

## 8. LITHOSPERMUM Linnaeus, Sp. Pl. 1: 132. 1753.

紫草属 *zi cao shu*

*Buglossoides* I. M. Johnston.

Herbs annual or perennial, short strigose. Leaves alternate. Cymes terminal or flowers solitary, bracteate. Calyx 5-parted nearly to base, slightly enlarged in fruit. Corolla white, yellow, or violet, actinomorphic, funnellform or salverform; throat with appendages or bands of hairs, or longitudinally crispate; limb usually campanulate, 5-parted; lobes spreading. Stamens included; filament very short; anthers oblong-linear, apex obtuse, mucronulate. Style filiform, not exerted; stigma entire or indistinctly 2-cleft, capitate. Gynobase flat. Nutlets white or gray, ovoid, smooth, shiny or tuberculate; attachment scar at base adaxially.

About 50 species: Africa, Asia, Europe, North America, South America; five species in China.

The genus is here treated in the broad sense. Species 3 and 4 are frequently placed in *Buglossoides*.

- 1a. Corolla more than 1.5 cm, violet, blue-purple, or purple-red.
  - 2a. Leaf blade linear to linear-lanceolate, 4–15 cm, crowded; persistent; stems sheathed by overlapping leaf bases; rhizomes absent ..... 5. *L. hancockianum*
  - 2b. Leaf blade oblanceolate to spatulate, 3–6 cm, sparsely arranged; stems without sheathing leaf bases; rhizomes present ..... 4. *L. zollingeri*
- 1b. Corolla less than 1 cm, white or pale yellow-green (sometimes blue in *L. arvense*).
  - 3a. Herbs annual; nutlets triangular-ovoid, gray-brown, finely tuberculate ..... 3. *L. arvense*
  - 3b. Herbs perennial; nutlets ovoid, white or slightly yellowish brown, smooth, shiny.
    - 4a. Corolla 7–9 mm, tube ca. as long as limb, lobes broadly ovate, ca. as long as wide, throat appendages glabrous; roots with a copious purple dye ..... 1. *L. erythrorhizon*
    - 4b. Corolla 4–6 mm, tube ca. 2 × as long as limb, lobes oblong-ovate, longer than wide, throat appendages short pubescent; roots with little or no purple dye ..... 2. *L. officinale*

**1. *Lithospermum erythrorhizon*** Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(3): 149. 1846.

紫草 *zi cao*

*Lithospermum officinale* Linnaeus subsp. *erythrorhizon* (Siebold & Zuccarini) Handel-Mazzetti.

Herbs perennial. Roots dark red, with a copious purple dye. Stems usually 1–3, erect, appressed or spreading, branching distally, 40–90 cm tall, short strigose; branches ascending, frequently slightly curved. Leaves sessile, ovate-lanceolate to broadly lanceolate, 3–8 × 0.7–1.7 cm, short strigose, base attenuate, apex acuminate; veins prominent abaxially, more densely strigose. Inflorescences terminal, 2–6 cm, elongated in fruit; bracts similar to leaves but smaller. Calyx lobes linear, ca. 4 mm, to 9 mm in fruit, short strigose outside. Corolla white, 7–9 mm, sparsely pubescent outside; tube ca. 4 mm; throat appendages semiglobose, glabrous; limb ca. as long as tube; lobes spreading, broadly ovate, 2.5–3 mm, margin entire or subundulate, apex sometimes retuse. Stamens inserted slightly above middle of corolla tube; filaments ca. 0.4 mm; anthers 1–1.2 mm. Style 2.2–2.5 mm. Nutlets white or pale yellowish brown, ovoid, ca. 3.5 mm, smooth, shiny, concave adaxially with center line forming a longitudinal groove. Fl. and fr. Jun-Sep.  $2n = 28$ .

Meadows on slopes. SE Gansu, N Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan [Japan, Korea, E Russia].

The roots are used in Chinese medicine.

**2. *Lithospermum officinale*** Linnaeus, Sp. Pl. 1: 132. 1753.

小花紫草 *xiao hua zi cao*

Herbs perennial; most parts short strigose. Roots containing little purple dye when young. Stems usually single, erect, to 1 m tall, frequently much branched at apex. Leaves sessile, lanceolate to ovate-lanceolate, 3–8 × 0.5–1.5 cm, base cuneate to attenuate, apex short acuminate; veins prominent abaxially, more densely strigose along veins. Inflorescences on upper stems and branches, to 15 cm in fruit; bracts similar to leaves but smaller. Calyx lobes linear, ca. 5–7 mm in fruit. Corolla white or pale yellow, 4–6 mm; tube ca. 2 × as long as limb; throat with 5 trapeziform, densely short pubescent appendages ca. 0.4 mm; lobes of limb erect, oblong-ovate, ca. 1.5 mm, margin undulate. Stamens inserted at middle of corolla tube; filaments ca. 0.4 mm; anthers ca. 1.2 mm. Stigma capitate. Nutlets white or yellowish brown, ovoid, ca. 3 mm, smooth, shiny, concave adaxially with center line forming a longitudinal groove. Fl. and fr. Jun-Aug.  $2n = 28, 56$ .

