

147. **TIBETIA** (Ali) H. P. Tsui, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1979(5): 48. 1979.

高山豆属 gao shan dou shu

Bao Bojian (包伯坚); Anthony R. Brach

Gueldenstaedtia subg. *Tibetia* Ali, Candollea 18: 140. 1962.

Herbs, perennial. Taproot conical, strong. Stems many from collar, slender, branched, sometimes with adventitious roots. Leaves imparipinnate; stipules brown, ovate or elliptic, membranous, amplexicaul and opposite to leaves; leaflets elliptic, orbicular, or cordate, apex rounded to retuse, rarely bifid. Umbel 1–4-flowered, on axillary peduncles. Calyx brown, upper 2 teeth larger and joined. Corolla usually dark purple, rarely yellow; standard broadly obovate or obcordate, clawed; wings broadly obovate, equal in length to standard; keel oblong or obovate, small. Stamens diadelphous. Ovary cylindrical, pilose or glabrous; style rolled inward. Legume cylindrical, with many seeds. Seeds reniform, smooth.

About five species: Bhutan, China, India, Nepal, Pakistan; five species (four endemic) in China.

- 1a. Plants with dense appressed glandular hairs.
 - 2a. Leaflets villous; stipules acute at apex 2. *T. himalaica*
 - 2b. Leaflets pilose; stipules rounded or sometimes acuminate at apex 3. *T. yadongensis*
- 1b. Plants subglabrous or with sparse appressed glandular hairs.
 - 3a. Corolla purple, purplish blue, or red; stipules acute at apex 4. *T. yunnanensis*
 - 3b. Corolla yellow; stipules rounded or sometimes acuminate at apex.
 - 4a. Stipules with brown-purple marks; ovary glabrous 1. *T. tongolensis*
 - 4b. Stipules without brown-purple marks; ovary with white appressed hairs 5. *T. forrestii*

1. ***Tibetia tongolensis*** (Ulbrich) H. P. Tsui, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1979(5): 50. 1979.

黄花高山豆 huang hua gao shan dou

Gueldenstaedtia tongolensis Ulbrich, Bot. Jahrb. Syst. 50 (Beibl. 110): 11. 1913; *Amblytropis flava* (Adamson) C. Y. Wu ex H. P. Tsui; *G. flava* Adamson; *G. flava* var. *tongolensis* (Ulbrich) Ali.

Stems slender. Leaves ca. 10 cm, 5–9-foliolate; stipules free, with brown-purple spots, broadly ovate, 5–6 mm, membranous; leaflets obovate, broadly elliptic, or broadly ovate, ca. 12 × 9 mm, abaxially pilose, adaxially glabrous, apex truncate or retuse. Umbel 2- or 3-flowered; rachis usually ca. as long as leaves or slightly longer; bract narrowly triangular; pedicel ca. 5 mm, with rigid hairs; bracteole narrowly ovate, glandular on margin. Calyx campanulate or broadly campanulate, ca. 5 × 2.5 mm, densely brown rigidly hairy; upper 2 teeth joined at base. Corolla yellow; standard broadly ovate, ca. 9.5 mm, base narrowed to claw, apex retuse; wings broadly obliquely ovate, ca. 9 × 5 mm, claw linear; keel obovate, ca. 4 × 1.5 mm. Ovary cylindrical, glabrous. Legume glabrous. Fl. Apr–Jul, fr. Aug–Sep.

• Hills; above 3000 m. Sichuan, Yunnan.

2. ***Tibetia himalaica*** (Baker) H. P. Tsui, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1979(5): 51. 1979.

高山豆 gao shan dou

Gueldenstaedtia himalaica Baker in J. D. Hooker, Fl. Brit. India 2: 117. 1876; *Amblytropis uniflora* (Strachey ex Jacot Guillarmod) Kuang & H. P. Tsui; *G. diversifolia* Maximowicz; *G. santapau* Thothathri; *G. uniflora* Strachey ex Jacot Guillarmod; *Tibetia himalaica* f. *alba* X. Y. Zhu.

Taproot straight. Stems obvious. Leaves 2–7 cm, 9–13-

foliolate; stipules ovate, large, to 7 mm, densely villous, apex acute; petiole sparsely villous; leaflets orbicular, elliptic, broadly obovate, or ovate, 1–9 × 1–8 mm, appressed villous, apex retuse. Umbel 1–3-flowered, rarely 4-flowered; rachis usually ca. as long as leaves or slightly longer, sparsely villous; bract narrowly triangular. Calyx campanulate, 3.5–5 mm, villous; upper 2 teeth 1.5–2 mm, joined from base to middle. Corolla bluish purple, purple, blue, mauve, violet, or red; standard ovate-orbicular, 6.5–8 × 4.5–7.5 mm, base with claw ca. 2 mm, apex retuse; wings broadly cuneate, 6–7 × 2–3 mm; keel subrectangular, 3–4 × 1–2 mm. Ovary villous. Legume pilose or glabrescent. Fl. May–Jun, fr. Jul–Aug.

Hilly areas, alpine meadows, rocky slopes, forests; 3000–5000 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Pakistan].

The type was originally collected in India (Sikkim).

3. ***Tibetia yadongensis*** H. P. Tsui, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1979(5): 52. 1979.

