascendentibus albis 1.5–2 mm longis obtecto (nec pilis nigris subappressis et albis tantum ad 1 mm longis obtecto); petalis flavi-brunnescentibus (nec albi-violaceis); petalis longioribus; ovario dense pilis albis oblique patentibus ad 1.5 mm longis obtecto.

Plants suffrutescent, ca. 40 cm tall. Caudex with a pluricipital root-crown. Stems several, branched, parts of the current year 9–12 cm long, densely to very densely covered with ± symmetrically medifixed, appressed white hairs 0.4–0.7 mm long, with some black hairs mixed in. Stipules narrowly triangular, 3–4 mm long, shortly adnate to the petiole, with appressed white and black hairs. Leaves 4–5 cm long, those of the lateral branches mostly distinctly shorter, all sessile or with petiole up to 0.8 cm long; rhachis slender, hairy like the stem. Leaflets in ca. 5 pairs (on leaves of side-branches often only in 3 pairs), linear, 10–17 × 1.5–2 mm, at the apex acute, on upper side loosely, on underside densely covered

with appressed white hairs 1–1.2 mm long, folded. Peduncles 9–12 cm long, rather densely to densely appressed hairy like the stem, below the raceme with increasing black hairs. Racemes 3–4 cm long, loosely 5–7-flowered, scarcely elongating in fruit; axis covered with  $\pm$  symmetrically medifixed, subappressed white hairs 0.4–0.5 mm long and with basifixed, spreading white and predominantly black hairs up to 1(–1.5) mm long. Bracts 3–4 mm long, ovate, very densely villous, with basifixed, ascending to spreading, predominantly black hairs ca. 1 mm long. Pedicels 1–2 mm long, white and black hairy; flowers subhorizontally spreading. Calyx widely tubular to slightly ventricose, 13–15 mm long, gibbous at the base, obliquely cut at the mouth, rather densely covered with asymmetrically to strongly asymmetrically medifixed or basifixed subappressed to  $\pm$  spreading black hairs 0.3–0.7 mm long and rather densely to densely with basifixed, tanglex ascending white hairs 1.5–2 mm long; teeth narrowly triangular, 2–3 mm long, hairy on inner side, at the base densely white, at the apex predominantly black hairy. Petals buff yellow. Standard ca. 24 mm long; blade obovate, ca. 8 mm long, slightly emarginate at the apex, at the base slightly angularly passing into the rather long, narrowly cuneate claw. Wings ca. 24 mm long, as long as the standard; blades narrowly obovate, constricted above the auricle, rounded at the apex,  $9-9.5 \times 3.5$  mm; auricle ca. 0.5 mm long, claw 14–15 mm long. Keel 20–21 mm long; blades obliquely elliptic, with widely curved lower edge and nearly straight upper edge, subacute at the apex,  $7.5 \times 4$  mm; auricle minute, claw ca. 13 mm long. Staminal tube truncate at the mouth. Ovary sessile, fusiform, densely covered with ascending white hairs up to 1.5 mm long; style glabrous. Legumes unknown.

Remark: The type of this species was recognized by Ali as a new species but later on he has changed his mind according to the determination by A. Borissova who named it *A. urgutinus* Lipsky. In spite of some superficial resemblance it is a species distinct from the latter which is endemic in the western Zeravshan and Turkestan Ranges.

*Astragalus bingöellensis* Podlech, spec. nov. (§ *Dissitiflori*).

Holotype: Turkey, Prov. Mus, [B8] Buglan Geçidi (pass) E Solhan, between Bingöl and Mus, 1640 m, 17.7.1983, *M. Nydegger 18265* (MSB; isotype: BASBG).

Plantae 35 cm altae, dense pilosae. Stipulae membranaceae, 4–8 mm longae, petiolo adnatae. Folia 5–10 juga, foliolis ellipticis  $7-18 \times 2,5-7$  mm, laxe ad densiuscule pilosis. Pedunculus ca. 13 cm longus, pilosus. Racemus ca. 20 cm longus, laxe multiflorus. Bractae membranaceae, 2,5–3 mm longae, praecipue nigri-pilosae. Pedicelli 2–2,5 mm longi. Calyx 7–8 mm longus, campanulati-tubulosus, pilis asymmetricice medifixis appressis obtectus, dentibus 2–2,5 mm longis. Vexillum 15–17 mm longum et ca. 6 mm latum. Alae ca. 10 mm longae. Legumina sessiles, oblique elliptica, leviter curvata, dense pilis ascendentibus arcte asymmetricice medifixis oblecta.

Plants 35 cm tall, caulescent, densely hairy. Stem ca. 10 cm long, branched, angular-sulcate, very densely covered with symmetrically to asymmetrically, often somewhat flexuose, appressed to subappressed white hairs ca. 1 mm long. Stipules membranous, 4–8 mm long, adnate to the petiole for 1–4 mm, narrowly triangular to nearly subulate, rather densely

covered with symmetrically to strongly asymmetrically medifixed white, near the apex also with some black hairs. Leaves 9–13 cm long; petiole 3–4 cm long, like the rachis grooved on upper side, loosely to densely hairy like the stem. Leaflets in 5–10 pairs,  $\pm$  elliptic, 7–18  $\times$  2.5–7 mm, at the apex shortly acuminate, loosely to rather densely covered with  $\pm$  symmetrically medifixed, appressed white hairs 0.8–1 mm long. Peduncle 13 cm long, angular-sulcate, loosely white hairy like the stem, towards the raceme with increasing, distinctly shorter black hairs. Raceme ca. 20 cm long, loosely many-flowered; axis hairy like upper part of peduncle. Bracts membranous, narrowly triangular, 2.5–3 mm long, with predominantly black hairs. Pedicels 2–2.5 mm long, white and black hairy, flowers erect. Bracteoles none. Calyx 7–8 mm long, campanulate-tubular, slightly obliquely cut at the mouth, rather densely covered with asymmetrically medifixed, often flexuose, appressed to subappressed white hairs 1–1.2 mm long and with sometimes shorter black hairs; teeth subulate, 2–2.5 mm long, densely white hairy on innerside. Corolla violet fading to yellowish-brown or yellowish fading to violet. Standard 15–17 mm long; blade ca. 6 mm wide, elliptic, rounded at the apex, subabruptly narrowed into the short, cuneate claw. Wings ca. 10 mm long; blades narrowly oblong, obtuse at the apex, 6  $\times$  2 mm; auricle 0.8 mm long, claw ca. 5 mm long. Keel ca. 9 mm long, blades obliquely oblong, with in the middle slightly curved lower edge and slightly sigmoid-concave upper edge, acutish at the apex, 4.5  $\times$  2 mm; auricle ca. 0.3 mm long, claw ca. 4 mm long. Staminal tube truncate at the mouth. Ovary sessile, elliptic, white hairy; style glabrous. Legumes (unripe) sessile, obliquely elliptic, slightly curved, with strongly curved dorsal side and slightly concave ventral side, ca. 10 mm long, 3 mm high, attenuate at the apex into a beak ca. 3 mm long; valves densely covered with strongly asymmetrically medifixed, ascending white hairs 1–1.2 mm long.

*Astragalus doabensis* Podlech, spec. nov. (sect. *Dissitiflori*).

Holotype: North Afghanistan, Doab [Doabe Mekhe Zarin], 5700', 30.4.1937, R. Meinertzhagen (BM!).

Plantae ca. 30 cm altae, pilis symmetrice medifixis appressis oblecta. Stipulae 4–6 mm longae. Folia 5–12 cm longa. Foliola 5–6-juga, remota, elliptica. 9–17  $\times$  3–8 mm, supra laxe subtus densiore pilosa. Racemus pedunculo ca. 18 cm longo albi-piloso suffultus, laxe 5–6-florus. Bracteae 2,5–3 mm longae. Pedicelli 2 mm longi. Calyx 18–20 mm longus, tubulosus, pilis albis nigrisque 0,4–1 mm longis oblectus, dentibus 3–4 mm longis. Vexillum 25 mm longum, 8 mm latum, longe unguiculatum. Alae 25 mm longae, lamina 6  $\times$  2 mm. Carina 21 mm longa. Ovarium breviter stipitatum lineare, albi-pilosum. Legumina ignota.

Plant 30 cm tall, covered with  $\pm$  appressed, mostly symmetrically medifixed hairs. Caudex branched. Stems few, erect, 10–12 cm long, densely covered with white hairs 0.9–1 mm long. Stipules greenish, narrowly triangular, 4–6 mm long, shortly adnate to the petiole, loosely to rather densely white and black hairy. Leaves 5–12 cm long; petiole 2–4 cm long, like the rachis densely hairy like the stem. Leaflets in 5–6 pairs, remote, elliptic, 9–17  $\times$  3–8 mm, acuminate at both ends, on upper side loosely, on underside loosely to rather densely covered with white hairs 0.6–1.2 mm long. Peduncle ca. 18 cm long, erect, loosely to rather densely white hairy. Raceme short, loosely 5–6-flowered. Bracts whitish, narrowly triangular or from ovate base acuminate, 2.5–3 mm long, white and black or predominantly black hairy. Pedicels

2 mm long, white and black hairy. Calyx 18–20 mm long, tubular, obliquely gibbous at the base, obliquely cut at the mouth, densely covered with appressed to subappressed, ± symmetrically medifixed white and black hairs 0.4–1 mm long; teeth subulate, 3–4 mm long, on innerside densely covered with very thin white hairs. Petals color unknown. Standard ca. 25 mm long; blade widely elliptic, ca. 8 mm wide, emarginate at the apex, at the base gradually narrowed into the long claw. Wings 25 mm long; blades narrowly oblong, rounded at the apex, 6 × 2 mm; auricle short, claw 19 mm long. Keel 21 mm long; blades obliquely elliptic, with widely curved lower edge and nearly straight upper edge, obtuse at the apex, 6 × 3 mm; auricle short, claw 15 mm long. Staminal tube truncate at the mouth. Ovary with a stipe ca. 1.5 mm long, linear, white hairy; style glabrous. Legumes unknown.

*Astragalus fruticulosus* Podlech, spec. nov. (sect. *Dissitiflori*).

Holotype: Afghanistan, Prov. Badghis, 8 km E Qades, 1380 m, Lössboden, 63°30' E, 34°48' N, 4.5.1977, *D. Podlech & Kh. Jarmal 29825* (MSB!).

Affinis *A. xyloclado* Rech.f. & Gilli, sed differt stipulis 1,5–2,5 mm tantum (nec 4–5 mm) longis, foliolis in caule principali 4–5 (nec 7–8)-jugis, supra laxe pilosis (nec marginem versus tantum pilosis), lamina alarum late elliptica, 5 × 4,5 mm (nec anguste oblonga, 6–7 × 2 mm).

