

## CARYOPHYLLACEAE

石竹科 shi zhu ke

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Herbs annual or perennial, rarely subshrubs or shrubs. Stems and branches usually swollen at nodes. Leaves opposite, decussate, rarely alternate or verticillate, simple, entire, usually connate at base; stipules scarious, bristly, or often absent. Inflorescence of cymes or cymose panicles, rarely flowers solitary or few in racemes, capitula, pseudoverticillasters, or umbels. Flowers actinomorphic, bisexual, rarely unisexual, occasionally cleistogamous. Sepals (4 or)5, free, imbricate, or connate into a tube, leaflike or scarious, persistent, sometimes bracteate below calyx. Petals (4 or)5, rarely absent, free, often comprising claw and limb; limb entire or split, usually with coronal scales at juncture of claw and limb. Stamens (2–)5–10, in 1 or 2 series. Pistil 1; carpels 2–5, united into a compound ovary. Ovary superior, 1-loculed or basally imperfectly 2–5-loculed. Gynophore present or absent. Placentation free, central, rarely basal; ovules (1 or) few or numerous, campylotropous. Styles (1 or)2–5, sometimes united at base. Fruit usually a capsule, with pericarp crustaceous, scarious, or papery, dehiscent by teeth or valves 1 or 2 × as many as styles, rarely berrylike with irregular dehiscence or an achene. Seeds 1 to numerous, reniform, ovoid, or rarely dorsiventrally compressed, abaxially grooved, blunt, or sharply pointed, rarely fimbriate-pectinate; testa granular, striate or tuberculate, rarely smooth or spongy; embryo strongly curved and surrounding perisperm or straight but eccentric; perisperm mealy.

Between 75 and 80 genera and ca. 2000 species: widespread but mainly of temperate or warm-temperate occurrence in the N hemisphere, with principal centers of distribution in the Mediterranean region and W Asia to W China and the Himalayas, fewer species in Africa S of the Sahara, America, and Oceania; 30 genera (two endemic) and 390 species (193 endemic) in China.

*Arenaria*, *Silene*, and *Stellaria* contain over half the species in the family in China. They are mostly concentrated in the Qinghai-Xizang plateau, and are especially rich from the Hengduan Mountains to the Himalayas.

The main uses of this family are medicinal and ornamental. *Dianthus superbus*, *Pseudostellaria heterophylla*, *Stellaria dichotoma* var. *lanceolata*, and *Vaccaria hispanica* are commonly used in traditional Chinese medicine. Some species of *Arenaria*, *Dianthus*, *Gypsophila*, *Psammophilene*, and *Silene* are used as medicinal herbs among the people or are habitually used in local Chinese medicine. Many species of *Dianthus*, *Gypsophila*, *Lychnis*, *Saponaria*, and *Silene* are grown as ornamentals. *Atocion armeria* (Linnaeus) Rafinesque (*Silene armeria* Linnaeus), native to Russia and Europe, is also cultivated in China. It differs from *Silene* in having a corymbose inflorescence and obscure calyx veins.

Wu Cheng-yih, Ke Ping, Zhou Li-hua, Tang Chang-lin & Lu De-quan. 1996. Caryophyllaceae. In: Tang Chang-lin, ed., Fl. Reipubl. Popularis Sin. 26: 47–449.

1a. Stipules present, rarely obscure (subfam. Paronychioideae).

2a. Fruit an achene; petals absent.

3a. Sepal apex aristate; pistil 3-carpeled; style apex 3-fid; leaves subulate-linear; shrublets .. 1. *Gymnocarpus*

3b. Sepal apex not aristate; pistil 2-carpeled; style apex 2-fid; leaves oblong, elliptic, or subcordate;  
herbs perennial ..... 2. *Herniaria*

2b. Fruit a capsule; petals present.

4a. Styles free.

5a. Styles 5; capsule 5-valved; leaves usually pseudoverticillate, stipules not connate ..... 3. *Spergula*

5b. Styles 3; capsule 3-valved; leaves decussate, stipules connate ..... 4. *Spergularia*

4b. Styles connate at base or throughout.

6a. Sepals green, leaflike; petals 2–6-parted ..... 5. *Drymaria*

6b. Sepals white, scarious; petals entire or 2-lobed.

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- 7a. Sepals centrally ridged abaxially, hyaline at margin; style apex 3-lobed; leaves obovate or spatulate ..... 6. *Polycarpon*
- 7b. Sepals not ridged, hyaline throughout; style apex entire; leaves linear or oblong ... 7. *Polycarpaea*
- 1b. Stipules absent.
- 8a. Sepals free, rarely connate at base; petals nearly clawless, rarely absent; stamens often perigynous (subfam. Alsinoideae).
- 9a. Flowers of 2 types: chasmogamous at stem apex, with petals, usually sterile; cleistogamous at stem base, without petals, fertile; plants with fleshy root tubers ..... 8. *Pseudostellaria*
- 9b. Flowers not of 2 types: cleistogamous flowers absent; plants usually without fleshy root tubers.
- 10a. Capsule teeth as many as styles.
- 11a. Styles 4 or 5; petals shorter than or equaling sepals, rarely absent.
- 12a. Petals entire ..... 9. *Sagina*
- 12b. Petals 2-fid ..... 10. *Stellaria*
- 11b. Styles 2 or 3; petals longer than sepals.
- 13a. Styles 3; seeds numerous ..... 11. *Minuartia*
- 13b. Styles 2(or 3); seeds 1 or 2 ..... 12. *Lepyrodiclis*
- 10b. Capsule teeth 2 × as many as styles.
- 14a. Styles (4 or)5.
- 15a. Petals 2-fid for up to 1/3 their length, retuse, or rarely entire; capsule cylindrical, usually greatly exceeding calyx, apex 8–10-toothed ..... 13. *Cerastium*
- 15b. Petals deeply 2-fid; capsule ovoid to shortly cylindrical, shorter than or slightly exceeding calyx, apex 10-toothed, or 5-valved to middle with valves 2-fid at apex.
- 16a. Capsule shortly cylindrical, shorter than calyx, apex 10-toothed; styles episepalous ..... 14. *Pseudocerastium*
- 16b. Capsule ovoid, slightly exceeding calyx, 5-valved to middle, valves 2-fid at apex; styles alternisepalous ..... 15. *Myosoton*
- 14b. Styles (2 or)3(or 4).
- 17a. Petals 2-fid, rarely absent, lobes not toothed at apex.
- 18a. Petals 2-fid for up to 1/3 their length; capsule cylindrical, toothed at apex 13. *Cerastium*
- 18b. Petals deeply 2-fid, rarely absent; capsule ovoid or globose, opening by valves ..... 10. *Stellaria*
- 17b. Petals entire, rarely emarginate, toothed, or 2-fid with toothed lobes.
- 19a. Sepals connate below middle; seed testa spongy ..... 16. *Thylacospermum*
- 19b. Sepals free; seed testa not spongy.
- 20a. Seeds with membranous strophiole ..... 17. *Moehringia*
- 20b. Seeds without strophiole.
- 21a. Inflorescence umbellate; capsule cylindrical; seeds dorsiventrally compressed ..... 18. *Holosteum*
- 21b. Inflorescence cymose, paniculate, or flowers solitary; capsule ovoid or oblong; seeds reniform or globose.
- 22a. Seeds few or numerous, rarely 1; sepals herbaceous; petals shorter or longer than sepals; herbs erect, diffuse, or cushionlike 19. *Arenaria*
- 22b. Seed 1; sepals subscarious, semihyaline; petals much shorter than sepals; herbs climbing ..... 20. *Brachystemma*
- 8b. Sepals connate into a distinct calyx tube; petals usually clawed; stamens hypogynous (subfam. Caryophylloideae).
- 23a. Styles 3 or 5.
- 24a. Fruit berrylike, drying when mature; irregularly dehiscent (*Silene baccifera*) ..... 21. *Silene*
- 24b. Fruit a capsule, with regular teeth.
- 25a. Calyx lobes leaflike, longer than tube; styles hairy ..... 22. *Agrostemma*
- 25b. Calyx teeth shorter than tube; styles glabrous.
- 26a. Capsule septicidal, 5-toothed; style base reflexed and persistent in fruit ..... 23. *Lychnis*
- 26b. Capsule loculicidal (usually also septicidal), 6- or 10-toothed; style base not persistent in fruit ..... 21. *Silene*
- 23b. Styles 2(or 3).
- 27a. Calyx 5-winged ..... 24. *Vaccaria*

- 27b. Calyx wingless.  
 28a. Calyx with 1 to several pairs of bracts at base; seeds dorsiventrally compressed . 25. *Dianthus*  
 28b. Calyx without bracts at base; seeds reniform or ± so, rarely dorsiventrally compressed.  
 29a. Capsule membranous proximally, irregularly transversely dehiscent; seeds 1 or 2;  
 leaves spiny ..... 26. *Acanthophyllum*  
 29b. Capsule dry and brittle, 4-toothed or valved; seeds numerous; leaves not spiny.  
 30a. Petals with coronal scales ..... 27. *Saponaria*  
 30b. Petals without coronal scales.  
 31a. Stamens 5; calyx 15-veined ..... 28. *Psammosilene*  
 31b. Stamens 10; calyx 5-veined.  
 32a. Seeds reniform ..... 29. *Gypsophila*  
 32b. Seeds dorsiventrally compressed ..... 30. *Petrorhagia*

## 1. GYMNOCARPOS Forsskål, Fl. Aegypt.-Arab. 65. 1775.

裸果木属 *luo guo mu shu*

Lu Dequan (鲁德全); Mats Thulin

Shrublets or herbs. Stems glabrous, much branched. Leaves opposite, often fascicled, sessile or shortly petiolate, linear-oblongate to suborbicular, terete or with a shallow groove, fleshy, mucronate; stipules membranous. Inflorescence cymose; bracts membranous or leaflike. Flowers bisexual. Sepals 5, mucronate at apex. Petals absent. Stamens 10, 2-whorled, outer 5 staminodes, inner 5 opposite sepals. Pistil 3-carpellate. Ovary superior or ± sunken into the receptacle, 1-locular with single ovule. Style 1; stigma 3-fid. Fruit rupturing irregularly, enclosed in persistent calyx.

Ten species: from Macaronesia in the west to NW China and Mongolia in the east, with a center of diversity in tropical E Africa; one species in China.

**1. *Gymnocarpus przewalskii*** Bunge ex Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg, sér. 3, 26: 502. 1880.

裸果木 *luo guo mu*

*Gymnocarpus przewalskii* var. *scabrida* Chaudhri, Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 285: 58. 1968.

Shrublets 20–100 cm tall, forming thickets up to ca. 2 m wide. Bark dark gray, tender branches ochreous-red, nodes inflated. Leaves linear-subulate, 5–20 × 1–1.5 mm, apex acute, mucronate. Cymes axillary; bracts broadly elliptic, 6–8 × 3–5 mm. Sepals connate at base;

tube ca. 1.5 mm; lobes reddish, oblanceolate, 3–4 mm. Petals absent. Outer stamens without anther; inner filaments 1.5–2.2 mm; anther ellipsoid, longitudinally dehiscent. Ovary subglobose. Seeds brown, oblong, ca. 1.6 × 1.2 mm. Fl. May–Jun, fr. Jul–Sep.

Gobi Desert, dry riverbeds, gravelly hill slopes; 800–2500 m. Gansu, W Nei Mongol, Ningxia, N Qinghai, Xinjiang [S Mongolia].

This is a rare species in China; it is useful for binding sand, and camels relish the tender branches.

## 2. HERNIARIA Linnaeus, Sp. Pl. 1: 218. 1753.

治疝草属 *zhi shan cao shu*

Lu Dequan (鲁德全); Michael G. Gilbert

Herbs annual or perennial. Stems diffuse or procumbent, much branched. Leaves alternate or opposite, sessile or shortly petiolate; leaf blade oblong, elliptic, or subcordate; stipules small, membranous, caducous. Inflorescence a small cyme or glomerule, sometimes reduced to a solitary flower, leaf-opposed or terminal; bracts small, membranous. Flowers 4- or 5-merous. Pedicel green, short or nearly absent, small. Sepals not aristate at apex, persistent. Petals very small or absent. Stamens as many as and shorter than sepals. Ovary obovoid, 1-locular with 1 to several ovules; style very short, apex 2-fid. Fruit a utricle, a membranous-walled achene enclosed within persistent sepals, irregularly dehiscent or indehiscent, usually 1-seeded. Seeds brown, ovoid or flat-orbicular; testa shiny.

About 45 species: Africa, Europe, and Mediterranean region to C Asia; three species in China.

1a. Flowers 4-merous; sepals abaxially hairy, apex apiculate ..... 1. *H. polygama*

1b. Flowers 5-merous; sepals glabrous or marginally ciliate, apex obtuse.