亚东高山豆 ya dong gao shan dou

Taproot straight. Stems long, branched. Leaves 3–5.5 cm, 7–15-foliolate; stipules broadly ovate, membranous, abaxially hairy, adaxially glabrous, apex rounded or acuminate; petiole pilose; leaflets elliptic to obcordate, 7–10 × 6–8 mm, both surfaces pilose, apex parted to bifid. Umbel 1- or 2-flowered; rachis pilose, usually ca. as long as leaves; bract linear, ca. 1 mm; pedicel ca. 2 mm; bracteole lanceolate, slightly shorter than bract. Calyx brown, narrowly campanulate, ca. 5 mm. Corolla purple; standard orbicular, ca. 10 × 8 mm, base narrowed to claw, apex retuse; wings obliquely obovate, ca. 9 × 4 mm, claw curved, auriculate; keel nearly triangular, ca. 4 × 1.5 mm. Ovary cylindrical, densely villous. Legume ca. 2 cm, pilose. Fl. May–

Jun, fr. Jul–Sep.

- Grasslands on hills, thickets; 3000–4100 m. Xizang.

4. *Tibetia yunnanensis* (Franchet) H. P. Tsui, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1979(5): 54. 1979.

云南高山豆 yun nan gao shan dou

Stems very developed, slender. Leaves 3–7(or 9)-foliolate; stipules amplexicaul, joined at base and opposite to leaf, obovate or broadly elliptic, margin glandular toothed, apex acuminate; leaflets obovate, broadly elliptic, or broadly ovate to obcordate, appressed pilose, apex truncate to retuse. Umbel 1- or 2(or 3)-flowered; rachis 5–10 cm, pilose; bract lanceolate or narrowly triangular, 2(–2.5) mm; bracteole lanceolate or narrowly ovate, ca. 1.5 mm. Calyx campanulate, 4–5 mm; teeth lanceolate, upper 2 teeth joined for up to 2/3 length, villous. Corolla purple, purplish blue, or red; standard obcordate or ovate-orbicular, 10.5–11 × ca. 9 mm, base narrowed to claw, apex retuse; wings subcuneate or subelliptic, 9–10 × 3.5–4 mm; keel obovate, 4–4.5 × ca. 1.5 mm. Ovary villous with long appressed hairs or glabrous. Legume ca. 1.2 cm, pilose. Fl. Jun–Jul, fr. Sep.

- Hilly areas, grassy or rocky places at streamsides, disturbed forests, thickets, N-facing ravines; above 2500 m. Sichuan, SE Xizang, Yunnan.

- 1a. Ovary with long appressed hairs 4a. var. *yunnanensis*
1b. Ovary glabrous 4b. var. *coelestis*

4a. *Tibetia yunnanensis* var. *yunnanensis*

云南高山豆(原变种) yun nan gao shan dou (yuan bian zhong)

Gueldenstaedtia yunnanensis Franchet, Pl. Delavay. 164. 1890; *Amblytropis yunnanensis* (Franchet) C. Y. Wu ex H. P. Tsui.

Ovary with long appressed hairs.

- Hilly areas, grassy places at streamsides, disturbed forests, thickets, N-facing ravines; above 2500 m. Sichuan, Yunnan.

4b. *Tibetia yunnanensis* var. *coelestis* (Diels) X. Y. Zhu, Bot. J. Linn. Soc. 148: 479. 2005.

蓝花高山豆 lan hua gao shan dou

Astragalus coelestis Diels, Notes Roy. Bot. Gard. Edinburgh 5: 244. 1912; *Amblytropis coelestis* (Diels) C. Y. Wu ex H. P. Tsui; *Gueldenstaedtia coelestis* (Diels) N. D. Simpson; *Tibetia coelestis* (Diels) H. P. Tsui; *T. tongolensis* (Ulbrich) H. P. Tsui f. *coelestis* (Diels) P. C. Li; *T. tongolensis* var. *coelestis* (Diels) H. P. Tsui.

Ovary glabrous.

- Grasslands on hills; above 3000 m. Sichuan, SE Xizang, Yunnan.

5. *Tibetia forrestii* (Ali) P. C. Li, Acta Bot. Yunnan. 11: 287. 1989.

中甸高山豆 zhong dian gao shan dou

Gueldenstaedtia forrestii Ali, Candollea 18: 153. 1962; *?Tibetia liangshanensis* P. C. Li.

Stems prostrate, elongated. Leaves 7- or 9-foliolate; stipules connate at base, obovate or oblong, abaxially with appressed pale yellow hairs, adaxially glabrous, apex obtuse or subtruncate; petiole 3.5–9 cm; petiolules ca. 1 mm; leaflets obovate or orbicular, 11–19 × 9–15 mm, apex retuse, rarely subtruncate or obtuse. Peduncle 13–14 cm; bracts lanceolate, ca. 4 mm; pedicels 3–4 mm. Calyx ca. 8 mm, with appressed yellow hairs, 2-lobed; upper lobe ca. 3 mm, apex retuse, lower lobe equal, linear, 2–3 mm. Corolla pale yellow; standard ca. 1.6 × 1.2 cm, retuse at apex; wings ca. 1.4 cm, claw 2–3 mm; keel ca. 6 × 2 mm, claw ca. 2 mm, auricle shorter than 1 mm. Ovary with densely appressed white hairs; style shorter than 1 mm. Fl. and fr. Jun–Sep.

- Understories of *Pinus* and *Quercus* forests; above 3000 m. Sichuan, Yunnan.

The placement of *Tibetia liangshanensis* here is uncertain, and further study is needed.

