

New Species and a New Combination in *Astragalus* (Leguminosae) from China

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ABSTRACT. Forty-four new species of *Astragalus* L. (Leguminosae) are described here. They belong to the following sections: section *Brachycarpus* Borissova: *A. athranthus* Podlech & L. R. Xu, *A. brachysema* Podlech & L. R. Xu, *A. despectus* Podlech & L. R. Xu; section *Caprini* DC.: *A. fukangensis* Podlech & L. R. Xu, *A. luculentus* Podlech & L. R. Xu, *A. psilosepalus* Podlech & L. R. Xu; section *Chlorostachys* Bunge: *A. brachytrichus* Podlech & L. R. Xu, *A. chengkangensis* Podlech & L. R. Xu, *A. zadaensis* Podlech & L. R. Xu; section *Cysticalyx* Bunge: *A. gongliuensis* Podlech & L. R. Xu; section *Dissitiflora* DC.: *A. laetabilis* Podlech & L. R. Xu; section *Erioceras* Bunge: *A. yangchangii* Podlech & L. R. Xu; section *Helmia* Bunge: *A. hoshanbaoensis* Podlech & L. R. Xu, *A. persimilis* Podlech & L. R. Xu; section *Hypsophilus* Bunge: *A. yechengensis* Podlech & L. R. Xu; section *Komaroviella* Gontscharow: *A. leptocladus* Podlech & L. R. Xu; section *Laguopsis* Bunge: *A. chamaephyton* Podlech & L. R. Xu; section *Ornithopodium* Bunge: *A. huochenensis* Podlech & L. R. Xu, *A. maiusculus* Podlech & L. R. Xu, *A. sadiensis* Podlech & L. R. Xu, *A. supralaevis* Podlech & L. R. Xu; section *Oroboidei* A. Gray: *A. gongshanensis* Podlech & L. R. Xu; section *Poliothrix* Bunge: *A. baxoiensis* Podlech & L. R. Xu, *A. jiazaensis* Podlech & L. R. Xu; section *Trachycercis*: *A. acceptus* Podlech & L. R. Xu, *A. brevirexillatus* Podlech & L. R. Xu, *A. filidens* Podlech & L. R. Xu, *A. glabritubus* Podlech & L. R. Xu, *A. levidensis* Podlech & L. R. Xu, *A. lustricola* Podlech & L. R. Xu, *A. lychnobius* Podlech & L. R. Xu, *A. macriculus* Podlech & L. R. Xu, *A. ningxiaensis* Podlech & L. R. Xu, *A. occultus* Podlech & L. R. Xu, *A. perbrevis* Podlech & L. R. Xu, *A. porphyreus* Podlech & L. R. Xu, *A. secretus* Podlech & L. R. Xu, *A. sinkiangensis* Podlech & L. R. Xu, *A. tesquorum* Podlech & L. R. Xu, *A. transecticola* Podlech & L. R. Xu, *A. trijugus* Podlech & L. R. Xu, *A. rescus* Podlech & L. R. Xu, *A. visibilis* Podlech & L. R. Xu; section *Uliginosi* A. Gray: *A. qitaiensis* Podlech & L. R. Xu. Furthermore, two taxa are raised in rank.

Key words: *Astragalus*, China, Leguminosae.

During a stay in China to see the rich *Astragalus* L. (Leguminosae) material in the largest herbaria, namely, Beijing (PE), Kunming (KUN), and Yangling (WUK), we identified a number of new species that were previously unnamed or wrongly named. They are described here. The flora of China is very rich in *Astragalus* species. In a forthcoming volume of *Flora of China*, 388 species, of which 210 are endemic in China, will be treated.

1. *Astragalus* sect. *Brachycarpus* Borissova, in Fl. URSS 12: 877. 1946. TYPE: *Astragalus melanostachys* Benth. (lectotype, designated by Podlech, 1990: 466).

1. *Astragalus athranthus* Podlech & L. R. Xu, sp. nov. TYPE: China. Qinghai: Chaidam [Qaidam] basin, Donjishan kou, 4020 m, 5 July 1959, *Qinghai-Gansu Team 578* (holotype, PE).

Differt ab *Astragalo densifloro* Karelin & Kirilov stipulis foliorum superiorum laxo albo-nigro-pilosis, imprimis margines apicemque versus (nec margine tantum albo-ciliatis), calyce 5–6 mm (nec 3–4 mm) longo, vexillo ca. 9 mm (nec 6–7 mm) longo, lacinis alarum obovato-spathulatis, apicem truncatum versus valde dilatatis, 2 mm latis (nec anguste oblongis, 1.2 mm latis), ovarii glabris (nec pilosis).

Plants ca. 15 cm tall. *Caudex* with \pm elongated, slender, branched stolons. *Stems* 3–10 cm long, slender, prostrate to ascending, loosely to densely covered with appressed, white hairs 0.3–0.5 mm long, at the nodes with some black hairs mixed in, the basal parts and the stolons glabrous. *Stipules* adnate to the petiole for 1–2 mm, those of lower leaves membranous, 3–4 mm long, triangular, shortly vaginateconnate behind the stem, glabrous or sparsely hairy, those of upper leaves greenish, narrowly triangular, 5–7 mm long, free from each other, loosely white and black hairy, especially toward the margins and the tip.

Leaves 3.5–5.5 cm long; petiole 1–1.5 cm long, like the rachis loosely covered with appressed to slightly ascending, tangled white hairs 0.3–0.5 mm long, sometimes with black hairs mixed in. *Leaflets* in 5 to 8 pairs, narrowly elliptic, 6–18 × 2–3.5 mm, obtuse to acute, on upper side glabrous, on underside loosely to densely covered with appressed to subappressed white hairs 0.3–0.6 mm long. *Peduncles* 4–7 cm long, rather densely hairy like the rachis, toward the raceme with increasing black hairs. *Racemes* ovoid, ca. 3 × 2 cm, densely many-flowered. *Bracts* whitish membranous, very narrowly triangular, ca. 4(–5) mm long, black hairy. *Pedicels* 1–1.5 mm long, black hairy. *Calyx* pale reddish brown, 5–6 mm long, campanulate, ± densely covered with slightly ascending black hairs 0.5–1 mm long, with some grayish hairs mixed in; teeth subulate, 2–3 mm long, hairy on inner side. *Petals* yellowish when dry. *Standard* ca. 9 mm long; limb ca. 4 mm wide, oblong-obovate, emarginate, subabruptly contracted into a claw ca. 3 mm long. *Wings* ca. 7 mm long; limbs obovate-spathulate, truncate, 4 × 2 mm; auricle ca. 0.5 mm long, claw ca. 3 mm long. *Keel* ca. 6 mm long; limbs obliquely elliptic-curved, with widely curved lower edge and slightly concave upper edge, subacute, ca. 3 × 1.8 mm; auricle minute, claw ca. 2.5 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* sessile, widely ovoid, glabrous. *Legumes* unknown.

Astragalus athranthus differs from *A. densiflorus* by stipules of upper leaves loosely black hairy, especially at the margins and toward tip (vs. only at the margins white ciliate); calyx 5–6 mm (vs. 3–4 mm); standard ca. 9 mm (vs. 6–7 mm); wing limbs obovate-spathulate, strongly dilated toward the truncate tip (vs. narrowly oblong, 1.2 mm wide); and ovary glabrous (vs. hairy).

Etymology. The species epithet is from the Latin “athranthus,” meaning “with packed flowers.”

2. *Astragalus brachysemia* Podlech & L. R. Xu, sp. nov. TYPE: China. NW Sichuan: Norgai, ca. 33°N, 103°E, 3420 m, 13 Aug. 1975, s. coll. no. 10393 (holotype, PE).

Differt ab *Astragalo densifloro* Karelin & Kirilov caulibus 13–15 cm longis (nec 2–5(–10) cm longis), pilis 0.1–0.3 mm (nec 0.4–0.5 mm) longis obtectis, stipulis inter se liberis (nec inferioribus a tergo caulibus breviter connatis), imprimis nigropilosis (nec margine tantum albo-ciliatis), rhachidibus saepissime albo-nigro-pilosis (nec mere albo-pilosis), ovariiis glabris (nec pilosis).

Plants ca. 25 cm tall. *Stems* ca. 13–15 cm long, prostrate to ascending, rather densely covered with subappressed white hairs 0.1–0.3 mm long, soon

glabrescent. *Stipules* greenish, narrowly triangular, 3.5–6 mm long, very shortly adnate to the petiole, otherwise free, sparsely to loosely predominantly black hairy. *Leaves* 4–7 cm long; petiole 0.5–1 cm long, like the rachis sulcate adaxially, loosely white or white and black hairy like the stem. *Leaflets* in 4 to 6 pairs, narrowly elliptic, 10–20 × 2–5 mm, subobtusate to obtuse, on upper side glabrous, on underside loosely covered with appressed white hairs 0.2–0.5 mm long. *Peduncles* 6–8 cm long, angular-sulcate, hairy like the stem, toward the raceme with increasing, more spreading black hairs. *Racemes* cylindric, ca. 5 cm long, rather densely to densely many-flowered. *Bracts* whitish membranous, linear to very narrowly triangular, 2–4 mm long, black hairy. *Pedicels* ca. 0.5 mm long, black hairy. *Calyx* ca. 4 mm long, campanulate, ± densely covered with ascending black hairs ca. 0.5 mm long; teeth subulate, 1.5–2 mm long, black hairy on inner side. *Petals* violet, in dry state very pale lilac. *Standard* ca. 6 mm long; limb obovate, ca. 3.5 mm wide, rounded, gradually narrowed at the base without distinct claw. *Wings* ca. 5 mm long; limbs narrowly oblong, slightly curved, rounded, ca. 3 × 1.2 mm; auricle ca. 0.4 mm long, claw ca. 2 mm long. *Keel* ca. 4 mm long; limbs obliquely obovate, upper part with nearly rectangularly curved lower edge and slightly curved upper edge, subacute, 2 × 1 mm; auricle minute, claw ca. 2 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* with a slender stipe ca. 0.5 mm long, subglobular, glabrous. *Legumes* unknown.

Astragalus brachysemia differs from *A. densiflorus* by stems 13–15 cm long, covered with hairs 0.1–0.3 mm (vs. 2–5(–10) cm, with hairs 0.4–0.5 mm); stipules free from each other, predominantly black hairy (vs. those of lower leaves shortly connate behind the stem, all only white ciliate at the margins); rachis mostly white and black hairy (vs. only white hairy); and ovary glabrous (vs. hairy).

Etymology. The specific epithet is from the Greek “brachysemia,” meaning “short standard.”

3. *Astragalus despectus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xizang: near Shuang Hu, ca. 33°35'N, 86°58'E, 5100 m, 4 Aug. 1976, K. J. Lang 9942 (holotype, PE; isotype, KUN).

Differt ab *Astragalo malcolmii* Hemsley & H. Pearson cui habitu similis, caule evolutio, 1–3.5 cm longo, internodio basali excepto appresse piloso (nec planta acaulescente ad subacaulescente, internodiis basalibus exceptis pilis ascendentibus ad patentibus obtectis), stipulis ca. 5 mm (nec 2.5–3 mm) longis, rachide appresse (nec patentem) piloso, foliolis supra glabris, subtus laxae appresse pilosis (nec supra sparse ad laxae, subtus laxae ad dense subpatenter pilosis),

pedunculis subappresse (nec subpatenter) pilosis, vexillo ca. 5.5×3.5 mm (nec $7-8 \times 5-5.5$ mm).

Plants small, 4–5 cm tall, subacaulescent to shortly caulescent. *Caudex* with slender, elongated, branched, subterranean stolons furnished with pale leafless stipules. *Stems* 1–3.5 cm long, lowest internodes glabrous, the next one internode densely covered with ascending hairs, the upper ones loosely covered with appressed white hairs 0.2–0.3 mm long, toward the nodes with few black hairs mixed in. *Stipules* greenish to whitish, ca. 5 mm long, ovate, very shortly adnate to the petiole, the lower ones and those of the leafless stolons highly vaginate-connate, the upper ones free from each other, sparsely white or black hairy, ciliate at the margins. *Leaves* 2–2.5 cm long; petiole up to 0.5 cm long, like the rachis loosely to rather densely covered with appressed white hairs 0.1–0.2 mm long, with black hairs mixed in. *Leaflets* in 5 to 8 pairs, narrowly elliptic, $3-7 \times 1.5-3$ mm, obtuse, upper side glabrous, on underside loosely covered with appressed white hairs 0.1–0.3 mm long. *Peduncles* subterminal, 1.5–2 cm long, loosely to rather densely covered with subappressed white hairs 0.1–0.2 mm long, with some longer, mostly black hairs up to 0.5 mm long mixed in. *Racemes* globular, 1–1.5 cm diam., densely ca. 20-flowered. *Bracts* whitish membranous, 1.5–3 mm long, narrowly triangular, sparsely black hairy. *Pedicels* very short, predominantly black hairy. *Calyx* campanulate, ca. 3 mm long, densely covered with ascending to spreading, tangled, predominantly black hairs 0.4–0.6 mm long; teeth narrowly triangular-linear, 1–1.5 mm long, on inner side black hairy. *Petals* mauve. *Standard* ca. 5.5 mm long; limb ca. 3.5 mm wide, suborbicular, slightly emarginate, narrowed at the base without distinct claw. *Wings* ca. 4 mm long; limbs obtriangular, widest below the widely truncate tip, ca. $2.5 \times 1.8-2$ mm; auricle ca. 0.5 mm long, claw 1.5–2 mm long. *Keel* ca. 4 mm long; limbs triangular, middle part with widely curved lower edge and \pm straight upper edge, subobtuse, ca. 2×1.5 mm; auricle indistinct, claw ca. 1.5 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, globular, glabrous, 2-ovulate. *Legumes* unknown.

Astragalus despectus looks like *A. malcolmii* but differs by being shortly caulescent with stem 1–3.5 cm long, with exception of the lowermost internode covered with appressed hairs (vs. acaulescent to subacaulescent, with exception of the lowermost internodes covered with ascending to spreading hairs); stipules ca. 5 mm long (vs. 2.5–3 mm); rachis appressed (vs. spreading) hairy; leaflets on upper side glabrous, on underside loosely appressed hairy (vs. on upper side sparsely to loosely, on underside with more

densely nearly spreading hairs); peduncles subappressed (vs. nearly spreading) hairy; and standard ca. 5.5×3.5 mm (vs. $7-8 \times 5-5.5$ mm).

Etymology. The specific epithet is from the Latin “despectus,” meaning “overlooked.”

Paratype. CHINA. **Xizang:** near Shuang Hu, ca. $86^{\circ}58'E$, $33^{\circ}35'N$, 5100 m, 4 Aug. 1976, *K. J. Lang* 9833 (PE).

II. *Astragalus* sect. *Caprini* DC., Prodr. 2: 301. 1825. TYPE: *Astragalus caprinus* L.

1. *Astragalus fukangensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: Fukang [ca. 50 km NNE Urumqi], 9 July 1998, *L. R. Xu* 2013 (holotype, MSB; isotype, WUK).

Differt ab *Astragalo flexo* Fischer cui habitu similis planta glaberrima (nec pilis ad 2 mm longis instructa), racemis cum petiolo longissimis ad 35 cm longis, leguminibus stipite 3–4 mm (nec 6–8 mm) suffultis.

Plants ca. 40 cm tall, acaulescent, completely glabrous. *Caudex* simple, in upper part covered with remnants of old stipules. *Stipules* membranous, ca. 10 mm long, triangular, adnate to the petiole for ca. 2 mm. *Leaves* ca. 35 cm long; petiole 8–10 cm long, like the rachis 1.5–2.5 mm thick, rigid, slightly indurated. *Leaflets* in 7 to 8 pairs, remote, widely elliptic to suborbicular, rounded to retuse, $15-25 \times 12-22$ mm. *Peduncles* 15–18 cm long, up to 2.5 mm thick. *Racemes* as long as the peduncle, remotely up to 20-flowered. *Bracts* membranous, linear-acute, 8–10 mm long. *Flowers* unknown. *Legumes* with a stipe 3–4 mm long, ellipsoid, 17–18 mm long, 9–12 mm high, 9–10 mm wide, slightly keeled ventrally, widely rounded dorsally, with a triangular beak ca. 2 mm long, incompletely bilocular; valves thinly coriaceous, straw-colored.

Astragalus fukangensis looks similar to *A. flexus* but differs by being completely glabrous (vs. covered with hairs up to 2 mm long); by very long racemes with peduncle 15–18 cm long (vs. racemes rather short, with peduncle 5–12 cm); and by legumes with a stipe 3–4 mm long (vs. 6–8 mm).

2. *Astragalus luculentus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: around Gongliu, $43^{\circ}28'N$, $82^{\circ}13'E$, 1500 m, 15 July 1990, *L. R. Xu* 1514 (holotype, WUK).

Differt ab *Astragalo tschimganico* Popov stipulis albidis, 20–30 mm longis, anguste triangularibus longissime acuminatis, distincte longitudinaliter nervosis (nec hyalino-membranaceis, 11–15(–20) mm longis, breviter acuminatis, sine nervis distinctis), petiolo 8–11 cm (nec 3.5–7 cm) longis,

foliolis 11–15-jugis (nec 8–9-jugis), pedunculis 8–9 cm (nec 2–5 cm) longis, calycibus 12–13 mm (nec ad 20 mm) longis, dentibus 2–4 mm (nec 3–10 mm) longis, leguminibus subsessilibus (nec stipite 10–11(–20) mm longo suffultis).

Plants ca. 35 cm tall, completely glabrous. *Stems* stout, 3–4 mm diam., ca. 20 cm long, angular-sulcate, ascending to erect. *Stipules* whitish, 20–30 mm long (in sprouting branches, after grazing much smaller), narrowly triangular, very long-acuminate, distinctly longitudinally nerved, free from the petiole. *Leaves* 25–30 cm long; petioles 8–11 cm long. *Leaflets* in 11 to 15 pairs, ovate, 20–35 × 8–18 mm (in sprouting branches, after grazing much smaller), subacute to rounded, often minutely mucronulate. *Racemes* distributed along the whole stem, with a peduncle 8–9 cm long, loosely ca. 5- to 9-flowered. *Bracts* whitish, very narrowly triangular, 10–15 mm long. *Pedicels* 4–6 mm long. *Calyx* 12–13 mm long, tubular; teeth subulate, unequal, 2–4 mm long. *Petals* yellow. *Standard* ca. 25 mm long. *Keel* ca. 15 mm long. Other petal data missing. *Legumes* subsessile, oblong, straight, 18–25 mm long, 5–8 mm high and ca. 9 mm wide, rounded with prominent, thickened nerve ventrally, deeply and widely grooved dorsally, with a narrowly triangular beak 1–2 mm long, incompletely bilocular; valves coriaceous, pale brownish, dark brown suffused.

Astragalus luculentus differs from *A. tschimganicus* by whitish stipules 20–30 mm long, narrowly triangular, very long-acuminate, distinctly longitudinally nerved (vs. hyaline-membranous, 11–15(–20) mm, shortly acuminate, without distinct nerves); petiole 8–11 cm long (vs. 3.5–7 cm); leaflets in 11 to 15 pairs (vs. 8 to 9 pairs); peduncles 8–9 cm long (vs. 2–5 cm); calyx 12–13 mm long, with teeth 2–4 mm long (vs. up to 20 mm, with teeth 3–10 mm); and legumes subsessile (vs. with a stipe 10–11(–20) mm long).

Etymology. The specific epithet is from the Latin “luculentus,” meaning full of light, bright, but also handsome.

Paratype. CHINA. **Xinjiang:** Gongliu, 1550 m, 4 May 1959, A. R. Li 288 (KUN).

3. *Astragalus psilosepalus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Habahe, ca. 48°02'N, 86°26'E, 1478 m. *Zhao Yang Chang et al.* no. 2004-448 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo sewertzowii* Bunge stipulis a petiolo liberis (nec per 1–2 mm adnatis), calyce 11–13 mm (nec 17–20 mm) longo, dentibus adaxialibus triangularibus, 3–4 mm longis, abaxialibus anguste triangularibus, 4–5 mm longis (nec subulatis, 8–15 mm longis).