2a. Sepals glabrous; plants glabrous or thinly pilose; flowers 1.2–1.5(–1.7) mm ..... 2. *H. glabra*

2b. Sepals ciliate; plants tomentose; flowers (1.6–)1.8–2.3 mm ..... 3. *H. caucasica*

**1. *Herniaria polygama*** J. Gáy, Rev. Bot. Recueil Mens. 2: 371. 1847.

杂性治疝草 *za xing zhi shan cao*

Plants annual, pubescent. Stems spreading, 3–15 cm. Petiole short; leaf blade oblong-elliptic, 3–10 × 1–3 mm, base attenuate, apex obtuse. Glomerules leaf-opposed, (6–)10–12- or more flowered. Flowers 4-merous, 1.4–1.5(–1.7) mm. Sepals lanceolate, ca. 1.5 × 0.5 mm, abaxially hairy, apex apiculate. Stamens 4, shorter than sepals. Style (0.3–)0.5 mm, often longer than sepals at maturity, divided for ca. 1/3 length. Achene ovoid, subequaling calyx. Fl. Jul–Aug, fr. Aug–Sep.

Steppes, riverside grasslands; ca. 500 m. Xinjiang [Russia; E Europe].

**2. *Herniaria glabra*** Linnaeus, Sp. Pl. 1: 218. 1753.

治疝草 *zhi shan cao*

Plants annual or perennial, yellowish green. Stems spreading, 5–18(–35) cm, glabrous or thinly pilose. Leaf blade elliptic-obovate, 3–7 × 1–3 mm, glabrous, base cuneate, apex obtuse. Glomerules leaf-opposed, 6–10-flowered. Flowers 5-merous, 1.2–1.5(–1.7) mm. Sepals ovate-oblong, ca. 1.5 × 0.5 mm, glabrous, apex obtuse. Stamens 5, short. Style 0.2–0.3 mm; stigma lobes nearly sessile. Achene ovoid, longer than sepals.

Seed flat-orbicular, ca. 0.5 mm in diam. Fl. Jul, fr. Aug–Sep.

Meadows, mires, hillsides, ravines; 900–2400 m. W Sichuan, N Xinjiang [Afghanistan, Mongolia, Russia, Uzbekistan; Europe].

Chaudhri (Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 285: 315–320. 1968) divided this rather variable species into four varieties based on minor differences in flower size and indumentum.

**3. *Herniaria caucasica*** F. Ruprecht, Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 15(2): 241. 1869.

高加索治疝草 *gao jia suo zhi shan cao*

Plants perennial, yellowish green, tomentose. Stems prostrate, 5–15 cm. Leaf blade obovate or oblong, 4–5 × 2–3 mm, base attenuate, apex obtuse. Glomerules leaf-opposed, (1–)4–12-flowered. Flowers 5-merous, yellowish green, (1.6–)1.8–2.3 mm. Sepals oblong, 1–1.5 × ca. 0.5 mm, ciliate, apex obtuse. Stamens 5, shorter than sepals. Style exerted at maturity, 0.3–0.4 mm, stigmas 2, often spreading. Achene subequaling calyx. Seed dark brown, subglobose, ca. 0.8 × 0.8 mm. Fl. Jul–Aug, fr. Aug–Sep.

Hillsides, meadows; 1400–2000 m. Xinjiang [Kazakhstan, Mongolia, Russia; SW Asia].

### 3. SPERGULA Linnaeus, Sp. Pl. 1: 440. 1753.

大爪草属 *da zhua cao shu*

Lu Dequan (鲁德全); Michael G. Gilbert

Herbs annual, rarely perennial, much branched at base. Stems ascending, often decumbent. Leaves opposite, usually apparently verticillate with leaf-fascicles (short, leafy, lateral branches) on both sides of nodes, sessile; leaf blade linear, fleshy; stipules free, scarious. Inflorescence a cyme, terminal. Flowers 5-merous. Pedicel reflexed, long. Sepals free, green, margin scarious. Petals white, margin entire. Stamens 10, rarely 5. Ovary 1-loculed, with numerous ovules; styles 5. Fruit a capsule, ovoid to subglobose, 5-valved, valves opposite sepals, many seeded. Seeds lenticular, often winged.

Five species: originally native to N temperate regions but now widespread as introductions; one species in China.

**1. *Spergula arvensis*** Linnaeus, Sp. Pl. 1: 440. 1753.

大爪草 *da zhua cao*

*Spergula linicola* Boreau ex Nyman; *S. maxima* Weihe; *S. sativa* Boenninghausen; *S. vulgaris* Boenninghausen.

Plants annual. Stems (7–)13–50(–60) cm, pilose, apically glandular hairy. Stipules triangular-ovate, small, soon deciduous. Leaf blade linear, (1.1–)1.5–4 cm × 0.5–0.7 mm, abaxially channeled, glabrous or glandular pubescent, apex acute. Cymes lax, at first dichasial, upper branches monochasial. Pedicel 1.5–2.5 cm, slender. Sepals ovate, 3(–5) mm, glandular pubescent, apex subacute to obtuse. Petals obovate, slightly

shorter than to slightly longer than sepals, apex obtuse. Stamens 10, shorter than ovary. Ovary ovoid; style extremely short; stigmas 5. Capsule ovoid, ca. 4 mm in diam., slightly longer than sepals. Seed gray-black, subglobose, slightly compressed, 1–2 mm, both surfaces often with minute, pale, club-shaped papillae, margin with narrow wing. Fl. Jun–Jul, fr. Jul–Aug.

Grasslands, riverbanks. SW Guizhou, N Heilongjiang, Shandong, Yunnan [Bhutan, N India, Japan, Kazakhstan, Philippines, Russia, Sikkim; N Africa, SW Asia, Europe, North America].

This plant is a weed of wheat fields, and is used as fodder.

### 4. SPERGULARIA (Persoon) J. & C. Presl, Fl. Cech. 94. 1819, nom. cons.

拟漆姑属 *ni qi gu shu*

Lu Dequan (鲁德全); Richard K. Rabeler

*Arenaria* Linnaeus subgen. *Spergularia* Persoon, Syn. Pl. 1: 504. 1805; *Buda* Adanson, nom. rej.; *Tissa* Adanson, nom. rej.

Herbs annual or perennial. Stems erect, decumbent, or procumbent, dilated at nodes, somewhat flattened. Leaves decussate, linear; stipules pale, scarious, connate around nodes, forming ± triangular structures on either side of stem; leaf fascicles (short, leafy lateral branches) when present borne on only one side at each node. Inflorescence of racemose cymes; bracts immediately subtending calyx absent. Sepals 5, free, green, margin scarious. Petals 5, white or pink, entire. Stamens 2–5 or 10. Ovary 1-loculed; ovules numerous; styles 3. Capsule ovoid, opening by 3 valves. Seeds numerous, flat, winged or not; embryo curved.

About 25 species: N temperate regions, mostly halophytes; four species in China.

1a. Sepals 5–7 mm; capsule 1.5–2 × as long as calyx; stamens (5 or)10; all or most seeds winged ..... 3. *S. media*

1b. Sepals 1.5–4.5 mm; capsule ca. equaling or slightly longer than calyx; stamens 2–5 or 10; all or most seeds unwinged.

2a. Leaves fasciculate; stipules lanceolate, silvery; stamens (5 or)10 ..... 1. *S. rubra*

2b. Leaves not or rarely fasciculate; stipules triangular (rarely lanceolate), not silvery; stamens 2–5.

3a. Capsule 1.5–3 mm, equaling calyx; seeds dark brown to black, unwinged ..... 2. *S. diandra*

3b. Capsule 5–6 mm, slightly longer than calyx; seeds light brown, mostly unwinged ..... 4. *S. marina*

**1. *Spergularia rubra*** (Linnaeus) J. & C. Presl, Fl. Cech. 94. 1819.

无翅拟漆姑 wu chi ni qi gu

*Arenaria rubra* Linnaeus, Sp. Pl. 1: 423. 1753; *A. campestris* Linnaeus; *Spergularia campestris* (Linnaeus) Ascherson.

Herbs annual, sometimes perennial. Taproot slender, sometimes ± woody. Stems diffuse, decumbent or procumbent, 20–25 cm, branched at base, apically glandular pubescent. Leaves fasciculate, 5–20 × 0.5–1 mm, glabrous or pubescent; stipules silvery, lanceolate, apex acuminate. Cymes sparse; bracts nearly as large as leaves. Sepals lanceolate, 3–4.5 mm. Petals uniformly pink, obovate, equaling or shorter than sepals. Stamens (5 or)10. Capsule 4–5 mm, ca. equaling calyx. Seeds dark brown, subtrigonal, small, tuberculate, unwinged. Fl. May–Jul, fr. Jul–Oct.  $2n = 18, 27, 36, 54$ .

Sands, saline soils, forests, shallow watersides; ca. 800 m. Xinjiang [Afghanistan, N India, Japan, Kazakhstan, Russia; Europe].

**2. *Spergularia diandra*** (Gussone) Heldreich, in schedis autogr. Pl. Atticae, a. 1848, s.n. [1851 sec. FI in sched.].

二雄蕊拟漆姑 er xiong rui ni qi gu

*Arenaria diandra* Gussone, Fl. Sicul. 1: 515. 1829.

Herbs annual. Stems ascending, 5–15 cm tall, slender, glandular pubescent. Leaves not or rarely fasciculate, 5–20 × 0.3–0.5 mm, apex obtuse; stipules not silvery, triangular, rarely lanceolate, short. Cymes sparse, small; bracts reduced. Pedicel slender. Sepals oblong-ovate, 1.5–2.5 × ca. 1 mm, apex obtuse. Petals lilac, rarely white, oblong-elliptic, shorter than sepals. Stamens 2 or 3. Capsule ovoid, 1.5–3 mm, ca. equaling calyx, valves purple-black at maturity. Seeds dark brown to black, ovoid, ca. 0.5 mm, unwinged. Fl. May–Jul, fr. Jun–Sep.  $2n = 18$ .

Wet saline grasslands, floodlands; 900–2600 m. Gansu, Ningxia, Qinghai, Xinjiang [Kazakhstan, Pakistan, Russia; Europe, SW Asia].

**3. *Spergularia media*** (Linnaeus) C. Presl ex Grisebach, Spic. Fl. Rumel. 1: 213. 1843.

缘翅拟漆姑 yuan chi ni qi gu

*Arenaria media* Linnaeus, Sp. Pl., ed. 2, 1: 606. 1762; *Spergularia marginata* Kittel.

Herbs perennial. Stems erect or decumbent, 15–30 cm tall, glandular hairy on inflorescence. Leaves not or rarely fasciculate, 1–2 cm × ca. 1 mm, fleshy, apex mucronate; stipules not silvery, lanceolate. Cymes sparse; bracts reduced. Sepals lanceolate or oblong-ovate, 5–7 × 1.5–2 mm. Petals pink, rarely white, oblong, equaling or somewhat exceeding sepals. Stamens (5 or)10. Capsule 1.5–2 × as long as calyx. Seeds dark brown, orbicular, ca. 1 mm, smooth or tuberculate, with membranous wing. Fl. May–Aug, fr. Aug–Oct.  $2n = 18$ .

Saline soils, floodlands; ca. 1200 m. Nei Mongol, Xinjiang [Afghanistan, Kazakhstan, Pakistan, Russia, Turkmenistan; N Africa, Europe, SW Asia].

**4. *Spergularia marina*** (Linnaeus) Grisebach, Spic. Fl. Rumel. 1: 213. 1843.

拟漆姑 ni qi gu

*Arenaria rubra* Linnaeus var. *marina* Linnaeus;

*Spergularia salina* J. Presl & C. Presl.

Herbs annual or biennial, rarely perennial, with slender or slightly fleshy stock. Stems 10–30 cm tall, densely pubescent. Leaves not or rarely fasciculate, 5–30 × 1–1.5 mm, fleshy, apex mucronate; stipules not silvery, broadly triangular, forming a sheath. Flowers terminal or axillary; bracts reduced. Sepals ovate, ca. 3.5 × 1.5–1.8 mm, abaxially glandular pubescent, margin membranous. Petals pink above, white near base, rarely entirely white, ovate-oblong or elliptic-ovate, shorter than sepals, apex obtuse. Stamens 2–5. Capsule 5–6 mm, ovoid, usually exceeding calyx. Seeds light brown, 0.5–0.7 mm, smooth or densely tuberculate, mostly unwinged, sometimes with erose wing. Fl. Apr–Jul, fr. May–Sep.  $2n = 36$ .

Saline soils, salt meadows, riversides, lakesides, farmlands; 200–2800 m. Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [Afghanistan, Japan, Kazakhstan, Korea, Mongolia, Pakistan, Russia; N Africa, Europe, North America].

The nomenclatural history involving the first use of the epithet “*marina*” at the species rank is complex, and some authors feel that *Spergularia salina* is the correct name for this taxon.

