

### 9. ARNEBIA Forsskål, Fl. Aegypt.-Arab. 62. 1775.

软紫草属 ruan zi cao shu

*Ulugbekia* Zakyrov.

Plants annual or perennial, bristly or pubescent. Roots frequently containing purple dye. Stems erect or prostrate. Leaves alternate. Cymes bracteate. Flowers often heterostylous. Calyx 5-parted to base, slightly enlarged, base sometimes hardened. Corolla funnellform, usually with hairs outside; tube straight or slightly curved; throat unappendaged; limb usually shorter than tube; lobes spreading. Ovary 4-lobed. Style 2- or 4-branched, each branch terminated with 1 stigma. Gynobase flat. Long-styled flowers with included stamens inserted at middle of corolla tube; style long, slightly exerted. Short-styled flowers with stamens inserted at throat; style shorter, reaching to middle of corolla tube. Nutlets oblique-ovate, tuberculate, adaxially flat or slightly concave; attachment scar at base.

About 25 species: N Africa, Europe, C and SW Asia, Himalaya; six species in China.

- 1a. Corolla blue-purple to purple-red.
  - 2a. Plants densely gray-white hirsute; leaves small, less than 2.5 cm ..... 5. *A. fimbriata*
  - 2b. Plants spreading white or pale yellow hirsute; leaves more than 5 cm ..... 6. *A. euchroma*
- 1b. Corolla yellow, rarely white.
  - 3a. Herbs annual; stamens spirally inserted at apex of corolla tube ..... 1. *A. decumbens*
  - 3b. Herbs perennial; stamens inserted at same level in corolla tube.
    - 4a. Leaf blade more than 1.5 cm wide ..... 2. *A. tschimganica*
    - 4b. Leaf blade less than 1.2 cm wide.
      - 5a. Stems densely pubescent; stem leaves narrowly ovate to linear-oblong, 1–2 cm; inflorescences widely spaced ..... 3. *A. szechenyi*
      - 5b. Stems both spreading long hispid and short strigose; stem leaves spatulate-linear, 1.5–5.5 cm; inflorescences crowded ..... 4. *A. guttata*

**1. *Arnebia decumbens*** (Ventenat) Cosson & Kralik, Bull. Soc. Bot. France 4: 402. 1857.

硬萼软紫草 ying e ruan zi cao

*Lithospermum decumbens* Ventenat, Descr. Pl. Nouv. 37, t. 37. 1800; *L. cornutum* Ledebour.

Herbs annual. Roots containing a purple dye. Stems erect, branched from base, 10–30 cm tall, spreading long hispid; branches alternate or subopposite. Stem leaves sessile, linear-oblong to linear-lanceolate, 2–6 cm × 2–16 mm, sparsely hispid, apex obtuse. Calyx lobes linear, ca. 7 mm, to 1.2 cm in fruit, long hispid, short strigose, base extended and hardened, subtending nutlet. Corolla yellow, tubular-campanulate, 1–1.4 cm, pubescent outside; tube straight or slightly curved; limb 3–6 mm wide; lobes broadly ovate, subequal. Stamens spirally inserted at apex of corolla tube; anthers oblong, ca. 1 mm. Style filiform, nearly reaching throat, twice 2-cleft; stigma globose. Nutlets brown, triangular-ovoid, ca. 2 mm, densely tuberculate, adaxial center line prominent, abaxially convex, slightly wrinkled, apex nearly keeled. Fl. and fr. May–Jun.  $2n = 8, 22$ .

Mountain slopes, sand, wasteland. N Xinjiang [Afghanistan, Mongolia, Pakistan, Turkmenistan; N Africa, SW Asia, Europe].

**2. *Arnebia tschimganica*** (B. Fedtschenko) G. L. Chu, Acta Phytotax. Sin. 20: 326. 1982.

天山软紫草 tian shan ruan zi cao

*Lithospermum tschimganicum* B. Fedtschenko, Izv. Bot.

Sada Petra Velikago V, 1: 42. 1906; *Macrotomia tschimganica* (B. Fedtschenko) Popov ex Zakirov; *Ulugbekia tschimganica* (B. Fedtschenko) Zakirov.

Herbs perennial. Roots without purple dye. Stems several, not branched, 15–30 cm tall, pubescent. Petiole of basal leaves 4–10 cm; leaf blade oblanceolate, 8–15 × 2–4 cm, pubescent, base attenuate, margin entire, apex acuminate; stem leaves sessile, elliptic to oblong-lanceolate, base clasping. Cymes not branched; bracts lanceolate, ca. as long as flowers. Flowers heterostylous. Pedicel very short. Calyx ca. 8 mm at anthesis; lobes lanceolate to subulate, 6–8 mm. Corolla yellow, funnellform, 1.5–2 cm; limb ca. 8 mm wide. Anthers ca. 1.5 mm, apex obtuse. Style 2-cleft, each branch with 1, 2-cleft stigma. Nutlets unknown. Fl. Apr–May.

• Meadows, slopes, thickets, river marshes; 1000–2000 m. W Xinjiang.

The stigma in *Arnebia tschimganica* was originally described as entire which, coupled with the pollen type, places the species in *Lithospermum*. On the basis of habit, long tubular corolla, and minutely 4-lobed stigma, the species was placed in different genera, including the monotypic *Ulugbekia*.

**3. *Arnebia szechenyi*** Kanitz, Pl. Exped. Szechenyi in As. Centr. Coll. 42., t. 5. 1891.

疏花软紫草 shu hua ruan zi cao

*Lithospermum szechenyi* (Kanitz) I. M. Johnston.