Plants 20–35 cm tall, acaulescent or shortly caulescent, glabrous or sparsely white hairy. *Caudex* up to 10 mm thick, scarcely divided, with short, thick branches. *Stems*, if present, up to 7 cm long. *Stipules* whitish membranous, 10–20 mm long, narrowly ovate, free from the petiole, the lower ones obtuse, the upper acute, glabrous. *Leaves* 12–35 cm long; petiole 4–8 cm long, at the base up to 2 mm thick, like the rachis finely striate-sulcate, glabrous or loosely covered with spreading hairs 1–2 mm long. *Leaflets* in 10 to 15 pairs, ovate, 8–30 × 5–22 mm, rounded to very shortly acuminate, glabrous or at the margins and on underside at the midvein sparsely covered with spreading hairs ca. 1 mm long. *Peduncles* 0.5–2 cm long. *Racemes* very loosely 5- to 7-flowered. *Bracts* whitish membranous, narrowly triangular, 5–12 mm long, glabrous or loosely hairy. *Pedicels* 3–7 mm long. *Calyx* 11–13 mm long, shortly tubular, obliquely cut at the mouth, glabrous or with few spreading hairs at the teeth; teeth unequal, the upper (adaxial) 2 triangular, 3–4 mm long, the lower (abaxial) 3 narrowly triangular, 4–5 mm long. *Petals* yellow or greenish yellow. *Standard* 24–25 mm long; limb 8–9 mm wide, oblong to elliptic, emarginate, gradually narrowed into the short, wide claw. *Wings* 20–22 mm long; limbs narrowly oblong, rounded, 10–12 × 3–3.5 mm; auricle ca. 1 mm long, claw ca. 10 mm long. *Keel* 17–18 mm long; limbs elliptic, with slightly curved lower edge and upper edge, acute, ca. 8 × 4 mm; auricle triangular, acute, 0.5–0.8 mm long, claw ca. 10 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* with a stipe 1–1.5 mm long, hairy. *Legumes* ellipsoid, ca. 20 mm long and 10 mm high.

Astragalus psilosepalus differs from *A. sewertzowii* by stipules free from the petiole (vs. adnate to it for 1–2 mm); and calyx 11–13 mm long with adaxial teeth triangular, 3–4 mm long, abaxial teeth narrowly triangular, 4–5 mm long (vs. 17–20 mm with teeth subulate, 8–15 mm).

Etymology. The specific epithet is from the Greek “psilo,” meaning “glabrous,” and the Latin “sepalus,” meaning “sepals”; therefore, “with glabrous calyx.”

Paratypes. CHINA. **Xinjiang:** Gongliu, 82°13'E, 43°28'N, 1259 m, 19 May 1904, C. Y. Chang et al. 2004-283 (WUK); Gongliu, Merhe, Qiayi, 1500 m, 15 July 1989, L. R. Xu 1514 (PE); between Burqin and Altai, May 2004, C. Y. Chang et al. 2004-259 (WUK).

III. *Astragalus* sect. *Chlorostachys* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 27. 1868. TYPE: *Astragalus chlorostachys* Lindley.

1. *Astragalus brachytrichus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xizang: Langxian, 3100 m, 4 Aug. 1982, C. C. Ni *et al.* 2253 (holotype, PE).

Differt ab *Astragalo lucido* H. T. Tsai & T. T. Yu stipulis ca. 5 mm, in ramis lateralibus 2–3 mm longis (nec 7–16(–25) mm longis), foliolis 4–7 × 2–3.5 mm (nec 6–15 × 2.5–7 mm), bracteis 1–3 mm longis, anguste triangularibus ad linearibus (nec 4–5 mm longis et ca. 2 mm latis, spatulatis ad anguste ellipticis), vexillo ca. 9 mm (nec 11 mm) longo.

Plants at least 35 cm tall (basal parts missing). *Stems* branched, erect, slender, 1.5 mm thick, finely angular-sulcate, glabrous, those of side branches sparsely covered with subappressed white hairs 0.15–0.3 mm long. *Stipules* membranous to greenish, narrowly triangular, ca. 5 mm long, in side branches 2–3 mm long, free, at the margins and tip sparsely white and black hairy. *Leaves* 3–7 cm long; petiole 0.5–1.5 cm long, like the rachis very slender, sparsely to loosely white hairy, with some black hairs mixed in. *Leaflets* in 8 to 15 pairs, elliptic, 4–7 × 2–3.5 mm, truncate to retuse, on upper side glabrous, on underside sparsely appressed hairy at the margin and at the midrib. *Peduncles* 3–4.5 cm long, angular-sulcate, sparsely white hairy like the rachis, with few black hairs mixed in. *Racemes* 2–3 cm long, rather densely 12- to 15-flowered. *Bracts* whitish membranous, narrowly triangular to linear-acute, 1–3 mm long, sparsely hairy like the stipules. *Pedicels* 1–2 mm long, loosely black hairy. *Calyx* ca. 4 mm long, obliquely campanulate, glabrous or with scattered hairs only, between and at the teeth sparsely black ciliate; teeth unequal, narrowly triangular, the 3 abaxial ca. 2 mm long, the 2 adaxial ca. 1 mm long, on inner side glabrous or sparsely black hairy. *Petals* greenish yellow. *Standard* ca. 9 mm long; limb obovate, ca. 5 mm wide, emarginate, gradually narrowed into the short cuneate claw. *Wings* ca. 8 mm long; limbs narrowly oblong, rounded, 4 × 1 mm; auricle ca. 0.3 mm long, claw ca. 4 mm long. *Keel* ca. 8 mm long; limbs obliquely elliptic, obtuse, 4 × 2 mm; auricle triangular, 0.6–1 mm long, claw 4 mm long. *Stamen tube* truncate at the mouth. *Ovary* with a stipe ca. 2 mm long, glabrous. *Legumes* (unripe) with a stipe 3–4 mm long, obliquely ellipsoid, somewhat curved, ca. 10–12 mm long, incompletely bilocular (septum to 3/4 of the fruit's height); valves thinly membranous, pale brownish, glabrous.

Astragalus brachytrichus differs from *A. lucidus* by stipules ca. 5 mm long, in side branches 2–3 mm long (vs. 7–16(–25) mm); leaflets 4–7 × 2–3.5 mm (vs. 6–15 × 2.5–7 mm); bracts 1–3 mm long, narrowly triangular to linear (vs. 4–5 × ca. 2 mm, spatulate to narrowly elliptic); and standard ca. 9 mm long (vs. 11 mm).

Etymology. The specific epithet derives from the Greek, and it means “with short hairs.”

2. *Astragalus chengkangensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Yunnan: Chengkang [Zhenkang], snow range, 2900 m, 2 Aug. 1938, T. T. Yu 17255 (holotype, PE).

Differt ab *Astragalo dumetorum* Handel-Mazzetti caudice simpliciter, caule singulare irramoso (nec caudice ramoso, caulibus nonnullis, saepe ramis lateralibus non-floriferis evolutis), foliolis 8–11-jugis, 15–30 × 5–13 mm, supra saepissime sparse pilosis (nec 12–16-jugis, 5–18 × 3–8 mm, supra glabris), bracteis persistentibus, laxe pilosis (nec mox caducis, glabris), bracteolis evolutis, 2–3 mm longis, persistentibus (nec interdum tantum evolutis, 0.4–1 mm longis, mox caducis), vexillo 16–17 mm (nec 10–11 mm) longo.

Plant ca. 110 cm tall. *Caudex* slender, unbranched. *Stems* singular, ca. 100 cm long, ca. 4 mm diam., hollow, erect, striate, glabrous. *Stipules* green, narrowly triangular to ovate-acuminate, 10–15 mm long, obliquely inserted at the stem, free, white hairy at the margins and tip. *Leaves* 10–17 cm long; petiole 2–2.5 cm long, like the rachis sulcate adaxially, sparsely to rather loosely covered with subappressed to ascending, tangled white and black hairs up to 1 mm long. *Leaflets* in 8 to 11 pairs, narrowly elliptic, 15–30 × 5–13 mm, rounded, minutely mucronulate, on upper side mostly sparsely appressed hairy, on underside loosely, at the margins more densely covered with white hairs 0.2–0.5 mm long. *Peduncles* several in each stem, in the axils of the upper leaves, 8–12 cm long, hairy like the rachis. *Racemes* rather densely 12- to 22-flowered, elongating after anthesis. *Bracts* greenish, narrowly ovate, long-acuminate, 7–11 mm long, loosely covered with tangled, white and black hairs up to 1 mm long, ± persistent. *Pedicels* 3–4 mm long, with short blackish hairs, erect, bent at the insertion of the calyx, flowers and fruits therefore spreading. *Bracteoles* 2–3 mm long, at the base of calyx, persistent. *Calyx* shortly tubular, ca. 8 mm long, obliquely gibbous at the mouth, rather densely covered with subappressed to ascending, predominantly black hairs 0.2–0.8 mm long; teeth narrowly triangular, ca. 2 mm long, black hairy on inner side. *Petals* yellow. *Standard* 16–17 mm long; limb obovate, ca. 7 mm wide, emarginate, slightly constricted near the base, subabruptly angularly passing into the claw ca. 5 mm long. *Wings* ca. 15 mm long; limbs narrowly oblong, slightly narrowed toward the obtuse tip, ca. 7 × 2.5 mm; auricle ca. 2 mm long, claw 8 mm long. *Keel* ca. 15 mm long; limbs obliquely obovate, elliptic, with widely curved lower edge and slightly concave upper edge, obtuse, 6 × 3 mm;

auricle widely triangular, ca. 1 mm long, claw ca. 10 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* with a stipe ca. 5 mm long, linear, glabrous. *Legumes* unknown.

Astragalus chengkangensis differs from *A. dumetorum* by its simple, non-branched stem (vs. stems several, mostly with non-flowering side-branches); leaflets in 8 to 11 pairs, 15–30 × 5–13 mm, on upper side mostly sparsely hairy (vs. in 12 to 16 pairs, 5–18 × 3–8 mm, on upper side glabrous); bracts persistent, loosely hairy (vs. soon falling, glabrous); bracteoles present, 2–3 mm long, persistent (vs. only rarely present, 0.4–1 mm long, soon falling); standard 16–17 mm long (vs. 10–11 mm).

This species is placed in section *Chlorostachys* provisionally because it is not clear if the fruit is unilocular or bilocular. In habit and most characters, it resembles *Astragalus dumetorum* and not any species of section *Cenantrum* with glabrous ovary.

3. *Astragalus zadaensis* Podlech & L. R. Xu, sp. nov. TYPE: China. SW Xizang: near Zada, 3500 m, 28 June 1976, *Qinghai-Tibetan Exped. 76-8083* (holotype, KUN).

Astragalo mongholic Bunge e sect. *Cenantrum* Bunge similis, sed differt in partibus vegetativis pilis 0.2–0.5 mm (nec 1–1.5(–2) mm) longis instructus, rhachidibus glabris vel subglabris (nec sparse ad laxe appresse ad patenter pilosis), foliolis apice acuminato-mucronulatis (nec rotundatis ad retusis vel leviter emarginatis), bracteis cito caducis, sub anthesin jam delapsis (nec persistentibus), leguminibus ± anguste ellipticis (nec a latere visis oblique ellipticis ad subsemicircularibus), bilocularibus (nec unilocularibus).

Plants more than 55 cm tall, covered in vegetative parts with appressed white hairs 0.2–0.5 mm long. *Stems* erect, at the base ca. 4 mm diam., finely angular-sulcate, glabrous. *Stipules* of lower leaves unknown, of upper leaves ca. 5 mm long, glabrous very sparsely white and black hairy, soon falling. *Leaves* 6–15 cm long, nearly sessile; rachis glabrous or with scattered hairs only. *Leaflets* in 6 to 8 pairs, elliptic, acuminate-mucronulate, 10–20 × 5–12 mm, on both sides glabrous or with scattered hairs only. *Peduncles* 7–10 cm long, with scattered white and black hairs. *Racemes* 5–7 cm long, loosely 10- to 12-flowered; axis with scattered white and black hairs. *Bracts* whitish membranous, narrowly triangular to linear, ca. 2 mm long, white and black hairy. *Pedicels* 1–2.5 mm long, sparsely black hairy. *Bracteoles* whitish, linear, 1–2 mm long, at the pedicel just below the calyx. *Calyx* campanulate-tubular, 9–11 mm long, obliquely cut at the mouth, sparsely covered with ascending to spreading black hairs 0.3–0.5 mm long; teeth subulate, 4–5 mm long. *Petals* pale lilac. *Standard* ca.

18 mm long; limb ca. 8 mm wide. *Wings* ca. 17 mm long. *Keel* ca. 17 mm long; limbs ± triangular, with rectangularly curved lower edge and slightly concave upper edge, obtuse, ca. 7 × 4 mm; auricle ca. 1 mm long, claw ca. 10 mm long. *Stamen tube* strongly obliquely cut at the mouth. *Ovary* with a stipe 4–7 mm long, glabrous. *Legumes* with a slender stipe 8–10 mm long, narrowly ellipsoid, 20–25 mm long, ca. 6 mm high, keeled ventrally, narrowly rounded dorsally, shortly acuminate, bilocular; valves membranous, dull straw-colored, glabrous.

Astragalus zadaensis is similar to *A. mongholicus* (sect. *Cenantrum*) but differs by hairs in vegetative parts 0.2–0.5 mm long (vs. 1–1.5(–2) mm); rachis glabrous to subglabrous (vs. sparsely to loosely spreading hairy); leaflets acuminate-mucronulate (vs. rounded to retuse or slightly emarginate); bracts very soon falling, at flowering time mostly fallen away (vs. bracts persistent); and legumes ± narrowly elliptic, bilocular (vs. obliquely elliptic to semi-circular, unilocular).

IV. *Astragalus* sect. *Cysticalyx* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 135. 1868. TYPE: *Astragalus cysticalyx* Ledebour.

1. *Astragalus gongliuensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Gongliu, ca. 43°28'N, 82°13'E, 1100 m, 29 May 1985, *Z. Hai 85-112* (holotype, WUK).

Differt ab *Astragalo tyttocarpo* Gontscharow stipulis omnibus inter se liberis, mere albo-pilosis (nec inferioribus a tergo caulis connatis, praecipue nigro-pilosis), foliolis 10–20 × 1–1.5 mm (nec 12–35 × 3–4 mm), supra sparse ad laxe, subtus dense pilosis (nec supra sparsissime et remote, subtus sparse pilosis), racemis 3–4 cm longis (nec 6–10 cm longis), bracteis praecipue albo-pilosis (nec nigro-pilosis), calyce fructifero ca. 14 mm (nec 8–11 mm) longo.

Plants subshrubby, 25–45 cm tall. *Caudex* divided, covered with blackish brown bark. *Stems* branched, the older parts ligneous, covered with blackish bark, 3–4 cm long; parts of the current year up to 20 cm long, very densely covered with medifixed, appressed white hairs ca. 1 mm long, toward the nodes with scattered black hairs mixed in. *Stipules* 4–6 mm long, adnate to the petiole for 1–2 mm, otherwise free from each other, densely appressed hairy like the stem. *Leaves* 4–8 cm long, subsessile; rachis sulcate adaxially, densely white hairy like the stem. *Leaflets* in 5 to 7 pairs, linear, 10–20 × 1–1.5 mm, acute, on upper side sparsely to loosely, on underside densely covered with medifixed hairs 1–1.5 mm long. *Peduncles* 10–13 cm long, densely hairy like the stem, toward the raceme with some black hairs mixed in, slightly glabrescent with age. *Racemes* ca. 3–4 cm

long, ca. 3 cm diam., densely ca. 12-flowered. *Bracts* whitish membranous, 3–4 mm long, narrowly triangular, covered with subbasifixed to basifixed, spreading white hairs 1–1.5 mm long, with shorter black hairs mixed in. Calyx at anthesis tubular, soon ovoid-inflated, ca. 14 mm long, loosely covered with strongly to extremely asymmetrically bifurcate, ascending to spreading white hairs 1–2 mm long and with more symmetrically bifurcate, subappressed black hairs 0.5–1 mm long. *Petals* yellow. *Standard* ca. 19 mm long; limb ca. 4 mm wide, narrowly oblong, emarginate, gradually narrowed into a claw ca. 4 mm long. *Wings* ca. 17 mm long; limbs narrowly oblong, obtuse, ca. 6×2 mm; auricle ca. 0.8 mm long, claw 11 mm long. *Keel* ca. 16 mm long; limbs obliquely elliptic, slightly curved, with slightly, widely curved lower edge and slightly concave upper edge, obtuse, 5×2 mm; auricle minute, claw 11 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely covered with subbasifixed, ascending white hairs at least 1.5 mm long. *Legumes* unknown.

Astragalus gongliuensis differs from *A. tyttocarpus* by all stipules free from each other and white hairy (vs. the lower ones behind the stem connate, predominantly black hairy); leaflets $10\text{--}20 \times 1\text{--}1.5$ mm, on upper side sparsely to loosely, on underside densely hairy (vs. $12\text{--}35 \times 3\text{--}4$ mm, on upper side with scattered hairs only, on underside sparsely hairy); racemes 3–4 cm long (vs. 6–10 cm); bracts predominantly white hairy (vs. black hairy); and fruiting calyx ca. 14 mm long (vs. 8–11 mm).

V. *Astragalus* sect. *Cytisodes* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 127. 1868. TYPE: *Astragalus cytisodes* Bunge.

1. *Astragalus yanerwoensis* (S. B. Ho) Podlech & L. R. Xu, nom. et stat. nov. Basionym: *Astragalus parlorianus* Gamajunova var. *longirostris* S. B. Ho, Bull. Bot. Res. North-East. Forest. Inst. 3(1): 67. 1983. TYPE: China. Xinjiang: Ürümqi, Yanerwo, 17 May 1962, *Inst. Bio.-Ped.-Psamm. Xinjiang* 3510 (holotype, XJBI; isotype, WUK).

This species differs from *Astragalus parlorianus* by several characters: stipules 3–7 mm long, predominantly white hairy (vs. 1.8–2.5 mm, black hairy); leaflets narrowly elliptic to elliptic, $7\text{--}15 \times 3\text{--}5$ mm (vs. narrowly elliptic to nearly linear, $4\text{--}17 \times 1.5\text{--}3$ mm); peduncles 1.5–4 cm long (vs. 5–15 cm); bracts 4–6 mm long (vs. 2 mm); calyx ca. 15 mm long (vs. 11–13 mm); standard ca. 24 mm long (vs. 17–18 mm); and legumes without beak 15–20 mm long, with a beak 6–10 mm long (vs. 35–50(–65) mm, with a beak ca. 6 mm).

VI. *Astragalus* sect. *Dissitiflori* DC., Prodr. 2: 284. 1825. TYPE: *Astragalus virgatus* Pallas (lectotype, designated by Podlech, 1990: 473).

1. *Astragalus lactabilis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xizang: Zada, 2 July 1976, *Qinghai-Tibetan Complex Exped.* 76-8141 (holotype, KUN).

Differt ab *Astragalo compresso* Ledebour caulibus laxe (nec densissime) pilosis, pilis nigris immixtis (nec mere albob pilosis), foliolis filiformibus 0.3–0.5 mm (nec 1–1.5 mm) latis, petalis flavis (nec lilacino-purpureis), leguminibus praecipue nigro-pilosis (nec praecipue albo-pilosis).