5. **DRYMARIA** Willdenow ex Schultes in Roemer & Schultes, Syst. Veg. 5: 31. 1819.

荷莲豆草属 he lian dou cao shu

Lu Dequan (鲁德全); Michael G. Gilbert

Herbs annual or perennial. Stems creeping or suberect, with dichotomous branching. Leaves opposite, shortly petiolate; leaf blade orbicular or ovate-cordate, 3–5-veined; stipules small, bristly, often fugacious. Inflorescence a cyme, terminal. Flowers (4-or)5-merous, pedicellate, small. Sepals free, green, herbaceous. Petals absent or (1–)3–5, 2-lobed, occasionally appendiculate in sinus and/or auriculate at top of claw. Stamens (2–)5, opposite sepals; filaments joined at base. Ovary with few ovules; styles (2 or)3, joined at base. Fruit a capsule, (2-or)3-valved, 1- to many seeded. Seeds ovate or reniform, small, flat; testa tuberculate.

About 48 species: native to Central and South America from Mexico to Patagonia, also widely distributed as weeds in the Old World tropics; two species in China.

1a. Stems and often also leaves villous or hirsute ..... 1. *D. villosa*

1b. Stems and leaves glabrous or minutely papillose ..... 2. *D. cordata*

1. ***Drymaria villosa*** Chamisso & Schlechtendal, Linnaea 5: 232. 1830.

毛荷莲豆草 mao he lian dou cao

Plants annual. Stems diffuse, slender, rarely rooting at lower nodes, pilose or hirsute. Stipules 0.5–1.5 mm, slender, scarious. Leaf blade ovate or reniform, 0.5–1(–1.5) cm, pilose or glabrous. Peduncle 1–5 cm. Pedicel 0.2–2 cm, pilose. Sepals ovate-elliptic, ca. 3 × 1 mm, glabrous or pilose, margin membranous, apex acute. Petals white, subequalling sepals, 2-parted. Stamens 5, shorter than sepals, 2–3.5 mm. Ovary ovoid; styles 3, connate to below middle. Capsule ovoid, 2–3 mm. Seed reniform, tuberculate.

Grasslands between forests; 1700–1900 m. S Xizang [native to Central and South America].

This plant is much more delicate than the more common, following species.

2. ***Drymaria cordata*** (Linnaeus) Schultes in Roemer & Schultes, Syst. Veg. 5: 406. 1819.

荷莲豆草 he lian dou cao

*Holosteam cordatum* Linnaeus, Sp. Pl. 1: 88. 1753;

*Dry-maria cordata* subsp. *diandra* (Blume) J. A. Duke;

*D. diandra* Blume.

Plants annual. Stems straggling, sometimes subscandent, usually rooting at lower nodes, 60–90 cm, mostly glabrous, minutely papillose toward inflorescence.

Stipules membranous, splitting into few whitish setae. Petiole poorly defined, 3–7 mm; leaf blade ovate-cordate, (0.5–)1–3(–3.5) × 0.6–3 cm, prominently 3–5-veined from base. Bracts lanceolate, scarious. Pedicel 3–5 mm, slender, glandular hairy. Sepals lanceolate-ovate, 2–3.5(–5) mm, margin membranous, 3-veined, glandular hairy, apex subacute. Petals white, obovate-cuneate, ca. 2.5 mm, deeply 2-cleft; segments narrow, apex ± acute. Stamens 2–3(–5), shorter than sepals.

Styles 3, connate at base. Capsule ovoid, (1.5–)2–3 mm in diam., 3-valved. Seed dark brown, suborbicular, ca. 1.5 mm, regularly densely tuberculate. Fl. Apr–Oct, fr. Jun–Dec.

Damp shaded sites, often near streams or under shrubs, disturbed areas; 200–1900(–2400) m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [native to Central and South America].

This species is used medicinally and is a widely distributed, noxious weed.

6. **POLYCARPON** Linnaeus, Syst. Nat., ed. 10, 2: 859, 881, 1360. 1759.

多莢草属 duo jia cao shu

Lu Dequan (鲁德全); Michael G. Gilbert

Herbs annual or perennial. Stems diffuse or erect, usually branched. Leaves opposite, sometimes apparently verticillate, sessile or indistinctly petiolate; leaf blade obovate or spatulate; stipules membranous. Inflorescence a cymose cluster, axillary or terminal; bracts scarious. Flowers small. Sepals 5, margin hyaline, midvein raised abaxially into rounded fleshy keel. Petals often fewer than 5, hyaline, less than 1/2 as long as sepals. Stamens 3–5; filaments ± united at base. Ovary 1-loculed with numerous ovules; style short, 3-lobed. Fruit a capsule, 3-valved, several seeded.

About 16 species: tropics and subtropics; one species in China.

1. ***Polycarpon prostratum*** (Forsskål) Ascherson & Schweinfurth in Ascherson, Oesterr. Bot. Z. 39: 128. 1889.

多莢草 duo jia cao

*Alsine prostrata* Forsskål, Fl. Aegypt.-Arab. 207. 1775;

*Loeflingia indica* Retzius; *Pharnaceum depressum*

Linnaeus; *Polycarpon indicum* (Retzius) E. D. Merrill; *P. loeflingii* Wight & Arnott ex Bentham.

Plants annual. Stems prostrate or ascending, ± woody at base, 10–25 cm, pubescent or glabrous. Leaf blade obovate or spatulate, 5–15(–25) × 1.5–2.5(–5) mm, glabrous, base attenuate, apex acute. Cymes often

axillary, sometimes rather lax, 2–4 cm; bracts stipulelike. Pedicel short or absent, pilose. Sepals lanceolate, 2.5–3(–4) mm, apex obtuse, ± hooded. Petals often fewer than 5, oblong, less than 1/2 as long as sepals, entire. Stamens 3(–5), shorter than sepals. Capsule ovoid, shorter than sepals. Seed light brown,

cylindric, with raised lateral hylum, reticulate, ca. 0.5 mm. Fl. Feb–May, fr. May–Jun.

On open sands, farmlands; 300–1500 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [tropical regions of Asia and Africa].

## 7. POLYCARPAEA Lamarck, J. Hist. Nat. 2: 3, 5. 1792, nom. cons.

白鼓钉属 bai gu ding shu

Lu Dequan (鲁德全); Michael G. Gilbert

*Polia* Loureiro, nom. rej.

Herbs or subshrubs, annual or perennial. Stems erect or diffuse. Leaves opposite or falsely verticillate with axillary clusters of leaves, sessile or petiolate; leaf blade linear to obovate; stipules membranous or hyaline. Inflorescence a cyme, terminal. Flowers numerous, 5-merous. Sepals hyaline, midvein not raised. Petals usually small, entire or 2-lobed. Stamens (2–)5. Ovary 1-loculed with few to many ovules; style undivided at apex. Fruit a capsule, 3-valved, few to several seeded. Seeds reniform, slightly flat.

About 50 species: mostly in the Old World tropics and subtropics, a few in the New World tropics; two species in China.

1a. Leaves linear or acicular, ca. 1 mm wide, longer than internodes at least near base, erect or recurved; sepals

2–3 mm; style short, 1/3–1/2 as long as ovary ..... 1. *P. corymbosa*

1b. Leaves narrowly oblong to oblong, 1–3.5 mm wide, shorter than internodes, often mostly sharply reflexed

at base; sepals ca. 4 mm; style 1–2 × as long as ovary ..... 2. *P. gaudichaudii*

1. *Polycarpaea corymbosa* (Linnaeus) Lamarck, Tab. Encycl. 2: 129. 1797.

白鼓钉 bai gu ding

*Achyranthes corymbosa* Linnaeus, Sp. Pl. 1: 205. 1753.

Herbs annual or short-lived perennial. Stems erect, 15–35 cm tall, mostly branching above middle, occasionally branched at base, white pilose. Stipules ovate-lanceolate, 2–4 mm, scarious, margin hyaline, apex acute. Leaves apparently verticillate; leaf blade linear or acicular, 1.5–2 cm × ca. 1 mm, erect or uniformly recurved from erect base, apex acute to needlelike. Bracts lanceolate, longer than pedicel, hyaline, membranous. Pedicel slender, white pilose. Sepals lanceolate, (2–)2.7–3.5 × 0.5–1 mm, membranous, hyaline, apex acuminate. Petals milky white or reddish, broadly ovate, ca. 1/2 as long as sepals, apex obtuse. Stamens usually 5, shorter than petals. Style short, 1/3–1/2 as long as ovary. Capsule brown, ovoid, ca. 1/2 as long as calyx, 5–13-seeded. Seed brown, flat, ca. 0.5 × 0.3 mm, obscurely reticulate. Fl. Jul–Aug, fr. Sep–Oct.

Mostly on open, often moist, sandy soils, less often in grassy places on mountain slopes; sea level to 1200 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hubei, Jiangxi, Taiwan, Yunnan [widespread throughout tropics and subtropics, most variable and probably originating in Africa].

This species is used medicinally.

2. *Polycarpaea gaudichaudii* Gagnepain, Bull. Soc. Bot. France 56: 37. 1909.

大花白鼓钉 da hua bai gu ding

Herbs or subshrubs, perennial. Rootstock slightly woody. Stems branching near base, ascending, 20–30 cm, pilose. Stipules white, long triangular, 1.5–2 mm, scarious. Leaves opposite or apparently verticillate; leaf blade narrowly oblong to oblong-elliptic, 5–20 × 1–3.5 mm, distinctly shorter than internode, glabrous, mostly sharply reflexed from base, apex obtuse, mucronate. Cymes rather lax; bracts scarious. Pedicel mostly short, to 5 mm in fruit, with sparse long hairs. Flowers ca. 4 mm. Sepals white, with thick brown veins near base, ovate, ca. 3 × 1.5 mm, apex acuminate. Petals white, with purple-brown veins, longer than sepals. Stamens usually 5, subequaling sepals. Style filiform, 1–2 × as long as ovary. Capsule brown, ovoid, ca. 3 mm, glossy. Seed brown, ca. 0.7 × 0.3 mm. Fl. May–Jul, fr. Aug–Oct.

Most records from coastal sands, also recorded from grasslands on mountain slopes. Guangdong, Hainan [Cambodia, India, Malaysia, Vietnam].

The collections from Hainan are very uniform, with distinctively reflexed leaves and well-developed, brown veins at the bases of the sepals. Material from Vietnam is more variable, rarely showing the reflexed leaves and with more indistinct sepal venation, and is difficult to separate from the rather variable *Polycarpaea arenaria* (Loureiro) Gagnepain.

## 8. PSEUDOSTELLARIA Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

孩儿参属 hai er shen shu

Lu Dequan (鲁德全); Richard K. Rabeler

*Krascheninikovia* Turczaninow ex Fenzl in Endlicher, Gen. Pl. 968. 1840, not Gueldenstaedt (1772).

Herbs perennial. Root tubers fusiform, ovoid or subglobose. Stems erect or ascending, sometimes repent. Leaves ovate, ovate-lanceolate, or linear-lanceolate; stipules absent. Flowers of two types. Chasmogamic flowers larger, solitary in distal leaf axils or in terminal cymes, bracts immediately subtending calyx absent, pedicel longer, usually without fruit; sepals (4 or)5; petals (4 or)5, white, entire or emarginate; stamens (8 or)10; ovary globose or ovoid, 1-loculed, ovules numerous; styles (2 or)3; stigma capitate. Cleistogamic flowers smaller, on stem in proximal leaf axils, shortly pedicellate or subsessile; sepals 4(or 5); petals very small, membranous, or absent; stamens reduced, rarely 2; ovary globose or ovoid, 1-loculed, ovules numerous; styles 2 or 3. Capsule (2 or) 3(or 4)-valved. Seeds few, large, somewhat flattened, tuberculate or smooth; embryo curved.

About 18 species: E and N Asia, one species in Europe, two species in North America; nine species (two endemic) in China.

1a. All leaves linear, lanceolate-linear, or ovate-lanceolate.

2a. Stems 15–25 cm tall; leaves linear or lanceolate-linear, 3–5(–7) cm × 2–3(–5) mm; seeds with awned tubercles ..... 1. *P. sylvatica*

2b. Stems 5–10 cm tall; leaves lanceolate or ovate-lanceolate, 1–3 cm × 3–8 mm; seeds with anchor-shaped barbs ..... 2. *P. rupestris*

1b. Middle and distal leaves ovate, broadly ovate, ovate-oblong, or oblong.

3a. Leaves rounded at base, subsessile; seeds mammillate, with pointed mammillae.

4a. Stems repent, procumbent to 50 cm; capsule 4-valved; seeds with non-bristly protuberances 3. *P. davidii*

4b. Stems erect, 15–20 cm tall; capsule 3-valved; seeds with bristly protuberances ..... 4. *P. japonica*

3b. Leaves attenuate at base into petiole; seeds tuberculate or not.