Plants fruticulose, 8–18 cm tall, in vegetative parts covered with appressed to subappressed white hairs, the stipules also with black hairs. Caudex diffusely branched. Stems several, prostrate to erect, branched, with numerous non-flowering, short brachyblasts, the older parts with greyish-brown bark, stems of the current year 2–15 cm long, very densely covered with ± symmetrically medifixed, appressed white hairs 0.3–0.6 mm long. Stipules greenish, triangular, 1.5–2.5 mm long, shortly adnate to the petiole, rather densely white and black or sometimes predominantly black hairy. Leaves of the main stems 2–3.5 cm long; petiole 0.5–0.8 cm long, like the rachis narrowly grooved on upper side, rather densely to densely white hairy like the stem; leaves of the brachyblasts shorter, nearly sessile. Leaflets in 4–5 pairs, narrowly elliptic, 3–8 × 1–2.2 mm, those of brachyblast leaves smaller, all rounded or obtuse at the apex, on upper side loosely, on underside densely covered with appressed white hairs 0.6–1 mm long. Peduncle singular in lower part of the stem, 1.5–5 cm long, at fruiting time up to 10 cm long, rather densely hairy like the stem, but toward the raceme also with black hairs. Raceme at anthesis short, densely 4–10-flowered, at fruiting time strongly elongated and 4–6 cm long; axis densely covered with spreading, mostly basifixed hairs white hairs 0.3–1 mm long and with few medifixed to basifixed, ± appressed to ascending, shorter black hairs. Bracts whitish-membranous, 1.5–2 mm long, ovate, covered with ± spreading, mostly basifixed white and black or predominantly black hairs. Pedicels 0.5–1 mm long, white and black hairy. Calyx 11–14 mm long, tubular, slightly gibbous at the base, nearly straightly cut at the mouth, densely villous, with thin, tousled, spreading, basifixed white hairs 1–1.5 mm long and with ascending to ± spreading, basifixed to asymmetrically bifurcate, distinctly shorter black hairs; teeth linear-acute to narrowly triangular, 1–2 mm long, densely white hairy on innerside. Petals yellowish.. Standard ca. 20 mm long; blade obovate, ca. 7 mm wide, rounded to scarcely retuse at the apex, at the base long cuneately narrowed. Wings ca. 20 mm long; blades widely elliptic, rounded at the apex, 6 × 4.5 mm; auricle ca. 1 mm long, claw 13–14 mm long. Keel ca. 17 mm long; blades obliquely

elliptic with in the middle widely and nearly rectangular-curved lower edge and straight to slightly concave upper edge, acute at the apex,  $6 \times 3$  mm; auricle minute, claw ca. 13 mm long. Staminal tube truncate at the mouth. Ovary sessile, linear, hairy; style glabrous. Legumes (unripe) sessile, linear, strongly falcate, ca. 40 mm long, 1 mm in diameter; valves densely covered with appressed, symmetrically to strongly asymmetrically medifixed white and a few black hairs mixed in up to 1 mm long.

*Astragalus lanzhouensis* Podlech & L.-R.Xu, spec. nov. (sect. *Dissitiflori*).

Holotypus: China, Prov. Gansu, Lanzhou, 1600 m, 12.6.1996, *Lang-Ran Xu 96-005* (MSB; iso: WUK).

Differt ab *A. stenoceras* stipulis 3–4 (nec 1,5–2) mm longis, alte connati-vaginantibus (nec inter se liberis), foliis 8–12-jugis (nec 4–7-jugis), bracteis 3–4 (nec 1–1,5) mm longis, calyce 11–12 (nec 8–10) mm longo, dentibus subulatis 4–5 mm longis (nec anguste triangularibus, 1–1,5 mm longis), vexillo ca. 16 mm (nec 20–22 mm) longo, leguminibus curvatis, 17–20 mm longis, mere albi-pilosis (nec rectis, 20–35 mm longis, albi-nigri-pilosis).

Plants 10–25 cm tall, with  $\pm$  symmetrically medifixed, appressed to subappressed hairs. Stems branched near to the base, 7–20 cm long, angular-sulcate, rather densely to densely covered with appressed white hairs, at the nodes sometimes also with a few black hairs, 0.6–1 mm long. Stipules whitish-membranous, triangular, 3–4 mm long, free from the petiole, behind the stem high up connate, with white and sometimes a few black hairs. Leaves 2–5 cm long; petiole 0.5–1 cm long, like the rachis slender, loosely to rather densely white hairy as stem. Leaflets in 8–12 pairs, narrowly elliptic, acute at the apex,  $7\text{--}15 \times 1\text{--}3$  mm, covered on both sides loosely or more rarely rather densely with white hairs 0.8–1 mm long. Peduncles 2.5–8.5 cm long, angular-sulcate, loosely hairy like as stem, below the raceme sometimes with a few black hairs. Raceme at fruiting time 2–4 cm long, loosely 4–8-fruited. Bracts whitish-membranous, ovate, long acuminate, 3–4 mm long, sparsely white and black hairy, at the margins also with subbasifixed to basifixed hairs. Pedicels ca. 2 mm long, white and black hairy. Calyx 11–12 mm long, tubular, slightly obliquely cut at the mouth, loosely covered with subappressed white and black, but mostly predominantly white hairs ca. 1 mm long; teeth subulate, (3–)4–5 mm long, white hairy on innerside. Standard ca. 16 mm long; blade narrowly elliptic-oblong, ca. 6.5 mm wide, widely emarginate at the apex, at the base shortly and indistinctly narrowed. Wings ca. 14 mm long, blades narrowly oblong, slightly obliquely emarginate at the otherwise rounded apex, ca.  $7 \times 2$  mm; auricle ca. 0.8 mm long, claw ca. 7 mm long. Keel ca. 11 mm long; blades obliquely obovate-triangular, with widely corved lower edge and straight upper edge, acute at the apex,  $5 \times 2.5$  mm; auricle ca. .8 mm long, claw ca. 6 mm long. Staminal tube truncate at the mouth. Legumes obliquely erect or spreading, shortly stipitate, linear, slightly curved, terete, 17–20 mm long, 2–2.4 mm high, ca. 2 mm wide, carinate ventrally, grooved dorsally, at the apex shortly attenuate into a straight slender beak ca. 1 mm long, nearly fully bilocular; valves thin but tough, loosely to rather densely covered with appressed to subappressed, somewhat flexuose white hairs 0.6–0.8 mm long.

Other specimen seen:

**China.** Prov. Gansu: mountains Beitaschan, N of Lanzhou, 24.6.1957, *M.P. Petrov* (LE).

*Astragalus montis-karkasii* Podlech, spec. nov. (sect. *Dissitiflori*).

Holotype: Iran, Prov. Esfahan, Kuh-e Karkas (Kuh-i-Kargiz), 33°27' N, 51°48' E, in declivibus supra Tar, 2300–2500 m, 27.5.1974, *K.H. Rechinger 46555* (M; iso: W).

Differt ab *A. sitiens* Bunge stipulis vaginati-amplexentibus, truncatis, sine apiculis distinctis, foliis brevioribus, brevissime petiolatis, foliolis pilis 0,5–1 (nec 1–1,5) mm longis obtectis, calyce 6–7 (nec 7–10) mm longo, dentibus triangularibus, ca. 1 mm longis (nec subulatis, 1,5–3 mm longis).

Plants 13–25 cm tall, covered with appressed, ± symmetrically medifixed, white hairs. Caudex divided. Stems several, branched in lower part, the older parts ligneous, short, covered with greyish-brown bark, parts of the current year 3–5 cm long, angular-sulcate, very densely covered with hairs 0.6–1 mm long. Stipules whitish-hyaline, 1.5–3 mm long, adnate to the petiole for ca. 1 mm, behind the stem vaginate-connate, truncate, without distinct free tips, sparsely to loosely hairy. Leaves 2–3 cm long; petiole 0.1–0.6 cm long, together with the short rachis hairy like the stem. Leaflets in 1–2 pairs, 12–23 × 1.5–2 mm, densely covered on both sides with hairs 0.5–1 mm long. Peduncle 5–7.5 cm long, erect, hairy like the stem. Raceme 5–8 cm long, remotely 5–10-flowered; axis hairy like the peduncle. Bracts membranous, ovate, 1 mm long, sparsely black hairy. Pedicels ca. 3 mm long, erect, densely predominantly shortly black hairy. Calyx 6–7 mm long, turbinate-tubular, not gibbous at the base, obliquely cut at the mouth, rather densely covered with appressed to subappressed black hairs 0.3–0.5 mm long and with mostly fewer, slightly longer white hairs; teeth triangular, ca. 1 mm long, on innerside densely covered with very thin, white, basifixed hairs. Petals pale bluish to pale violet. Standard ca. 16 mm long; blade ca. 6 mm wide, elliptic, emarginate at the apex, with a rather long, narrowly cuneate claw. Wings ca. 14 mm long; blades narrowly oblong, obtuse to slightly obliquely retuse the apex, 7.5 × 2 mm; auricle ca. 1 mm long, claw 7 mm long. Keel ca. 12 mm long; blades obliquely elliptic-curved, with slightly widely curved lower edge and slightly concave upper edge, acutish at the apex, 5 × 2.5 mm; auricle ca. 0.5 mm long, claw 7 mm long. Ovary subsessile, narrowly elliptic, long white hairy; style glabrous. Legumes unknown.

*Astragalus pravitzii* Podlech, spec. nov. (sect. *Dissitiflori*).

Holotypus: Iran, Prov. Fars: Didegan, in alpe, 2000 m, 16.5.1915, *H. Pravitz 696* (S!).

*A. saadatabadensi* Podlech ob calycem petalaeque brevia similis sed differt stipulis non difformibus, foliolis (1–)2–3(–4) paria (nec 1–3 foliolis tantum), distincte majoribus.