Plants ca. 30 cm tall. *Caudex* with a pluricapital root crown, branched, like the older parts of stems covered with blackish bark. *Stems* several, ligneous old parts 2–3 cm long; parts of the current year up to 18 cm long, loosely covered with medifixed, appressed white hairs 0.4–0.5 mm long, with some black hairs mixed in. *Stipules* greenish, 1.5–3 mm long, triangular-acuminate to narrowly triangular, very shortly adnate to the petiole, hairy like the stem. *Leaves* 2–4.5 cm long; petiole 0.8–2 cm long, very slender, with the rachis loosely to rather densely hairy like the stem. *Leaflets* in 2 to 4 pairs, filiform, (4–)8–20 \times 0.3–0.5 mm, acuminate, on both sides loosely covered with medifixed, appressed hairs 0.5–1 mm long. *Peduncles* 6–11 cm long, hairy like the stem. *Racemes* 2.5–4 cm long, 3- to 7-flowered. *Bracts* membranous, 1.5–2 mm long, narrowly triangular, predominantly black hairy. *Pedicels* ca. 2 mm long, black hairy. *Calyx* 11–12 mm long, tubular, slightly gibbous at the base, obliquely cut at the mouth, rather densely covered with \pm medifixed, appressed white and black hairs 0.5–1 mm long; teeth subulate, 2–3 mm long, densely white hairy on inner side. *Petals* yellow. *Standard* ca. 20 mm long; limb 7–8 mm wide, obovate, emarginate, in the middle constricted, gradually narrowed into the short claw. *Wings* ca. 18 mm long; limbs narrowly oblong, obtuse, ca. 7.5×2.5 mm; auricle ca. 0.5 mm long, claw ca. 10 mm long. *Keel* ca. 15 mm long; limbs obliquely obovate, with widely curved lower edge and \pm straight upper edge, subobtuse, ca. 5×2.5 mm; auricle minute, claw 10 mm long. *Stamen tube* truncate at the mouth. *Ovary* substipitate, linear, white and black hairy; style sparsely hairy at the base. *Legumes* (not fully ripe) linear, straight, 30–35 mm long, ca. 2 mm wide, keeled ventrally, narrowly grooved dorsally, shortly acuminate, bilocular; valves thinly coriaceous, straw-colored, densely covered with \pm medifixed, appressed, predominantly black hairs 0.3–0.5 mm long.

Astragalus lactabilis differs from *A. compressus* by stems loosely covered with white hairs, with black

hairs mixed in (vs. very densely only white hairy); leaflets filiform 0.3–0.5 mm wide (vs. 1–1.5 mm wide); petals yellow (vs. lilac to purple); and legumes predominantly black hairy (vs. predominantly white hairy).

Etymology. The specific epithet is from the Latin “laetabilis,” meaning “pleasant.”

VII. *Astragalus* sect. *Erioceras* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 109. 1868. TYPE: *Astragalus erioceras* Fischer & C. A. Meyer.

1. *Astragalus yangchangii* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang, Toli, ca. 45°56'N, 83°37'E, 800 m, 26 June 2004, C. Y. Chang et al. 2004-368 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo pilutschensi* N. Ulziykhutag plantis acaulescentibus (nec caule breve evoluta), stipulis 1–2 mm longis, a petiolo liberis (nec 3–9 mm longis, petiolo adnatis), rhachidibus pilis ± medifixis ad 1 mm longis obtectis (nec pilis medifixis ad 1 mm longis et insuper pilis arcte asymmetricè bifurcatis ad 2 mm longis obtectis), foliolis 3–7-jugis (nec 9–16-jugis), bracteis 3–4 mm (nec 5–9 mm) longis, calycibus 11–12 mm (nec 12–15 mm) longis, leguminibus (20–)30–40 mm (nec 12–15 mm) longis.

Plants 8–12 cm tall, acaulescent. *Stipules* whitish membranous to slightly greenish, 1–2 mm long, triangular, free from the petiole, densely covered with ± medifixes, appressed, tangled white hairs ca. 1 mm long, at the margins also with basifixes hairs. *Leaves* 4–9 cm long; petiole 2–4 cm long, like the rachis densely covered with partly flexuose, tangled, ascending to spreading, ± medifixes white hairs 0.5–1 mm long. *Leaflets* in 3 to 7 pairs, elliptic, 5–10 × 3–5 mm, acute to rounded, on upper side loosely to rather densely, on underside densely covered with symmetrically to asymmetrically bifurcate, flexuose, tangled, ascending to spreading white hairs ca. 1 mm long. *Peduncles* 3–8 cm long, white hairy like the rachis, just below the raceme with some black hairs mixed in. *Racemes* (in fruit) rather densely 2- to 6-flowered; axis short white hairy with some black hairs mixed in. *Bracts* membranous, (2–)3–4 mm long, narrowly triangular, with strongly asymmetrically bifurcate, predominantly black hairs. *Pedicels* 1–2 mm long, white and black hairy. *Calyx* 11–12 mm long, tubular, obliquely cut at the mouth, rather densely villous, with ± symmetrically to extremely asymmetrically bifurcate, flexuose, tangled, ascending to spreading white hairs 0.5–1 mm long and, especially at the dorsal (lower) side and the teeth with shorter black hairs; teeth subulate, 2–3 mm long, white hairy on inner side. *Petals* unknown. *Legumes* sessile, linear, ± erect, straight or slightly curved,

(20–)30–40 mm long, 2.5–3.5 mm high and wide, obtusely keeled ventrally, shallowly grooved dorsally, acuminate into a beak 1–2 mm long, bilocular; valves densely covered with symmetrically to asymmetrically bifurcate, ± appressed white hairs ca. 0.5–0.6 mm long and with extremely asymmetrically bifurcate, ascending to spreading hairs ca. 1 mm long.

Astragalus yangchangii differs from *A. pilutschensis* by being acaulescent (vs. shortly caulescent); stipules 1–2 mm long, free from the petiole (vs. 3–9 mm, adnate to the petiole); rachis covered with ± medifixes hairs up to 1 mm long (vs. beside the medifixes hairs with strongly asymmetrically bifurcate hairs up to 2 mm long); leaflets in 3 to 7 pairs (vs. 9 to 16 pairs); bracts 3–4 mm long (vs. 5–9 mm); calyx 11–12 mm long (vs. 12–15 mm); and legumes (20–)30–40 mm long (vs. 12–15 mm).

Etymology. *Astragalus yangchangii* is named in honor of Zhao-Yang Chang, Director of the Herbarium of Northwestern Institute of Botany, Yangling, Shaanxi Province (WUK).

VIII. *Astragalus* sect. *Helmia* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 111. 1868. TYPE: *Astragalus helmii* Fischer.

1. *Astragalus hoshanbaoensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Tash Kurgan [Taxkorgan], 3700–3800 m, 3 July 1987, Qinghai-Xizang Exped. 87-389 (holotype, PE).

Differt ab *Astragalo heptapotamico* Sumnevicz foliis 0.5–1 cm (nec ad 4(–7) cm) longis, foliolis unijugis, pilis 0.5–0.8 mm obtectis (nec 2–5-jugis, pilis 1–1.2 mm longis), calyce 6–7 mm longo dentibus ca. 1 mm (nec 8–10(–12) mm, dentibus 1.5–3.5 mm), vexillo 13–14 mm (nec 17–22(–25) mm) longo.

Plants 2–3 cm tall, acaulescent or nearly so, densely caespitose, forming compact mats, appressed white. *Caudex* with a pluricipital root crown. *Stems*, if present, up to 1 cm long, very densely covered with medifixes hairs 0.5–0.6 mm long. *Stipules* whitish hyaline, 2–3 mm long, connate up to the top, adnate to the petiole for ca. 1 mm, the lower ones glabrous or ciliate only at the margins, the uppermost ones loosely hairy like the stem, at the margins with asymmetrically bifurcate to subbasifixes hairs. *Leaves* 0.5–1 cm long, petiole 0.3–0.6 cm long, like the rachis grooved adaxially, densely hairy like the stem. *Leaflets* in 1 pair, close together, narrowly obovate, 3–5 × 1–2 mm, obtuse to acute, flat or boot-shaped to folded, on both sides densely covered with appressed, medifixes hairs 0.5–0.8 mm long. *Peduncles* 0.3–3 cm long, densely hairy like the stem, below the

rachis with some black hairs mixed in. *Racemes* 2- to 8-flowered, subsessile or with a peduncle up to 1 cm long, densely white hairy like the stem. *Bracts* whitish membranous, ovate to narrowly triangular, 1.5–3 mm long, white hairy, sometimes with black hairs mixed in, at the margins with subbasifixed hairs and minute subsessile glands. *Pedicels* ca. 1 mm long, white and black hairy. *Calyx* 6–7 mm long, tubular, slightly obliquely cut at the mouth, densely covered with medifixed, appressed white and black hairs 0.3–0.8 mm long; teeth narrowly triangular to subulate, ca. 1 mm long, densely white hairy on inner side. *Petals* pale purplish with darker keel. *Standard* 13–14 mm long; limb obovate, ca. 5 mm wide, emarginate, gradually narrowed at the base. *Wings* 12–13 mm long; limbs narrowly oblong, obtuse, ca. 7×1.5 mm; auricle short, claw 5–6 mm long. *Keel* ca. 11 mm long; limbs ca. 4×1.5 mm; auricle indistinct, claw ca. 7 mm long. *Stamen tube* truncate at the mouth. *Ovary* with a stipe ca. 1 mm long, narrowly ellipsoid, white hairy; style glabrous. *Legumes* unknown.

Astragalus hoshanbaoensis differs from *A. heptapotamicus* by leaves 0.5–1 cm long (vs. 4(–7) cm); leaflets in 1 pair, covered with hairs 0.5–0.8 mm long (vs. in 2 to 5 pairs, with hairs 1–1.2 mm); calyx 6–7 mm long, with teeth ca. 1 mm (vs. 8–10(–12) mm, with teeth 1.5–3.5 mm); and standard 13–14 mm long (vs. 17–22(–25) mm).

Etymology. *Astragalus hoshanbaoensis* is named in honor of Shan-bao Ho, who has contributed greatly to our knowledge of *Astragalus* in China.

Paratype. CHINA, **Xinjiang**: near Tash Kurgan [Taxkorgan], 12 June 1974, *Xinjiang expedition of NW Biological Institute 3107* (PE).

***Astragalus persimilis* Podlech & L. R. Xu, sp. nov.**

TYPE: China, Xinjiang: near Wenquan, ca. 44°58'N, 81°06'E, 22 May 2004, *Zhao Yang Chang et al. 2004-307* (holotype, WUK; isotype, MSB).

Differt ab *Astragalo chomutowii* B. Fedtschenko stipulis 1–2 mm (nec 3–5 mm) longis, foliolis 2–5-jugis (nec 1–3-jugis), bracteis ca. 1 mm (nec 2.5–4 mm) longis, dentibus calycis ca. 1 mm (nec 2–2.5 mm) longis, leguminibus (immaturis) ca. 15 mm longis, linearibus, appresse pilosis (nec 6–10 mm longis, oblongis, villosis).

Plants ca. 5 cm tall, acaulescent or nearly so, covered in vegetative parts with appressed, \pm medifixed, merely white hairs. *Caudex* with a pluricipital root crown, with flowering and non-flowering rosettes. *Stems*, if present, up to 1 cm long, very densely covered with hairs ca. 0.5 mm long. *Stipules* whitish hyaline, 1–2 mm long, triangular-ovate, nearly

free from the petiole, behind the stem connate shortly or up to the middle, loosely to rather densely hairy, at the margins also with basifixed hairs. *Leaves* 1.5–3 cm long; petiole 0.5–1.2 cm long, with the rachis hairy like the stem. *Leaflets* in 2 to 5 pairs, narrowly elliptic, acute, $2-6 \times 1-1.5$ mm, on both sides very densely covered with hairs ca. 1 mm long. *Peduncles* 2–3 cm long, densely hairy like the leaflets. *Racemes* short, rather densely 6- to 8-flowered. *Bracts* whitish membranous, ovate, ca. 1 mm long, white and black hairy. *Pedicels* ca. 1 mm long, black hairy. *Calyx* tubular, 7–8 mm long, obliquely cut at the mouth, rather densely covered with \pm medifixed, subappressed, flexuose black hairs 0.5–1 mm long, with some longer, ascending, white and black hairs mixed in; teeth narrowly triangular, ca. 1 mm long, loosely hairy on inner side. *Petals* violet. *Standard* ca. 17 mm long; limb elliptic, ca. 6 mm wide, emarginate, gradually narrowed at the base. *Wings* ca. 14 mm long; limbs narrowly oblong, obtuse, 6.5×1.5 mm; auricle ca. 1 mm long, claw ca. 8 mm long. *Keel* ca. 13 mm long; limbs oblong-curved, with widely curved lower edge and slightly concave upper edge, subacute, 5×2 mm; auricle 0.5 mm long, claw 8 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, linear, densely appressed white hairy; style glabrous. *Legumes* (immature) sessile, linear, pendulous, distinctly falcate, ca. 15 mm long, acuminate; valves densely covered with symmetrically to strongly asymmetrically bifurcate, appressed white hairs 0.5–1 mm long.

Astragalus persimilis differs from *A. chomutowii* by stipules 1–2 mm long (vs. 3–5 mm); leaflets in 2 to 5 pairs (vs. in 1 to 3 pairs); bracts ca. 1 mm long (vs. 2.5–4 mm); calyx teeth ca. 1 mm long (vs. 2–2.5 mm); and legumes (unripe) ca. 15 mm long, linear, appressed hairy (vs. 6–10 mm long, oblong, villous).

Etymology. The specific epithet is from the Latin “persimilis,” meaning “very similar,” because the species is similar to other species of the section.

IX. *Astragalus* sect. *Hypsophilus* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 136. 1868. TYPE: *Astragalus nivalis* Karelin & Kirilov.

1. *Astragalus yechengensis* Podlech & L. R. Xu, sp. nov. TYPE: China, Xinjiang: near Yecheng, ca. 37°53'N, 77°22'E, 3100 m, 17 Aug. 1987, *Qinghai-Xizang Team 1126* (holotype, PE).

Differt ab *Astragalo kukunorico* N. Ulziykhutag planta 25–35 cm (nec 12–20 cm) alta, pedunculis 5–18 cm (nec 1–3 cm) longis, sparsissime ad sparse (nec densiuscule) pilosis, calyce pilis nigris 0.4–1.2 mm et albis ad 1.5 mm longis (nec

pilis nigris 0.3–0.5 mm longis et albis paulum longioribus) oblecto, ovariis stipite 1.5–2 mm longo suffultis, albo-nigropilosis (nec subsessilibus, mere albo-pilosis).

Plants 25–35 cm tall. *Caudex* with a pluricipital root crown and short subterranean branches. *Stems* several, densely covered with medifixed, appressed white hairs 0.3–0.6 mm long, with some black hairs mixed in, especially toward the nodes. *Stipules* membranous, 3–4 mm long, free from the petiole, connate behind the stem high up, loosely white and black hairy, partly glabrescent with age. *Leaves* 3–7 cm long; petiole 0.4–1.5 cm long, with the rachis sulcate adaxially, hairy like the stem. *Leaflets* in 5 to 8 pairs, elliptic, 4–7 × 1.5–3 mm, obtuse and mostly very minutely mucronulate, on upper side glabrous, on underside sparsely to loosely covered with appressed white hairs 0.4–0.8 mm long. *Peduncles* 5–18 cm long, very sparsely to sparsely hairy like the stem. *Racemes* ca. 3 cm long, densely ca. 8- to 10-flowered; axis loosely covered with symmetrically to asymmetrically bifurcate, subappressed black hairs, with few basifixed white hairs mixed in. *Bracts* whitish membranous, narrowly triangular, 3–4 mm long, with strongly asymmetrically bifurcate to basifixed white and black hairs. *Pedicels* ca. 1 mm long, predominantly black hairy. *Calyx* at anthesis narrowly ellipsoid, ca. 11 mm long, loosely covered with subappressed, symmetrically to strongly asymmetrically bifurcate, flexuose black hairs 0.4–1.2 mm long and with fewer strongly asymmetrically bifurcate to basifixed white hairs 1–1.5 mm long; teeth triangular, ca. 1 mm long, on inner side densely white hairy. *Petals* probably white with violet-tipped keel or pale violet. *Standard* 19–20 mm long; limb ca. 7 mm wide, narrowly obovate, retuse, gradually narrowed into the short claw. *Wings* 16–17 mm long; limbs narrowly oblong, obliquely retuse to incised, ca. 5 × 1.5 mm; auricle ca. 0.8 mm long, claw 11–12 mm long. *Keel* 14–15 mm long; limbs obliquely oblong-curved, upper part with nearly rectangularly curved lower edge and concave upper edge, subacute, 4 × 1.5 mm, claw 10–11 mm long. *Stamen tube* slightly obliquely cut at the mouth. *Ovary* with a stipe 1.5–2 mm long, narrowly ellipsoid, white and black hairy; style glabrous. *Legumes* unknown.

Astragalus yechengensis differs from *A. kukunoricus* by being 25–35 cm tall (vs. 12–20 cm tall); peduncles 5–18 cm long, very sparsely to sparsely hairy (vs. 1–3 cm, rather densely hairy); calyx covered with black hairs 0.4–1.2 mm and white hairs up to 1.5 mm long (vs. black hairs 0.3–0.5 mm and slightly longer white hairs); and ovary with a stipe 1.5–2 mm long, white and black hairy (vs. subsessile, only white hairy).

X. *Astragalus* sect. *Komaroviella* Gontscharow, Fl. URSS 12: 876. 1946. TYPE: *Astragalus alpinus* L. (lectotype, designated by Barneby, 1964: 100).

1. *Astragalus leptocladus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Urumqi, 2000 m, July 1957, s. coll. 245 (holotype, PE).

Differt ab *Astragalo alpino* L. caule saepissime singulare, ad 55 cm longo, internodiis ad 10 cm longis (nec nonnullis ad multis, 1–15 cm longis, internodiis valde brevioribus), pedunculis mere nigro-pilosis (nec albo-nigro-pilosis), leguminibus ca. 12 mm longis, distincte curvatis, bilocularibus (nec 8–10 mm longis, rectis vel parce curvatis, unilocularibus).

Plants 65 cm tall. *Caudex* slender. *Stems* 1 to 2, slender, up to 55 cm long, angular-sulcate, very sparsely covered with ± appressed black hairs 0.2–0.4 mm long, especially toward the nodes. *Stipules* greenish, 3–5 mm long, narrowly triangular, free from or very shortly adnate to the petiole, the lower ones vaginate-connate behind the stem up to the middle, the upper ones free from each other, sparsely covered with white and black hairs up to 1 mm long. *Leaves* 8–12 cm long; petiole 1–2 cm long, with the slender rachis sparsely hairy like the stem. *Leaflets* in 10 to 12 pairs, narrowly elliptic, 9–20 × 2–6 mm, rounded to subacute, mostly very minutely mucronulate, on upper side sparsely, on underside loosely covered with subappressed white hairs ca. 1 mm long. *Peduncles* 10–12 cm long, slender, erect, angular-sulcate, sparsely to rather loosely black hairy. *Racemes* at anthesis capitate, densely 12- to 15-flowered, slightly elongated at fruiting time. *Bracts* whitish membranous, ca. 2 mm long, narrowly triangular, black hairy. *Pedicels* ca. 1 mm, in fruit ca. 2 mm long, black hairy. *Calyx* campanulate, ca. 5 mm long, obliquely cut at the mouth, loosely to rather densely covered with subappressed black hairs 0.1–0.4 mm long; teeth filiform, 2–3 mm long, densely black hairy on inner side. *Petals* whitish with violet tip. *Standard* ca. 12 mm long; limb ca. 6 mm wide, ovate, widely and deeply emarginate, subabruptly passing into the short, cuneate claw. *Wings* ca. 10 mm long, distinctly shorter than standard and keel; limbs narrowly oblong, obtuse, 6 × 1 mm; auricle narrow, ca. 1 mm long, claw ca. 4 mm long. *Keel* ca. 11 mm long; limbs obliquely elliptic, middle part with widely curved lower edge and slightly concave upper edge, obtuse, ca. 7 × 3 mm; auricle acute, ca. 1 mm long, claw ca. 4 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* with a glabrous stipe 3–4 mm long, densely white hairy, becoming black hairy with age; style glabrous. *Legumes* spreading to nodding, with a stipe ca. 3 mm long, oblong, distinctly curved, ca. 12 mm long, ca. 3 mm high and ca. 2 mm wide, keeled

ventrally, grooved dorsally, with a slender beak ca. 2 mm long, bilocular; valves thin, loosely to rather densely covered with appressed to ascending or partly spreading black hairs 0.3–0.5 mm long.

Astragalus leptocladus differs from *A. alpinus* by usually having one singular stem up to 55 cm long, with internodes up to 10 cm long (vs. several to many stems 1–15 cm, with much shorter internodes); peduncles only black hairy (vs. white and black hairy); and legumes ca. 12 mm long, distinctly curved, bilocular (vs. 8–10 mm, straight or slightly curved, unilocular).