5a. Chasmogamic flowers with sepals 4, petals 4, stamens 8; seeds tuberculate, apex of tubercles with one short hair ..... 5. *P. helanshanensis*

5b. Chasmogamic flowers with sepals 5, petals 5, stamens 10; seeds tuberculate or not.

6a. Stems with apical 2(or 3) pairs of leaves larger, approximate, decussate, broadly ovate 8. *P. heterophylla*

6b. Stems not as above.

7a. Chasmogamic flowers with sepals glabrous; cleistogamic flowers subsessile; leaves ovate or oblong ..... 9. *P. tibetica*

7b. Chasmogamic flowers with sepals abaxially pubescent; cleistogamic flowers shortly pedicellate; distal middle leaves ovate-oblong.

8a. Capsules 2–3 mm; seeds without protuberances ..... 6. *P. himalaica*

8b. Capsules 3.5–4 mm; seeds tuberculate ..... 7. *P. heterantha*

**1. *Pseudostellaria sylvatica*** (Maximowicz) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

细叶孩儿参 xi ye hai er shen

*Krascheninikovia sylvatica* Maximowicz, Prim. Fl. Amur. 57. 1859; *Stellaria sylvatica* (Maximowicz) Maximowicz ex Regel.

Root tubers usually several in a row (moniliform), narrowly ovoid or shortly fusiform. Stems erect, 15–25 cm tall, 4-angled, with 2 lines of hairs. Leaves sessile, linear or lanceolate-linear, 3–5(–7) cm × 2–3(–5) mm, thin, margin ciliate at base, abaxially grayish blue; midvein prominent. Chasmogamic flowers solitary or in dichasium; pedicel 5–15 mm, slender; sepals 5, green, lanceolate, abaxially pubescent, margin membranous, apex acuminate; petals 5, obovate, slightly longer than

sepals, apex 2-lobed; stamens shorter than petals, anthers brown; styles 2 or 3, usually exerted.

Cleistogamic flowers axillary on stem or terminal on a dwarf shoot; sepals narrowly lanceolate, abaxially pubescent, apex acuminate; petals absent. Capsule ovoid, slightly longer than sepals, 3-valved. Seeds reniform, ca. 1.5 mm, tuberculate, apex of tubercles awned. Fl. and fr. Jun–Jul.

Pine forests, mixed forests; (1500–)2400–2800(–3800) m. Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Qinghai, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, Japan, Korea, Russia].

This species is used medicinally.

**2. *Pseudostellaria rupestris*** (Turczaninow) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

石生孩儿参 shi sheng hai er shen



*Krascheninikovia rupestris* Turczaninow, Fl. Baical-Dahur. 1: 238. 1842; *Pseudostellaria terminalis* W. Z. Di & Y. Ren.

Root tubers globose or broadly ellipsoid, ca. 1 cm. Stems erect, 5–10 cm tall, slender, unbranched, or sparsely branched apically, glabrous or with 1 or 2 lines of short hairs. Leaves lanceolate or ovate-lanceolate, 1–3 cm × 3–8 mm, base attenuate into a short petiole, glabrous or ciliate, apex acute. Chasmogamic flowers terminal or axillary; pedicel 1.5–2.5 cm, slender, glabrous or pubescent; sepals 5, oblong-lanceolate, veins pilose, margin membranous; petals 5, oblong, ca. 1.5 × as long as sepals, margin entire, rarely emarginate; stamens 10, subequaling petals; styles (2 or)3. Cleistogamic flowers axillary, small; pedicel ca. 1.2 cm; sepals 4; petals absent; stamens 2; styles 2 or 3. Capsule ellipsoid, ca. 4 × 3 mm. Seeds brown, ovoid, ca. 1.5 mm, with anchor-shaped barbs. Fl. May–Jun, fr. Jul–Sep.

*Picea* forests, rocky mountain slopes, 2700–3400 m. S Jilin (Changbai Shan), SW Nei Mongol (Helan Shan), Qinghai [Mongolia, Russia].

**3. *Pseudostellaria davidii*** (Franchet) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

蔓孩儿参 wan hai er shen

*Krascheninikovia davidii* Franchet, Pl. David. 1: 51. 1884; *Stellaria davidii* (Franchet) Hemsley.

Root tubers fusiform. Stems repent, decumbent, to 50 cm, slender, sparsely branched, with 2 lines of hairs. Leaves subsessile, petiole 3–5 mm; leaf blade ovate, 1.5–3 × 1–2 cm, base rounded, ciliate, apex acute. Chasmogamic flowers axillary; pedicel ca. 3.8 cm, slender, with 1 row of hairs; sepals 5, lanceolate, ca. 3 mm, abaxially pubescent at midvein; petals 5, narrowly obovate or oblanceolate, ca. 2 × as long as sepals, margin entire; stamens 10, shorter than petals; anthers purple; styles (2 or)3. Cleistogamic flowers axillary; pedicel ca. 1 cm, hairy; sepals 4, narrowly lanceolate, ca. 3 × 0.8–1 mm, pubescent; stamens reduced; styles 2. Capsule ovoid, slightly longer than sepals, 4-valved. Seeds reniform or subglobose, ca. 1.5 mm, mammillate with pointed projections. Fl. May–Jul, fr. Jul–Aug.

Mixed forests, brooksides, stony hillsides, forest margins; 1000–3800 m. Anhui, Gansu, Guangxi, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [Korea, Mongolia, Russia].

**4. *Pseudostellaria japonica*** (Korshinsky) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

毛脉孩儿参 mao mai hai er shen

*Krascheninikovia japonica* Korshinsky, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 5, 9: 40. 1898.

Root tubers fusiform. Stems erect, 15–20 cm tall, unbranched, with 2 lines of hairs. Basal leaves lanceolate,

1.5–2.5 cm × 2–3 mm; middle and distal leaves subsessile, ovate or broadly ovate, 1.5–3 × 1–2 cm, both surfaces sparsely pubescent, base rounded, ciliate, apex acute. Chasmogamic flowers solitary or in cymes; pedicel 1.5–2.5 cm, slender, pubescent; sepals 5, lanceolate, 3–3.5 × 1.5–2 mm, with sparse long hairs at margin and abaxially at midvein, margin membranous; petals 5, obovate or broadly elliptic-obovate, ca. 5 mm, ca. 2 × as long as sepals, base attenuate, apex emarginate; stamens 10, shorter than petals, anthers purple-brown; ovary ovoid; styles 3. Cleistogamic flowers axillary; pedicel slender. Capsule ovoid, longer than sepals, 3-valved. Seeds brown, ovoid, slightly compressed, ca. 1 mm, mammillate with pointed projections, apex of projections bristly. Fl. May–Jun, fr. Jul–Aug.

Coniferous and broadleaf mixed forests in shaded, wet areas; ca. 400 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia].

**5. *Pseudostellaria helanshanensis*** W. Z. Di & Y. Ren, Acta Phytotax. Sin. 25: 478. 1987.

贺兰山孩儿参 he lan shan hai er shen

Root tubers solitary or several in fascicles, lilac. Stems usually repent at base, ascending above, 5–10 cm tall, slender, much branched, with 2 lines of hairs, with dwarf shoots from leaf axils. Proximal leaves narrowly elliptic, 1.5–2.5 cm × 4–6 mm, base attenuate into a petiole, margin rough, apex acute. Middle and distal leaves: petiole 3–10 mm, sparsely pubescent; leaf blade ovate or broadly ovate, 1–2.5 × 0.6–1.5 cm, base cuneate, apex acute. Chasmogamic flowers solitary, terminal at stem apex; pedicel slender, sparsely pubescent; sepals 4, narrowly elliptic, ca. 3 × 1.5 mm; petals 4; stamens 8; ovary ovoid; styles 2. Cleistogamic flowers solitary in leaf axils of dwarf shoot; pedicel 5–20 mm, sparsely pubescent; sepals 4, narrowly elliptic; petals absent; stamens 2. Capsule with purple stains, ovoid, 3–4 mm, 4-valved. Seeds deep brown, subreniform, ca. 1.5 mm, tuberculate, apex of tubercles with one short hair. Fl. Jun–Jul, fr. Jul–Aug.

• Forested wetlands, near drainage areas; 2800–3000 m. Nei Mongol (Helan Shan).

**6. *Pseudostellaria himalaica*** (Franchet) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

须弥孩儿参 xu mi hai er shen

*Stellaria davidii* Hemsley var. *himalaica* Franchet, Pl. Delavay. 100. 1889; *Krascheninikovia himalaica* (Franchet) Korshinsky; *Pseudostellaria cashmiriana* Schaeftlein; *P. dalaolingsensis* Z. E. Zhou & J. Q. Wu; *P. heterantha* (Maximowicz) Pax var. *himalaica* (Franchet) Ohwi.

Root tubers globose or fusiform. Stems erect, 3–13 cm tall, slender, branched, pubescent. Leaves ovate, 3–14 ×

2–8 mm, midvein prominent, both surfaces pubescent, base attenuate into a short petiole, apex acute. Chasmogamic flowers solitary, terminal; pedicel 2–4 cm, pilose; sepals 5, lanceolate, 3–4 × ca. 1 mm, abaxially pilose, margin narrowly membranous, apex acuminate; petals 5, obovate, slightly longer than sepals, margin entire or emarginate, base slightly narrowed; stamens 10, shorter than petals, anthers brown-purple; styles 2 or 3. Cleistogamic flowers 1 or 2 in proximal leaf axils; pedicel 8–10 mm, pilose; sepals 4, lanceolate; petals absent. Capsule ovoid, 2–3 mm. Seeds brown, compressed, orbicular, ca. 0.5 mm, without protuberances. Fl. May–Jun, fr. Jun–Jul.

*Picea* forests or evergreen broadleaf forests, in scrub on rocks; 2300–3800 m. Gansu, Hubei, Qinghai, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

*Pseudostellaria dalaolingensis*, described from Hubei, is tentatively assigned here; the present authors have not seen material of this species. Although in the protologue Zhou and Wu distinguished it from *P. maximowicziana* (*P. heterantha* here), the description more closely fits *P. himalaica*.

**7. *Pseudostellaria heterantha*** (Maximowicz) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

异花孩儿参 yi hua hai er shen

*Krascheninikovia heterantha* Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 18: 376. 1873; *K. eritrichoides* Diels; *K. maximowicziana* Franchet & Savatier; *Pseudostellaria eritrichoides* (Diels) Ohwi; *P. maximowicziana* (Franchet & Savatier) Pax.

Root tubers fusiform. Stems solitary, erect, 8–15 cm tall, branched at base, with 2 lines of hairs. Proximal middle leaves oblanceolate, base attenuate into a petiole, apex acute; distal middle leaves shortly petiolate, ovate-oblong, 2–2.5 × 0.8–1.2 cm, base sparsely ciliate. Chasmogamic flowers terminal or axillary; pedicel 3–3.5 cm, pilose; sepals 5, green, lanceolate, 3–4 mm, abaxially pilose, margin ciliate; petals 5, oblong-oblanceolate, longer than sepals, apically obtuse or acute; stamens 10, slightly shorter than petals, anthers purple; styles 2 or 3. Cleistogamic flowers axillary at stem base; pedicel short; sepals 4, lanceolate, 2–3 mm; petals absent; stamens 4 or 5; styles very short; stigma 2-lobed. Capsule ovoid, 3.5–4 mm, slightly longer than sepals, 4-valved. Seeds reniform, slightly compressed, tuberculate. Fl. May–Jul, fr. Jul–Aug.

Mountain forests, scrublands, hillside grasslands; 1400–4100 m. Anhui, Gansu, Guizhou, Hebei, Henan, SW Nei Mongol (Helan Shan), Ningxia, Qinghai, Shaanxi (Taibai Shan), Shanxi, Sichuan, Xizang [Japan, Russia].

**8. *Pseudostellaria heterophylla*** (Miquel) Pax in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 16c: 318. 1934.

孩儿参 hai er shen

*Krascheninikovia heterophylla* Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 187. 1867; *K. raphanorrhiza* (Hemsley) Korshinsky; *Pseudostellaria raphanorrhiza* (Hemsley) Pax; *Stellaria heterophylla* (Miquel) Hemsley; *S. raphanorrhiza* Hemsley.

Root tubers white, slightly grayish yellow, long fusiform. Stem solitary, erect, (8–)15–20 cm tall, with 2 lines of hairs. Proximal leaves usually 1 or 2 pairs, spatulate or oblanceolate, base attenuate into a petiole, apex obtuse; middle leaves lanceolate, 3–4 cm × 5–8 mm; distal leaves 2 or 3 pairs, decussate, approximate, broadly ovate, 3–6 × 1–2 cm, abaxially pilose at veins, adaxially glabrous, base attenuate, apex acuminate. Chasmogamic flowers axillary, solitary or in cymes; pedicel 1–2(–4) cm, pubescent; sepals 5, lanceolate, ca. 5 mm, abaxially pilose and ciliate; petals 5, oblong or obovate, 7–8 mm, margin entire, slightly toothed, or emarginate; stamens 10, shorter than petals; ovary ovoid; styles 3, slightly longer than stamens, stigmas capitate. Cleistogamic flowers axillary, pedicels short; sepals 4, pilose; petals absent; stamens 2; styles 3. Capsule ovoid, unsplit or 3-valved. Seeds brown, oblong-reniform or compressed orbicular, ca. 1.5 mm, tuberculate. Fl. Apr–Jul, fr. Jul–Aug.