Plants 12–15 cm tall, with ± symmetrically medifixed, appressed, white hairs, at the stipules and in the inflorescence also with black hairs. Caudex divided with short branches, covered with greyish bark. Stems several, ascending to erect, 5–8 cm long, in basal parts densely, in upper parts loosely to rather densely covered with hairs 0.4–0.8(–1) mm long. Stipules slightly greenish, narrowly triangular, 2–2.5 mm long, shortly adnate to the petiole, sparsely to loosely white hairy, sometimes with a few black hairs at the base. Leaves 1.5–3 cm long; petiole 0.5–1.5 cm long, hairy like the stem. Leaflets in (1–)2–3(–4) pairs, elliptic to obovate, 4–9 × 1.5–4 mm, acute to rounded and minutely acuminate at the apex, on both sides rather densely covered with hairs 0.6–1 mm long. Peduncles 4–5 cm long, loosely white hairy

like the stem. Racemes loosely 8–12-flowered; axis hairy like the peduncle. Bracts whitish-membranous, narrowly triangular, ca. 2 mm long, sparsely to loosely covered with partly strongly asymmetrically medifixed, predominantly black hairs. Pedicels 0.5–1 mm long, white hairy. Calyx ca. 7 mm long, tubular, scarcely obliquely gibbous at the base, obliquely cut at the mouth, rather densely to densely covered with appressed white, or white and black hairs 0.6–1 mm long; teeth narrowly triangular, ca. 1 mm long, on innerside nearly glabrous. Petals in dry state yellowish. Standard 14 mm long; blade elliptic, ca. 6 mm wide, slightly emarginate at the apex, at the base cuneately narrowed. Wings 12 mm long; blades narrowly oblong, rounded at the apex, 5 × 2 mm; auricle ca. 1 mm long, claw 7 mm long. Keel 10–11 mm long; blades obliquely obovate, with in upper part widely, nearly rectangular-curved lower edge and slightly concave upper edge, acutish at the apex, 3.5 × 2.2 mm; auricle short, claw 7–8 mm long. Staminal tube truncate at the mouth. Ovary with a stipe ca. 2 mm long, linear, shortly hairy; style glabrous. Legumes (immature) linear, densely covered with appressed white hairs.

Other specimen seen:

**Iran.** Fars: Abadeh, Nadjaf-abad, 16.5.1962, *Boroumand 12412-E* (IRAN).

*Astragalus recurvatus* Podlech, spec. nov. (sect. *Dissitiflora*).

Holotype: Persia, Kashan, Mooteh protected region, ad bifurcationem viae publicae versus Muteh (Mooteh) ducentis, c. 140 km NW Esfahan, 1950 m, 30.5.1974, *K.H. Rechinger 46775* (M; iso: W).

Differt ab *A. sitiens* Bunge statura altiore, caulibus pilis brevioribus, 0,2–0,5 mm (nec 0,7–1,1 mm) longis, stipulis longioribus, 6–8 mm (nec 3–4 mm) longis, distincte vaginati-amplectentibus (nec liberis), foliis 4–6 (nec 1–3)-jugis, sparse ad laxe pilosis pilis brevioribus, leguminibus recurvatis ad laterum dorsalem versus, laxe et breviter pilosis.

Plant 50 cm tall, covered with appressed hairs. Caudex slender, with a pluricipital root-crown. Stems few, 22–34 cm long, erect, slightly angular-striate, loosely to densely covered with symmetrically medifixed white hairs 0.2–0.5 mm long. Stipules hyaline-membranous, 6–8 mm long, nearly free from the petiole, behind the stem distinctly to up to the middle vaginate-connate, the free tips narrowly triangular to subulate, sparsely to loosely white hairy, sometimes nearly glabrous. Leaves 4–9 cm long; petiole 1.5–2 cm long, like the rachis loosely hairy. Leaflets in (3–)4–6 pairs, narrowly linear, 12–20 × 1–1.2 mm, loosely covered on both sides with hairs 0.5–1 mm long. Peduncle 4–11 cm long, erect, angular-striate, loosely hairy like the stem. Raceme remotely 10–15-flowered, at fruiting time elongated and up to 17 cm long; axis white hairy like the peduncle but also with a few black hairs mixed in. Bracts whitish-membranous, narrowly triangular, ca. 3 mm long, sparsely to loosely white and black hairy. Pedicels (at fruiting time) 2–3 mm long, white and black hairy. Calyx whitish-membranous, 7–8.5 mm long, tubular, scarcely obliquely gibbous at the base, slightly obliquely cut at the mouth, loosely to rather densely covered with ± appressed white hairs up to 1.2 mm long and with black hairs 0.3–1 mm long; teeth subulate, 2–3 mm long, mostly curved, on innerside covered with very thin hairs. Petals color unknown. Standard ca. 20 mm long; blade ca. 7 mm wide, elliptic, emarginate at the apex, with a rather long, narrowly cuneate claw. Wings and keel unknown. Staminal tube truncate at the mouth. Legumes sessile, ascending to spreading or even slightly pendulous, narrowly linear, subterete, slightly to

strongly recurved to the dorsal side, 50–60 mm long, ca. 2 mm high and 1.5 mm wide, carinate ventrally, flattish dorsally, at the apex attenuate into a beak 6–10 mm long, incompletely bilocular; valves straw-colored, loosely covered with appressed,  $\pm$  symmetrically medifixed white hairs 0.2–0.4 mm long, later on partially glabrescent. Seeds ca. 8 in each locule, rectangular,  $3 \times 1$  mm, blackish.

*Astragalus saadatabadensis* Podlech, spec. nov. (sect. *Dissitiflori*).

Holotypus: Iran, Prov. Fars, Pasagarde, 15 km N of Saadatabad, semidesert, 2000 m, 21.5.1964, *M.L. Grant 15784* (W).

Differt ab *A. argyroides* Beck stipulis difformibus, basalibus quam superiores distincte longioribus et petiolo longe adnatis (nec omnes conformibus), foliis cum 1–3 foliolis tantum (nec 3–4–6(–7)-jugis, calyce 7–8 (nec 11–13) mm longo, petalis brevioribus, vexillo ca. 14 (nec 18–22) mm longo.

Plants ca. 12 cm tall, with  $\pm$  symmetrically medifixed, appressed, white, only in the inflorescence also with few black hairs. Caudex with a pluricipital root-crown. Stems several, 3–5 cm long, erect, densely covered with hairs 0.8–1 mm long. Stipules different, the lower ones membranous, 5–7 mm long, at the base wide, adnate to the petiole for 2–3.5 mm, densely covered with somewhat flexuose, partly asymmetrically medifixed hairs 1–1.5 mm long, the free tips up to 4 mm long, narrowly triangular, sparsely to loosely hairy, the upper ones greenish, distinctly shorter, narrowly triangular, adnate to the petiole for 1–2.5 mm, sparsely hairy. Leaves 1–4 cm long; petiole 0.5–2.5 cm long, hairy like the stem. Leaflets 1–3, narrowly elliptic to obovate, 7–10  $\times$  2–4, the end-leaflet mostly larger, 12–16  $\times$  4–6 mm, all acute to shortly acuminate at the apex, on both sides loosely to rather densely covered with hairs 0.8–1.2 mm long. Peduncles 5–7 cm long, loosely hairy like the stem. Racemes loosely 6–8-flowered; axis hairy like the peduncle. Bracts whitish-membranous, narrowly triangular, ca. 2 mm long, sparsely to loosely covered with partly strongly asymmetrically medifixed white or white and black hairs, at the base also with few sessile, minute glands. Pedicels 1 mm long, white hairy. Calyx 7–8 mm long, tubular, slightly obliquely gibbous at the base, obliquely cut at the mouth, rather densely to densely covered with appressed, white hairs 0.8–1 mm long, at the teeth sometimes also with very few black hairs; teeth narrowly triangular, 1–1.5 mm long, on innerside nearly glabrous. Petals in dry state yellowish, slightly flushed with pink. Standard 14 mm long; blade obovate, ca. 7 mm wide, slightly emarginate at the apex, at the base cuneately narrowed. Wings 11 mm long; blades narrowly obovate, rounded at the apex, 5  $\times$  2 mm; auricle ca. 0.5 mm long, claw 6 mm long. Keel 10 mm long; blades obliquely obovate, with in upper part widely, nearly rectangular-curved lower edge and slightly concave upper edge, obtuse to acutish at the apex, 4  $\times$  2 mm; auricle short, claw 6 mm long. Staminal tube truncate at the mouth. Ovary with a stipe ca. 1 mm long, linear, shortly hairy; style glabrous. Legumes unknown.

*Astragalus sata-kandaoensis* Podlech, spec. nov. (sect. *Dissitiflora*).

Holotype: Afghanistan, Prov. Paktia, 9–20 km SE Gardez versus jugum Sata Kandao, 2300 m, 3.6.1967, K.H. Rechinger 35430 (MSB!; iso: W!).

Differt ab *A. xyloclado* Rech.f. & Gilli stipulis 1,5–2 mm (nec 4–5 mm) longis, foliis 2–4-jugis (nec 7–8-jugis), racemis elongatis, remote 3–8 (nec brevibus, dense 7–15-floris), axi racemorum pilis medifixis (nec basifixis) obtecto, calyce pilis ± medifixis, subappressis (nec basifixis, patulis) obtecto, ovario 3–4 mm longe stipitato (nec sessile).

Plants fruticose, 10–20 cm tall, in vegetative parts with ± symmetrically medifixed, appressed to partly subappressed hairs. Caudex up to 10 mm in diameter, strongly branched, covered with grey-brownish bark. Stems several, ascending to erect, branched, with numerous non-flowering, short brachyblasts, the older parts with dark brownish bark, stems of the current year 4–5 cm long, very densely covered with white hairs, near the nodes also with black hairs 0.4–0.8 mm long. Stipules membranous to greenish, triangular, 1.5–2 mm long, very shortly adnate to the petiole, densely white and black or predominantly black hairy. Leaves 1–2 cm long, nearly sessile; rachis densely white hairy like the stem, sometimes also with some black hairs. Leaflets in 2–4 pairs, linear or narrowly elliptic, often somewhat recurved, 3–10 × 0.5–1.5(–2) mm, subobtusate to rounded at the apex, often folded, on both sides densely covered with appressed white and sometimes a few black hairs mixed in, 0.8–1.2 mm long. Peduncle 3–6 cm long, white hairy like the stem, in upper part some black hairs. Raceme 2–7 cm long, remotely 3–8-flowered; axis covered with ± medifixed, predominantly white hairs. Bracts whitish-membranous, ca. 2 mm long, ovate-triangular, predominantly black hairy, at the margins with subbasifixed to basifixed hairs. Pedicels ca. 2 mm long, densely predominantly black hairy. Calyx 9–11 mm long, tubular, strongly obliquely gibbous at the base, obliquely cut at the mouth, densely covered with somewhat tousled, subappressed to slightly ascending, ± medifixed white and black hairs up to 1.5 mm long; teeth narrowly triangular-acuminate, ca. 2 mm long, on inner side densely covered with very thin, white hairs. Petals purplish-violet, fading to pale yellowish. Standard 20 mm long; blade obovate, 9–10 mm wide, slightly to distinctly emarginate at the apex, at the base cuneately narrowed. Wings 18–19 mm long; blades narrowly oblong, rounded at the apex, 9–10 × 3–4 mm; auricle 1–1.2 mm long, claw 10 mm long. Keel 16–17 mm long; blades obliquely obovate, with widely curved lower edge and straight to slightly concave upper edge, obtuse at the apex, 8–9 × 3.5–4 mm; auricle ca. 1 mm long, claw 9 mm long. Staminal tube truncate at the mouth. Ovary on a stipe 3–4 mm long, linear, hairy; style glabrous.