Herbs perennial. Roots slightly containing purple dye. Stems sparsely branched, 20–30 cm tall, densely gray-white

pubescent. Leaves sessile, narrowly ovate to linear-oblong, 1–2 cm × 2–6 mm, short strigose and minutely hispid, hairs discoid at base, margin obtusely serrate, apex acute, bristly. Cymes 1.5–5 cm, several flowered; bracts same shape as leaves. Flowers heterostylous. Calyx ca. 1 cm; lobes linear, densely hirsute and hirtellous on both sides. Corolla white, yellowish when dry, tubular-campanulate, 1.5–2.2 cm, short pubescent outside; limb 5–7 mm wide, frequently purple spotted. Anthers oblong, ca. 1.6 mm. Style filiform, apex 2-lobed. Nutlets light yellow-brown, triangular-ovate, ca. 2.7 mm, tuberculate, short appressed pubescent. Fl. and fr. Jun-Sep.

• Sunny mountain slopes. NW Gansu, Nei Mongol, Ningxia, E and S Qinghai.

**4. *Arnebia guttata*** Bunge, Index Sem. Hort. Petrop. 7. 1840.

黄花软紫草 huang hua ruan zi cao

*Arnebia thomsonii* C. B. Clarke; *A. tibetana* Kurz; *Lithospermum guttatum* (Bunge) I. M. Johnston; *Macrotomia guttata* (Bunge) Farrer.

Herbs perennial or sometimes biennial. Roots containing purple dye. Stems usually 2–4, sometimes only 1, erect, much branched, 10–25 cm tall, densely spreading long hispid, short strigose. Leaves sessile, spatulate-linear to linear, 1.5–5.5 cm × 3–11 mm, densely hirsute, hairs discoid at base, apex obtuse. Inflorescences crowded; cymes 3–10 cm; bracts linear-lanceolate. Flowers heterostylous. Calyx lobes linear, 6–10 mm, to 1.5 cm in fruit, long hispid. Corolla yellow, tubular-campanulate, pubescent outside; limb 7–12 mm wide; lobes spreading, broadly ovate or semiorbicular, frequently purple spotted. Anthers oblong, ca. 1.8 mm. Style filiform, apex 2-lobed; stigma reniform. Nutlets light yellow-brown, triangular-ovate, 2.5–3 mm, tuberculate. Fl. and fr. Jun-Oct.

Gobi Desert, rocky slopes, gravelly marshes. W Gansu, N Hebei, Nei Mongol, Ningxia, Xinjiang, Xizang [Afghanistan, NW India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

There are biennial and perennial groups within the species, the former predominantly in Russia and Mongolia, the latter in Xizang and Xinjiang (*Arnebia tibetana*). These groups, which lack the blackish purple spots on corolla lobes, probably represent distinct subspecies.

The roots are used medicinally.

**5. *Arnebia fimbriata*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 27: 507. 1881.

灰毛软紫草 hui mao ruan zi cao

Herbs perennial, densely gray-white hirsute. Stems usually numerous, much branched, 10–18 cm tall. Leaves sessile, linear-oblong to linear-lanceolate, 0.8–2.5 cm × 2–4 mm. Cymes 1–3 cm; bracts linear. Flowers crowded, heterostylous. Calyx lobes subulate, ca. 1.1 cm, densely hirsute on both sides. Corolla pale blue-purple or pink, sometimes white, 1.5–2.2 cm, sparsely pubescent; tube straight or slightly curved; limb 5–13 mm wide; lobes broadly ovate, subequal, margin irregularly dentate. Anthers ca. 2

mm. Style filiform, apex 2-lobed. Nutlets triangular-ovate, ca. 2 mm, densely tuberculate, glabrous. Fl. and fr. Jun-Sep.

Gobi Desert, rocky slopes, gravelly places. W Gansu, Ningxia, Qinghai (Qaidam Basin) [Mongolia].

**6. *Arnebia euchroma*** (Royle) I. M. Johnston, Contr. Gray Herb. 73: 49. 1924.

软紫草 ruan zi cao

*Lithospermum euchromon* Royle, Ill. Bot. Himal. Mts. 1: 305. 1839; *Macrotomia euchroma* (Royle) Paulsen.

Herbs perennial. Roots stout, to 2 cm in diam., containing copious purple dye. Stems usually 1 or 2, erect, branched above, sheathed with remaining bases of leaves, 15–40 cm tall, spreading white or pale yellow hirsute. Leaves sessile, sparsely semiappressed hirsute. Basal leaves linear to linear-lanceolate, 7–20 × 0.5–1.5 cm, base sheathlike, apex short acuminate; stem leaves lanceolate to linear-lanceolate, smaller without sheathlike base. Cymes terminal, 2–6 cm at anthesis, many flowered; bracts lanceolate. Flowers heterostylous. Calyx lobes linear, 1.2–1.6 cm, to 3 cm in fruit, densely pale yellow hirsute on both sides, apex subacute. Corolla dark purple, sometimes pale yellow and purple-red tinged, tubular-campanulate, glabrous or sparsely short pubescent outside; tube straight, 1–1.4 cm; limb 6–10 mm wide; lobes spreading, ovate. Anthers ca. 2.5 mm. Style apex 2-lobed; stigmas 2, obovate. Nutlets black-brown, broadly ovate, ca. 3.5 × 3 mm, scabrous reticulate lined, with few tubercles, adaxially almost flat, center line prominent, abaxially convex, apex subacute; attachment scar somewhat triangular. Fl. and fr. Jun-Aug.

Rocky slopes, gravelly marshes, meadows. Xinjiang, W Xizang [Afghanistan, NW India, Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

The roots are used medicinally.

Flora of China 16: 344–346. 1995.