Mountain valleys, moist shaded forests; 800–2700 m. Anhui, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Sichuan, Zhejiang [Japan, Korea].

This species is used medicinally.

**9. *Pseudostellaria tibetica*** Ohwi, J. Jap. Bot. 9: 103. 1937.

西藏孩儿参 xi zang hai er shen

*Pseudostellaria heterantha* var. *tibetica* (Ohwi) Kozhevnikov.

Stems erect, 5–10(–20) cm tall, slender, with 2 lines of hairs. Leaves with petiole 3–20 mm; leaf blade ovate or oblong, 0.5–3 cm × 3–10 mm, adaxially pubescent, base cuneate, margin ciliate with short hairs, apex obtuse, apiculate. Chasmogamic flowers solitary and terminal, or axillary; pedicel 2–3 cm, with 1 line of hairs; sepals 5, lanceolate, 5–6 mm, long acuminate, subglabrous; petals 5, cuneate-obovate, slightly longer than sepals, margin entire; stamens 10; ovary ovoid; styles 3, ca. 3 mm. Cleistogamic flowers axillary, small, subsessile; sepals 4, 3–4 mm, with long hairs; petals absent. Capsule globose, 2.5–4 mm. Seeds brown, elliptic, ca. 1 mm, tuberculate. Fl. May–Jun, fr. Jul.

• Hillsides, mountain valleys, forest margins, wet river shores; 2900–4000 m. W Sichuan, E Xizang.

## 9. SAGINA Linnaeus, Sp. Pl. 1: 128. 1753.

漆姑草属 qi gu cao shu

Lu Dequan (鲁德全); Richard K. Rabeler

Herbs annual, biennial, or perennial, small. Stems often caespitose, procumbent or ascending, slender. Leaves linear or subulate, basally connate; stipules absent. Flower solitary, axillary or terminal, rarely in cymes, small, pedicellate; bracts immediately subtending calyx absent. Sepals 4 or 5. Petals 4 or 5, sometimes absent, white, usually shorter than sepals, rarely equal, margin entire, rarely slightly emarginate. Stamens 4 or 5, sometimes 8 or 10. Ovary 1-loculed; ovules numerous; styles 4 or 5, alternating with sepals. Capsule ovoid to globose, 4- or 5-valved; valves opposite sepals. Seeds numerous, reniform, minute, tuberculate or smooth; embryo curved.

About 30 species: mainly in N temperate regions, a few species in the subtropics; four species in China.

- 1a. Flowers 4-merous; seeds grooved ..... 1. *S. procumbens*  
1b. Flowers 5-merous; seeds grooved or not.  
2a. Pedicel and sepals without glandular hairs; seeds reniform-triangular, grooved ..... 2. *S. saginoides*  
2b. Pedicel and sepals glandular pubescent; seeds reniform-globose, not grooved.  
3a. Seeds sharply tuberculate ..... 3. *S. japonica*  
3b. Seeds with short linear striae ..... 4. *S. maxima*

**1. *Sagina procumbens*** Linnaeus, Sp. Pl. 1: 128. 1753.

仰卧漆姑草 *yang wo qi gu cao*

Herbs perennial. Stems ascending or procumbent, 3–10 cm tall, slender, branched, glabrous. Leaves linear, 2–10 × 1–2 mm, shortly aristate, glabrous or ciliate. Flower solitary, terminal or axillary. Pedicel recurved after anthesis, erect in fruit, slender. Sepals 4, broadly ovate, 1.5–2 mm, margin white, apex obtuse. Petals 4, ovate, shorter than sepals. Stamens 4 (rarely 8). Styles 4. Capsule ovoid, longer than sepals, 4-valved. Seeds black-brown, triangular, grooved, smooth. Fl. Jul–Aug, fr. Sep–Oct.  $2n = 22$ .

Mire meadows, forest margins; ca. 4200 m. Xinjiang [Afghanistan, N India (Darjiling), Philippines, Russia, ?Sikkim; W Asia, Europe].

**2. *Sagina saginoides*** (Linnaeus) H. Karsten, Deut. Fl. 539. 1882.

无毛漆姑草 *wu mao qi gu cao*

*Spergula saginoides* Linnaeus, Sp. Pl. 1: 441. 1753;  
*Sagina linnaei* C. Presl.

Herbs perennial. Stems caespitose, ca. 7 cm tall, glabrous. Leaves linear or subulate, 5–15 × ca. 1 mm, glabrous. Flower solitary, terminal. Pedicel recurved after anthesis, erect in fruit, (0.6–)1.5–3 cm. Sepals 5, ovate-oblong, 1.5–3 × ca. 1.5 mm, apex obtuse. Petals 5, ovate, shorter than sepals. Stamens (5 or)10. Styles 5. Capsule conical-ovoid, 3–5 mm, ca. 2 × as long as appressed sepals, shiny, 5-valved. Seeds brown, reniform-triangular, ca. 0.3 mm, grooved, ?sharply tuberculate. Fl. May–Jul, fr. Jul–Aug.  $2n = 22$ .

Rocky mountain slopes, mire meadows, scrub, wet river banks; 1400–4200 m. Nei Mongol, Qinghai, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, India, Japan, Kazakhstan, Korea, Nepal, Pakistan, Russia, Sikkim, Vietnam; SW Asia, Europe, North America].

This species is used medicinally.

**3. *Sagina japonica*** (Swartz) Ohwi, J. Jap. Bot. 13: 438. 1937.

漆姑草 *qi gu cao*

*Spergula japonica* Swartz, Ges. Naturf. Freunde Berlin Neue Schriften 3: 164. 1801.

Herbs annual or biennial. Stems tufted, suberect or creeping, 5–20 cm tall, slender, basally branched, apically glandular hairy. Leaves linear, 5–20 × 0.8–1.5 mm, glabrous, connate at base, acute and minutely spine tipped. Flower solitary, terminal or axillary. Pedicel erect, 1–2 cm, sparsely pubescent. Sepals 5, ovate-elliptic, ca. 2 mm, glandular hairy, apex obtuse. Petals 5, ovate, slightly shorter than sepals, apex rounded. Stamens 5. Ovary ovoid; styles 5. Capsule globose, slightly longer than sepals, 5-valved. Seeds brown, reniform-globose, not grooved, sharply tuberculate. Fl. Apr–May, fr. May–Jun.  $2n = 46, 64$ .

Sandy riversides, uncultivated farmland, roadside grasslands, forests, streamsides, floodlands; (100–)600–1900(–4000) m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Japan, Korea, Nepal, Russia, Sikkim].

This species is used medicinally.

**4. *Sagina maxima*** A. Gray, Mem. Amer. Acad. Arts, n.s., 6: 382. 1859.

根叶漆姑草 *gen ye qi gu cao*

*Sagina litoralis* Hultén.

Herbs annual, sometimes perennial. Stems caespitose, erect or ascending, 4–8 cm tall, slender, basally branched, glabrous. Leaves linear, 4–6 × 0.7–1 mm, apex acuminate. Flower solitary, axillary. Pedicel slightly recurved after anthesis, erect in fruit, 4–25 mm, somewhat glandular hairy. Sepals 5, elliptic, 2–2.5 mm, abaxially glandular hairy. Petals 5, broadly ovate, slightly shorter than or subequaling sepals, basally clawed. Stamens 5. Styles 5. Capsule ovoid, longer than sepals, 5-valved. Seeds brown, reniform-globose, ca. 0.5 mm, not grooved, with short linear striae. Fl. Jul–Aug, fr. Aug–Sep.  $2n = 22, 44$ .

Fields, rocky mountain slope meadows. Anhui, Liaoning, Sichuan, Taiwan, Xinjiang [Japan, Korea, Russia; North America].

Chinese plants belong to subsp. *maxima*.

**10. STELLARIA** Linnaeus, Sp. Pl. 1: 421. 1753.

繁缕属 fan lu shu

Chen Shilong (陈世龙); Richard K. Rabeler

*Fimbripetalum* (Turczaninow) Ikonnikov; *Mesostemma* Vvedensky.

Herbs annual, biennial, or perennial. Roots or rhizomes filiform and slender, roots sometimes robust, fleshy. Stems erect, ascending, or prostrate. Leaves compressed, variously shaped, rarely needlelike; stipules absent. Flowers terminal, seldom only axillary, in cymes or solitary, small; bracts immediately subtending calyx absent. Sepals (4 or)5. Petals (4 or)5, white, rarely green, usually 2-cleft nearly to base, rarely retuse or multilobed, sometimes absent. Stamens 2–5 or (6–)10. Ovary 1-loculed, rarely 3-loculed when young; ovules numerous, rarely several and only 1 or 2 mature; styles (2 or)3(or 4). Capsule orbicular or ovoid, opening by valves (1 or)2 × number of styles. Seeds (1 to) numerous, reniform, slightly compressed, tuberculate or smooth; embryo curved.

About 190 species: mainly in temperate and cold regions; 64 species (28 endemic) in China.

- 1a. Petals 5–7-cleft, longer than sepals ..... 58. *S. radians*  
 1b. Petals 2-cleft either apically or often to base, longer or shorter than sepals, seldom absent.  
 2a. Styles 2(or 3) or 4; capsules 4(or 6)-valved.  
 3a. Styles 4.  
 4a. Sepals rounded apically ..... 64. *S. strongylosepala*  
 4b. Sepals long acuminate apically ..... 45. *S. oxycoccooides*  
 3b. Styles 2(or 3).  
 5a. Petals and sepals 4; stamens 8; petals ca. 1.5 × as long as sepals; styles 2 ..... 59. *S. martjanovii*  
 5b. Petals and sepals 5; stamens 10; petals shorter than the sepals; styles 2(or 3).  
 6a. Stems 0.1–0.3 m, tufted; leaves oblong-lanceolate, 0.1–0.2 cm ..... 63. *S. bistyla*  
 6b. Stems 1–2 m, diffuse; leaves ovate-lanceolate, (2–)3–10 cm ..... 61. *S. ovatifolia*  
 2b. Styles usually 3; capsules usually 6-valved.  
 7a. Seeds 1–3(–8), ovules few or many; capsules shorter than sepals, often globose; stamens (5–)8–10.  
 8a. Stems 15–20 cm tall, not tufted; inflorescence bracts absent; petals ca. 2 × as long as sepals 25. *S. ebracteata*  
 8b. Stems 2–200 cm, tufted if less than 30 cm; inflorescence bracts present; petals shorter than sepals or absent.  
 9a. Stems 50–200 cm, diffuse; leaves lanceolate to oblong- or ovate-lanceolate, (2–)3–11(–23) cm; young ovary 3-loculed, with 3 or 4 ovules.  
 10a. Stamens 5; capsule with 2 or 3 mature seeds; petals subequaling sepals ..... 62. *S. delavayi*  
 10b. Stamens 5 or 10; capsule with 1 mature seed; petals shorter than sepals.  
 11a. Plants glandular hairy; leaves lanceolate to oblong-lanceolate, base rounded, semiclasping; petals ca. 2/3 as long as sepals ..... 60. *S. monosperma*  
 11b. Plants pubescent with curved hairs; leaves ovate-lanceolate, base narrowed into petiole; petals minute, ca. 1/3 as long as sepals ..... 61. *S. ovatifolia*  
 9b. Stems 2–30(–60) cm, tufted, plants often cushionlike; leaves linear or ovate, 0.3–3.5 cm; ovary 1-loculed, ovules many.  
 12a. Petals 2-cleft to middle; plants glandular hairy; stamens 10.  
 13a. Sepals lanceolate, apex acuminate, margin narrowly membranous; stems terete ..... 22. *S. dichotoma*  
 13b. Sepals oblong, apex obtuse, margin broadly membranous; stems quadrangular .. 23. *S. amblyosepala*  
 12b. Petals 2-cleft nearly to base or absent; plants densely cushionlike, glabrous or pubescent or woolly; stamens 5 or (8–)10.  
 14a. Petals subequaling sepals; stamens 5 ..... 12. *S. petiolaris*  
 14b. Petals shorter than sepals or absent; stamens (8–)10.  
 15a. Leaves ovate to ovate-lanceolate, 3–6 mm.  
 16a. Plants 5–7 cm tall; stems glabrous basally, pubescent apically ..... 53. *S. arenarioides*  
 16b. Plants 10–20 cm tall; stems densely white pubescent, rarely glabrous ..... 56. *S. decumbens*  
 15b. Leaves linear to linear-lanceolate, 4–20(–25) mm.  
 17a. Stems glabrous ..... 55. *S. petraea*  
 17b. Stems pubescent, either with curved hairs or white pilose apically.  
 18a. Stems pubescent with curved hairs; flowers few in loose cymes ..... 54. *S. cherleriae*  
 18b. Stem white lanate apically; flowers many in dense cymes ..... 57. *S. congestiflora*  
 7b. Seeds and ovules many (rarely few); capsules usually subequaling or longer than sepals, often ovoid; stamens (2–)10, hypogynous or perigynous.  
 19a. Sepals distinct; stamens hypogynous or perigynous.