Other specimens seen:

**Afghanistan.** Bamian: hill on west side of Shibar pass, 3000 m, 14.6.1962, *Hedge & Wendelbo W.4198* (BG). – Parwan: Shibar-Pass, nahe der Passhöhe, 2900 m, 27.6.1967, *Freitag 1201* (MSB) – east side of Shibar pass, c. 2800 m, 14.6.1962, *Hedge & Wendelbo W.4247* (BG).

*Astragalus wakhanicus* Podlech, spec. nov. (*Dissitiflora*).

Holotype: Afghanistan, Prov. Badakhshan, Wakhan, oberes Baroghil Tal und Baroghil Pass, 73°22' E, 36°53' N, 3300–3800 m, 30.7.1971, *O. Anders 7905* (MSB!; iso: S!).

Differt ab *A. viridis* Bunge stipulis brevibus, 1,5–3 (nec 5–7) mm longis, foliis 4–5 (nec 5–9)-jugis, foliolis apice acuto, rubri-brunneo, breviter cartilaginei-cucullato, axi racemi pilis

brevibus appressis albis nigrisque oblecto (nec pilis oblique patentibus ad patentibus albis, 0,3–1,2 mm longis oblecto), bracteis 2–3 (nec 4–6) mm longis, leguminibus pilis longissimis ad 1,5 mm (nec ad 3) mm longis oblectis.

Plants suffruticose, 30–35 cm tall, vegetative parts covered with ± symmetrically medifixed, appressed hairs. Caudex branched. Stems at the base ligneous, covered with dark greyish bark, branched, stems of the current year 6–17 cm long, very densely covered with white, near the nodes also with a few black hairs 0.5–0.7 mm long. Stipules narrowly triangular, 1.5–3 mm long, adnate to the petiole for 0.5–1.5 mm, white hairy, those of upper leaves sometimes also with black hairs. Leaves 4–7 cm long; petiole 0.3–0.5 cm long, like the rhachis slender, densely hairy like the stem. Leaflets in 4–5 pairs, linear to filiform, 10–20 × 0.8–1 mm, at the apex acute, with a short, reddish-brown, cartilaginous, cucullate tip, on both sides densely covered with white hairs 0.8–1 mm long. Peduncles 11–16 cm long, loosely to rather densely white hairy like the stem, toward the raceme also with some black hairs, sometimes partly glabrescent. Racemes (in fruiting state) loosely 4–12-flowered; axis subappressed hairy like the peduncle but with mixed black and white hairs. Bracts narrowly triangular to ovate-acuminate, 2–3 mm long, white and black hairy, at the margins also with basifixed hairs. Pedicels (in fruit) ca. 3 mm long, with ascending white and black hairs. Calyx ca. 15 mm long, tubular, rather densely covered with subappressed, ± symmetrically to asymmetrically medifixed black hairs 0.3–0.7 mm long and with ascending, strongly asymmetrically medifixed to subbasifixed white hairs 1–1.5 mm long; teeth subulate, 3–3.5 mm long, densely white hairy on innerside. Petals unknown. Staminal tube truncate at the mouth. Legumes sessile, erect, oblong, ca. 20 mm long, 4–5 mm high and wide, carinate ventrally, slightly grooved dorsally, at the apex subabruptly attenuate into a beak 2–3 mm long, fully bilocular; valves thinly coriaceous, brownish to blackish when ripe, densely villous with ascending to spreading, basifixed white hairs 1–1.5 mm long and with short, asymmetrically medifixed, subappressed black hairs, at the dorsal side also with ascending, subbasifixed black hairs up to 1 mm long.

*Astragalus sherriffii* Podlech, spec. nov. (Sect. *Hemiphaca*).

Holotype: India, Kashmir, Gya. Ladah, 13,500 ft, 14.7.1941, *F. Ludlow & G. Sherriff 8491* (E).

Differt ab *A. lhorongensis* P.C.Li & C.C.Ni stipulis inferioribus post tergum caulis distincte vaginanti-connatis nec omnibus inter se liberis), foliis 3–4 (nec 4–10) cm longis, 4–5 (nec 5–7)-jugis, lamina alarum apice retusa ad emarginata (nec rotundata).

Plants ca. 25 cm tall, covered with appressed to subappressed hairs 0.2–0.3 mm long. Caudex up to 10 mm thick, with a pluricipital root-crown. Stems several, ascending to erect, very sparsely to sparsely furnished with white and some black hairs especially below the nodes. Stipules greenish, the lower ones ca. 3 mm long, ovate, free from petiole, distinctly vaginate-connate behind the stem, the upper ones narrowly triangular, up to 4 mm long, free from each other, all loosely white or white and black hairy. Leaves 3–4 cm long; petiole 0.8–2 cm long, like the rhachis slender, sparsely to loosely hairy like the stem. Leaflets in 4–5 pairs, linear, 7–12 × 1.5–3 mm, obtuse at the apex, on upper side glabrous, on underside sparsely to loosely appressed white hairy. Peduncles 3–7 cm long, sparsely to loosely, toward the raceme more densely hairy like the stem. Racemes 2–3 cm long, loosely many-flowered. Bracts

whitish-membranous, narrowly triangular, 1–1.5 mm long, predominantly black hairy. Pedicels ca. 0.5 mm long, predominantly black hairy; flowers ± spreading. Calyx campanulate, ca. 3 mm long, obliquely cut at the mouth, rather densely covered with predominantly black hairs; teeth unequal, the upper two triangular, 0.5–1 mm long, the lower three narrowly triangular, 1–1.5 mm long, hairy on innerside. Petals flushed with pink. Standard ca. 7 mm long; blade elliptic to widely elliptic, 4–5 mm wide, incised at the apex, narrowed at the base without a distinct claw. Wings 5.5 mm long; blades narrowly oblong, retuse to emarginate at the apex, 4 × 1.5 mm; auricle 0.5 mm long, claw 2 mm long. Keel 4 mm long; blades obliquely obovate-triangular, with rectangular-curved lower edge and straight to slightly concave upper edge, subobtusate at the apex, 2.5 × 1.5 mm; auricle indistinct, claw 1.5 mm long. Staminal tube truncate at the mouth. Ovary shortly stipitate, glabrous; style thick, short. Legumes unknown.

*Astragalus tsangpoensis* Podlech & L.R.Xu, spec. nov. (sect. *Hemiphaca*).

Holotypus: China, Xizang, SE. Tibet, Tsangpo valley, c. 5 km W of Gonggar (Lhasa Airport), 29°17' N, 90°49' E, 3620 m, 30.7.1989, *B. Dickoré 3064* (MSB).

Plantae ultra 30 cm altae, pilis albis nigrisque subappressis ad adscendentibus 0,3–0,7 mm longis instructae. Caules ramosi. Stipulae triangulares, 3–5 mm longae, liberae. Folia 3–7 cm longa. Foliola 8–11 juga, 4–9 × 1–2,5 mm, acuta, complicata, supra glabra, subtus laxe ad densiuscule appresse pilosa. Pedunculi 5–6 cm longi, sparse ad laxe pilosi. Racemi 1,5–2,5 cm longi, laxe 6–10-flori. Bracteeae 1,5–2 mm longae. Calyx campanulatus, c. 3 mm longus, albi-vel albi-nigri-pilosus, dentibus 1 mm longis. Vexillum c. 7 mm longum, orbiculare, 6 mm latum, brevissime unguiculatum. Alae 6,5 mm longae, lamina apice rotundata, 4,5 × 2,5 mm. Carina c. 5 mm longa. Ovarium sessile, albi-pilosum. Legumina ignota.

Plants at least 30 cm tall (basal parts missing), covered with subappressed to tangled-ascending hairs 0.3–0.7 mm long. Stem ascending to erect, branched, 2–3 mm in diameter, glabrous in basal parts, sparsely to loosely white and black hairy in upper part. Stipules greenish, 3–5 mm long, triangular, sparsely white and black hairy, free from petiole and from each other. Leaves 3–7 cm long; petiole 0.5–1.5 cm long, like the rachis loosely to rather densely covered with white and sometimes with fewer black hairs. Leaflets in 8–11 pairs, narrowly ovate to narrowly elliptic, acute at the apex, 4–9 × 1–2.5 mm, glabrous on upper side, loosely to rather densely subappressed white hairy on underside, mostly folded. Peduncles 5–6 cm long, hairy like the stem. Racemes 1.5–2.5 cm long, loosely 6–10-flowered. Bracts whitish-membranous to slightly greenish, 1.5–2 mm long, narrowly triangular, sparsely white and black hairy, at the margins with few sessile, minute glands. Pedicels 0.5 mm long, black and white hairy. Calyx campanulate, slightly obliquely cut at the mouth, ca. 3 mm long, loosely to rather densely covered with white or white and black hairs; teeth linear, ca. 1 mm long, hairy on inner side. Petals (in dry state) whitish yellow or very slightly flushed pale bluish. Standard ca. 7 mm long; blade orbicular, ca. 6 mm long, widely emarginate at the apex, at the base abruptly constricted into the very short claw. Wings ca. 6.5 mm long; blades elliptic, rounded at the apex, 4.5 × 2.5 mm; auricle ca. 0.5 mm long, claw ca. 2 mm long. Keel ca. 5 mm long; blades obliquely elliptic-triangular, with in the middle widely curved lower edge and slightly convex upper edge, obtusish to acute at the apex, 3.5 × 2 mm; auricle minute, claw ca. 2 mm long. Staminal tube slightly oblique at the mouth. Ovary sessile, ellipsoid, white hairy; style glabrous. Legumes unknown.

*Astragalus olurensis* Podlech, spec. nov. (sect. *Incani*).

Holotype: Turkey, Prov. Çoruh (Artvin), between Olur and Yusufeli, towards Ishan, 870 m, 25.5.1990, *M. Nydegger 45536* (MSB; isotype: BASBG).