Etymology. The specific epithet derives from the Greek, and it means “with slender stem.”

Paratype. CHINA, Xinjiang: near Urumqi, Nanshan, 1800 m, 10 July 1963, S. Q. Wang 0064 (PE).

XI. *Astragalus* sect. *Laguropsis* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 137, 1868. TYPE: *Astragalus laguroides* Pallas (lectotype, designated by Podlech, 1990: 479).

1. *Astragalus chamaephyton* Podlech & L. R. Xu, sp. nov. TYPE: China, Xinjiang: near Wenquan, ca. 44°58'N, 81°06'E, 1710 m, 22 May 2004, Zhao Yang Chang et al. 2004-309 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo laguroides* Pallas pilis in partibus vegetativis 0.5–0.8 mm (nec 0.3–1.1 mm) longis, stipulis ca. 3 mm (nec 6–7(–10) mm) longis, a tergo caulis alte connatis (nec inter se liberis), foliis 1.5–2.5 cm (nec 3–14 cm) longis, foliolis 2–3-jugis, 4–7 × 1.5–2.5 mm (nec 3–5(–8)-jugis, 3–25 × 3–8 mm), bracteis 2–2.5 mm (nec 5–10 mm) longis, calycibus 7–8 mm (nec 11–14 mm) longis, dentibus ca. 1 mm (nec 3–6 mm) longis, ovariis glabris (nec dense albopilosis).

Plants ca. 7 cm tall, acaulescent, in vegetative parts covered with medifixed, appressed white hairs 0.5–0.8 mm long. **Caudex** with a pluricipital root crown. **Stipules** whitish membranous, ca. 3 mm long, adnate to the petiole for ca. 1 mm, behind the stem highly connate, loosely to rather densely subappressed hairy. **Leaves** 1.5–2.5 cm long; petiole 0.5–1 cm long, sulcate adaxially, very densely hairy. **Leaflets** in 2 to 3 pairs, narrowly obovate, 4–7 × 1.5–2.5 mm, obtuse to subobtuse, on both sides densely hairy. **Peduncles** ca. 4 cm long, rather densely hairy like the rachis, toward the raceme with increasing black hairs. **Racemes** globular to ovoid, 2–3 cm long, densely ca. 12- to 15-flowered. **Bracts** whitish membranous, narrowly ovate, 2–2.5 mm long, with strongly asymmetrically bifurcate to basifixed white and black hairs. **Pedicels** ca. 1 mm long, black hairy. **Calyx** soon becoming ovoid-inflated, 7–8 mm long, loosely cov-

ered with strongly asymmetrically bifurcate to basifixed, tangled, spreading white and black hairs; teeth narrowly triangular, ca. 1 mm long, black, at the base white hairy on inner side. **Petals** violet. **Standard** ca. 15 mm long; limb ca. 5 mm wide, narrowly oblong, rounded, mostly slightly constricted above the lower 1/3, at the base obtuse-angularly passing into the cuneate claw. **Wings** ca. 14 mm long; limbs narrowly oblong, obliquely emarginate, 6 × 2 mm; auricle 0.8 mm long, claw ca. 8 mm long. **Keel** ca. 13 mm long; limbs slightly obliquely obovate, with widely curved lower edge and nearly straight upper edge, subacute, ca. 5 × 2 mm; auricle minute, claw ca. 8 mm long. **Stamen tube** truncate at the mouth. **Ovary** sessile, glabrous. **Legumes** unknown.

Astragalus chamaephyton differs from *A. laguroides* by hairs in vegetative parts 0.5–0.8 mm long (vs. 0.8–1.1 mm); stipules ca. 3 mm long, behind the stem highly connate (vs. 6–7(–10) mm, free from each other); leaves 1.5–2.5 cm long (vs. 3–14 cm); leaflets in 2 to 3 pairs, 4–7 × 1.5–2.5 mm (vs. 3 to 5(to 8) pairs, 3–25 × 3–8 mm); bracts 2–2.5 mm long (vs. 5–10 mm); calyx 7–8 mm long, with teeth ca. 1 mm (vs. 11–14 mm, with teeth 3–6 mm); and ovary glabrous (vs. densely white hairy).

Etymology. The specific epithet is from the Greek “chamaephyton,” meaning “low-growing plant.”

XII. *Astragalus* sect. *Ornithopodium* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 100, 1868. TYPE: *Astragalus ornithopodioides* Lamarek (lectotype, designated by Podlech, 1990: 483).

1. *Astragalus huochengensis* Podlech & L. R. Xu, sp. nov. TYPE: China, Xinjiang: near Shawan, ca. 44°19'N, 85°34'E, 1287 m, 13 May 2004, C. Y. Chang et al. 2004-192 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo leansanico* Ulbrich stipulis 3–5 mm longis, sparse ad laxe pilosis (nec 5–7 mm longis, glabris vel margine tantum ciliatis), calycibus 3–12 mm (nec 5–7 mm) longis, pilis ± medifixis (nec arcte asymmetricè bifurcatis) obtectis, vexillo 21–24 mm (nec 13–14 mm) longo.

Plants 15–30 cm tall, covered with appressed, ± medifixed hairs. **Caudex** up to 8 mm thick, with a pluricipital root crown, with short branches covered with gray-brown bark. **Stems** several, branched at the base, the old parts lignified, 2–5 cm long, ca. 1 mm thick, covered with gray-brown bark, decumbent to erect; parts of the current year 3–20 cm long, angular-sulcate, densely to very densely covered with white or black and white hairs 0.5–1 mm long, partly glabrescent with age. **Stipules** 3–5 mm long, very shortly

adnate to the petiole, the lower ones hyaline-membranous, behind the stem highly connate, often up to 3/4 of the length or higher, subglabrous to sparsely hairy, the upper ones often slightly greenish, shortly connate, with narrowly triangular free tips, sparsely to loosely hairy. *Leaves* 3–9 cm long; petiole 1–3 cm long, like the rachis slender, slightly sulcate adaxially, hairy like the stem. *Leaflets* in 5 to 10 pairs, narrowly elliptic, 5–10 × 1–3 mm, obtuse to minutely acuminate, on upper side glabrous or sparsely hairy, on underside loosely to rather densely covered with hairs 0.6–1 mm long. *Peduncles* 5–11 cm long, angular-sulcate, sparsely to loosely white or black and white hairy like the stem. *Racemes* rather densely 3- to 15-flowered, elongating in fruit. *Bracts* membranous, pale brownish, narrowly triangular, sometimes long-acuminate, 1.5–2 mm long, sparsely white and black hairy. *Pedicels* 1–2 mm long, white and black hairy. *Calyx* tubular, 8–12 mm long, slightly obliquely cut at the mouth, rather densely covered with ± medifixed, subappressed white and black hairs 0.3–1 mm long; teeth subulate, 1–3 mm long, sparsely hairy on inner side. *Petals* purple, wings and keel yellow. *Standard* 21–24 mm long; limb ca. 7 mm wide, narrowly rhombic-obovate, emarginate, gradually narrowed into a short claw. *Wings* 18–21 mm long; limbs narrowly oblong, obliquely minutely incised, ca. 7.5–8 × 2 mm; auricle ca. 0.5 mm long, claw 11–12 mm long. *Keel* 16–19 mm long; limbs obliquely elliptic, with widely curved lower edge and slightly concave curved upper edge, obtuse, ca. 6–6.5 × 2.5 mm; auricle short, claw 11–12 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile or subsessile, linear, white hairy; style glabrous. *Legumes* (unripe) sessile or subsessile, erect, linear, slightly to distinctly curved, at least 25 mm long, 2 mm high and wide, with a short, straight beak 1–2 mm long, bilocular; valves densely covered with symmetrically to asymmetrically bifurcate, appressed white hairs 0.5–0.8 mm long.

Astragalus huochengensis differs from *A. leansanicus* by stipules 3–5 mm long, sparsely to loosely hairy (vs. 5–7 mm, glabrous or ciliate at the margins only); calyx 8–12 mm long, with ± medifixed hairs (vs. 5–7 mm, with strongly asymmetrically bifurcate hairs); and standard 21–24 mm long (vs. 13–14 mm).

Etymology. *Astragalus huochengensis* is named after the town Huocheng in China.

Paratypes. CHINA. **Xinjiang:** near Huocheng, 1100 m, 16 June 1985, Z. H. Wu 85-277 (WUK); near Shawan, 808 m, 13 May 2004, C. Y. Chang et al. 2004-189 (MSB, WUK); near Ürümqi, 1700 m, 28 June 1987, s. coll. nr. 1-224 (PE).

2. *Astragalus maiusculus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: Toli, ca. 45°56'N, 83°37'E, 1 Sep. 1999, D. F. Cui 93050 (holotype, PE).

Differt ab *Astragalo dsharkentico* Popov caulibus homotinis densissime (nec laxe) pilosis, stipulis 5–9 mm (nec 2–3 mm) longis, pedunculis 2–4 cm (nec 5–15 cm) longis, bracteis 4–5 mm (nec 1.5–2 mm) longis, vexillo 25–27 mm (nec 20–22 mm) longo.

Plants ca. 20 cm tall. *Caudex* divided. *Stems* several, branched, the old parts lignified, with gray-black bark, the stems of the current year 1–5 cm long, very densely covered with ± medifixed, appressed to subappressed white hairs, near the nodes also black hairs, 0.8–1 mm long. *Stipules* greenish, 5–9 mm long, narrowly triangular, very shortly adnate to the petiole, shortly but distinctly vaginate-connate behind the stem, densely hairy. *Leaves* 5–15 cm long; petiole 3–9 cm long, like the rachis slender, grooved adaxially, sparsely to loosely covered with subappressed to ascending, symmetrically to strongly asymmetrically bifurcate hairs 0.8–1.5 mm long. *Leaflets* in 5 to 8 pairs, remote, elliptic, 5–10 × 2–6 mm, rounded, on both sides loosely covered with symmetrically to asymmetrically bifurcate, subappressed to slightly ascending hairs 1.2–2 mm long. *Peduncles* 2–4 cm long, loosely to rather densely white and black hairy like the rachis. *Racemes* short, densely 3- to 5-flowered. *Bracts* membranous, 4–5 mm long, ovate-acuminate to narrowly triangular, white and black or predominantly black hairy. *Pedicels* 3–4 mm long, black hairy. *Calyx* 13–14 mm long, tubular, slightly inflated, obliquely cut at the mouth, rather densely covered with symmetrically to asymmetrically bifurcate, subappressed to ascending, flexuose, on dorsal side and at the teeth predominantly black, on ventral side often predominantly white hairs 0.8–1 mm long; teeth subulate, 2–3 mm long, white hairy on inner side. *Petals* pale yellow. *Standard* 25–27 mm long; limb 10–11 mm wide, obovate, deeply and widely emarginate, gradually narrowed into the short widely cuneate claw. *Wings* 23–24 mm long; limbs narrowly oblong, obliquely and sometimes deeply emarginate, ca. 11 × 3 mm; auricle ca. 1 mm long, claw 11–12 mm long. *Keel* ca. 20 mm long; limbs obliquely obovate, with upper part widely, nearly rectangularly curved lower edge and slightly concave upper edge, obtuse, ca. 6–6.5 × 3 mm; auricle ca. 0.5 mm long, claw 13–14 mm long. *Stamen tube* truncate at the mouth. *Ovary* subsessile, linear, white hairy; style hairy only at the base. *Legumes* unknown.

Astragalus maiusculus differs from *A. dsharkenticus* by stems of the current year very densely hairy (vs.

loosely hairy); stipules 5–9 mm long (vs. 2–3 mm); peduncles 2–4 cm long (vs. 5–15 cm); bracts 4–5 mm long (vs. 1.5–2 mm); and standard 25–27 mm long (vs. 20–22 mm).

Etymology. The specific epithet is from the Latin “maiusculus,” meaning “slightly taller,” because the plant is slightly taller than *Astragalus dsharkenticus*.

3. *Astragalus sadiensis* Podlech, L. R. Xu & C. Y. Chang, sp. nov. TYPE: China, Xinjiang: Taokexun, 4 May 1959, *Xin-Tuo 0063* (holotype, PE; isotype, PE).

Differt ab *Astragalo hamiensi* S. B. Ho foliolis anguste ellipticis, 7–12 × 1.5–3 mm (nec ellipticis, 10–20 × 4–10 mm), petalis flavis (nec albidis vel roseis), leguminibus ca. 25 mm longis, breviter acuminatis (nec 25–40 mm longis, rostro distincto, 1–2 mm longo provisis).

Plants 20–25 cm tall, white hairy. *Caudex* with a pluricipital root crown and short branches. *Stems* few, slender, densely covered with medifixed, appressed hairs 0.5–0.8 mm long. *Stipules* ca. 3(–4) mm long, narrowly triangular, only those of lowest leaves shortly connate behind the stem, the others free from each other, all rather densely appressed hairy. *Leaves* ca. 4–5 cm long; petiole 1–1.5 cm long, with the rachis slender, densely hairy like the stem, at the insertion of the leaflets and petiole with ± spreading, strongly to extremely asymmetrically bifurcate hairs ca. 0.8 mm long. *Leaflets* in 4 pairs, narrowly elliptic, 7–12 × 1.5–3 mm, acute to shortly acuminate, on both sides loosely to rather densely covered with medifixed, appressed hairs 0.6–1 mm long. *Peduncles* 3–5 cm long, slender, hairy like the stem. *Racemes* loosely 2- to 10-flowered. *Bracts* 2–3 mm long, narrowly triangular, loosely hairy. *Pedicels* ca. 1 mm long, hairy. *Calyx* 7–10 mm long, tubular, slightly obliquely gibbous at the base, strongly obliquely cut at the mouth, loosely to rather densely covered with subappressed, ± medifixed white hairs 0.5–0.8 mm long, at the margins of teeth also with strongly asymmetrically bifurcate hairs; teeth subulate, unequal, 2–3 mm long. *Petals* yellow. *Standard* ca. 15 mm long; limb ca. 5 mm wide, emarginate, gradually narrowed into the short claw. *Wings* ca. 12 mm long; limbs narrowly oblong, ± obtuse, 5 × 1 mm; auricle ca. 0.5 mm long, claw 7 mm long. *Keel* ca. 12 mm long; limbs obliquely obovate, with widely curved lower edge and slightly concave upper edge, obtuse, 4.5 × 2 mm; auricle short, claw 7 mm long. *Stamen tube* slightly obliquely cut at the mouth. *Ovary* with a stipe ca. 1 mm long, linear, white hairy; style glabrous. *Legumes* (immature) ca. 25 mm long, 2 mm

high, shortly acuminate; valves loosely covered with medifixed, appressed white hairs 0.5–0.8 mm long.

Etymology. The specific epithet is from the Chinese “sadi,” meaning “desert.”

Paratype. CHINA, Xinjiang: Taokexun, 10 June 1958, A.-R. Li 7229 (KUN).

4. *Astragalus supralaevis* Podlech & L. R. Xu, sp. nov. TYPE: China, Yunnan: Daiching, Baima Shan mountains, 3300 m, 10 July 1981, *Qin-ghai-Xizang Team 2325* (holotype, KUN).

Differt ab *Astragalo leansanico* Ulbrich planta mere albo-pilosa (nec in inflorescentiis nigro-pilosa), stipulis basalibus tantum breviter a tergo caulis connatis, laxe ad densiuscule pilosis (nec omnibus alte connatis, glabris vel margine sparsissime ciliatis), foliis 10–16 cm (nec 3–6 cm) longis, bracteis 5–10 mm (nec 2–4 mm) longis, calyce pilis albis medifixis tantum oblecto (nec pilis partim maxime asymmetrically bifurcatis nigris oblecto).

Plants at least 35 cm tall (basal parts missing), covered with appressed, mostly ± medifixed white hairs 0.3–0.5 mm long. *Stems* loosely to rather densely hairy. *Stipules* greenish, linear-acute to subulate, 6–10 mm long, very shortly adnate to the petiole, only those of lowest leaves shortly connate behind the stem, all others free from each other, loosely to rather densely hairy. *Leaves* 10–16 cm long; petiole 2–2.5 cm long, hairy like the stem. *Leaflets* in 9 to 12 pairs, narrowly elliptic, 12–22 × 4–9 mm, obtuse to rounded, on upper side glabrous, on underside sparsely to loosely hairy. *Peduncles* 10–11 cm long, hairy like the stem. *Racemes* loosely many-flowered, elongating in fruit, up to 8 cm long. *Bracts* greenish, linear-acute, 5–10 mm long, loosely to rather densely hairy. *Pedicels* 1–1.5 mm long, hairy. *Calyx* campanulate, ca. 8 mm long, rather densely to densely hairy; teeth subulate, unequal, the upper (adaxial) ca. 2 mm, the lower (abaxial) ca. 3 mm long, hairy on inner side. *Petals* pink. *Standard* ca. 13 mm long; limb ca. 5 mm wide, obovate to elliptic, emarginate, gradually narrowed into the rather long claw. *Wings* ca. 12 mm long; limbs narrowly oblong to slightly dilated upward, rounded, 6 × 2 mm; auricle ca. 1 mm long, claw 6 mm long. *Keel* 10 mm long; limbs obliquely obovate, upper part with widely curved lower edge and nearly straight to slightly curved upper edge, obtuse, 5 × 2.5 mm; auricle short, claw 5 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* sessile or subsessile, glabrous. *Legumes* (unripe) sessile, linear, slightly curved, ca. 15 mm long, 3 mm high, with a short, straight beak ca. 2 mm long; valves loosely hairy, soon glabrescent.

Astragalus supralaevis differs from *A. leansanicus* by being white hairy (vs. on inflorescence black

hairy); only the basal stipules shortly connate behind the stem, all loosely to rather densely hairy (vs. all highly connate, glabrous or at the margin very sparsely ciliate); leaves 10–16 cm long (vs. 3–6 cm); bracts 5–10 mm long (vs. 2–4 mm); and only the calyx covered with white medifixed hairs (vs. partly with strongly asymmetrically bifurcate black hairs).

Etymology. The specific epithet is from the Latin “supralaevis,” meaning “smooth above,” because the leaflets are glabrous on the upper side.

XIII. *Astragalus* sect. *Oroboidei* A. Gray, Proc. Amer. Acad. 6: 203. 1864. TYPE: *Astragalus oroboides* Hornemann.

1. *Astragalus gongshanensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Yunnan: Gongshan, 2200–2500 m, 29 May 1940, K. M. Feng 7076 (holotype, PE).

Differt ab *Astragalo taipaihanensi* Y. C. Ho & S. B. Ho stipulis 2–4 mm longis, linear-acutis (nec 5–10 mm longis, oblongis ad anguste triangularibus), bracteis ad 3 mm (nec ad 5 mm) longis, pedicellis ca. 1 mm (nec 2–5 mm) longis, calyce pilis subappressis ad patentibus, flexuosis, implexis 0.1–0.5 mm longis oblecto (nec pilis subappressis, rectis, 0.5–0.8 mm longis oblecto), dentibus non in latere abaxiali congestis, vexillo ca. 10 × 4 mm (nec 12–14 × 6 mm), ovariis stipite ca. 1.5 mm longo suffultis (nec sessilibus).