- 20a. Leaves linear-lanceolate; petals ca.  $1.5 \times$  as long as sepals ..... 24. *S. henryi*
- 20b. Leaves broader, usually ovate or ovate-lanceolate; petals of varying lengths.
- 21a. Leaves sessile or subsessile, base sometimes slightly clasping.
- 22a. Plants glabrous ..... 17. *S. gyirongensis*
- 22b. Plants hairy.
- 23a. Plants stellate hairy ..... 16. *S. infracta*
- 23b. Plants pubescent, hairs not stellate.
- 24a. Plants pubescent, hairs short, not dense; abaxial leaf midvein prominent.
- 25a. Leaves with inconspicuous reticulate abaxial veins, only basal margin ciliate; sepals  
2–2.5  
mm ..... 14. *S. omeiensis*
- 25b. Leaves with conspicuous reticulate abaxial veins, margin ciliate; sepals ca. 2.5 mm 15. *S. reticulivena*
- 24b. Plants glandular hairy, woolly, or hairs long filiform; abaxial leaf midvein prominent or  
not.
- 26a. Plants densely glandular hairy.
- 27a. Leaves ovate, 5–15 mm, margin ciliate; petals 2-cleft to base; seeds rugulose 18. *S. zangnanensis*
- 27b. Leaves oblong, 12–18 mm, margin not ciliate; petals 2-cleft to middle; seeds  
tuberculate ..... 19. *S. tibetica*
- 26b. Plants woolly or with long hairs.
- 28a. Plants densely white woolly; petals shorter than sepals; stamens 8; capsules ca.  $2 \times$   
as long as persistent sepals ..... 20. *S. lanata*
- 28b. Plants long filiform hairy; petals nearly as long as sepals; stamens 10; capsules  
shorter than persistent sepals ..... 21. *S. patens*
- 21b. All leaves or only leaves of lower stems petiolate.
- 29a. Cymes with few flowers or flower solitary and axillary; petals slightly longer than sepals,  
2-cleft to base or 2-lobed.
- 30a. Stems glabrous; petals apically 2-cleft only to  $1/3$ ; flowers of 2 types: lower axillary  
flowers  
lacking stamens (and petals) ..... 5. *S. wushanensis*
- 30b. Stems hairy; petals 2-lobed or 2-cleft to base; flowers uniform.
- 31a. Stems glandular hairy; leaves ovate or ovate-oblong, 2–8 cm.
- 32a. Capsule slightly longer than sepals; stem with 1 line of multicellular glandular  
hairs; sepals ovate-oblong to ovate-lanceolate, apex obtuse ..... 1. *S. bungeana*
- 32b. Capsule  $1.5\text{--}2 \times$  as long as sepals; stem sparsely glandular hairy; sepals  
lanceolate, apex acute ..... 2. *S. nemorum*
- 31b. Stem hairs not glandular; leaves ovate to rhombic, 0.5–1.5 cm.
- 33a. Stems with appressed hairs; leaves ovate, apex obtuse, base rounded, shortly petiolate  
or  
sessile; petals 2-cleft nearly to base ..... 3. *S. nepalensis*
- 33b. Stems sparsely stiffly hairy; leaves rhombic or triangular-ovate, apex acuminate, base  
rounded or nearly cordate; petals 2-lobed ..... 4. *S. arisanensis*
- 29b. Cymes usually with numerous flowers; petals shorter than or subequaling sepals,  
sometimes very  
small or absent.
- 34a. Plants with 1(or 2) lines of hairs on stems or basal margin of leaves and nodes, not pilose  
or stellate hairy.
- 35a. Petals absent or very small; stamens 3–5; seeds 0.7–0.8 mm in diam., with tiny  
protuberances ..... 8. *S. pallida*
- 35b. Petals present, shorter than or subequaling sepals; stamens 3–10; seeds ca. 1 mm or  
more in  
diam., with conic or semiglobose protuberances.
- 36a. Stems somewhat stout, 30–80 cm tall; petals subequaling sepals; stamens (6–)8–10;  
seeds ca. 1.5 mm in diam., with conic protuberances ..... 6. *S. neglecta*
- 36b. Stems slender, 10–30 cm tall; petals shorter than or subequaling sepals; stamens 3–5;  
seeds  
1–1.2 mm in diam., with semiglobose protuberances ..... 7. *S. media*
- 34b. Plants stellate hairy or pilose, rarely glabrous.
- 37a. Plants stellate hairy ..... 9. *S. vestita*

- 37b. Plants pilose or only petioles pilose, rarely glabrous.
- 38a. Leaves ovate to ovate-lanceolate, glabrous on both surfaces, sometimes reddish green 10. *S. chinensis*
- 38b. Leaves narrowly ovate to oblong-lanceolate, white hairy on both surfaces, rarely glabrous.
- 39a. Petals absent; leaves lanceolate to linear-lanceolate ..... 13. *S. lanipes*
- 39b. Petals present; leaves oblong-lanceolate to narrowly ovate.
- 40a. Leaves oblong-lanceolate, 2.5–4 cm; petals slightly shorter than sepals; stamens 10 ..... 11. *S. pilosoides*
- 40b. Leaves narrowly ovate, 1.5–2.5 cm; petals subequaling sepals; stamens 5 ... 12. *S. petiolaris*
- 19b. Sepals connate at base into obconic calyx; stamens perigynous.
- 41a. Flowers solitary, axillary or terminal; bracts herbaceous, without membranous margin; pedicels filiform, curved after anthesis; stems glabrous.
- 42a. Plants usually less than 5 cm tall; stamens subequaling petals ..... 26. *S. winkleri*
- 42b. Plants 5–14 cm; stamens shorter than petals ..... 27. *S. crassifolia*
- 41b. Flowers in cymes or umbels, rarely solitary; bracts all herbaceous or with membranous margin; pedicels not filiform; stems glabrous or not.
- 43a. Flowers in cymose umbels; petals absent or small.
- 44a. Petals small; inflorescence compact; stems less than 5 cm tall ..... 49. *S. irrigua*
- 44b. Petals absent; inflorescence loose; stems 5–20 cm tall.
- 45a. Stems pilose; leaves ovate-lanceolate to ovate ..... 50. *S. parviumbellata*
- 45b. Stems glabrous; leaves elliptic or linear to linear-lanceolate.
- 46a. Stems tufted; leaves linear to linear-lanceolate; stamens 5 ..... 52. *S. subumbellata*
- 46b. Stems solitary; leaves elliptic; stamens 10 ..... 51. *S. umbellata*
- 43b. Flowers in dichotomous cymes, rarely solitary; petals present (rarely absent), usually conspicuous.
- 47a. Leaves lanceolate to narrowly ovate, base semiclasping.
- 48a. Plants glabrous; leaves lanceolate.
- 49a. Leaf margin herbaceous; stamens 10 ..... 28. *S. discolor*
- 49b. Leaf margin cartilaginous, crisp; stamens 5(–10).
- 50a. Leaves (2–)5–20 mm; stamens 5(–10) ..... 33. *S. alsine*
- 50b. Leaves 30–60 mm; stamens 10 ..... 38. *S. salicifolia*
- 48b. Plants pubescent; leaves lanceolate to ovate-lanceolate.
- 51a. Leaves lanceolate or narrowly ovate, 4–12 mm, base narrowed; inflorescences with 1–3 flowers ..... 30. *S. pusilla*
- 51b. Leaves ovate-lanceolate, 3–10 mm; inflorescences with numerous flowers.
- 52a. Leaf apex acute; stems with retrorse hairs; petals slightly longer than sepals; pedicel 5–30 mm, longer than sepals ..... 31. *S. mainlingensis*
- 52b. Leaf apex obtuse; stems minutely pubescent; petals shorter than sepals (rarely absent); pedicel 3–4 mm, subequaling sepals ..... 32. *S. depressa*
- 47b. Leaves narrower, linear to linear-lanceolate; base semiclasping or not.
- 53a. Flower solitary; mature capsule black ..... 48. *S. soongorica*
- 53b. Inflorescences with numerous flowers; mature capsule yellow.
- 54a. Stems pubescent.
- 55a. Stems pubescent, hairs retrorse ..... 44. *S. alaschanica*
- 55b. Stem pubescence not retrorse.
- 56a. Stems not tufted.
- 57a. Stems minutely pubescent; leaves linear, sickle-shaped ..... 29. *S. gyangtseensis*
- 57b. Stems with 2 lines of hairs; leaves linear to linear-lanceolate, not sickle-shaped 34. *S. graminea*
- 56b. Stems tufted.
- 58a. Stems densely tufted, 5–15 cm tall, with one line of recurved hairs; petals ca. 2/3 as long as sepals ..... 46. *S. uda*
- 58b. Stems sparsely tufted, 20–30 cm tall, sparsely hairy; petals slightly shorter than or subequaling sepals ..... 47. *S. souliei*
- 54b. Stems glabrous or nearly so.
- 59a. Petals 1/2–2/3 as long as the sepals; leaves lanceolate, 1–2 cm ..... 35. *S. brachypetala*
- 59b. Petals slightly shorter than to 2 × as long as sepals; leaves linear to lanceolate.
- 60a. Abaxial midvein of leaf blade inconspicuous, not raised.

- 61a. Leaves oblong-lanceolate, ca. 1 cm, apex obtuse, margin glabrous; flowers 1 or 2; petals slightly longer than sepals ..... 41. *S. imbricata*
- 61b. Leaves linear to lanceolate, 0.5–7 cm, apex acute, margin usually ciliate; flowers numerous; petals slightly shorter to longer than sepals.
- 62a. Leaves 0.5–4 cm, margin ciliate at base; seeds black-brown, granulose .... 34. *S. graminea*
- 62b. Leaves 3–5(–7) cm, margin ciliate; seeds brown, sparsely tuberculate . 36. *S. yunnanensis*
- 60b. Abaxial midvein of leaf blade conspicuously raised.
- 63a. Stems rough; leaf margin finely papillate roughened, rarely sparsely ciliate.
- 64a. Sepals ca. 3 mm or less at anthesis, apex obtuse, veins inconspicuous; mature capsule black-brown; seeds smooth ..... 40. *S. longifolia*
- 64b. Sepals (4–)5 mm or more at anthesis, apex acuminate, veins conspicuous; mature capsule yellowish; seeds rugulose ..... 37. *S. palustris*
- 63b. Stems smooth; leaf margin often ciliate, especially near base of blade.
- 65a. Pedicels ca. 15 mm or less; sepals 6–7 mm; petals shorter than sepals .. 39. *S. dianthifolia*
- 65b. Pedicels ca. 14 mm or longer; sepals 4–5.5 mm; petals subequaling to 2 × as long as sepals.
- 66a. Seeds orbicular-reniform, tuberculate; petals 1.5–2 × as long as sepals . 42. *S. nipponica*
- 66b. Seeds ellipsoid, rugulose; petals subequaling to 1.5 × as long as sepals .. 43. *S. filicaulis*

**1. *Stellaria bungeana*** Fenzl var. ***stubendorffii*** (Regel) Y. C. Chu, Fl. Pl. Herb. Chin. Bor.-Orient. 3: 29. 1975.

林繁缕 lin fan lu

*Stellaria nemorum* Linnaeus var. *stubendorffii* Regel, Bull. Soc. Imp. Naturalistes Moscou 35(1): 270. 1862. Herbs perennial. Stems ascending or erect, 50–80 cm tall, simple or branched, with 1 line of multicellular hairs. Leaves ovate, ovate-oblong, or ovate-lanceolate, 4–8 × 2–3(–4) cm, both surfaces nearly glabrous, base nearly cordate, rounded, or cuneiform, margin with multicellular hairs, apex acuminate; proximal cauline leaves petiolate, distal leaves sessile. Flowers in terminal cymes; bracts ovate, herbaceous, ciliate. Pedicel 1–3 cm, densely glandular hairy. Sepals 5, narrowly ovate-oblong to ovate-lanceolate, 4–5 mm, with soft hairs, midvein inconspicuous, apex slightly obtuse-acute. Petals 5, slightly longer than sepals, 2-cleft nearly to base. Stamens 10, nearly as long as sepals. Styles 3. Capsule ovoid, slightly longer than persistent sepals, 6-valved. Seeds blackish brown, compressed reniform, ca. 1.2 mm in diam., densely tuberculate. Fl. Apr–Jun, fr. Jul–Aug.