Differt ab *A. latifolio* Lam. statura humiliore, calyce brevior, tubo ejus intus glabro, petalis violaceis distincte brevioribus, forma leguminis diversissima, leguminibus 18–20 mm (nec 40–60–80) mm longis, ca. 4 mm (nec 2,5 mm) altis.

Plants 5–15 cm tall, covered with appressed, mostly symmetrically medifixed, merely white hairs 0.3–0.5 mm long. Caudex up to 10 mm in diameter, unbranched or slightly and shortly branched, covered in upper part with remnants of old leaves. Stipules narrowly triangular, ca. 5 mm long, adnate to the petiole for ca. 2 mm, densely hairy, sometimes glabrescent. Leaves 4–7 cm long; petiole 1.5–4.5 cm long, densely hairy. Leaflets only 1 or 1–6 paired, often with quite different number of leaflets in one plant, ovate to widely elliptic, at the base widely cuneate to truncate, at the apex acute to acuminate or widely rounded, mostly minutely mucronulate, if only one leaflet, this 10–25 × 6–21 mm, if more leaflets, than those 3–7 × 2–5 mm but end-leaflet mostly larger, on both sides loosely to rather densely hairy and mostly spotted with minute reddish dots. Peduncle erect or ascending, 4–9 cm long, loosely to rather densely hairy. Raceme loosely 6–8-flowered. Bracts membranous, narrowly triangular, 1–2.5 mm long, sparsely hairy, at the margins near the base with minute, globular, sessile glands. Pedicels erect, 1 mm long, white hairy. Bracteoles linear, 0.5–1 mm long, at the base of the calyx. Calyx 11–13 mm long, tubular, obliquely cut at the mouth, loosely to rather densely hairy, inner side of tube glabrous; teeth subulate, 5–6 mm long, on inner side densely hairy. Corolla violett. Standard 17–18 mm long; blade slightly upcurved, 7 mm wide, elliptic, at the apex emarginate, at the base gradually narrowed into the short, cuneate claw. Wings 13–14 mm long; blades narrowly oblong, gibbous above the auricle, at the apex rounded, laterally obliquely slightly emarginate, 7 × 2 mm; auricle 1 mm long, claw 7 mm long. Keel ca. 11 mm long; blades obliquely obovate, with widely curved lower edge and slightly concave upper edge, at the apex subacute, 5 × 2.5 mm; auricle ca. 0.5 mm long, claw 7 mm long. Staminal tube truncate at the mouth. Ovary linear, sessile, white hairy; style glabrous. Legumes sessile, erect linear, slightly to distinctly upcurved, 18–20 mm long, ca. 4 mm high, 3 mm wide, carinate ventrally, slightly grooved dorsally, tapering into a straight beak ca. 3 mm long, bilocular; valves coriaceous, dirty pale brownish, loosely to rather densely hairy.

*Astragalus zaraensis* Podlech, spec. nov. (sect. *Incani*).

Holotype: Turkey, Prov. Sivas, [B7] N of Karabel, at road from Divrigi to Zara, 1560 m, 18.6.1992, *M. Nydegger 46325* (MSB; isotype: BASBG).

Differt ab *A. ancistrocarpo* Boiss. & Hausskn. calyce brevior, 7–8 (nec 11–14) mm longo, dentibus ejus 0,5–1,5 (nec 2–4 mm longis, petalis distincte brevioribus, vexillo apicem versus non lingulato-angustato, laminis alarum anguste oblongis, ca. 2 mm latis (nec apicem versus distincte dilatatis, 3,8–4 mm latis), leguminibus erectis 16–20 mm longis (nec saepissime pendulis vel patentibus, 20–35–40 mm longis).

Plants acaulescent, ca. 12–16 cm tall, covered in vegetative parts with appressed, symmetrically medifixed white hairs 0.4–0.5 mm long. Caudex simple or shortly branched,

covered with remnants of old leaves. Stipules narrowly triangular to narrowly oblong, 6–8 mm long, adnate to the petiole for 1.5–2 mm, rather densely hairy. Leaves 5–11 cm long; petiole 2–4 cm long, like the rhachis loosely to rather densely hairy. Leaflets in 5–11 pairs, elliptic to obovate, 3–8 × 2–5 mm, at the apex obtuse to retuse, on both sides densely hairy when young, loosely hairy with age, on upper side sometimes spotted with minute pellucid to reddish dots. Peduncle 7–10 cm long, loosely white hairy. Raceme at anthesis rather densely 10–20-flowered, strongly elongating in fruit; axis hairy like the peduncle. Bracts whitish- to brownish-membranous, narrowly triangular, 1.5–3 mm long, sparsely white and black hairy, at the margins with minute, sessile, globular glands. Pedicels ca. 2 mm long, black and white hairy; flowers erect. Bracteoles minute, 0.3–1 mm long, whitish, at the base of calyx or just below the calyx at the pedicel. Calyx 8–9 mm long, tubular, gibbous at the base, obliquely cut at the mouth, loosely covered with appressed white and black hairs 0.2–0.4 mm long and with somewhat longer white hairs; teeth narrowly triangular to linear, 0.5–1.5 mm long, hairy on inner side. Petals violet. Standard ca. 20–21 mm long; blade distinctly upcurved above the middle, ca. 6–6.5 mm wide, narrowly elliptic, not attenuate towards the slightly retuse apex, subabruptly narrowed at the base into the rather long claw. Wings ca. 15 mm long; blades narrowly oblong, obliquely laterally emarginate at the apex, 7–8 × 2 mm; auricle ca. 1 mm long, claw ca. 8 mm long. Keel 13 mm long; blades obliquely obovate, with widely curved lower edge and sigmoid-concave upper edge, at the apex obtuse to subacute, 5 × 2.5 mm; auricle 0.5 mm long, obtuse, claw ca. 7 mm long. Staminal tube truncate at the mouth. Ovary subsessile, linear, sparsely appressed hairy; style glabrous. Legume sessile, erect, linear, distinctly upcurved to sickle-shaped, 16–20 mm long, ca. 2 mm high and 2.5 mm wide, slightly carinate ventrally, narrowly grooved dorsally, attenuate at the apex into a slender, ± straight beak 3–4 mm long, fully bilocular; valves thinly coriaceous, pale brownish, distinctly purplish mottled, loosely covered with appressed white hairs 0.5–0.6 mm long, sometimes glabrescent.

Other specimen seen:

**Turkey.** Sivas: [B6] Bestepeler Geçidi at road from Kayseri to Sivas, 1400 m, 12.6.1992, *Nydegger 46236* (MSB).

*Astragalus damxungensis* Podlech & L.R.Xu, spec. nov. (sect. *Komaroviella*).

Holotype: China, Prov. Xizang, Nyaingentanglha Shan, between Yangbajain and Damxung, valley SE of Nyaingentanglha Feng, 5060 m, 30°19' N, 90°35' E, 12.8.1989, *B. Dickoré 3887* (MSB).

Plantae fere acaules, humiles, 3–4 cm altae, subglabrae, pilis perpaucis nigris 0,2–0,3 mm longis instructae. Stipula 3–4 mm longae, a petiolo liberae, inter se distincte vaginanti-connatae. Folia 4–6 juga, foliolis 3–5 × 1–2,8 mm. Racemi pedunculo 0,5–1 cm longo suffulti, 1–2-flori. Calyx campanulatus, ca. 6 mm longus, dentibus 2,5–3 mm longis. Petala purpurei-violacea. Vexillum 12–13 mm longum, lamina ca. 10 mm latum, suborbiculare. Alae 10 mm longae. Carina 11 mm longa. Legumina ignota.

Plants 3–4 cm tall, nearly acaulescent, in vegetative parts subglabrous, with few sub-appressed, black hairs 0.2–0.3 mm long. Caudex with short stolones. Stems inconspicuous, glabrous. Stipules greenish to membranous, 3–4 mm long, narrowly ovate to oblong, with

obtusish tips, nearly free from the petiole, behind the stem distinctly to highly up vaginate-connate, glabrous. Leaves 1.5–2.5 cm long; petiole 0.4–0.7 cm long, like the rhachis glabrous or with scattered hairs. Leaflets in 4–6 pairs, elliptic, 3–5 × 1–2.8 mm, at the apex obtuse to acutish, glabrous or more rarely with scattered hairs on underside, glabrous on upper side, conspicuously and densely rugulose when dry on underside. Peduncle 0.5–1 cm long, glabrous or below the raceme with scattered black hairs. Raceme 1–2-flowered. Bracts whitish-membranous, ca. 3 mm long, narrowly ovate, glabrous. Pedicels ca. 2 mm long, rather densely hairy. Bracteoles present, linear-subulate, 1–2 mm long, whitish, sparsely hairy, at the base of calyx. Calyx campanulate, ca. 6 mm long, rather densely hairy; teeth linear, slightly unequal, 2.5–3 mm long, hairy on innerside. Petals purple-violet. Standard 12–13 mm long; blade ca. 10 mm wide, widely obovate-orbicular, at the apex emarginate, at the base gradually narrowed into a short, cuneate claw. Wings ca. 10 mm long; blades narrowly obovate, rounded at the apex, 7 × 3 mm; auricle ca. 1 mm long, claw 3 mm long. Keel 11 mm long; blades obliquely obovate, with in upper part widely curved lower edge and ± straight upper edge, at the apex obtuse, 8 × 4 mm; auricle ca. 0.5 mm long, claw 3.5 mm long. Staminal tube truncate at the mouth. Ovary with a stipe ca. 1.5 mm long, glabrous. Pods unknown.

*Astragalus rasmontii* Podlech, spec. nov. (sect. *Onobrychoidei*).

Holotype: Turkey, Prov. Sivas, Yazyurdu, 1760 m, 38°48'14" N, 36°56'07" E, 11.7. 1995, *P. Rasmont PR105* (MSB!; iso: LG).

Plantae ca. 50 cm altae, pilis bifurcatis albis nigrisque 0,1–0,3 mm longis obtectae. Stipulae 2–4 mm longae, inferiores vaginanti-connatae, superiores inter se liberae. Folia 7–9 cm longa, 10–13 juga, foliolis anguste ellipticis, 6–13 × 1–2,5 mm, supra glabris, subtus sparse ad laxiuscule albi-pilosis. Racemi pedunculo 6–9 cm longo laxiuscule piloso suffulti, 2,5–4,5 cm longi, dense multiflori. Bracteae ovatae, 1,5–2 mm longae. Calyx ca. 4 mm longus, campanulatus, albi-nigri-pilosus, dentibus 1–1,5 mm longis. Petala violacea. Vexillum 14–15 mm longum, 5–6 mm latum, ovatum, apicem versus gradatim angustatum. Alae 9–10 mm longae. Carina 7–7,5 mm longa. Legumina ca. 5 mm longa, bilocularia, pilis albis arcte asymmetricice medifixis ca. 0,5 mm longis obtecta.