Plants ca. 30 cm tall, loosely hairy. *Caudex* unknown. *Stems* ascending to erect, branched with short non-flowering side branches, striate, sparsely to loosely covered with appressed to spreading black hairs 0.3–0.7 mm long, with some white hairs mixed in. *Stipules* greenish, 2–4 mm long, linear-acute, free from petiole and from each other, sparsely hairy to subglabrous, ciliate at the margins and with minute glands. *Leaves* 5–8 cm long; petiole 1–2 cm long, with the rachis slender, hairy like the stem. *Leaflets* in 5 to 8 pairs, dull green on upper side, lighter on underside, narrowly elliptic to narrowly obovate, 8–20 × 3–8 mm, obtuse to retuse, on upper side glabrous, on underside loosely covered with subappressed white hairs 0.4–0.8 mm long. *Peduncles* 7–9 cm long, slender, loosely hairy like the stem. *Racemes* loosely ca. 12- to 20-flowered. *Bracts* membranous, very narrowly triangular, 2–3 mm long, white and black hairy, at the base with minute glands. *Pedicels* ca. 1 mm long, white and black hairy. *Calyx* shortly tubular, 5–6 mm long, at the base obliquely gibbous, slightly obliquely cut at the mouth, loosely, toward the teeth more densely, covered with subappressed to spreading, tangled, flexuose black and white hairs 0.1–0.5 mm long; teeth unequal, the upper (adaxial) ones narrowly triangular, ca. 1 mm long, the lower (abaxial) ones triangular, 0.3–0.5 mm long, hairy on

inner side. *Petals* yellow. *Standard* ca. 10 mm long; limb ca. 4 mm wide, oblong, emarginate, contracted into a short, wide claw. *Wings* ca. 9 mm long; limbs narrowly oblong, slightly curved, obtuse, ca. 4 × 1 mm; auricle ca. 1.2 mm long, claw ca. 5 mm long. *Keel* ca. 8.5 mm long; limbs obliquely triangular-elliptic, middle part with rectangularly curved lower edge and nearly straight upper edge, subobtuse, ca. 4 × 2 mm; auricle acute, ca. 1 mm long, claw 4.5 mm long. *Stamen tube* truncate at the mouth. *Ovary* with stipe ca. 1.5 mm long, glabrous. *Legumes* unknown.

Astragalus gongshanensis differs from *A. taipaihanensis* by stipules 2–4 mm long, linear-acute (vs. 5–10 mm, oblong to narrowly triangular); bracts up to 3 mm long (vs. up to 5 mm); pedicels ca. 1 mm long (vs. 2–5 mm); calyx covered with subappressed to spreading flexuose, tangled hairs 0.1–0.5 mm long (vs. subappressed straight hairs 0.5–0.8 mm); standard ca. 10 × 4 mm (vs. 12–14 × 6 mm); and ovary with a stipe ca. 1.5 mm long (vs. sessile).

XIV. *Astragalus* sect. *Poliothrix* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 48. 1868. TYPE: *Astragalus leucocephalus* Benth.

1. *Astragalus baxoiensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xizang: near Baxoi City, ca. 30°01'N, 96°55'E, 4200 m, 27 Aug. 1973, Qinghai-Xizang Exped. 73-1283 (holotype, KUN).

Differt ab *Astragalo cobresiiophilo* Podlech & L. R. Xu caulibus rhachidibus, pedunculisque glabris (nec sparse ad laxe appresse pilosis), ovariis leguminibusque glabris (nec pilis nigris oblectis).

Plants 6–12 cm tall, densely caespitose, with appressed hairs. *Caudex* with a pluricapital root crown and numerous, very short subterranean branches. *Stems* diffusely prostrate to ascending, up to 6 cm long, slender, angular-sulcate, glabrous. *Stipules* greenish, often reflexed, 2–3 mm long, narrowly triangular, nearly free from the petiole, distinctly connate behind the stem, sparsely hairy to sometimes glabrous. *Leaves* 1.5–4.5 cm long; petiole 0.5–1 cm long, like the rachis slender, grooved adaxially, glabrous or with scattered hairs up to 0.3 mm long. *Leaflets* in 5 to 8(to 9) pairs, elliptic, 2–3 × 1–1.5 mm, subobtuse, on upper side glabrous, on underside especially at the midvein sparsely covered with appressed hairs up to 0.3 mm long. *Peduncles* several in upper leaf axils, 2–3.5 cm long, slender, glabrous. *Racemes* short, rather densely 4- to 8-flowered. *Bracts* whitish membranous, ovate to narrowly triangular, 1–2 mm long, sparsely white and black hairy. *Pedicels* 1–1.5 mm long, sparsely black hairy. *Calyx* campanulate, ca. 3 mm long, slightly

obliquely cut at the mouth, loosely covered with appressed white and black hairs 0.1–0.3 mm long; teeth narrowly triangular, 1–1.5 mm long, sparsely hairy on inner side. *Petals* pale purple. *Standard* ca. 8 mm long; limb widely elliptic to orbicular, ca. 4.5 mm wide, emarginate, at the base gradually narrowed without distinct claw. *Wings* ca. 7 mm long; limbs narrowly oblong, obtuse, 5×1.5 mm; auricle 0.5 mm long, claw 3 mm long. *Keel* 6 mm long; limbs obliquely obovate, with widely curved lower edge and sigmoid upper edge, subobtusate, 3×2 mm; auricle minute, claw 3 mm long. *Stamen tube* truncate at the mouth. *Ovary* with a stipe ca. 1 mm long, glabrous. *Legumes* with a stipe ca. 1 mm long, ellipsoid, ca. 5 mm long, 2 mm high and 2.5 mm wide, keeled ventrally, grooved dorsally, acute with the hooked persistent style, unilocular; valves thin, pale brownish, glabrous. *Seeds* 1.5×1 mm, blackish brown.

Astragalus baxoiensis differs from *A. cobresiophilus* by stems, rachides, and peduncles glabrous (vs. sparsely to loosely hairy), and ovary and legumes glabrous (vs. black hairy).

Etymology. *Astragalus baxoiensis* is named for the city Baxoi, China.

2. *Astragalus jiazaensis* Podlech & L. R. Xu, sp. nov. TYPE: China, Xizang: Jiaza, 3400 m, 2 Aug. 1982, C. C. Ni et al. 2729 (holotype, PE).

Differt ab *Astragalo tibeticola* Podlech & L. R. Xu stipulis foliorum superiorum inter se liberis, foliolis 11–15-jugis (nec 9–11-jugis) acutis vel acuminatis (nec rotundatis ad emarginatis), calyce 3–4 mm (nec 4–5 mm) longo, vexillo ca. 7×3 –3.5 mm, late obovato (nec 6 – 7×5 mm, transverse elliptico), legumine uniloculari (nec semibiloculari).

Plants up to 25 cm tall. *Caudex* divided with short, subterranean branches. *Stems* several, \pm erect, sparsely to loosely covered with subappressed to slightly ascending white hairs 0.2–0.6 mm long, with some shorter black hairs mixed in. *Stipules* greenish, 5–6 mm long, narrowly triangular to narrowly ovate, acuminate, the lower ones shortly connate behind the stem, the upper ones free from each other, all sparsely to loosely covered with subappressed hairs, at the margins with \pm spreading white hairs 0.4–1 mm long, with some short black hairs mixed in. *Leaves* 6–10 cm long, the upper ones sessile, the lower ones with a petiole 1.5–2.5 cm long; rachis slender, sulcate adaxially, sparsely hairy like the stem. *Leaflets* in 11 to 15 pairs, narrowly elliptic to elliptic, 8 – 15×1 –4 mm, acute to acuminate, on upper side glabrous, on underside loosely covered with subappressed hairs 0.4–0.6 mm long. *Peduncles* 4–7 cm long, sparsely hairy like the stem. *Racemes* 2.5–4 cm long, rather

densely many-flowered; axis hairy like the peduncle. *Bracts* membranous, narrowly triangular, 1.5–2(–3) mm long, predominantly black hairy, at the margins with minute glands. *Pedicels* ca. 0.5 mm long, black hairy. *Calyx* 3–4 mm long, campanulate, obliquely cut at the mouth, loosely covered with subappressed black and white hairs 0.2–0.5 mm long; teeth unequal, the upper (ventral) narrowly triangular, 0.5–0.8 mm long, the lower (dorsal) 3 subulate, 1.5–1.8 mm long, all black hairy on inner side. *Petals* pale violet with deep purple keel tip. *Standard* ca. 7 mm long; limb ca. 3–3.5 mm wide, widely obovate, deeply emarginate, subabruptly contracted into the short, cuneate claw. *Wings* ca. 5.5 mm long; limbs narrowly oblong, obtuse, ca. 3.5×1 mm; auricle ca. 0.5 mm long, claw ca. 2 mm long. *Keel* 4.5 mm long; limbs obliquely obovate, with widely curved lower edge and slightly curved upper edge, obtuse, 2.5×1.5 mm; claw ca. 2 mm long. *Stamen tube* obliquely cut at the mouth. *Legumes* sessile, narrowly ellipsoid, curved, 6–7 mm long, ca. 2.5 mm high and wide, keeled ventrally, rounded dorsally, very shortly acuminate, unilocular; valves loosely covered with appressed black hairs 0.2–0.3 mm long, glabrescent with age. *Seeds* ca. 4, dark brown, 2×1 mm.

Astragalus jiazaensis differs from *A. tibeticola* by stipules of upper leaves free from each other (vs. connate behind the stem); leaflets in 11 to 15 pairs, acute or acuminate (vs. in 9 to 11 pairs, rounded to emarginate); calyx 3–4 mm long (vs. 4–5 mm); standard ca. 7×3 –3.5 mm, widely obovate (vs. 6 – 7×5 mm, transversely elliptic); and legumes unilocular (vs. incompletely bilocular).

Etymology. *Astragalus jiazaensis* is named for the city Jiaza, China.

Paratypes. CHINA. **Xizang:** Miling, 2900 m, 24 Aug. 1974, Qinghai-Xizang Team 74-1866 (KUN); near Lhasa, 3900 m, 31 Aug. 1965, J. T. Zhang & K. Y. Lang 2231 (PE).

XV. *Astragalus* sect. *Skythropos* N. D. Simpson, Notes Roy. Bot. Gard. Edinburgh 8: 255. 1915. TYPE: *Astragalus skythropos* Bunge.

1. *Astragalus yunnanensis* Franchet subsp. **incanus** (E. Peter) Podlech & L. R. Xu, comb. et stat. nov. Basionym: *Astragalus tatsiensis* f. *incanus* E. Peter, Acta Horti Gothob. 12: 54. 1937. TYPE: China, Yunnan: Bei-ma-shan, s.d., G. Forrest 14412 (lectotype, designated by Wenninger, 1991, E; isotypes, BM, K, W).

Astragalus yunnanensis subsp. *incanus* differs from subspecies *yunnanensis* Franchet by leaflets villous, densely to very densely covered on both sides with ascending to spreading, flexuose, tangled white hairs

0.5–1 mm long (vs. leaflets on upper side glabrous or sparsely to loosely hairy, on underside loosely to densely hairy, sometimes only at the midvein and margins, rarely glabrous). Besides the morphological differences, it is endemic in a restricted area of northwestern Yunnan and adjacent Sichuan. The status of subspecies is therefore appropriate.

XVI. *Astragalus* sect. *Trachycercis* Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg 11(16): 114. 1868. TYPE: *Astragalus humilis* M. Bieberstein (lectotype, designated by Podlech, 1990: 490).

Astragalus acceptus Podlech & L. R. Xu, sp. nov. TYPE: China, Qinghai: Chaidamu (Delingha), ca. 37°22'N, 97°23'E, 3400 m, 27 July 1959, *Exped. Gansu et Qinghai Acad. Sin. 1029* (holotype, PE).

Differt ab *Astragalo porphyreo* Podlech & L. R. Xu vexillo 22 × 6–7 mm (nec 16–17 × 4.5–5.5 mm), alis ca. 19 mm (nec 14–15 mm) longis, carina 18 mm (nec 12–13 mm) longa, foliolis 3–4-jugis (nec 1–2-jugis), bracteis ca. 7 mm (nec ca. 3 mm) longis.

Plants 4–5 cm tall, acaulescent, densely caespitose, only white hairy. *Caudex* with a pluricipital root crown with short, divided branches, covered in upper part densely with remnants of old stipules. *Stipules* whitish membranous, 5–8 mm long, narrowly triangular, adnate to the petiole for ca. 3 mm, densely covered with ± symmetrically to asymmetrically bifurcate, subappressed hairs 1–1.5 mm long. *Leaves* 2–6 cm long; petiole 1–3 cm long, like the rachis slender, densely covered with ± medifixed, subappressed hairs 0.4–0.6 mm long. *Leaflets* in 3 to 4 pairs, elliptic, 4–8 × 1.8–3 mm, subacute to obtuse, on upper side sparsely, on underside rather densely covered with medifixed, appressed hairs ca. 1 mm long. *Racemes* sessile, 1- to 2-flowered. *Bracts* whitish membranous, narrowly triangular, ca. 7 mm long, sparsely covered with basifixed hairs 0.8–1 mm long, at the margins with minute glands. *Flowers* sessile. *Calyx* campanulate-tubular, 9–10 mm long; densely covered with strongly asymmetrically bifurcate to basifixed, flexuose, tangled white hairs 0.7–1 mm long; teeth narrowly triangular, 2.5–3 mm long, hairy on inner side. *Petals* yellowish when dry. *Standard* ca. 22 mm long; limb 6–7 mm wide, oblong, emarginate, slightly constricted below the middle, subabruptly contracted into the claw ca. 5 mm long. *Wings* ca. 19 mm long; limbs narrowly oblong, laterally incised, 9 × 2 mm; auricle ca. 0.5 mm, claw 11 mm long. *Keel* 18 mm long; limbs obliquely elliptic-curved, with widely curved lower edge and slightly concave upper edge, subacute. *Stamen tube* truncate at the mouth. *Ovary* sessile, white hairy.

Astragalus acceptus differs from *A. porphyreus* by standard 22 × 6–7 mm (vs. 16–17 × 4.5–5.5 mm); wings ca. 19 mm long (vs. 14–15 mm); keel 18 mm long (vs. 12–13 mm); leaflets in 3 to 4 pairs (vs. 1 to 2 pairs); and bracts ca. 7 mm long (vs. ca. 3 mm).

Etymology. The specific epithet is from the Latin “acceptus,” meaning “accepted.”

2. *Astragalus brevivexillatus* Podlech & L. R. Xu, sp. nov. TYPE: China, Xinjiang: near Burqin, ca. 47°41'N, 86°59'E, 490 m, 29 May 2004, *Zhao-Yang Chang et al. 2004-408* (holotype, WUK; isotype, MSB).

Differt ab *Astragalo gregorii* B. Fedtschenko & Basilevskaja foliolis 2–3(–4)-jugis (nec unijugis), pilis 2–2.5 mm (nec 0.6–0.8 mm) longis instructis, calyce pilis basifixis albis ± patentibus (nec pilis medifixis praecipue nigris, appressis) oblecto, dentibus filiformibus 3–5 mm longis (nec dentibus 1.5–2 mm longis), vexillo ca. 12 mm longo (nec ca. 21 mm longo).

Plants 5–6 cm tall, acaulescent, caespitose, with only white hairs. *Caudex* with a pluricipital root crown. *Stipules* whitish membranous, ca. 2 mm long, narrowly triangular, shortly adnate to the petiole, hairy like the rachis. *Leaves* 3–6 cm long; petiole 2–4 cm long, like the rachis densely covered with appressed, symmetrically to asymmetrically bifurcate hairs ca. 1 mm long. *Leaflets* 2- to 3(4)-paired, narrowly elliptic to elliptic, 7–15 × 3–5 mm, acute, on both sides densely covered with ± medifixed, appressed hairs 2–2.5 mm long. *Racemes* sessile, 3- to 4-flowered. *Bracts* whitish membranous, 4–7 mm long, very narrowly triangular, with basifixed hairs up to 1 mm long. *Flowers* subsessile. *Calyx* whitish membranous, ca. 8 mm long, campanulate-tubular, rather densely covered with subbasifixed to basifixed, ascending to spreading, tangled hairs ca. 1 mm long; teeth filiform, 3–5 mm long. *Petals* white. *Standard* ca. 12–13 mm long; limb ca. 4 mm wide, oblong, rounded or minutely emarginate, below the middle slightly constricted, angularly passing into the cuneate claw. *Wings* ca. 12 mm long; limbs narrowly oblong, obtuse, ca. 5 × 1.3 mm; auricle minute, claw 12 mm long. *Keel* ca. 9 mm long; limbs obliquely elliptic, with widely curved lower and upper edge, subobtuse, ca. 3.5 × 2 mm; auricle indistinct, claw ca. 6 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, ellipsoid, white hairy; style hairy in basal part. *Legumes* sessile, obliquely ellipsoid, ca. 5 mm long, 2 mm high and wide, keeled ventrally, widely flattened dorsally, with a rigid beak 4–5 mm long, incompletely bilocular; valves thin, straw-colored, densely covered with appressed to ascending,

tangled medifixed to basifixed hairs 0.5–1 mm long. *Seeds* 2 in each locule.

Astragalus brevixillatus differs from *A. gregorii* by leaflets in 2 to 3(to 4) pairs, covered with hairs 2–2.5 mm long (vs. in 1 pair, with hairs 0.6–0.8 mm); calyx covered with basifixed, spreading white hairs, with teeth 3–5 mm long (vs. covered with medifixed, appressed, predominantly black hairs, with teeth 1.5–2 mm); and standard ca. 12 mm long (vs. ca. 21 mm).

Etymology. The specific epithet is from the Latin “brevixillatus,” meaning “short standard.”

Paratypes. CHINA. **Xinjiang:** near Altai city, 790 m, 1 June 2004, Zhao-Yang Chang et al. 2004-470a (MSB, WUK); near Burqin, 524 m, 29 May 2004, Zhao-Yang Chang et al. 2004-460 (MSB, WUK), 450 m, 1 July 1996, L.-R. Xu 96-132 (MSB); Fuhai, Keke Tuohai, 865 m, 3 June 2004, Zhao-Yang Chang et al. 2004-498 (MSB); near Toli, 800 m, 26 May 2004, Zhao-Yang Chang et al. 2004-367 (MSB, WUK); near Taoli, Laufengkou, 550 m, 5 July 1996, L.-R. Xu 96-165 (MSB); near Jinghe, 688 m, 14 May 2004, Zhao-Yang Chang et al. 2004-205 (MSB, WUK); Hoboksar, 1274 m, 27 May 2004, Zhao-Yang Chang et al. 2004-205 (MSB, WUK); near Ürümqi, 900 m, 10 May 2004, Zhao-Yang Chang et al. 2004-168 (MSB, WUK), 1000 m, 29 May 1958, A.-R. Li 6009 (MSB).

3. *Astragalus filidens* Podlech & L. R. Xu, sp. nov.

TYPE: China. Xinjiang: near Sailimu, 44°37'N, 81°22'E, 2091 m, 28 May 2004, Zhao Yang Chang et al. 2004-382 (holotype, WUK; isotype, MSB).

Differt ab omnibus speciebus sectionis vexillo alisque pilosis.

Plants 6–8 cm tall, acaulescent or subacaulescent, caespitose, densely covered with ascending to spreading, bifurcate, white hairs. *Caudex* divided, with short subterranean branches. *Stems*, if present, up to 2 cm long, densely covered with symmetrically to asymmetrically bifurcate, ascending to spreading, flexuose, tangled hairs 0.5–0.8 mm long. *Stipules* whitish, 3–5 mm long, narrowly triangular, shortly adnate to the petiole, hairy like the stem. *Leaves* 3–6 cm long; petiole 1–2.5 cm long, like the rachis densely covered with symmetrically to asymmetrically bifurcate, ascending to spreading, tangled hairs 0.5–0.8 mm long and with strongly asymmetrically bifurcate, spreading hairs up to 2.5 mm long. *Leaflets* in 5 to 9 pairs, narrowly elliptic to elliptic, 4–9 × 2–3 mm, subacute, partly folded, on both sides densely covered with symmetrically to asymmetrically bifurcate, ascending to partly spreading, tangled hairs 1.5–2.5 mm long. *Racemes* subsessile, ca. 4- to 5-flowered. *Bracts* greenish, linear, acute, 7–8 mm long, with mostly strongly asymmetrically bifurcate hairs 0.8–1.5 mm long. *Flowers* subsessile.

Calyx whitish membranous, tubular, obliquely cut at the mouth, 10–12 mm long, densely covered with mostly strongly asymmetrically bifurcate, ascending to spreading, tangled hairs 1.5–2.5 mm long; teeth filiform, greenish, 5–6 mm long, densely hairy on inner side. *Petals* whitish or yellow; adaxial standard and outer wings loosely covered with ± asymmetrically bifurcate, flexuose, appressed hairs. *Standard* ca. 15 mm long; limb ca. 4–4.5 mm wide, oblong-panduriform, emarginate, below the middle distinctly constricted, toward the base widened and obtuse-angularly passing into the short, cuneate claw. *Wings* ca. 14 mm long; limbs narrowly oblong, distinctly incised, ca. 7 × 1.5 mm; auricle ca. 0.5 mm long, claw ca. 7 mm long. *Keel* ca. 10 mm long; limbs narrowly elliptic, with widely curved lower edge and ± straight upper edge, subacute, ca. 4 × 2 mm; auricle indistinct, claw ca. 6 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely white hairy. *Legumes* unknown.