Meadows on slopes, forest margins. C Gansu, Nei Mongol, Ningxia, N Xinjiang [Afghanistan, Bhutan, N India, Nepal, Russia; Europe, SW and W Asia].

**3. *Lithospermum arvense*** Linnaeus, Sp. Pl. 1: 132. 1753.

田紫草 *tian zi cao*

*Buglossoides arvensis* (Linnaeus) I. M. Johnston; *Rhytispermum arvense* (Linnaeus) Link.

Herbs annual. Roots with purple dye. Stems usually single, branched from base or only above, 15–30 cm tall, short strigose. Leaf blade oblanceolate to linear, 2–4 cm × 3–

7 mm, short strigose, apex acute. Cymes terminal, to 10 cm; bracts same shape as leaves but smaller. Flowers sparse, short pedicellate. Calyx lobes usually erect, linear, 4–5.5 mm, to 1.1 cm in fruit, short strigose on both sides, base becoming slightly hardened. Corolla white, sometimes blue or light blue, salverform; tube ca. 4 mm, sparsely pubescent outside; throat with 5 bands of hair extending to tube; limb ca. 1/2 as long as tube; lobes somewhat unequal, erect to slightly spreading, ovate or oblong, ca. 1.5 mm. Stamens attached below middle of tube; anthers oblong, ca. 1 mm. Style 1.5–2 mm; stigma capitate. Nutlets gray-brown, triangular-ovoid, ca. 3 mm, finely tuberculate. Fl. and fr. Apr-Aug.  $2n = 14, 28, 36, 42$ .

Hills, pastures, mountain slopes, margins of cultivated ground. Anhui, Gansu, Hebei, Heilongjiang, Hubei, Jiangsu, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Xinjiang, Zhejiang [Afghanistan, N India, Japan, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].

A highly variable species with several infraspecific taxa recognized in Europe.

**4. *Lithospermum zollingeri*** A. de Candolle, Prodr. 10: 587. 1846.

梓木草 *zi mu chao*

*Buglossoides zollingeri* (A. de Candolle) I. M. Johnston.

Herbs perennial. Rhizomes creeping, to 30 cm. Roots brown, containing purple dye. Stems erect, 5–25 cm tall. Basal leaves sparsely arranged, short petiolate, oblanceolate to spatulate, 3–6 × 0.8–1.8 cm, short strigose, abaxially more densely strigose; stem leaves sessile, same shape as basal leaves but smaller, base attenuate, apex acute or obtuse. Inflorescences terminal, 2–5 cm, 1- to several flowered; bracts leaflike. Pedicel short. Calyx ca. 6.5 mm; lobes linear-lanceolate, pubescent on both sides. Corolla blue or bluish purple, 1.5–1.8 cm, sparsely pubescent outside; tube and limb without a conspicuous border; throat with 5 longitudinal pleats extending to tube, ca. 4 mm, pleats slightly thickened and papillate; limb ca. 1 cm wide; lobes subequal, broadly obovate, 5–6 mm, margin entire, without veins. Stamens attached below pleats; anthers 1.5–2 mm. Style ca. 4 mm; stigma capitate. Nutlets white or light yellowish brown, oblique ovoid, 3–3.5 mm, smooth, shiny, concave adaxially, with center line forming a longitudinal groove. Fl. and fr. May-Aug.  $2n = 16$ .

Hills, mountain slopes, thickets. Anhui, SE Gansu, Guizhou, Jiangsu, Shaanxi, Sichuan, Taiwan, Zhejiang [Japan, Korea].

**5. *Lithospermum hancockianum*** Oliver, Hooker's Icon. Pl. 25: t. 2562. 1896.

石生紫草 *shi sheng zi cao*

*Lithodora hancockianum* (Oliver) Handel-Mazzetti;  
*Lithospermum mairei* H. Léveillé.

Herbs perennial. Stems usually solitary, erect, 5–15 cm tall; lower stems with persistent leaf bases, forming a chaffy stem sheath. Leaves crowded on stems, sessile, broadly linear

or linear-lanceolate, 4–15 cm × 3–9 mm, white short strigose, abaxially more densely strigose and gray-white. Inflorescences crowded, frequently branched; bracts same shape as leaves, 1–2 cm. Calyx ca. 1.1 cm; lobes linear, short strigose outside. Corolla purple-red; tube straight, 1–2.2 cm, pubescent outside; throat unappendaged but usually with 5 longitudinal pleats; limb ca. 1.3 mm wide; lobes broadly ovate, ca. 6 mm, veins evident. Stamens attached at apex of corolla tube; anthers ca. 1.6 mm, apex obtuse or acute. Style ca. 4 mm, slightly surpassing anthers, ca. 4 mm, apex slightly inflated; stigma capitate. Nutlets brown or white, triangular-ovoid, ca. 3 mm, glabrous, slightly pitted, shiny, adaxially longitudinally keeled. Fl. and fr. Mar-Aug.

- Limestone slopes. W Guizhou, Yunnan.

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