Plants ca. 50 cm tall, covered with appressed bifurcate hairs 0.1–0.3 mm long. Stem up to 45 cm long, branched, sparsely white and black hairy, partly glabrescent. Stipules 2–4 mm long, the lower ones membranous, very shortly adnate to the petiole, behind the stem distinctly vaginate-connate, subglabrous, the upper ones often greenish, free from the petiole, mostly clasping the stem partly with a narrow rim but not connate, sparsely hairy at the margins. Leaves 7–9 cm long, subsessile, those of side-branches shorter; rhachis sparsely to loosely white and black hairy. Leaflets in 10–13 pairs, narrowly elliptic, 6–13 × 1–2.5 mm, obtuse at the apex, on upper side glabrous, on underside sparsely to rather loosely white hairy. Peduncles 6–9 cm long, rather loosely white and black hairy. Racemes ovoid to shortly cylindrical, 2.5–4.5 cm long, densely many-flowered. Bracts membranous, 1.5–2 mm long, ovate, sparsely hairy. Pedicels ca. 0.5 mm long, predominantly black hairy. Calyx campanulate, ca. 4 mm long, loosely to rather densely covered with black hairs and with somewhat longer white hairs up to 0.5 mm long; teeth narrowly triangular, 1–1.5 mm long, hairy on innerside. Petals deeply violet. Standard 14–15 mm long; blade 5–6 mm wide, ovate, gradually

narrowed toward the minutely emarginate apex, at the base subabruptly narrowed into the claw ca. 3 mm long. Wings 9–10 mm long; blades narrowly oblong, slightly dilated toward the slightly and obliquely retuse apex, ca.  $6 \times 2.5$  mm; auricle ca. 0.6 mm long, claw 3.5–4 mm long. Keel 7–7.5 mm long; blades obliquely elliptic, with in the middle widely curved lower edge and slightly curved upper edge, obtuse at the apex,  $3.5 \times 2.5$  mm; auricle ca. 0.5 mm long, claw 3.5–4 mm long. Staminal tube oblique at the mouth. Ovary subsessile, ellipsoidic, white hairy; style glabrous. Legumes (immature) subsessile, elliptic, ca. 5 mm long, 2 mm high, compressed laterally, carinate ventrally, grooved dorsally, at the apex with a short oblique beak, nearly completely bilocular; valves thin, rather densely covered with strongly asymmetrically medifixed white hairs ca. 0.5 mm long. Seeds two in each locule, brown.

*Astragalus austrotibetanus* Podlech & L.R.Xu, spec. nov. (sect. *Polycladus*).

Holotypus: China, Xizang, SE. Tibet, Lhasa valley, c. 30 km SW of Lhasa, 29°26' N, 90°55' E, 3650 m, 30.7.1989, *B. Dickoré 3093* (MSB; iso: hb. Dickoré).

*A. leucocephalo* Benth. similis sed differt pilis albis nigrisque (nec mere albis) instructus, caulibus pilis subappressis ad leviter ascendentibus (nec patentibus) obtectis, racemis oblongis, demum elongatis et laxiusculis (nec globosis ad ovoideis, densis), bracteis 3–4 (nec 5–6) mm longis, petalis caerulei-violaceis (nec pallide flavis), vexillo latiore, leguminibus curvatis (nec rectis).

Plants up to 30 cm tall, in vegetative parts covered with subappressed to ascending, often flexuous, tangled white hairs 0.5–1.5 mm long. Caudex up to 8 mm thick, branched. Stems several, erect or at the base slightly ascending, sometimes branched, 10–20 cm long, angular-sulcate, loosely to rather densely hairy. Stipules green, narrowly triangular, 6–9 mm long, free from petiole, the lower ones behind the stem distinctly connate, the upper ones free from each other, loosely hairy. Leaves 4–8 cm long, nearly sessile; petiole up to 1 cm long, like the rachis grooved on upper side, loosely to rather densely hairy. Leaflets in 12–15 pairs, elliptic, acute to obtuse,  $5\text{--}14 \times 1.5\text{--}7$  mm, on upper side glabrous or subglabrous to sparsely hairy, on underside loosely to rather densely hairy. Peduncles 1–3 in the axils of upper leaves, 2–7 cm long, hairy like the stem but mostly also with black hairs toward the raceme. Racemes shortly cylindric, 2–5 cm long, rather loosely many-flowered, later on slightly elongated. Bracts membranous, narrowly triangular, 3–4 mm long, predominantly white but also black hairy, at the margins with few minute glands. Pedicels ca. 1 mm long, predominantly white hairy, recurved, flowers therefore pendant. Calyx campanulate, 4–5 mm long, slightly obliquely cut at the mouth, rather densely covered with subappressed to ascending white hairs 0.5–1 mm long and with mostly somewhat shorter black hairs; teeth slightly unequal, narrowly triangular,  $1.5\text{--}3\text{--}(3.5)$  mm long, hairy also on inner side. Petals blue-violet or more rarely white. Standard 7–8(–9) mm long; blade widely elliptic to suborbicular, 5–6(–7) mm wide, at the apex slightly to deeply emarginate, at the base shortly gradually narrowed without distinct claw. Wings 5.5–7(–9) mm long; blades narrowly elliptic, obtuse at the apex,  $4\text{--}4.5\text{--}(6) \times 2\text{--}2.5$  mm; auricle ca. 0.5 mm long, claw 1.5–2.5(–3.5) mm long. Keel 5–6(–7) mm long; blades obliquely elliptic-triangular, with in the middle  $\pm$  rectangular-curved lower edge and slightly curved upper edge, obtuse at the apex,  $3\text{--}3.5\text{--}(4) \times 2\text{--}2.5$  mm; auricle minute, claw 2–3 mm. Staminal tube oblique at the mouth. Ovary subsessile, elliptic, hairy; style

short, glabrous. Pods sessile, obliquely elliptic, curved, ca. 6–7 mm long, 2–2.5 mm high and wide, carinate ventrally, flattened to shallowly grooved dorsally, narrowed toward the acute apex, often with persistent, hooked style, unilocular; valves rather densely covered with ascending white or white and black hairs up to 0.8 mm long. Seeds two, 3 × 1.5 mm, blackish.

Other specimens seen:

**China. Qinghai:** NE. Tibet, along Golmud - Lhasa highway, NE of Tanggulashanqu, 4580 m, 34°18' N, 92°34' E, 4.8.1993, *G. & S. Miehe 9413/15* (MSB, Hb. Miehe). – **Xizang:** Dochen Lake, c. 4600 m, 24.6.1939, *Gould 2192* (K) – Tingri, 4580–4890 m, 4.7.1974, *Hingston 201, 213* (K) – Rama, 4870 m, 29.6.1939, *Gould 2209* (K) – Samoda, 4280 m, 9.8.1936, *Chapman 507* (K) – Nalu La to Champitang, 3660–4280 m, 1.8.1936, *Chapman 1037* (K) – Goring valley, 90°25' E, 30°12' N, 5050 m, vii.-viii.1895, *Littledale* (K) – Gyantse, 4020 m, 19.8.1935, *Cutting & Vernay 43* (K) – SE. Tibet, Lhasa valley, Lhasa, W. City, 3660 m, 1.8.1989, *B.Dickoré 3134* (MSB, hb. Dickoré) – Lhasa, 21.5.1943, *Ludlow & Sherriff 9514* (E) – dto., 6.7.1943, *Ludlow & Sherriff 9739* (E) – dto., ix.1904, *Waddell* (E) – Tsangpo Valley, Gonggar (Lhasa Airport), 3620 m, 29°17' N, 90°50' E, 30.7.1989, *Dickoré 3025* (MSB, Hb. Dickoré) – ca. 10 km NNE of Lhasa, 4350 m, 2.8.1989, *Dickoré 3284, 3299* (MSB, hb. Dickoré) – Lhasa valley, c. 30 km SW of Lhasa, 29°26' N, 90°55' E, 3650 m, 30.7.1989, *Dickoré 3093* (MSB) – Lhasa, above Chup-sang Monastery, 4300–4400 m, 29°41' N, 91°08' E, 9.8.1997, *Miehe, Huang, Otsu & Tunsu 97-008-15* (MSB, Hb. Miehe) – dto., 4050 m, 13.8.1997, *Miehe, Huang, Otsu & Tunsu 97-014-02* (MSB) – Upper Kyi Chu, above Reting Monastery, 4300 m, 30°18' N, 91°31' E, 22.8.1997, *Miehe, Huang, Otsu & Tunsu 97-027-01* (MSB) – SE Tibet, upper Kyi Chu basin, S of Damxung, 4550 m, 30°33' N, 91°27' E, 7.9.1995, *G. & S. Miehe 95-37-05* (MSB) – Mekong - Salween divide, Salween tributary, Bamda - Nujiang, NE of pass, 4450 m, 30°10' N, 97°17' E, 5.7.1994, *Dickoré 8896* (MSB, Hb. Dickoré) – Mekong - Salween divide, Salween tributary, right flank of Yü Qu N of Bamda, 4130 m, 30°20' N, 97°15' E, 7.7.1994, *Miehe & Wündisch 94-52-1* (MSB, Hb. Miehe) – Mekong - Salween divide, Mekong tributary, Bamda - Qamdo, Zi Qu tributary SW of Gyitang, 3450 m, 30°42' N, 97°19' E, 7.7.1994, *Dickoré 9012* (MSB, hb. Dickoré) – Upper Gyamda Chu (Nyang Chu), W of Gongbogyamda, 4700–4850 m, 29°52' N, 92°17' E, 2.9.1994, *Miehe & Wündisch 94-256-1* (MSB, Hb. Miehe) – EC. Tibet, Yamco Yumco (Yamdruk Yutsho), above Dzamtschili, 4570 m, 28°59' N, 90°27' E, 5.9.1997, *Miehe, Huang, Otsu & Tunsu 97-057-25* (MSB, Hb. Miehe) – dto., 4450 m, 12.9.1995, *G. & S. Miehe 95-52-05* (MSB) – Yamco Yumco, above Shangling Gumpa, 4570 m, 28°58' N, 90°29' E, 4.9.1997, *Miehe, Huang, Otsu & Tunsu 97-054-17* (MSB, Hb. Miehe) – Yamco Yumco, (Yamdruk Yutsho), above Baidi, 4500 m, 29°07' N, 90°26' E, *Miehe, Huang, Otsu & Tunsu 97-063-21* (MSB, hb. Miehe) – Lhasa - Nagarze, Yamdruk Yumco, Zamu E of Nagarze, 4520 m, 28°59' N, 90°32' E, 24.7.1994, *Dickoré 9909* (MSB) – upper Subansiri, Lhünze - Qayü, 15 km NW of Qayü, 3800 m, 28°23' N, 92°42' E, 31.7.1994, *Dickoré 10268* (MSB) – Chayul Dzong, Loro Chu, *Ludlow & Sherriff 1326* (W).