Astragalus filidens differs from all species of the section *Trachycercis* by its hairy standard and wings.

Etymology. The specific epithet is from the Latin “filidens,” meaning “with long, thin teeth” (i.e., calyx teeth).

4. *Astragalus glabritubus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Toli, 45°56'N, 83°37'E, 1800 m, 24 May 2004, Zhao Yang Chang et al. 2004-321 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo parvicarinato* S. B. Ho, cui ob carinam perbreve similis, stipulis 5–7 mm (nec 1–3 mm) longis, margine ciliatis ceterum glabris (nec dense villosis), foliis 1–2.5 cm (nec 3–8 cm) longis, foliolis saepissime unijugis (nec 2–3-jugis), calycis tubo glabro (nec patenter piloso).

Plants 3–4 cm tall, acaulescent, very densely compactly caespitose, white hairy. *Caudex* divided with blackish subterranean branches up to 3 cm long, covered with remnants of old stipules and petioles. *Stipules* 5–7 mm long, adnate to the petiole up to the middle, free tips narrowly ovate, obtuse, at the margins with spreading, basifixed cilia ca. 0.8 mm long, otherwise glabrous. *Leaves* 1–2.5 cm long; petiole 0.6–1.8 cm long, like the rachis slender, densely covered with medifixed, appressed hairs 0.4–0.6 mm long. *Leaflets* in 1(to 2) pairs, narrowly obovate, 4–9 × 1.5–2.2 mm, subobtuse, mostly folded, on both sides loosely to rather densely covered with medifixed, appressed hairs 0.5–0.8 mm long. *Racemes* sessile, 2- to 3-flowered. *Bracts* greenish, 8–12 mm long, from narrowly ovate base long, linear-acute, at the margins comb-like ciliate with basifixed hairs. *Flowers* sessile. *Calyx* ca. 8–10 mm long,

campanulate, whitish membranous, tube glabrous; teeth subulate, ca. 4 mm long, at the margins comb-like ciliate with basifixed hairs up to 0.8 mm long. *Petals* white. *Standard* ca. 20 mm long; limb narrowly obovate, ca. 5 mm wide, emarginate, long and gradually narrowed at the base. *Wings* ca. 15 mm long; limbs narrowly oblong, obliquely retuse, ca. 10 × 1.5 mm; auricle 0.3 mm long, claw ca. 5 mm long. *Keel* ca. 9 mm long; limbs elliptic, subacute, ca. 4.5 × 2 mm, subacute; auricle indistinct, claw ca. 4.5 mm long. *Stamen tube* truncate at the mouth. *Ovary* shortly stipitate, subglobose, appressed white hairy; style glabrous. *Legumes* unknown.

Astragalus glabritubus similar to *A. parvicarinatus* by its very short keel but differs by stipules 5–7 mm long, ciliate only at the margins (vs. 1–3 mm, densely villous); leaves 1–2.5 cm long with leaflets mostly in 1 pair (vs. 3–8 cm, with leaflets in 2 to 3 pairs); and calyx tube glabrous (vs. spreadingly hairy).

Etymology. The specific epithet is from the Latin “glabritubus,” meaning “with glabrous tube” (i.e., calyx tube).

5. *Astragalus levidensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Qinghai: near Tianjun City, ca. 37°18'N, 99°04'E, 3400 m, 1 Aug. 1959, s. coll. nr. 1143 (holotype, PE).

Differt ab *Astragalo scaberrimo* Bunge stipulis petiolo per 3–4 mm (nec 1.5–2.5 mm) adnatis, racemis sessilibus, 1–3-floribus (nec pedunculo 0.3–1.4(–4) cm longo suffultis, 3–5-floribus), bracteis 7–8 mm (nec 2–3 mm) longis, calycibus pilis maxime asymmetricè bifurcatis ad basifixis, implexis, flexuosis, ± patentibus (nec pilis ± medifixis appressis) obtectis.

Plants 5–8 cm tall, acaulescent or nearly so, caespitose, mostly appressed hairy. *Caudex* strongly divided, with many short subterranean branches, densely covered with remnants of old stipules. *Stipules* 5–8 mm long, narrowly triangular, acuminate, adnate to the petiole for 3–4 mm, densely covered with symmetrically to strongly asymmetrically bifurcate, at the margins also basifixed white hairs 0.5–1.5 mm long, at the margins with minute sessile glands. *Leaves* (1.5–)2–5 cm long; petiole (0.5–)1–2.5 cm long, like the rachis slender, rather densely to densely covered with ± medifixed white hairs 0.4–0.5 mm long. *Leaflets* in 4 to 6 pairs, elliptic, 3–7 × 1–3 mm, subacute to rounded, on both sides loosely or on underside more densely covered with medifixed hairs 0.5–0.7 mm long. *Racemes* sessile, 1- to 3-flowered. *Bracts* membranaceous, 7–8 mm long, narrowly triangular to narrowly ovate, white hairy. *Flowers* nearly sessile. *Calyx* tubular, 7–9 mm long, densely covered with strongly asymmetrically

bifurcate, flexuose, tangled, ± spreading white hairs 1–1.2 mm long; teeth subulate, ca. 2 mm long, densely white hairy on inner side. *Petals* yellow when dry. *Standard* 20–21 mm long; limb obovate, ca. 7 mm wide, emarginate, slightly angularly passing into the short cuneate claw. *Wings* 17–18 mm long; limbs narrowly oblong, slightly dilated toward the distinctly, obliquely incised tip, ca. 8 × 2.5 mm; auricle ca. 0.8 mm long, claw ca. 10 mm long. *Keel* ca. 15 mm long; limbs elliptic, with slightly curved lower and upper edge, rounded, ca. 7 × 3 mm; auricle short. *Stamen tube* truncate at the mouth. *Ovary* sessile, narrowly oblong, white hairy; style long, glabrous. *Legumes* unknown.

Astragalus levidensis differs from *A. scaberrimus* by stipules adnate to the petiole for 3–4 mm (vs. 1.5–2.5 mm); racemes sessile, 1- to 3-flowered (vs. with a peduncle 0.3–1.4(–4) cm, 3- to 5-flowered); bracts 7–8 mm long (vs. 2–3 mm); and calyx with strongly asymmetrically bifurcate to basifixed, flexuose, tangled hairs (vs. with ± medifixed, appressed hairs).

Etymology. The specific epithet is from the Latin “levidensis,” meaning “insignificant.”

6. *Astragalus lustricola* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: Huoqiang, 44°03'N, 80°52'E, 975 m, 15 May 2004, Zhao Yang Chang et al. 2004-215 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo hsinbatiao* P. Y. Fu & Y. A. Chen stipulis viridiusculis, 5–6 mm longis, a petiolo liberis (nec albido-membranaceis, 7–10 mm longis, petiolo per ca. 2 mm adnatis), pilis ad 1 mm (nec ad 2 mm) longis instructis, racemis pedunculo ad 3 cm longo suffultis (nec subsessilibus), calyce pilis nigris immixtis (nec mere albo-piloso), vexillo ca. 20 × 8 mm, obovato (nec 22–28 × 6 mm, anguste obovato), leguminibus rostro 3–4 mm longo instructis (nec breviter acuminatis).

Plants 5–8 cm tall, acaulescent or nearly so, covered with ascending to spreading, bifurcate hairs. *Stems*, if present, very short, very densely tomentose. *Stipules* greenish, 5–6 mm long, narrowly triangular, free from the petiole, sparsely to loosely furnished with medifixed to basifixed, subappressed to spreading hairs 0.8–1 mm long. *Leaves* 7–9 cm long; petiole 1.5–3 cm long, like the rachis densely covered with ± medifixed, partly flexuose, tangled, ascending to spreading white hairs 0.5–0.8 mm long and with fewer, strongly to extremely asymmetrically bifurcate, straight, spreading hairs 1–1.5 mm long. *Leaflets* in 7 to 11 pairs, elliptic to obovate or narrowly elliptic, 7–10 × 2–7 mm, obtuse, minutely mucronulate, on both sides rather densely covered with ascending, straight or flexuose, ± medifixed hairs 1–1.5 mm long. *Racemes* 6- to 10-flowered, with a pedun-

cle hairy like the rachis. *Bracts* membranous to slightly greenish, narrowly triangular, ca. 5–6 mm long, furnished with \pm spreading white hairs up to 1.5 mm long, with short black hairs mixed in, at the margins with basifixed hairs. *Calyx* whitish membranous, tubular, obliquely cut at the mouth, 15–16 mm long, densely covered with flexuose, \pm medifixed, subappressed to ascending white hairs 0.8–1 mm long and with strongly asymmetrically bifurcate, spreading white hairs up to 2 mm long, with some short, medifixed black hairs mixed in; teeth subulate, 4–5 mm long, densely appressed white hairy on inner side. *Petals* yellowish. *Standard* ca. 20 mm long; limb ca. 8 mm wide, obovate, emarginate, distinctly constricted in the middle, subabruptly contracted into the claw ca. 6 mm long. *Wings* ca. 20 mm long; limbs narrowly elliptic, obtuse, ca. 7×2.5 mm; auricle 0.5 mm long, claw slender, 13–14 mm long. *Keel* ca. 17 mm long; limbs obliquely elliptic-curved, with widely curved lower edge and concave upper edge, obtuse, ca. 5×2.5 mm; auricle ca. 0.5 mm long, claw ca. 12 mm long. *Stamen tube* nearly truncate at the mouth. *Ovary* sessile, densely white hairy; style hairy at the base. *Legumes* (unripe) ca. 15 mm long, 3 mm high, keeled ventrally, rounded dorsally, with a beak 3–4 mm long; valves densely covered with subappressed, flexuose, \pm medifixed white hairs ca. 0.5 mm long and with strongly asymmetrically bifurcate, straight, spreading hairs 1.5–2 mm long.

Astragalus lustricola differs from *A. hsinbaticus* by greenish stipules 5–6 mm long, free from the petiole, with hairs ca. 1 mm long (vs. white-membranous, 7–10 mm, adnate to the petiole for ca. 2 mm, with hairs up to 2 mm); racemes with a peduncle up to 3 cm long (vs. subsessile); calyx with white and black hairs (vs. only with white hairs); standard ca. 20×8 mm, obovate (vs. $22\text{--}28 \times 6$ mm, narrowly obovate); and legumes with a beak 3–4 mm long (vs. shortly acuminate).

Etymology. The specific epithet is from the Latin “lustricola,” meaning “wilderness dweller.”

7. *Astragalus lychnobius* Podlech & L. R. Xu, sp. nov. TYPE: China, Xinjiang: near Habahe, ca. $48^{\circ}02'N$, $86^{\circ}26'E$, 730 m, 30 May 2004, Zhao Yang Chang et al. 2004-427 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo macriculo* Podlech & L. R. Xu stipulis anguste triangularibus, 4–5 mm longis (nec linearibus, 6–8 mm longis), foliolis 3–10-jugis (nec (4–)6–8 jugis), pilis \pm medifixis, appressis ad leviter ascendentibus (nec pilis medifixis ascenduntibus et pilis basifixis ascenduntibus ad patentibus) obteetis, bracteis ca. 2 mm longis (nec 6–10 mm

longis), dentibus calycis 1–1.5 mm (nec 2.5–3 mm) longis, vexillo ca. 25 mm (nec 20–21 mm) longo.

Plants 6–8 cm tall, acaulescent or nearly so, loosely caespitose, covered with bifurcate hairs. *Caudex* divided with subterranean stolons 3–6 cm long. *Stems*, if present, up to 1 cm long, very densely covered with strongly asymmetrically bifurcate, ascending to partly spreading, \pm flexuose, tangled white hairs 1–1.5 mm long. *Stipules* 4–5 mm long, narrowly triangular, adnate to the petiole for 1–2 mm, rather densely covered with symmetrically to asymmetrically bifurcate, subappressed to slightly ascending white hairs ca. 0.5 mm long, at the margins with basifixed hairs. *Leaves* 3–7 cm long; petiole 1.5–3 cm long, like the rachis densely covered with \pm medifixed, subappressed to ascending hairs 0.5–1 mm long and with few, strongly asymmetrically bifurcate, spreading hairs ca. 1 mm long. *Leaflets* in 8–10 pairs, narrowly elliptic to elliptic, $3\text{--}8 \times 1.5\text{--}4$ mm, subacute to rounded or minutely retuse, on both sides rather densely to densely (in immature plants) or loosely (in mature plants) covered with \pm symmetrically to slightly asymmetrically bifurcate, appressed to slightly ascending hairs 0.8–1.2 mm long. *Racemes* subsessile, 1- to 4-flowered. *Bracts* membranous, whitish, ca. 2 mm long, narrowly triangular, densely white hairy, with some black hairs mixed in. *Pedicels* ca. 1 mm long, white and black hairy. *Calyx* whitish membranous, tubular, obliquely cut at the mouth, 11–12 mm long, densely covered with strongly asymmetrically bifurcate or subbasifixed, tangled, flexuose white hairs 0.5–1 mm long and with more medifixed black hairs, especially toward the teeth, sometimes with 5 blackish longitudinal stripes; teeth narrowly triangular to subulate, 1–1.5 mm long, densely white hairy on inner side. *Petals* whitish or yellow, yellowish when dry. *Standard* ca. 25 mm long; limb ca. 9 mm wide, obovate, widely and deeply emarginate, gradually narrowed into the claw. *Wings* ca. 21 mm long; limbs narrowly obovate, widely obliquely emarginate, ca. 8×3 mm; auricle ca. 1 mm long, claw ca. 13 mm long. *Keel* ca. 20 mm long; limbs obliquely elliptic, with widely curved lower edge and slightly concave upper edge, obtuse, ca. 6×3 mm; auricle minute, claw ca. 13 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, narrowly oblong, very densely villous, with white, \pm spreading hairs; style sparsely hairy at the base. *Legumes* unknown.

Astragalus lychnobius differs from *A. macriculus* by stipules narrowly triangular, 4–5 mm long (vs. linear, 6–8 mm); leaflets in 8 to 10 pairs, with \pm medifixed, appressed to slightly ascending hairs (vs. (4 to)6 to 8 pairs, with medifixed, ascending hairs and basifixed, ascending to spreading hairs); bracts ca. 2 mm long

(vs. 6–10 mm); calyx teeth 1–1.5 mm long (vs. 2.5–3 mm); and standard ca. 25 mm long (vs. 20–21 mm).

Etymology. The specific epithet derives from the Greek, and it means “living in the light.”

8. *Astragalus macriculus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Yumin, ca. 46°12'N, 82°59'E, 974 m, 25 May 2004, *Zhao Yang Chang et al.* 2004-343 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo hsinbaticus* P. Y. Fu & Y. A. Chen foliis 4–5 cm (nec 8–18 cm) longis, foliolis (4–)6–8-jugis (nec 10–12-jugis), anguste ellipticis, 5–10 × 1.5–3 mm, acute (nec ellipticis ad obovatis, 7–15 × 3–8 mm, obtusis vel emarginatis), utrinque pilis ± medifixis et basifixis 0.8–1 mm longis (nec pilis medifixis tantum 1.5–2 mm longis) obtectis, bracteis 6–10 mm (nec ca. 5 mm) longis, calyce praeter pilis medifixis etiam pilis basifixis instructo.

Plants 6–8 cm tall, caespitose, nearly acaulescent, covered with ascending to spreading, bifurcate hairs. *Caudex* divided with short subterranean branches. *Stems* 1–1.5 cm long, very densely covered with strongly asymmetrically bifurcate, ascending to partly spreading, ± flexuose, tangled white hairs 1–1.5 mm long. *Stipules* greenish, 6–8 mm long, linear, acute, adnate to the petiole for 1–2 mm, loosely hairy like the stem, at the margins with basifixes hairs. *Leaves* 4–5 cm long; petiole 1.5–2 cm long, like the rachis densely covered with ± medifixes, subappressed to ascending hairs 0.5–1 mm long and with few, strongly asymmetrically bifurcate, spreading hairs 1.5–2 mm long. *Leaflets* in (4 to) 6 to 8 pairs, narrowly elliptic, 5–10 × 1.5–3 mm, acute, often folded, on both sides rather densely to densely covered with ± medifixes, ascending hairs and with basifixes, ascending to spreading hairs 0.8–1 mm long. *Racemes* subsessile, loosely 4- to 5-flowered. *Bracts* membranous, linear, 6–10 mm long, with subbasifixes white hairs 1–1.5 mm long and shorter black hairs. *Pedicels* 2–3 mm long, white and black hairy. *Calyx* whitish membranous, narrowly tubular, obliquely cut at the mouth, 11–12 mm long, densely covered with symmetrically to strongly asymmetrically, subbasifixes to ascending, flexuose, tangled white and black hairs up to 1 mm long and with ± straight, strongly asymmetrically bifurcate to basifixes, ± spreading hairs up to 2 mm long; teeth narrowly triangular to subulate, 2.5–3 mm long, densely white hairy on inner side. *Petals* whitish or yellow. *Standard* ca. 21 mm; limb ca. 8 mm wide, obovate, emarginate, slightly constricted below the middle, gradually narrowed into the short claw. *Wings* ca. 18 mm long; limbs narrowly elliptic, obtuse, ca. 7 × 3 mm; auricle very short, claw ca. 11 mm long. *Keel* 15–16 mm long; limbs obliquely elliptic, with widely

curved lower edge and slightly concave upper edge, subacute, ca. 6 × 3 mm; auricle indistinct, claw 10–11 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely white hairy. *Legumes* unknown.

Astragalus macriculus differs from *A. hsinbaticus* by leaves 4–5 cm long (vs. 8–18 cm); leaflets in (4 to) 6 to 8 pairs, narrowly elliptic, 5–10 × 1.5–3 mm, acute, with ± medifixes and basifixes hairs 0.8–1 mm long (vs. in 10 to 12 pairs, elliptic to obovate, 7–15 × 3–8 mm, obtuse or emarginate, with only medifixes hairs 1.5–2 mm); bracts 6–10 mm long (vs. ca. 5 mm); and calyx with medifixes and basifixes hairs (vs. only with medifixes hairs).

Etymology. The specific epithet is from the Latin “macriculus,” meaning “slight, thin and small,” because of the small size of the plant.

9. *Astragalus ningxiaensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Ningxia: near Zhongwei, ca. 37°31'N, 105°11'E, 1634 m, 4 May 2005, *Zhao Yang Chang et al.* 2004-090 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo levidensis* Podlech & L. R. Xu stipulis 4–5 mm (nec 5–8 mm longis), petiolo per 1–2 mm (nec 3–4 mm) adnatis, pilis maxime asymmetricè bifurcatis ad basifixis (nec symmetricè ad asymmetricè bifurcatis) obtectis, foliolis 6–8-jugis (nec 4–6-jugis), pilis 0.8–1 mm (nec 0.5–0.7 mm) longis instructis, bracteis angustissime triangularibus, 10–11 mm longis (nec anguste ovatis, 7–8 mm longis), calyce 10–12 mm longo cum dentibus 3.5–4 mm longis (nec 7–9 mm longo cum dentibus ca. 2 mm longis), vexillo 23–27 mm (nec 20–21 mm) longo.