Mixed woods, grassland slopes; ca. 1500 m. Jilin [Japan, Korea, Russia; Europe].

The typical variety differs from var. *stubendorffii* in its pubescent stems and flowers, ovate sepals, petals 1.5–2 × as long as sepals, and tuberculate seeds.

**2. *Stellaria nemorum*** Linnaeus, Sp. Pl. 1: 421. 1753.

腺毛繁缕 xian mao fan lu

*Stellaria nemorum* var. *bracteata* Fenzl; *S. diversiflora* Maximowicz var. *gymnandra* Franchet; *S. nemorum* var. *subbracteata* Fenzl.

Herbs annual, sparsely glandular pubescent. Stems 45–50 cm tall, diffuse and decumbent, quadrangular, sparsely branched at base. Basal leaves petiolate, ovate, small; middle cauline leaves with petiole 2–4 cm; leaf blade oblong-ovate, 2–4 × 2–3(–4) cm, both surfaces sparsely pubescent, base cordate, apex acuminate; distal leaves shortly petiolate, small, sessile to semiclapping. Flowers in terminal, sparse cymes; bracts ovate, herbaceous. Pedicel 2–3 cm, slender, with white soft hairs. Sepals 5, lanceolate, 5–8 mm, outside sparsely pubescent, apex acute. Petals slightly longer than sepals, 2-cleft nearly to base. Stamens 10, slightly shorter than sepals. Styles 3, linear. Capsules ovoid, 1.5–2 × as long as persistent sepals. Seeds numerous, brown, suborbicular, ca. 1 mm in diam., tuberculate. Fl. May–Jun, fr. Jun–Jul.  $2n = 26$ .

Grassland slopes; 2100–2700 m. Gansu, Shanxi [Japan, Mongolia, Russia; Europe].

**3. *Stellaria nepalensis*** Majumdar & Vartak, J. Indian Bot. Soc. 50: 215. 1971.

尼泊尔繁缕 ni po er fan lu

*Stellaria neotomentosa* Mizushima ex H. Ohba.

Herbs perennial. Stems prostrate, tufted, 10–30 cm; branchlets nearly claviform or triangular, sparsely white appressed hairy (hairs 0.4–0.7 mm). Leaves shortly petiolate or sessile; leaf blade broadly ovate or ovate, 0.5–1.5 × 0.4–1.3 cm, abaxially sparsely adpressed hairy, midvein conspicuous, adaxially glabrous, base cordate, margin ciliate, apex acute. Flowers 1–3 in axillary cymes; bracts lanceolate or ovate-lanceolate, 3–4 × 0.5–1 mm, herbaceous. Pedicel 1.5–5 cm, pubescent, subglabrous in fruit. Sepals 5, lanceolate, 5–7 × 1–1.5 mm, veins 1–3, outside glabrous, base rounded, margin membranous, apex acute. Petals 5, slightly longer than sepals, 2-cleft nearly to base; lobes

lanceolate. Stamens 10; filaments subulate; anthers purplish; disc lobed, ringlike, with glands. Styles 3, ca. 3 mm, filiform, glabrous. Capsules ovoid, 7–8 mm, 6-valved. Seeds numerous, brown, compressed, ca. 1.2 mm wide, conspicuously tuberculate. Fl. Jun–Jul, fr. Jul–Aug.

*Picea* forests, mixed coniferous and broadleaf forests; 2500–3100 m. Xizang [Bhutan, India, Nepal].

**4. *Stellaria arisanensis*** (Hayata) Hayata, Icon. Pl. Formosan. 3: 40. 1913.

阿里山繁缕 a li shan fan lu

*Cerastium arisanense* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 35. 1911; *Stellaria arisanensis* var. *leptophylla* Hayata; *S. diversiflora* Maximowicz var. *leptophylla* (Hayata) Mizushima.

Herbs perennial, sparsely hirsute. Stems diffuse, 20–60 cm tall, slender. Leaves with petiole compressed, 4–6 mm; leaf blade broadly rhombic to triangular-ovate, 5–7 × 5–8 mm, abaxially glabrous, adaxially pubescent, midvein hirsute, base broadly cuneiform or nearly rounded, margin ciliate, apex acuminate. Flower solitary, axillary. Pedicel 6–8 mm, hirsute. Sepals 5, lanceolate, 6–8 × 2–3 mm, with scales, outside sparsely hirsute. Petals 5, obovate-spatulate, 1.2–1.4 cm × 4–6 mm, apex 2-lobed. Stamens 10. Ovary ovoid, 2–3 mm, apex truncate; styles 3. Capsule globose. Seeds oblong.  $2n = 20^*$ .

• 1800–2400 m. Taiwan.

**5. *Stellaria wushanensis*** F. N. Williams, J. Linn. Soc., Bot. 34: 434. 1899.

巫山繁缕 wu shan fan lu

*Stellaria wushanensis* var. *trientaloides* Handel-Mazzetti.

Herbs annual. Stems sparsely tufted, slightly diffuse at base, erect above, 10–20 cm tall, multibranching, glabrous. Leaves with petiole 1–2 cm; leaf blade ovate-cordate to ovate, 2–3.5 × 1.5–2 cm, abaxially greenish, both surfaces glabrous or adaxially sparsely hirsute, midvein protuberant, base cordate or narrowed into long petiole, asymmetric, margin glabrous or ciliate, apex acute. Flowers several, usually 1–3 in terminal or axillary cymes; bracts herbaceous. Pedicel 2–6 cm, 4–10 × as long as sepals, glabrous or sparsely pubescent. Sepals 5, lanceolate, 5.5–6 mm, 1-veined, margin membranous, apex acute. Petals 5, obcordate, ca. 8 mm, apex 2-cleft to 1/3 of sepals. Stamens (7–) 10, shorter than petals. Styles (2 or)3(or 4). Axillary flower at middle or proximal parts of inflorescences female; stamens absent or sometimes both petals and stamens absent; styles 2. Capsule ovoid, subequaling persistent sepals. Seeds 3–5, brown, orbicular-reniform, tuberculate. Fl. Apr–Jun, fr. Jun–Jul.

• Mountains, hills; 1000–2000(–2500) m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

**6. *Stellaria neglecta*** Weihe in Bluff & Fingerhuth, Comp. Fl. German. 1: 560. 1825.

鸡肠繁缕 ji chang fan lu

?*Stellaria diversiflora* Maximowicz var. *gymnandra* Franchet; *S. media* (Linnaeus) Villars var. *decandra* Fenzl; *S. media* Villars var. *procera* Klatt & Richter; *S. octandra* Pobedimova.

Herbs annual or biennial, pale green. Stems tufted, 30–80 cm tall, with 1 line of hairs. Leaves shortly petiolate or sessile, ovate or narrowly ovate, (1.5–)2–3 × 0.5–1.3 cm, base cuneate, somewhat clasping, apex acute, basal leaf margin and stems between 2 basal leaves long hairy. Flowers terminal in dichotomous cymes; bracts lanceolate, herbaceous, glandular pubescent. Pedicel 1–1.5 cm, slender, with a line of dense soft hairs, nodding after anthesis. Sepals 5, ovate-elliptic to lanceolate, 3–4(–5) mm, outside densely pubescent with multicellular glandular hairs, margin membranous, apex acute, inflexed. Petals 5, nearly as long as or slightly longer than sepals, 2-cleft nearly to base. Stamens (6–)8–10, slightly longer than petals. Styles 3. Capsule ovoid, longer than persistent sepals, 6-valved; valves revolute. Seeds numerous, brown, nearly compressed orbicular, ca. 1.5 mm in diam., with sparse conical papillae. Fl. Apr–Jun, fr. Jun–Aug.  $2n = 22$ .

Mixed forests; 900–1200 m. Guizhou, Heilongjiang, Jiangsu, Nei Mongol, Qinghai, Shaanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Afghanistan, Japan, Kazakhstan, Nepal, Russia; N Africa, SW Asia, S Europe].

**7. *Stellaria media*** (Linnaeus) Villars, Hist. Pl. Dauphiné 3: 615. 1789.

繁缕 fan lu

Herbs annual, biennial, or perennial. Stems decumbent or ascending, pale purplish, 10–30 cm tall, sparsely branched at base, with 1(or 2) lines of hairs. Basal leaves long petiolate, distal leaves sessile or shortly petiolate; leaf blade broadly ovate to ovate-orbicular, 0.8–2.5 × (0.5–)1–1.5 cm, base narrowed or cordate, apex acuminate or acute. Flowers in sparse terminal or axillary cymes. Pedicel 0.7–1.4 cm, elongate and nodding after anthesis, slender, with 1 line of hairs. Sepals 5, ovate-lanceolate or ovate-oblong, ca. 2–2.5 or 4 mm, outside glandular pubescent, margin broadly membranous, apex slightly obtuse or nearly rounded. Petals oblong, shorter than or subequaling sepals, 2-cleft nearly to base; lobes nearly linear. Stamens 3–5, shorter than petals. Styles 3, linear. Capsule ovoid, slightly longer than persistent sepals, 6-valved. Seeds numerous, red-brown, ovoid to compressed globose, 1–1.2 mm in diam., semiglobose-tuberculate or curved reticulate. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 40, 42, 44$ . Fields. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Korea, Pakistan, Russia, Sikkim; Europe].



- 1a. Herbs annual or biennial; leaves 1.5–2.5 cm; sepals ca. 4 mm; petals shorter than sepals ..... 7a. var. *media*  
 1b. Herbs perennial; leaves 0.8–1 cm; sepals 2–2.5 mm; petals subequalling sepals 7b. var. *micrantha*

**7a. *Stellaria media* var. *media***

繁缕(原变种) fan lu (yuan bian zhong)

*Alsine media* Linnaeus, Sp. Pl. 1: 272. 1753; *Stellaria monogyna* D. Don.

Herbs annual or biennial. Stems 10–30 cm tall. Basal leaves long petiolate, distal leaves sessile or shortly petiolate; leaf blade ovate, 1.5–2.5 × 1–1.5 cm, apex acuminate. Stamens 3–5, shorter than petals. Styles 3, linear. Capsule ovoid, slightly longer than persistent sepals, 6-valved. Seeds numerous, red-brown, ovoid to suborbicular, slightly compressed, 1–1.2 mm in diam., semiglobose-tuberculate. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 40, 42, 44$ .

Fields. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Korea, Pakistan, Russia, Sikkim; Europe].

**7b. *Stellaria media* var. *micrantha*** (Hayata) T. S. Liu & S. S. Ying, Fl. Taiwan 2: 350. 1976.

小花繁缕 xiao hua fan lu

*Stellaria micrantha* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30: 36. 1911.

Herbs perennial. Stems decumbent, ascending above, 10–25 cm tall. Leaves sessile, broadly ovate-orbicular, 0.8–1 cm × 5–7 mm, base narrowed, somewhat clasping, apex acute, aristate. Flowers terminal or in axillary cymes. Pedicel usually opposite; bracts ovate-orbicular, very small, 1–1.5 mm. Sepals 5, ovate-oblong, 2–2.5 mm, apex acute. Petals 5, subequalling sepals, 2-cleft nearly to base. Stamens 5. Styles 3, short. Capsule ovoid, 6-valved. Seeds compressed globose, curved reticulate, apex with short rostellum, reflexed.

• Taiwan.

**8. *Stellaria pallida*** (Dumortier) Crépin, Man. Fl. Belgique, ed. 2, 19. 1866.

无瓣繁缕 wu ban fan lu

*Alsine pallida* Dumortier, Fl. Belg. 109. 1827.

Herbs annual or biennial. Stems usually decumbent, sometimes ascending, basal branches with 1 line of villous nonglandular hairs. Middle and distal leaves sessile, proximal leaves long petiolate; leaf blade suborbicular, small, 5–8(–15) mm, both surfaces glabrous, base cuneate, apex acute. Flowers in terminal dichotomous cymes. Pedicel slender. Sepals lanceolate, rarely ovate-lanceolate, 3–4 mm, ± densely pubescent,

rarely glabrous, apex acute. Petals absent or minute. Stamens 3–5, rarely absent. Styles very short. Seeds pale red-brown, minute, 0.7–0.8 mm in diam., minutely tuberculate, margin shallowly serrate or smooth.  $2n = 22$ .

Fields. Jiangsu, Xinjiang [Asia, Europe].

Chinese records of *Stellaria apetala* Ucria (e.g., in FRPS) are almost certainly referable to *S. pallida*.