*Astragalus cobresiiphila* Podlech & L.R.Xu, spec. nov. (sect. *Polycladus*).

Holotypus: China, Xizang, valley ca. 8 km SSE of Lhasa, 3950 m, *B. Dickoré 3384* (MSB; iso: hb. Dickoré).

Differt ab *A. stricto* Benth. foliolis 5–8 (nec 8–12)-jugis, 1–4 mm (nec 4–10 mm) longis, vexillo 6–7 mm (nec 7–9 mm) longo, leguminibus pilis ad 0,2 mm longis (nec 0,3–0,7 mm longis) obtectis.

Plants up to 12 cm tall, caespitose, furnished with appressed to subappressed hairs. Caudex with a pluricipital root-crown. Stems numerous, diffusely prostrate to ascending, up to 5 cm long, slender, angular-sulcate, loosely furnished with appressed, somewhat flattened hairs 0.1–0.2 mm long, partly glabrescent to glabrous, especially in lower part. Stipules

greenish or membranous, 2–3.5 mm long, ovate-triangular, free from the petiole, distinctly connate behind the stem, sparsely hairy to sometimes glabrous. Leaves 1–3.5 cm long; petiole 0.3–1.2 cm long, like the rhachis slender, somewhat flattened, sparsely to loosely hairy like the stem. Leaflets in 5–8(–9) pairs, elliptic, 1–4 × 0.6–2 mm, at the apex rounded to emarginate, on upper side glabrous, on underside especially at the midvein sparsely to loosely covered with appressed hairs up to 0.3 mm long. Peduncles several in upper leaf axils, 1.5–5 cm long, slender, sparsely to loosely hairy like the stem but with increasing black hairs toward the raceme. Racemes short, densely 3–10-flowered. Bracts whitish-membranous, ovate to narrowly triangular, 1–1.5 mm long, white and black hairy at the margins often with short stalked minute glands. Pedicels 0.5–1 mm long, black hairy. Calyx campanulate, (2.5–)3–4 mm long, slightly obliquely cut at the mouth, loosely covered with appressed black hairs 0.1–0.3 mm long and more rarely also with some white hairs; teeth unequal, the lower three narrowly triangular, 0.5–1.5 mm long, the other two triangular, 0.3–1 mm long. Petals blue to purple. Standard 6–7 mm long; blade widely elliptic to orbicular, ca. 5 mm wide, deeply emarginate at the apex, at the base gradually narrowed without distinct claw. Wings ca. 5.5 mm long; blades narrowly elliptic, obtuse at the apex, 3.5 × 1.8–2 mm; auricle 0.5 mm long, claw 2 mm long. Keel 5 mm long; blades obliquely elliptic, with widely curved lower edge and sigmoid upper edge, subacute at the apex, 3 × 1.8–2 mm; auricle minute, claw 2 mm long. Staminal tube slightly oblique at the mouth. Ovary with a stipe ca. 1 mm long, white hairy; style glabrous. Legumes subsessile or with a stipe ca. 1 mm long, pendulous, narrowly elliptic, curved, ca. 6 mm long, 2 mm high and wide, carinate ventrally, grooved dorsally, acute at the apex with the hooked persistent style, unilocular; valves thin, pale brownish, loosely covered with appressed black hairs 0.1–0.2 mm long, soon glabrescent. Seeds 3–4, 2 × 1.2 mm, blackish.

#### Other specimens seen:

**China.** **Qinghai:** Qinghai Nan Shan, S of Qinghai Hu, E of Jiangxigou, 3460 m, 36°33' N, 100°28' E, 26.7.1993, *G. & S. Miede 9316/28* (MSB, Hb. Miede) – Qilian Shan, Riyue Shan, Lyewa Pass, SE of Qinghai Hu, 3350 m, 36°25' N, 101°05' E, 26.7.1993, *G. & S. Miede 9313/10* (MSB, Hb. Miede) – Tangula Shan N, upper Yangtse basin, Bi Qu, Tangula Pass - Yanshiping, Tangula Station, 4890 m, 33°15' N, 91°51' E, 3.9.1989, *Dickoré 4637* (MSB, Hb. Dickoré) – Tangula Shan N, upper Yangtse basin, Gar Qu, Mt. Geladadong, NE glacier tongue, 5000 m, 33°34' N, 91°27' E, 30.8.1989, *Dickoré 4545* (MSB, Hb. Dickoré). – **Xinjiang:** Karakorum, Aghil Shan, northern declivity, Aghil valley, ca. 19 km SW of Ylik, 4160 m, 36°15' N, 76°33' E, 30.8.1986, *Dickoré 479* (MSB, Hb. Dickoré) – Aghila Shan, ca. 7 km NW of Aghil Pass, 4200 m, 36°14' N, 76°34' E, 30.8.1986, *Dickoré 486* (MSB, Hb. Dickoré). – **Xizang:** Upper Tsangpo basin, Ngamring – Sangsang, 4620 m, 29°19' N, 86,53' E, 20.8.1993, *G. & S. Miede 9518/07* (MSB, Hb. Miede) – EC. Tibet, Central Plateau, Nagqu - Siling Co, 4620 m, 31°24' N, 90°59' E, 12.8.1993, *G. & S. Miede 9469/02* (MSB, Hb. Miede) – Central Plateau, E of Siling Co, 4600 m, 31°42' N, 89°36' E, 13.8.1993, *G. & S. Miede 9478/06* (MSB, Hb. Miede) – Lhasa, 3670 m, 21.5.1943, *Ludlow & Sherriff 9515* (E) – dto., 3970 m, 25.6.1943, *Ludlow & Sherriff 9715* (E) – Lhasa, 5200 m, 6.9.1904, *Waddell* (K) – Nyainqentanghla Shan, Yangbajain - Damxung NW. of Lhasa, SE. of Nyainquent, 4900 m, 30°17' N, 90°37' E, 9.8.1989, *Dickoré 3538, 3569* (MSB, hb. Dickoré) – dto., 5060 m, *Dickoré 3786* (MSB, Hb. Dickoré) – 10 km NNE of Lhasa, 4280 m, 29°45' N, 91°09' E, 2.8.1989, *Dickoré 3249* (MSB, Hb. Dickoré) – Nagarze - Lhozak, Pomo Co (C7), 5010 m, 28°30' N, 90°33' E, 18.7.1994, *Miede & Wündisch 94-76-10* (MSB, Hb. Miede) – SE Tibet, upper Yi'ong Zangbo, above Lhari, 4530 m, 31°39' N, 93°12' E, 2.9.1995, *G. & S. Miede 95-07-03* (MSB, Hb. Miede).

*Astragalus conaensis* Podlech & L.R.Xu, spec. nov. (Sect. *Polycladus*)

Holotype: China, Xizang, Tibetan Himalaya NE of Bhutan, N of Cona, 28°07' N, 91°54' E, 4720 m, 30.7.1994, *B. Dickoré 10235* (MSB; iso Hb. Dickoré).

Differt ab *A. conferto* cui habitu similis foliis 3–7 (nec 5–9)-jugis, pedunculis ad 1,5 (nec ad 4) cm long, calyce pilis nigris 0,1–0,3 mm longis et pilis albis 0,6–1 mm longis (nec imprimis pilis nigris 0,1–0,3 mm tantum longis) obtecto, vexillo ca. 9 (nec 10–12) mm longo, lamina carinae 4,5 × 2,5 mm (nec 6–7 × 3 mm).

Plants acaulescent to subacaulescent, densely caespitose, 2–5 cm tall, furnished with subappressed, in vegetative parts white, in inflorescence also black hairs 0.4–0.5 mm long. CaudeX up to 10 mm in diameter, repeatedly divided with short thick, subterranean branches. Stems or basal leaf-rosettes numerous, stems if present up to 0.5 cm long, angular-sulcate, loosely hairy. Stipules whitish-membranous, 3–4 mm long, ovate-triangular, free from the petiole or shortly adnate, but distinctly connate before the petiole, behind the stem connate up to the middle, rather densely hairy. Leaves 1–2 cm long; petiole 0.5–0.8 cm long, like the rhachis slender, rather densely hairy. Leaflets in 3–7 pairs, narrowly elliptic to elliptic, 1–3 × 0.5–1.5 mm, obtuse at the apex, on upper side sparsely to loosely, on underside rather densely to densely hairy, often somewhat folded. Peduncles 0.3–1.5 cm long, white and black hairy. Racemes short, 2–5-flowered. Bracts whitish-membranous, narrowly triangular, 1.5–2.5 mm long, predominantly black hairy, at the base often with minute, sessile glands. Pedicels ca. 1 mm long, densely black hairy. Calyx narrowly campanulate, 4–5 mm long, slightly obliquely cut at the mouth, rather densely to densely covered with appressed, black hairs 0.1–0.3 mm long and with subappressed white hairs 0.6–1 mm long; teeth subulate, 2–2.5 mm long, densely hairy on innerside. Petals deeply violet. Standard ca. 9 mm long; blade widely elliptic to suborbicular, ca. 6 mm wide, retuse at the apex, at the base gradually narrowed, without distinct claw. Wings ca. 8 mm long; blades narrowly oblong, apex obtuse to rounded, ca. 5.5 × 1.8–2 mm; auricle ca. 1 mm long, claw 3.5 mm long, slightly curved. Keel ca. 8 mm long; blades obliquely elliptic, with in the middle widely to rectangular-curved lower edge and ± straight to slightly concave upper edge, obtuse at the apex, ca. 4.5 × 2.5 mm; auricle ca. 0.8 mm long, claw ca. 3.5 mm long. Staminal tube slightly oblique at the mouth. Ovary with a slender stipe ca. 1 mm long, narrowly elliptic, white hairy; style glabrous. Legumes unknown.

Other specimen seen:

**China.** Xizang: Tibetan Himalaya NE of Bhutan, N of Cona, 28°07' N, 91°54' E, 4610 m, 30.7.1994, *G. Miehe & Wündisch 94-123-12* (MSB) – N slope Shisha Pangma [Xixabangma], S. Tibet, 5100–5200 m, 10.9.1984, *Miehe 1515* (BM) – dto., 5530 m, 13.9.1984, *Miehe 1533* (BM) – up from Nyalam, 4300 m, 3.9.1984, *Miehe 1403* (BM).