Plants 5–7 cm tall, acaulescent, densely caespitose, white hairy. *Caudex* strongly divided, with many short subterranean branches. *Stipules* whitish membranous, 4–5 mm long, triangular, acute, adnate to the petiole for 1–2 mm, densely covered with strongly asymmetrically bifurcate to basifixes hairs 0.3–1 mm long, at the margins with minute sessile glands. *Leaves* 3–6 cm long; petiole 1.5–3 cm long, like the rachis slender, densely covered with ± medifixes, appressed hairs 0.6–0.7 mm long. *Leaflets* in 6 to 8 pairs, narrowly elliptic to elliptic, 3–7 × 1–2 mm, subacute to obtuse, on upper side sparsely to rarely loosely hairy, sometimes only toward the margins, on underside rather densely covered with ± medifixes, appressed hairs 0.8–1 mm long. *Racemes* sessile, 3- to 4-flowered. *Bracts* whitish membranous with greenish tip, 10–11 mm long, very narrowly triangular, covered with ± spreading, basifixes hairs 0.5–0.8 mm long. *Pedicels* 0.5–1 mm long, hairy. *Calyx* whitish with greenish teeth, tubular, 10–12 mm long, densely covered with subbasifixes to basifixes, tangled, ±

spreading hairs up to 1.2 mm long; teeth subulate, 3.5–4 mm long, densely white hairy on inner side. *Petals* purple in life, yellowish when dry. *Standard* 23–27 mm long; limb narrowly obovate, emarginate, gradually narrowed at the base. *Wings* 21–25 mm long; limbs narrowly oblong to slightly dilated toward the obliquely incised tip, 8–10 × 2.5–3 mm; auricle ca. 0.3–0.5 mm long, claw 13–16 mm long. *Keel* 18–20 mm long; limbs obliquely elliptic, with widely curved lower edge and slightly concave upper edge, obtuse, 6–7 × 3–3.5 mm; auricle minute, claw 12–13 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, narrowly oblong, white hairy; style long, glabrous. Legumes unknown.

Astragalus ningxiaensis differs from *A. levidensis* by stipules 4–5 mm long, adnate to the petiole for 1–2 mm, covered with strongly asymmetrically bifurcate to basifixed hairs (vs. 5–8 mm, adnate to the petiole for 3–4 mm, covered with symmetrically to asymmetrically bifurcate hairs); leaflets in 6 to 8 pairs, with hairs 0.8–1 mm long (vs. in 4 to 6 pairs, with hairs 0.5–0.7 mm); bracts very narrowly triangular, 10–11 mm long (vs. narrowly ovate, 4–5 mm); calyx 10–12 mm long with teeth 3.5–4 mm long (vs. 7–9 mm, with teeth ca. 2 mm); and standard 23–27 mm long (vs. 20–21 mm).

Etymology. *Astragalus ningxiaensis* is named after the Chinese province Ningxia.

Paratype. CHINA. **Ningxia:** near Wuzhong, 1290 m, 3 May 2004, Zhao-Yang Chang et al. 2004-082 (MSB, WUK).

10. *Astragalus occultus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Altai city, ca. 47°50'N, 88°12'E, 790 m, 1 June 2004, Zhao Yang Chang et al. 2004-470 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo galactite* Pallas, cui ob foliola supra glabra similis, stipulis 4–5 mm longis, dense pilis symmetrice ad asymmetric bifurcatis obtectis (nec 5–7(–10) mm longis, pilis maxime asymmetric bifurcatis obtectis), foliolis 2–6 × 0.8–2.5 mm (nec 5–13(–19) × 1–3(–5) mm), bracteis ca. 5 mm (nec 6–9 mm) longis, calyce 6–7 mm longis cum dentibus 1.5–2 mm longis (nec 9 mm longis cum dentibus 4–6 mm longis), pilis subbasifixis ad basifixis (nec asymmetric bifurcatis) obfecto, vexillo ca. 15–18 mm (nec 21–26 mm) longo.

Plants (including leaves) 5–7 cm tall, acaulescent or nearly so, densely caespitose, covered with white hairs. *Caudex* with a pluricipital root crown, branches very short, covered with blackish bark and remnants of old stipules. *Stems*, if present, very short, up to 0.5 cm long, very densely covered with ± medifixed appressed hairs 0.5–0.7 mm long. *Stipules* whitish

hyaline, 4–5 mm long, narrowly triangular to triangular, adnate to the petiole for ca. 2 mm, loosely to rather densely covered with symmetrically to asymmetrically bifurcate, appressed hairs, at the margins with basifixed hairs. *Leaves* ca. 5–7 cm long; petiole 2.5–3 cm long, like the rachis slender, densely to very densely hairy like the stem. *Leaflets* in 7 to 10 pairs, remote, narrowly elliptic, 2–6 × 0.8–2.5 mm, obtuse to subacute, on upper side glabrous or rarely with some hairs toward the margins, on underside rather densely to densely hairy like the rachis. *Racemes* sessile, 1- to 2-flowered. *Bracts* whitish hyaline, narrowly triangular to ovate, acute, ca. 5 mm long, densely covered with strongly asymmetrically bifurcate to basifixed hairs 0.8–1 mm long, at the margins with minute, globular glands. *Pedicels* up to 0.5 mm long, hairy. *Calyx* campanulate, 6–7 mm long, densely covered with ascending, subbasifixed to basifixed hairs 1–1.5 mm long; teeth narrowly triangular to subulate, 1.5–2 mm long, hairy on inner side. *Petals* yellowish or whitish. *Standard* ca. 15–18 mm long; limb elliptic, 5–6 mm wide, emarginate, gradually narrowed into the short, cuneate claw. *Wings* 15–17 mm long; limbs narrowly oblong, slightly obliquely emarginate, 6–7.5 × 2 mm; auricle 0.5 mm long, claw 9–10 mm long. *Keel* 14–15 mm long; limbs narrowly elliptic, ca. 5.5 × 2 mm; auricle indistinct, claw ca. 9 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, narrowly ellipsoid, white hairy; style glabrous. Legumes unknown.

Astragalus occultus differs from *A. galactites* by stipules 4–5 mm long with symmetrically to asymmetrically bifurcate hairs (vs. 5–7(–10) mm with strongly asymmetrically bifurcate hairs); leaflets 2–6 × 0.8–2.5 mm (vs. 5–13(–19) × 1–3(–5) mm); bracts ca. 5 mm long (vs. 6–9 mm); calyx 6–7 mm long, covered with subbasifixed to basifixed hairs, with teeth 1.5–2 mm long (vs. 9 mm, covered with asymmetrically bifurcate hairs, with teeth 4–6 mm); and standard ca. 15–18 mm long (vs. 21–26 mm).

Etymology. The specific epithet is from the Latin “occultus,” meaning “hidden,” because the flowers are hidden within the leaves.

Paratype. CHINA. **Gansu:** Lanzou, 1900 m, 14 June 1996, Lang-Ran Xu 96-010 (MSB).

11. *Astragalus perbrevis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Jeminay, ca. 47°25'N, 85°52'E, 1285 m, 27 May 2004, Zhao Yang Chang et al. 2004-377 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo jiuquanensi* S. B. Ho stipulis 8–10 mm (nec 3–4 mm) longis, petiolo cum rhachide dense

pilis \pm medifixis, flexuosis ca. 1 mm longis et basifixis, rectis, patentibus ad 2 mm longis oblecto (nec pilis \pm medifixis 0.4–0.6 mm longis tantum oblecto), foliolis utrinque dense pilis medifixis ascendentibus, ca. 1.5 mm longis (nec supra laxe, subtus densiore pilis medifixis appressis ad 1 mm longis) oblectis, bracteis 8–10 mm (nec 5–6 mm) longis.

Plants 2–3 cm tall, acaulescent, very densely caespitose, densely covered with white hairs. *Caudex* with a pluricipital root crown, with very short branches. *Stipules* whitish membranous, 8–10 mm long, adnate to the petiole for 1–3 mm, the free tips narrowly triangular, densely covered with basifixed, subappressed to slightly ascending hairs up to 2.5 mm long. *Leaves* 1.5–3 cm long; petiole 0.6–1 cm long, like the rachis densely covered with \pm medifixed, flexuose, subappressed to ascending hairs ca. 1 mm long and with basifixed, straight, spreading hairs up to 2 mm long. *Leaflets* in 1 to 3 pairs, narrowly elliptic, 5–10 \times 2–3.5 mm, subacute, on both sides densely covered with medifixed, ascending hairs ca. 1.5 mm long. *Racemes* sessile, few-flowered. *Bracts* whitish hyaline, narrowly triangular, 8–10 mm long, rather densely covered with basifixed hairs ca. 1 mm long. *Flowers* sessile. *Petals* whitish yellow when dry. *Calyx* ca. 12 mm long, densely covered with symmetrically to asymmetrically bifurcate, flexuose, subappressed to ascending hairs ca. 1 mm long and with basifixed, straight, ascending to nearly spreading hairs 2–3 mm long; teeth narrowly triangular, ca. 3 mm long, hairy on inner side. *Standard* ca. 25 mm long; limb ca. 9 mm wide, obovate, deeply emarginate, angularly passing into the cuneate claw. *Wings* ca. 22 mm long; limbs narrowly obovate, deeply emarginate to obliquely bilobed, 9 \times 3.5 mm; auricle 1 mm long, claw ca. 13 mm long. *Keel* ca. 21 mm long; limbs obliquely obovate, with widely curved lower edge and \pm straight upper edge, obtuse, ca. 7 \times 3.5 mm; auricle ca. 0.8 mm long, claw ca. 14 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely white hairy. *Legumes* unknown.

Astragalus perbrevis differs from *A. jiuquanensis* by stipules 8–10 mm long (vs. 3–4 mm); petiole and rachis densely covered with \pm medifixed, flexuose hairs ca. 1 mm long and with basifixed, straight, spreading hairs up to 2 mm long (vs. only with \pm medifixed hairs 0.4–0.6 mm); leaflets on both sides with medifixed, ascending hairs ca. 1.5 mm long (vs. on upper side loosely, on underside more densely covered with appressed hairs up to 1 mm); and bracts 8–10 mm long (vs. 5–6 mm).

Etymology. The specific epithet is from the Latin “perbrevis,” meaning “very short.”

12. *Astragalus porphyreus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: Berler, ca. 44°N, 83°E, 2091 m, 21 May 2004, *Zhao-Yang Chang et al.* 2004-302 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo vesco* Podlech & L. R. Xu stipulis pilis basifixis (nec symmetrice ad asymmetric bifurcatis) oblectis, foliolis 1–2-jugis (nec 2–3-jugis), pilis 0.3–0.5 mm (nec ad 1 mm) longis instructis, calyce pilis basifixis patentibus (nec pilis medifixis appressis) oblecto, petalis purpureis (nec albis et rubro-suffusis), vexillo ca. 16–17 mm longo, oblongo, emarginato, infra medium constricto, basi angulari-auriculato (nec ca. 19 mm longo, obovato, rotundato, basi gradatim angustato).

Plants 2–4 cm tall, acaulescent, densely caespitose, only white hairy. *Caudex* with a pluricipital root crown. *Stipules* whitish membranous, 5–6 mm long, triangular, adnate to the petiole for ca. 3 mm, loosely to rather densely covered with basifixed, subappressed hairs up to 1 mm long. *Leaves* 0.8–1.5 cm long; petiole 0.3–0.7 cm long, like the rachis slender, very densely covered with medifixed, appressed hairs 0.4–0.6 mm long. *Leaflets* in 1 to 2 pairs, obovate, 3–6 \times 1.2–3 mm, subacute to shortly acuminate, mostly boot-shaped or folded, especially toward the tip, covered on upper side loosely to rather densely, on underside more densely with appressed, medifixed hairs 0.3–0.5 mm long. *Racemes* sessile, 1- to 2-flowered. *Bracts* whitish membranous, very narrowly triangular, ca. 3 mm long, with basifixed hairs 0.5–1 mm long. *Flowers* sessile. *Calyx* campanulate-tubular, 8–9 mm long, rather densely to densely covered with subbasifixed to basifixed, spreading, tangled hairs 0.5–1 mm long; teeth subulate, 2–2.5 mm long. *Petals* purplish in life, whitish or yellowish when dry. *Standard* ca. 16–17 mm long; limb oblong, 4.5–5.5 mm wide, emarginate, below the middle constricted, at the base angular-auriculate, subabruptly contracted into the short claw. *Wings* 14–15 mm long; limbs narrowly oblong, obtuse, ca. 7.5–8 \times 2.2 mm; auricle ca. 0.5 mm long, claw ca. 7 mm long. *Keel* ca. 12–13 mm long; limbs obliquely elliptic, with widely curved lower edge and \pm straight upper edge, subacute, ca. 5 \times 2.2 mm; auricle short. *Ovary* sessile, white hairy; style glabrous. *Legumes* unknown.

Astragalus porphyreus differs from *A. vesco* by stipules with basifixed hairs (vs. symmetrically to asymmetrically bifurcate hairs); leaflets in 1 to 2 pairs, with hairs 0.3–0.5 mm long (vs. in 2 to 3 pairs, with hairs up to 1 mm); calyx with basifixed, spreading hairs (vs. medifixed, appressed hairs); petals purple (vs. whitish, red-suffused); and standard 16–17 mm long, oblong, emarginate, constricted below the middle, at the base angular-auriculate (vs.

ca. 19 mm, obovate, rounded, at the base gradually narrowed).

Etymology. The specific epithet is from the Latin "porphyreus," because of the purplish petals.

Paratypes. CHINA. Xinjiang: Berler, 1656 m, 21 May 2004, Zhao-Yang Chang et al. 2004-299 (MSB, WUK); near Wenquan, 1430 m, 22 May 2004, Zhao-Yang Chang et al. 2004-313 (MSB, WUK).

13. *Astragalus secretus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Burqin, ca. 47°41'N, 86°59'E, 524 m, 1 May 2004, Zhao-Yang Chang et al. 2004-461 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo vesco* Podlech & L. R. Xu foliolis 5–10 × 1.5–4 mm (nec 2–5 × 0.5–2.2 mm), utrinque densissime pilosis (nec supra laxe, subtus densiore pilosis), racemis pedunculo 2–3 cm longo suffultis, 5–7-floribus (nec sessilibus, 1–2-floribus), bracteis margine tantum ciliatis (nec pilosis), calyce pilis symmetrice ad maxime asymmetricè bifurcatis 0.8–1 mm longis (nec ± medifixis tantum 0.5–0.6 mm longis) oblecto, dentibus anguste triangularibus 1–2 mm longis (nec subulatis, 2–2.5 mm longis), petalis flavis (nec albis, rubro-suffusis), carina ca. 13 mm (nec ca. 16 mm) longa.

Plants 3.5–6 cm tall, acaulescent, caespitose, white hairy. *Caudex* divided with short branches, covered with blackish remnants of old leaves. *Stipules* whitish membranous, ca. 4 mm long, ovate, shortly acuminate, adnate to the petiole for ca. 2 mm, densely covered with ± medifixes, appressed hairs up to 1 mm long, at the margins with basifixes hairs. *Leaves* 2.5–3 cm long; petiole 0.8–2 cm long, like the rachis slender, sulcate adaxially, densely to very densely covered with medifixes, appressed hairs 0.5–0.7 mm long. *Leaflets* in 1 to 3 pairs, obovate, 5–10 × 1.5–4 mm, subacute, on both sides very densely covered with appressed, medifixes hairs 0.8–1.2 mm long. *Racemes* 5- to 7-flowered, with a peduncle 2–3 cm long and hairy like the rachis. *Bracts* whitish membranous, sometimes with slightly greenish tip, ovate or narrowly triangular, 2–4 mm long, at the margins with subbasifixes to basifixes hairs, otherwise glabrous. *Flowers* subsessile. *Calyx* campanulate, 7–8 mm long, densely covered with symmetrically to strongly asymmetrically bifurcate, appressed hairs 0.8–1 mm long; teeth narrowly triangular, 1–2 mm long, white hairy on inner side. *Petals* yellow. *Standard* ca. 17 mm long; limb obovate, ca. 8 mm wide, retuse, gradually narrowed into the widely cuneate, short claw. *Wings* ca. 16 mm long; limbs narrowly obovate, rounded, ca. 9 × 3.5 mm; auricle ca. 0.3–0.4 mm long, claw ca. 7 mm long. *Keel* ca. 13 mm long; limbs obliquely obovate, upper part with nearly rectangu-

larly curved lower edge and ± straight upper edge, subacute, ca. 6 × 3 mm; auricle minute, claw ca. 7 mm long. *Stamen tube* truncate at the mouth. *Ovary* subsessile, white hairy; style glabrous. *Legumes* unknown.

Astragalus secretus differs from *A. vesco* by leaflets 5–10 × 1.5–4 mm, on both sides very densely hairy (vs. 2–5 × 0.5–2.2 mm, on upper side loosely, on underside more densely hairy); racemes with a peduncle 2–3 cm long, 5- to 7-flowered (vs. sessile, 1- to 2-flowered); bracts ciliate only at the margins (vs. hairy all over); calyx with symmetrically to asymmetrically bifurcate hairs 0.8–1 mm long, teeth narrowly triangular, 1–2 mm long (vs. with ± medifixes hairs 0.5–0.6 mm, teeth subulate, 2–2.5 mm); petals yellow (vs. white, red-suffused); and keel ca. 13 mm long (vs. ca. 16 mm).

Etymology. The specific epithet is from the Latin "secretus," meaning "remote," because the plant is found in sparsely inhabited mountain areas.

14. *Astragalus sinkiangensis* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Wenquan, ca. 44°58'N, 81°06'E, 1430 m, 22 May 2004, Zhao Yang Chang 2004-314 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo geerwusuensi* H. C. Fu plantis acaulescentibus, sine stolonibus subterraneis elongatis (nec subacaulescentibus cum stolonibus subterraneis elongatis et caulibus brevibus sed distinctis), stipulis petiolo per ca. 1 mm (nec 3–5 mm) adnatis, foliolis late obovatis ad suborbicularibus, 4–6 × 3.5–5.5 mm (nec ellipticis, 8–14 × 3–8 mm), racemis 1–2-floribus, sessilibus (nec 7–10-floribus, pedunculo 1–2 cm longo suffultis), vexillo ca. 25 mm longo, oblongo-panduriforme, basia hastato-auriculato (nec 15–20 mm longo, elliptico-obovato).

Plants ca. 8 cm tall, acaulescent, caespitose. *Caudex* strong, with a pluricapital root crown. *Stipules* 10–15 mm long, from a narrowly triangular base long linear-acuminate, adnate to the petiole for ca. 1 mm, loosely covered with basifixes, spreading white hairs 1–2 mm long. *Leaves* 5–8 cm long; petiole 1.5–2 cm long, like the rachis rather densely covered with symmetrically to asymmetrically bifurcate, ± spreading, tangled hairs 0.5–1 mm long and with some basifixes longer hairs up to 2 mm long. *Leaflets* in 7 to 9 pairs, widely obovate to suborbicular, 4–6 × 3.5–5.5 mm, rounded, on upper side sparsely to loosely, on underside rather densely covered with symmetrically to asymmetrically, partly flexuose, ascending to spreading white hairs 0.5–0.8 mm long, with few basifixes straight, longer hairs mixed in. *Racemes* sessile, 1- to 2-flowered. *Bracts* narrowly triangular, 5–7 mm long, hairy like the stipules. *Pedicels* very

short. *Calyx* 10–12 mm long, tubular, densely covered with extremely asymmetrically bifurcate to basifixed, spreading hairs 1–2 mm long; teeth filiform, ca. 4 mm long, hairy on inner side. *Petals* white. *Standard* ca. 25 mm long; limb ca. 8 mm wide, oblong-panduriform, emarginate, in lower 1/3 slightly constricted, at the base widened, hastate-auriculate, widely cuneately passing into the short claw. *Wings* 22–23 mm long; limbs narrowly oblong, obliquely retuse, 10–11 × ca. 2 mm; auricle ca. 0.8 mm long, claw ca. 13 mm long. *Keel* ca. 21 mm long; limbs oblong, slightly curved, obtuse, ca. 7 × 2.5 mm; auricle ca. 0.8 mm long, claw 13 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, ellipsoid, densely white hairy; style long, glabrous. *Legumes* unknown.

Astragalus sinkiangensis differs from *A. geerwusuensis* by being acaulescent, without elongated subterranean stolons (vs. with short but distinct stems and elongated subterranean stolons); stipules adnate to the petiole for 1 mm (vs. for 3–5 mm); leaflets widely obovate to suborbicular, 4–6 × 3.5–5.5 mm (vs. elliptic, 8–14 × 3–8 mm); racemes sessile, 1- to 2-flowered (vs. with a peduncle 1–2 cm, 7- to 10-flowered); and standard ca. 25 mm long, oblong-panduriform, at the base hastate-auriculate (vs. 15–20 mm, elliptic-obovate).

Etymology. *Astragalus sinkiangensis* is named after Sinkiang, an earlier name for Xinjiang province, China.