*Astragalus tibeticola* Podlech, spec. nov. (sect. *Polycladus*).

Holotype: China, Prov. Xizang: S. Tibet, Chayul Dzong, Loro Chu, 23.4.1936, *F. Ludlow & G. Sherriff 1326* (BM).

Plants 15–25 cm tall. Stems 10–17 cm long, branched at the base, ascending to erect, striate-sulcate, sparsely to loosely covered with appressed to subappressed white, at the nodes also black hairs 0.4–0.7 mm long. Stipules green, 6–9 mm long, ovate-acuminate to

narrowly triangular, free from the petiole, behind the stem high up vaginate-connate, sparsely to loosely covered with appressed white and sometimes also with some black hairs. Leaves 6–12 cm long; petiole 1–3 cm long, like the rachis loosely covered with appressed white hairs 0.2–0.5 mm long. Leaflets in 9–11 pairs, narrowly elliptic to elliptic, 7–17 × 3–6 mm, rounded to slightly emarginate at the apex, glabrous on upper side, sparsely and mainly at the midrib furnished with appressed white hairs 0.5–1 mm long. Peduncles 5–6 cm long, hairy like the stem but in upper part with predominantly black hairs. Racemes ovoid, rather loosely 7–15-flowered, Bracts whitish, linear-acute, 2.5–3 mm long, predominantly black hairs. Pedicels ca. 1 mm long, black hairy. Calyx campanulate, 4–5 mm long, slightly oblique at the base, slightly obliquely cut at the mouth, rather densely covered with appressed black hairs 0.2–0.3 mm long and with fewer, slightly longer white hairs; teeth subulate, 1.5–2 mm long. Petals mauve with whitish center, keel purplish-mauve. Standard ca. 6 mm long; blade 5 mm wide, transverse-elliptic, deeply incised at the apex, at the base subabruptly contracted into the very short claw. Wings ca. 6 mm long; blades oblong, rounded at the apex, 3.5 × 2 mm; auricle wide, ca. 0.5 mm long, claw 2.5 mm long. Keel 5 mm long; blades oblique-elliptic, rounded at the apex, 3 × 2 mm; claw 2 mm long. Staminal tube truncate at the mouth. Ovary sessile, white-hairy; style glabrous. Legumes unknown.

*Astragalus* L. sect. *Pseudotapinodes* Podlech & L.R.Xu, sect. nov.

Differt ab *A.* sect. *Polyclado* Y.C.Ho stipulis petiolo adnatis et post tergum caulis distincte connatis (nec a petiolo liberis), leguminibus quoad cognatis semibilocularibus (nec unilocularibus).

Typus sectionis: *A. orbicularifolius* P.C.Li & C.C.Ni, Acta Phytotax. Sin. 17: 112. 1979. Holotypus: [China] Chongba, 5500 m, 9.8.1975, *Chinghai-Tibetan Complex Exp.* 6724 (PE).

The following species belongs to this section up to now: *A. dickorei* Podlech & L.R.Xu, *A. longiscapus* C.C.Ni & P.C.Li, *A. orbicularifolius* P.C.Li & C.C.Ni.

*Astragalus dickorei* Podlech & L.R.Xu, spec. nov. (Sect. *Pseudotapinodes*).

Holotypus: China, Sichuan, Litang to Batang, Jinsha (Jangtse) - Yalong divide, Pass to Litang Plateau E of Yidun, 4800 m, 30°14' N, 99°33' E, 28.6.1994, *B. Dickoré* 8532 (MSB).

Differt ab *A. longiscapo* foliis 0,8–1,5 (nec 1,5–9) cm longis, glabris vel subglabris (nec laxe ad densiuscule pilosis), bracteis ellipticis 3–4 mm longis (nec anguste triangularibus 2 mm longis, vexillo ca. 10 (nec 7) mm longo, carina alis multo breviora (nec ca. 1 mm tantum breviora)).

Plants acaulescent, 1.5–2 cm tall, subglabrous in vegetative parts. Caudex slender, sometimes branched. Stems absent. Stipules whitish-membranous, ovate, 3–4 mm long, widely rounded at the apex, adnate to the petiole for 1.5–2 mm, vaginate-connate behind the stem for 1–2 mm, toward the apex and at the margins with tousled, white and black hairs up to 0.3 mm long. Leaves 1–1.5 cm long, glabrous or leaflets with few white hairs up to 0.4 mm long;

petiole 0.4–0.6 mm long. Leaflets in 3–4 pairs, narrowly elliptic, 3–5 × 1–1.5 mm, obtuse at the apex. Peduncles inconspicuous, up to 0.3 cm long, densely covered with subappressed to slightly ascending, tousled black hairs ca. 0.3 mm long. Racemes short, densely 4–5-flowered. Bracts whitish-membranous, 3–4 mm long, elliptic, rather densely hairy like the peduncle. Pedicels 0.5–1 mm long, black hairy. Calyx campanulate, 3–4 mm long, rather densely covered with flexuous, tangled black hairs up to 0.3 mm long; teeth narrowly triangular to oblong, 1.5–2 mm long, black hairy on innerside. Petals blue-violet. Standard ca. 10 mm long, elliptic, ca. 6 mm wide, shortly incised at the apex, at the base subabruptly narrowed into the cuneate claw ca. 2 mm long. Wings ca. 9 mm long; blades narrowly obovate, rounded at the apex, 6–6.5 × 2.5 mm; auricle ca. 0.5 mm long, claw 2–2.5 mm long. Keel ca. 5 mm long; blades obliquely elliptic, with slightly but widely curved lower and upper edge, acutish at the apex, 3.5 × 2.2 mm; auricle short, claw 2 mm long. Staminal tube slightly oblique at the mouth. Ovary sessile, glabrous; style short, thick. Legumes unknown.

#### X. New names and combinations in *Astragalus*

*Astragalus angorensis* Podlech, nom. nov. – Typonym: *A. brevidentatus* Podlech, Sendtnera 6: 151. 1999, illeg. [non C.H.Wright 1906]

*Astragalus keredjensis* Podlech, nom. nov. – Typonym: *Astragalus triqueter* Bornm. & Gauba, Repert. Spec. Nov. Regni Veg. 39: 106. 1935, illeg. [non A.Gray 1878].

*Astragalus maowensis* Podlech, & L.R.Xu, nom. nov. – Typonym: *Astragalus aridicola* P.C.Li, Acta Bot. Yunnanica 11(3): 295. 1989, illeg. [non Sosn. 1948].

*Astragalus obtusifoliolus* (S.B.Ho) Podlech & L.-R.Xu, comb. nov.

Basion.: *A. nobilis* B.Fedtsch. var. *obtusifoliolus* S.B.Ho, Bull.Bot. Res. North-East. Forest. Inst. 3(4): 58. 1983. Holotype: [China] Xinjiang, Wuqia Xian, Jigen, Ximuhana, 3000 m, 29.7.1978, *Exped. Xinjiang Inst. Bot. Bor.-Occ. 2128* (WUK: foto MSB!; iso: WUK!)  
Figures: HO, S.B. loc. cit. 67, tab. 6, fig. 1–11; Flora Reipublicae Popularis Sinicae 42(1): 346, tab. 92, fig. 14–23. 1993

This plant has nothing to do with *A. nobilis* because of the spreading hairs at the calyx and the bilocular fruit. It is nearest to *A. sphaerocystis* Bunge. Because the taxon is based on a very short diagnosis only, a complete description is given here.

Plants 7–8 cm tall, acaulescent, in vegetative parts covered with ± symmetrically medifixed, appressed white hairs. Caudex divided with very short branches, covered with remnants of old leaves. Stipules whitish-membranous, ca. 5 mm long, adnate to the petiole for 2–3 mm, densely covered with hairs up to 1 mm long, at the margins also with basifixed hairs, the free tips triangular, glabrous on the innerside. Leaves 2–6 cm long; petiole 1–3 cm long, like the rhachis grooved on upper side, densely covered with hairs 0.5–1 mm long. Leaflets in 2–4 pairs, elliptic to obovate, 4–9 × 2–5 mm, at the apex rounded to very shortly acuminate, on both sides densely hairy like the rhachis. Peduncles 4–5 cm long, rather densely to densely white hairy like the rhachis, in upper part also with few black hairs, often

glabrescent. Racemes shortly ovoid, densely many-flowered. Bracts whitish-membranous, 4–5 mm long, narrowly triangular, with white and black hairs, at the margins with basifixed hairs. Pedicels ca. 1 mm long, white and black hairy. Calyx soon ovoid-inflated, 9–11 mm long, 7–9 mm in diameter, loosely covered with  $\pm$  spreading, basifixed to subbasifixed white hairs 1–1.5 mm long and with fewer and slightly shorter,  $\pm$  medifixed, subappressed black hairs, the whole surface finely rugulose-warty; teeth subulate, 1–2 mm long. Petals purple-red (according to the diagnosis). Standard ca. 20 mm long; blade ovate, ca. 7 mm wide, emarginate at the apex, subabruptly constricted in lower third and then gradually narrowed. Wings ca. 18 mm long; blades narrowly oblong, obliquely emarginate at the apex, ca.  $9 \times 2$  mm; auricle 0.5 mm long, claw 9–10 mm long. Keel 13–15 mm long; blades obliquely elliptic, with widely curved lower edge and slightly convex upper edge, acutish at the apex, ca.  $5 \times 3$  mm; auricle minute, claw 8–10 mm long. Staminal tube truncate at the mouth. Ovary sessile, densely appressed hairy; style hairy only at the base. Legumes subsessile, oblong, 6–7 mm long, 3–3.5 mm high and 2 mm wide, carinate ventrally, slightly grooved, at the apex abruptly terminating into a slender, hooked beak ca. 2 mm long with persistent style, bilocular; valves thin, straw-colored, densely covered with subappressed to partly ascending, subbasifixed white hairs 0.5–0.8 mm long.

*Astragalus pseudotauricola* (Ponert) Podlech, comb. et stat. nov. – Basion.: *A. macrourus* Hohen. subsp. *pseudotauricola* ('*pseudotauricolus*') Ponert, Feddes Repert. 83: 620. 1973.

*Astragalus parrisii* Podlech, nom. nov. – Typonym: *Astragalus glaberrimus* Podlech, Sendtnera 6: 146. 1999, illeg. [non Sirj. & Rech.f.].

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