15. *Astragalus tesquorum* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Tianshan, ca. 43°10'N, 88°36'E, 1540 m, 8 May 2004, *Zhao Yang Chang et al. 2004-124* (holotype, WUK; isotype, MSB).

Differt ab *Astragalo macriculo* Podlech & L. R. Xu mere albo-pilosus (nec bracteis calyceque pilis nigris immixtis), foliolis 4(–5)-jugis (nec 4(–6)–8)-jugis), pilis ± medifixis, ascendentibus ad patentibus 1.5–2.5 mm longis (nec pilis partim basifixis 0.8–1 mm longis) obtectis, calyce ca. 8 mm (nec 11–12 mm) longo, dentibus 2 mm (nec 2.5–3 mm) longis, vexillo ca. 17 mm (nec ca. 21 mm) longo.

Plants 3–5 cm tall, acaulescent, densely caespitose, covered with ascending to spreading, bifurcate, white hairs. *Caudex* divided with very short subterranean branches. *Stipules* whitish membranous, 4–8 mm long, linear, acute, adnate to the petiole for ca. 1 mm, rather densely covered with basifixed, ascending hairs 0.5–0.8 mm long. *Leaves* 2–5 cm long; petiole 1–2.5 cm long, like the rachis rather densely covered with symmetrically to strongly asymmetrically, ascending to spreading, ± flexuose, tangled hairs 1–1.8 mm long. *Leaflets* in 4(to 5) pairs, elliptic to

obovate, 3–7 × 1.5–4 mm, acute to obtuse, often folded, on both sides rather densely covered with ± medifixis, ascending to partly ± spreading hairs 1.5–2.5 mm long. *Racemes* subsessile, ca. 3-flowered. *Bracts* whitish membranous, linear, 7–8 mm long, hairy like the stipules. *Calyx* whitish membranous, narrowly tubular, obliquely cut at the mouth, ca. 8 mm long, rather densely covered symmetrically to strongly asymmetrically bifurcate or partly basifixed, ascending to spreading hairs up to 1.2 mm long; teeth narrowly triangular to subulate, ca. 2 mm long, densely white hairy on inner side. *Petals* in life purplish, yellowish when dry. *Standard* ca. 17 mm long; limb ca. 7 mm wide, obovate, emarginate, distinctly constricted below the middle, angularly passing into the short claw. *Wings* ca. 17 mm long; limbs narrowly oblong, minutely obliquely incised, ca. 7.5 × 2 mm; auricle ca. 0.5 mm long, claw ca. 9 mm long. *Keel* ca. 15 mm long; limbs obliquely obovate, upper part with widely curved lower edge and slightly concave upper edge, subobtusate, ca. 6 × 3 mm; auricle 0.3 mm long, claw 9 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely white hairy; style glabrous. *Legumes* unknown.

Astragalus tesquorum differs from *A. macriculus* by being white hairy (vs. bracts and calyx being white and black hairy); by leaflets in 4(to 5) pairs, with ± medifixis, ascending to spreading hairs 1.5–2.5 mm long (vs. in 4 to 6 to 8 pairs, with partly basifixed hairs 0.8–1 mm); calyx ca. 8 mm long, with teeth ca. 2 mm long (vs. 11–12 mm, with teeth 2.5–3 mm); and standard ca. 17 mm long (vs. 20–21 mm).

Etymology. The specific epithet is from the Latin “tesquorum,” because the species is found in barren wasteland.

16. *Astragalus transecticola* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: Berler, ca. 44°N, 83°E, 2090 m, 21 May 2004, *Zhao Yang Chang et al. 2004-303* (holotype, WUK; isotype, MSB).

Differt ab *Astragalo macriculo* Podlech & L. R. Xu pilis mere albis obsitis (nec in bracteis, pedicellis calyceque pilis nigris immixtis), stipulis 10–15 mm (nec 6–8 mm) longis, foliolis ellipticis ad late ellipticis, 3–4 × 2–2.5 mm, rotundatis (nec anguste ellipticis, 5–10 × 1.5–3 mm, acutis), floribus subsessilibus (nec pedicello 2–3 mm longo suffultis), vexillo elliptico (nec obovato, infra medium leviter constricto).

Plants 3–5 cm tall, acaulescent, caespitose, densely covered with ascending to spreading, bifurcate, white hairs. *Caudex* divided with short subterranean branches. *Stipules* whitish membranous, 10–15 mm

long, linear-acute or from ovate base long-acuminate, adnate to the petiole for ca. 3 mm, with spreading, basifixed hairs 1–2 mm long. *Leaves* 2–4.5 cm long; petiole 0.6–1.5 cm long, like the rachis densely covered with symmetrically to asymmetrically bifurcate or basifixed, subappressed to spreading, tangled hairs 0.8–1.5 mm long. *Leaflets* in 6 to 7 pairs, elliptic to widely elliptic, 3–4 × 2–2.5 mm, rounded, on both sides densely covered with asymmetrically to strongly asymmetrically bifurcate, ascending to partly spreading, tangled hairs 0.8–1 mm long. *Racemes* subsessile, ca. 2-flowered. *Bracts* whitish membranous, linear, acute, 10–12 mm long, with basifixed hairs ca. 1 mm long. *Flowers* subsessile. *Calyx* whitish membranous, tubular, obliquely cut at the mouth, 12–13 mm long, densely covered with symmetrically to asymmetrically bifurcate, flexuose, tangled hairs 0.5–1 mm long and with basifixed, ± spreading, straight hairs up to 2 mm long; teeth subulate, 3–4 mm long, densely white hairy on inner side. *Petals* whitish or yellow. *Standard* ca. 21 mm long; limb ca. 8 mm wide, elliptic, emarginate, gradually narrowed into the rather long claw. *Wings* 19–20 mm long; limbs narrowly oblong, distinctly obliquely emarginate, ca. 9 × 2.5 mm; auricle ca. 1 mm long, claw ca. 11 mm long. *Keel* ca. 17 mm long; limbs narrowly elliptic, with widely curved lower and upper edge, subacute, ca. 6 × 2.5 mm; auricle indistinct, claw 10–11 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely white hairy. *Legumes* unknown.

Astragalus transecticola differs from *A. macriculus* by being white hairy (vs. bracts and calyx being white and black hairy); stipules 10–15 mm long (vs. 6–8 mm); leaflets elliptic to widely elliptic, 3–4 × 2–2.5 mm, rounded (vs. narrowly elliptic, 5–10 × 1.5–3 mm, acute); flowers subsessile (vs. with pedicel 2–3 mm); and standard elliptic (vs. obovate, slightly constricted below the middle).

Etymology. The specific epithet is from the Latin “transecticola,” meaning an inhabitant of a transect, because the plant is found in many places, including remote regions without main roads.

17. *Astragalus trijugus* Podlech & L. R. Xu, sp. nov. TYPE: China. Hebei: near Neiqiu City, ca. 37°18'N, 114°31'E, 21 Apr. 1951, S. Y. Liou 044 (holotype, PE).

Differt ab *Astragalo gregorii* B. Fedtschenko & Basilevskaja plantis caulescentibus, caulibus 1.5–3 cm longis (nec acaulescentibus), foliolis trijugis, ellipticis, 3–8 × 1.5–4 mm (nec unijugis, anguste ellipticis, 3–10 × 1.5 mm), calyce albo-piloso (nec nigro-piloso), vexillo ca. 16 mm (nec

21 mm) longo, ovariis sessilibus (nec stipite ca. 2 mm longo suffultis).

Plants 6–7 cm tall, shortly caulescent, caespitose, with ± medifixed, appressed white hairs. *Caudex* with a pluricipital root crown. *Stems* many, procumbent to ascending, 1.5–3 cm long, very densely covered with hairs 0.8–1 mm long. *Stipules* membranous or with greenish tip, 2.5–4 mm long, triangular-acuminate, adnate to the petiole for 1–1.5 mm, densely hairy like the stem. *Leaves* 2–5 cm long; petiole 1–3 cm long, with the rachis slender, densely hairy like the stem. *Leaflets* in 3 pairs, elliptic, 3–8 × 1.5–4 mm, obtuse to rounded, on both sides loosely to densely covered with hairs 0.6–0.8 mm long. *Peduncles* 1–3 cm long, loosely to densely hairy like the stem. *Racemes* 2- to 4-flowered. *Bracts* membranous, 1–1.5 mm long, ovate, hairy, at the margins also with basifixed hairs. *Pedicels* ca. 0.5 mm long, hairy. *Calyx* 8–9 mm long, tubular, slightly obliquely cut at the mouth, densely hairy like the stem; teeth subulate, ca. 2 mm long, white hairy on inner side. *Petals* yellow when dry. *Standard* ca. 16 mm long; limb ca. 8 mm wide, obovate, widely emarginate, gradually cuneately narrowed at the base. *Wings* ca. 14 mm long; limbs narrowly obovate, obliquely incised, ca. 9 × 3 mm; auricle minute, claw 5–6 mm long. *Keel* ca. 11 mm long; limbs obliquely obovate, upper part with widely curved lower edge and slightly concave upper edge, acute, ca. 4.5 × 2.5 mm; auricle minute, claw ca. 5 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, narrowly oblong, sparsely white hairy; style glabrous. *Legumes* unknown.

Astragalus trijugus differs from *A. gregorii* by stems 1.5–3 cm long (vs. plants acaulescent); leaflets in 3 pairs, elliptic, 3–8 × 1.5–4 mm (vs. in 1 pair, narrowly elliptic, 3–10 × 1.5 mm); calyx white and black hairy (vs. only black hairy); standard ca. 16 mm long (vs. 21 mm); and ovary sessile (vs. with a stipe ca. 2 mm).

Etymology. The specific epithet is from the Latin “trijugus,” because the species has three pairs of leaflets.

18. *Astragalus vescus* Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: Balikun, ca. 44°N, 93°E, 1632 m, 8 May 2004, Zhao Yang Chang et al. 2004-127 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo parvicarinato* S. B. Ho stipulis 4–5 mm (nec 7–12 mm) longis, petiolo per 1–1.5 mm (nec per 4–6 mm) adnatis, bracteis ca. 3 mm (nec 6–7 mm) longis, calyce pilis ± medifixis appressis (nec basifixis, ± patentibus) oblecto, carina ca. 16 mm (nec 10 mm) longa.

Plants 2–3 cm tall, acaulescent, caespitose, white hairy. *Caudex* divided with short branches. *Stipules* whitish sometimes with greenish tip, 4–5 mm long, narrowly triangular, adnate to the petiole for 1–1.5 mm, loosely to rather densely covered with symmetrically to asymmetrically bifurcate, appressed hairs up to 1 mm long, at the margins with basifixed hairs and minute glands. *Leaves* 1.5–2 cm long; petiole 0.5–1.2 cm long, like the rachis slender, rather densely to densely covered with medifixed, appressed hairs 0.3–0.5 mm long. *Leaflets* in 2 to 3 pairs, obovate, $2-5 \times 0.5-2.2$ mm, obtuse, covered on upper side loosely, on underside more densely with appressed, medifixed hairs up to 1 mm long. *Racemes* sessile, 1- to 2-flowered. *Bracts* whitish membranous, ovate, ca. 3 mm long, hairy, at the margins with basifixed hairs and minute glands. *Flowers* sessile. *Calyx* campanulate-tubular, 8–9 mm long, rather densely to densely covered with \pm medifixed, appressed hairs 0.5–0.6 mm long; teeth subulate, 2–2.5 mm long. *Petals* white, sometimes suffused with red. *Standard* ca. 19 mm long; limb obovate, ca. 8 mm wide, rounded, gradually narrowed at the base. *Wings* ca. 18 mm long; limbs narrowly obovate, rounded, ca. 9×3 mm; auricle ca. 0.7 mm long, claw ca. 9 mm long. *Keel* ca. 16 mm long; limbs obliquely elliptic, with widely curved lower edge and slightly concave to straight upper edge, obtuse, ca. 7×3 mm; auricle minute. *Ovary* sessile, white hairy; style glabrous. *Legumes* unknown.

Astragalus vescus differs from *A. parvicarinatus* by stipules 4–5 mm long, adnate to the petiole for 1–1.5 mm (vs. 7–12 mm, adnate to the petiole for 4–6 mm); bracts ca. 3 mm long (vs. 6–7 mm); calyx with \pm medifixed, appressed hairs (vs. basifixed, \pm spreading hairs); and keel ca. 16 mm long (vs. 10 mm).

Etymology. The specific epithet is from the Latin “vescus,” meaning “thin, weak,” because the plant is very small in size.

Paratypes. CHINA. Xinjiang: Balikun, 2089 m, 6 June 2004, Zhao Yang Chang et al. 2004-510 (MSB, WUK); near Tianshan, 1540 m, Zhao Yang Chang et al. 2004-125 (MSB, WUK).

- 19. *Astragalus visibilis*** Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Burqin, ca. $47^{\circ}41'N$, $86^{\circ}59'E$, 506 m, 29 May 2004, C. Y. Chang et al. 2004-405 (holotype, WUK; isotype, MSB).

Differt ab *Astragalo gregorii* B. Fedtschenko & Basilevskaja foliolis $10-18 \times 3-8$ mm (nec $3-10 \times 1.5$ mm), racemis pedunculo 2–5 cm (nec 1–2 cm) longo suffultis, 8–

10-floribus (nec 2–4-floribus), calyce albi-piloso (nec pilis nigris, paucis albis immixtis oblecto), vexillo ca. 14 mm (nec ca. 21 mm) longo, ovario sessile (nec stipite ca. 2 mm longo suffulto).

Plants 4–7 cm tall, acaulescent, with \pm medifixed, appressed, white hairs 0.8–1 mm long. *Caudex* up to 8 mm thick, covered with black bark, with a pluricipital root crown. *Stipules* whitish membranous, 3–4 mm long, triangular, adnate to the petiole for 1–2 mm, densely hairy, at the margins also with basifixed hairs. *Leaves* 2–5 cm long; petiole 1–2.5 cm long, very densely hairy. *Leaflets* in the basal leaves singular, in the following leaves 3, close together, elliptic to obovate or partly narrowly obovate, $10-18 \times 3-8$ mm, subacute, on both sides very densely hairy. *Peduncles* 2–5 cm long, very densely hairy. *Racemes* densely 8- to 10-flowered. *Bracts* whitish membranous, 1.5–2 mm long, ovate, loosely hairy, at the margins with basifixed hairs and with minute glands. *Calyx* 5–7 mm long, campanulate-tubular, densely white hairy; teeth subulate, 2–3 mm long, densely white hairy on inner side. *Petals* pink. *Standard* ca. 14 mm long, ca. 8 mm wide, slightly emarginate, slightly constricted in lower 1/3, gradually narrowed at the base without distinct claw. *Wings* ca. 12 mm long; limbs narrowly obovate, rounded, 7.5×3 mm; auricle ca. 0.5 mm long, claw ca. 4.5 mm long. *Keel* ca. 10 mm long; limbs elliptic, subobtusate, 5×3 mm; auricle ca. 0.3 mm long, claw 4.5 mm long. *Stamen tube* truncate at the mouth. *Ovary* sessile, densely white hairy; style hairy. *Legumes* unknown.

Astragalus visibilis differs from *A. gregorii* by leaflets $10-18 \times 3-8$ mm (vs. $3-10 \times 1.5$ mm); racemes with a peduncle 2–5 cm long, 8- to 10-flowered (vs. with peduncle 1–2 cm, 2- to 4-flowered); calyx white hairy (vs. predominantly black hairy); standard ca. 14 mm long (vs. ca. 21 mm); and ovary sessile (vs. with a stipe ca. 2 mm).

Etymology. The specific epithet is from the Latin “visibilis,” meaning “visible.”

- XVII. *Astragalus* sect. *Uliginosi*** A. Gray, Proc. Amer. Acad. 6: 196. 1864. TYPE: *Astragalus uliginosus* L.

- 1. *Astragalus qitaiensis*** Podlech & L. R. Xu, sp. nov. TYPE: China. Xinjiang: near Qitai City, ca. $44^{\circ}01'N$, $89^{\circ}32'E$, 1700 m, 28 Sep. 1957, K. J. Guan 5221 (holotype, PE).

Differt ab *Astragalo uliginoso* L. caulibus 5–10 cm (nec 30–70 cm) longis, stipulis pilis 0.2–0.5 mm (nec 0.6–0.8 mm) longis oblectis, foliolis ellipticis, $10-25 \times 5-12$ mm, utrinque sparse pilosis (nec anguste ellipticis, 20–40

$\times 5\text{--}15$ mm, supra glabris, subtus laxe pilosis), pedunculis subglabris (nec laxe ad densiuscule pilosis), dentibus calycis $4\text{--}5$ mm (nec $1.5\text{--}3$ mm) longis, leguminibus incomplete bilocularibus, septo angusto, \pm dense nigro-pilosis (nec glabris).

Plants ca. 30 cm tall, covered with \pm medifixed, appressed hairs. *Caudex* branched, with short aerial branches. *Stems* of the current year $5\text{--}10$ cm long, angular-sulcate, sparsely to loosely covered with white hairs $0.3\text{--}0.5$ mm long, at the nodes sometimes with black hairs mixed in. *Stipules* whitish membranous, $7\text{--}15$ mm long, acuminate, highly vaginate-connate behind the stem, loosely to rather densely covered with symmetrically to asymmetrically bifurcate white hairs $0.2\text{--}0.5$ mm long. *Leaves* $10\text{--}12$ cm long; petiole $3\text{--}4$ cm long, with the rachis sulcate adaxially, sparsely to loosely white hairy like the stem. *Leaflets* in 9 to 10 pairs, elliptic, $10\text{--}25 \times 5\text{--}12$ mm, rounded to slightly retuse, on both sides sparsely covered with white hairs $0.3\text{--}0.5$ mm long. *Peduncles* $8\text{--}10$ cm long, angular-sulcate, subglabrous. *Racemes* ca. 4 cm long, densely many-flowered. *Bracts* hyaline-membranous, $4\text{--}5$ mm long, narrowly triangular, sparsely black ciliate, at the margins with minute glands. *Pedicels* ca. 1 mm long, black hairy. *Calyx* $9\text{--}10$ mm long, campanulate, loosely covered with medifixed, appressed black hairs $0.2\text{--}0.4$ mm long and with symmetrically to asymmetrically bifurcate white hairs $0.5\text{--}0.7$ mm long; teeth subulate, $4\text{--}5$ mm long. *Petals* pale greenish yellow. *Standard* $15\text{--}16$ mm long; limb ca. 5 mm wide, elliptic, emarginate, gradually narrowed at the base. *Wings* ca. 14 mm long; limbs narrowly oblong, obtuse, ca. 5×1 mm; auricle ca.

0.5 mm long, claw ca. 9 mm long. *Keel* ca. 13 mm long; limbs obliquely obovate, with widely curved lower and nearly straight upper edge, subacute, ca. 5×1.5 mm; auricle minute, claw ca. 8 mm long. *Stamen tube* obliquely cut at the mouth. *Ovary* sessile, hairy. *Legumes* sessile, obliquely erect, narrowly oblong, ca. 10 mm long, ca. 3 mm high and wide, keeled ventrally, \pm grooved dorsally, with a beak $1\text{--}2$ mm long, incompletely bilocular with a narrow septum; valves thinly coriaceous, densely covered with symmetrically to asymmetrically bifurcate, subappressed to slightly ascending, \pm flexuose black hairs $0.2\text{--}1$ mm long, partly glabrescent with age. *Seeds* $1.5\text{--}2.5$ mm, reddish brown, smooth.

Astragalus qitaiensis differs from *A. uliginosus* by stems $5\text{--}10$ cm long (vs. $30\text{--}70$ cm); leaflets elliptic, $10\text{--}25 \times 5\text{--}12$ mm, on both sides sparsely hairy (vs. narrowly elliptic, $20\text{--}40 \times 5\text{--}15$ mm, on upper side glabrous, on underside loosely hairy); peduncles subglabrous (vs. loosely to rather densely hairy); calyx teeth $4\text{--}5$ mm long (vs. $1.5\text{--}3$ mm); and legumes incompletely bilocular with narrow septum, \pm densely black hairy (vs. completely bilocular, glabrous).

Etymology. *Astragalus qitaiensis* is named after Qitai City in Xinjiang.

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