**9. *Stellaria vestita*** Kurz, J. Bot. 11: 194. 1873.

箐姑草 qing gu cao

Herbs perennial, stellate hairy. Stems sparsely tufted, diffuse or decumbent, 30–60(–90) cm tall, basally branched, apically densely stellate hairy. Leaves ovate or elliptic to oblong-lanceolate, 1–10 × 0.8–3 cm, both surfaces stellate hairy, midvein conspicuous abaxially, base rounded or clasping, rarely narrowed into short petiole, apex acute or acuminate. Flowers in sparse cymes; peduncles long, densely stellate pubescent; bracts ovate-lanceolate, herbaceous, margin membranous. Pedicel unequal, 1–3 cm, slender, densely stellate hairy. Sepals 5, gray-green, lanceolate, 4–6 mm, outside stellate pubescent, 3-veined, margin membranous, apex acute. Petals 5, shorter than or sub-equalling sepals, 2-cleft nearly to base; lobes linear. Stamens 10, shorter than or nearly as long as petals. Styles 3(or 4). Capsules ovoid, 4–5 mm, 6-valved. Seeds numerous, reniform, compressed, ca. 1.5 mm, ridges tuberculate. Fl. Apr–Jun, fr. Jun–Aug.  $2n = 24, 26, 28$ .

Stony places, grassland slopes, forests; 600–3600 m. Fujian, Gansu, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Myanmar, Nepal, New Guinea, Philippines, Sikkim, Vietnam].

- 1a. Plants 30–60(–90) cm tall; leaves ovate or elliptic ..... 9a. var. *vestita*  
 1b. Plants ca. 100 cm tall; leaves oblong-lanceolate or ovate-lanceolate ..... 9b. var. *amplexicaulis*

**9a. *Stellaria vestita* var. *vestita***

箐姑草(原变种) qing gu cao (yuan bian zhong)

*Stellaria hamiltoniana* Majumdar; *S. laxa* Merrill; *S. pseudosaxatilis* Handel-Mazzetti; *S. saxatilis* Buchanan-Hamilton ex D. Don (1825), not Scopoli (1772); *S. saxatilis* f. *petiolata* Mizushima; *S. stellatopilosa* Hayata.

Stems 30–60(–90) cm tall. Leaves ovate or elliptic, 1–3.5 × 0.8–2 cm, both surfaces stellate hairy, midvein conspicuous abaxially, base rounded, rarely narrowed into a short petiole, apex acute, rarely acuminate.

Stony places, grassland slopes, forests; 600–3600 m. Fujian, Gansu, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan,

India, Indonesia, Myanmar, Nepal, New Guinea, Philippines, Sikkim, Vietnam].

**9b. *Stellaria vestita* var. *amplexicaulis*** (Handel-Mazzetti) C. Y. Wu, Index Fl. Yunnan. 1: 263. 1984.

抱茎箐姑草 bao jing qing gu cao

*Stellaria saxatilis* Buchanan-Hamilton ex D. Don var. *amplexicaulis* Handel-Mazzetti, Symb. Sin. 7: 190. 1929.

Stems ca. 100 cm tall. Leaves oblong-lanceolate or ovate-lanceolate, 5–10 × 1–3 cm, base clasping, apex acuminate.

• Slopes; 1900–3200 m. Sichuan, Yunnan.

**10. *Stellaria chinensis*** Regel, Bull. Soc. Imp. Naturalistes Moscou 35: 283. 1862.

中国繁缕 zhong guo fan lu

*Stellaria hassiana* Loesener.

Herbs perennial. Stems diffuse or decumbent, quadrangular, 30–100 cm tall, slender, glabrous. Leaves shortly petiolate or sessile; petiole villous; leaf blade ovate to ovate-lanceolate, 3–4 × 1–1.6 cm, both surfaces glabrous, midvein conspicuous abaxially, base broadly cuneate or nearly rounded, apex acuminate. Flowers in sparse cymes; peduncles slender; bracts membranous. Pedicel ca. 1 cm or longer, slender. Sepals 5, lanceolate, 3–4 mm, margin membranous, apex acuminate. Petals 5, nearly as long as sepals, 2-cleft nearly to base. Stamens 10, slightly shorter than petals. Styles 3. Capsule ovoid, slightly longer than or subequaling persistent sepals, 6-valved. Seeds brown, ovoid, slightly compressed, papillate. Fl. May–Jun, fr. Jul–Aug.

• Scrub, *Abies* forests, wetlands; (160–)500–1300(–2500) m. Anhui, Fujian, Gansu, Guangxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, Sichuan, Zhejiang.

**11. *Stellaria pilosoides*** Shi L. Chen et al., Novon 11: 302. 2001.

长毛箐姑草 chang mao qing gu cao

*Stellaria pilosa* Franchet, Pl. Delavay. 99. 1889, not Dulac (1867).

Herbs annual, grayish white villous. Stems sparsely tufted, diffuse, decumbent or ascending, 20–30 cm tall, apically branched, villous. Basal leaves smaller, middle and distal ones larger. Leaves oblong-lanceolate, 2.5–4 cm × 3–10 mm, both surfaces villous, rarely glabrous, base narrowed into short petiole or sessile, apex acute or acuminate. Flowers numerous in sparse cymes; bracts lanceolate, 2–3 mm, densely villous. Pedicel 1–4 cm, slender, densely villous. Sepals 5, lanceolate, 5–6 × ca. 1 mm, margin narrowly membranous, apex long acuminate. Petals 5, slightly shorter than sepals, 2-cleft nearly to base. Stamens 10, nearly as long as petals; filaments linear; anthers yellow-brown, ellipsoid. Styles 3, linear. Capsule oblong-ovoid, nearly as long as persistent sepals, 6-valved. Seeds brown, compressed orbicular, tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

• Forest margins, grasslands; 2200–2800(–3700) m. Sichuan, Yunnan.

**12. *Stellaria petiolaris*** Handel-Mazzetti, Oesterr. Bot. Z. 89: 57. 1940.

细柄繁缕 xi bing fan lu

*Stellaria capillipes* (Franchet) C. Y. Wu; *S. pilosa* Franchet var. *capillipes* (Franchet) Handel-Mazzetti; *S. saxatilis* Buchanan-Hamilton ex D. Don var. *capillipes* Franchet.

Herbs perennial. Stems numerous, tufted, decumbent or ascending, ca. 20 cm; branches quadrangular, slender, white villous. Distal several leaves slightly denser than middle ones. Leaves narrowly ovate, 1.5–2.5 cm × 5–13 mm, abaxially paler than adaxially, veins prominent, base slightly rounded and narrowed, apex acuminate. Flowers numerous (to 13) in sparsely dichotomous cymes; peduncles long; proximal bracts herbaceous, other bracts membranous. Pedicel long, 1.5–2.5 cm, slender, declinate. Sepals 5, lanceolate, ca. 5 mm, glabrous or long hairy at anthesis, veins 3, margin narrowly membranous, apex acute. Petals 5, subequaling sepals, 2-cleft nearly to base; lobes narrowly linear. Stamens 5, nearly as long as petals; filaments filiform. Styles 3, subequaling filaments. Capsule ca. 1/2 as long as persistent sepals, 3-valved. Seeds rarely formed, tuberculate.

• *Picea* and *Quercus* forests, scrublands; 1800–2700(–3700) m. Sichuan, Xizang, Yunnan.

**13. *Stellaria lanipes*** C. Y. Wu & H. Chuang in C. Y. Wu et al., Fl. Yunnan. 6: 836. 1995.

绵柄繁缕 mian bing fan lu

Herbs diffuse. Stems 15–25 cm tall, slender, branched, shiny, glabrous; nodes densely white lanate. Leaves sessile or proximal leaves very shortly petiolate, narrowly lanceolate or linear-lanceolate, rarely lanceolate, 0.6–2 cm × 2–5 mm, dark, abaxially white lanate at midvein, adaxially glabrous, both surfaces with prominent midvein, base narrowed or rounded, apex acuminate or acute. Flowers in terminal cymes; bracts linear-lanceolate, smaller than leaves, herbaceous. Pedicel 0.7–1(–2.5) cm, slender, white lanate, hairs dense distally. Sepals 5, lanceolate, 2.5–3 mm, glabrous, veins very slender and inconspicuous, margin membranous, apex acute. Petals absent. Stamens 10, slightly shorter than petals; anthers suborbicular, small; filaments subulate. Ovary ovoid, ca. 1 mm; styles 3, subequaling ovary. Capsule narrowly ovoid, 3–4 mm. Seeds red-brown, globose, compressed, ca. 0.5 mm in diam., nearly smooth. Fl. Jun, fr. Jun.

• Wet valleys; ca. 3500 m. Yunnan.

**14. *Stellaria omeiensis*** C. Y. Wu & Y. W. Tsui ex P. Ke, Acta Bot. Yunnan. 7: 72. 1985.

峨眉繁缕 e mei fan lu

Herbs annual. Stem solitary, quadrangular, 20–30 cm tall, apically branched, pilose. Leaves ovate, orbicular-ovate, or ovate-lanceolate, 1.5–2.5(–4.5) × 0.8–1.2(–1.5) cm, abaxially sparsely hairy, adaxially glabrous, midvein conspicuously protuberant, densely hairy, base rounded, sessile, margin ciliate, apex acuminate. Flowers numerous, in terminal, sparse cymes; bracts ovate, membranous. Pedicel 1–2 cm, subglabrous. Sepals 5, lanceolate, 2–2.5 mm, midvein conspicuous, margin membranous, apex acuminate. Petals 5, shorter than sepals, 2-cleft nearly to base. Stamens 10, shorter than petals. Styles 3. Capsule oblong-ovoid, ca. 1.5 × as long as persistent sepals, 6-valved. Seeds brown-purplish, compressed globose, inconspicuously tuberculate. Fl. Apr–Jul, fr. Jun–Aug.

• Forests, grasslands; (1200–)1500–2900 m. Guizhou, Hubei, Sichuan, Yunnan.

**15. *Stellaria reticulivena*** Hayata, Icon. Pl. Formosan. 7: 1. 1918.

网脉繁缕 wang mai fan lu

Herbs annual. Stems decumbent or ascending, quadrangular, 20–30 cm tall, pilose, nodes densely pilose. Leaves sessile, orbicular-ovate, 1.5–2.5 × 0.8–1.2 cm, base rounded, apex long acuminate. Basal leaves petiolate, withered at anthesis, abaxially midvein prominent, hairy, reticulate veins conspicuous, adaxially midvein impressed, margin shortly ciliate. Flowers in terminal cymes; peduncles 4–6 cm, glabrous; bracts ovate, 1–1.5 mm, membranous. Pedicel 1–2 cm, slender. Sepals 5, ovate-lanceolate, ca. 2.5 × 1 mm, glabrous, midvein conspicuous, margin membranous, apex acuminate. Petals 5, ca. 2 × 0.3 mm, 2-cleft nearly to base; lobes narrowly linear, narrowed at base, apex obtuse. Stamens 10; filaments linear, ca. 2 mm; anthers subglobose. Ovary ovoid-orbicular; styles 3, ca. 0.5 mm. Capsule ovoid, ca. 3 mm, 6-valved to middle. Seeds brown, oblong, ca. 0.6 mm, inconspicuously muriculate. Fl. May–Jul, fr. Jul–Aug.

1800–2800 m. Taiwan, Zhejiang [Bhutan, Sikkim].

**16. *Stellaria infracta*** Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 72. 1889.

内弯繁缕 nei wan fan lu

*Arenaria velutina* Pax & K. Hoffmann; *Stellaria dichasioides* F. N. Williams; *S. infracta* Maximowicz var. *ovatolanceolata* Mattfeld; *S. nutans* F. N. Williams. Herbs perennial, densely grayish white stellate hairy. Stems diffuse, decumbent or ascending, rooting at nodes basally, 15–35(–50) cm, branched, stellate hairy. Leaves lanceolate or linear-lanceolate, rarely narrowly ovate, 1.5–3(–5) cm × 3–5(–9) mm, gray-green, both surfaces stellate hairy, midvein raised abaxially, base clasping, apex acute. Flowers numerous, in terminal dichotomous cymes, stellate hairy; bracts herbaceous, stellate hairy. Pedicel 0.3–1.5 cm, slender. Sepals 5, gray-green, linear-lanceolate, 3–4 × ca. 1.5 mm, stellate

hairy, margin membranous, apex acute. Petals 5, slightly shorter than sepals, 2-cleft nearly to base; lobes narrowly linear. Stamens 10, slightly shorter than petals. Styles 3. Capsules ovoid, ca. 4 mm, slightly longer than persistent sepals, 6-valved. Seeds brown, reniform, ca. 0.8 mm, with protuberances. Fl. Jun–Jul, fr. Aug–Sep.

• Grasslands; 800–2500(–3200) m. Gansu, Hebei, Henan, Nei Mongol, Shaanxi, Shanxi, Sichuan.

**17. *Stellaria gyirongensis*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 700. 1983.

吉隆繁缕 ji long fan lu

Stems 15–30 cm tall, slender, shiny, glabrous. Leaves sessile or shortly petiolate, pale green, ovate, 1–2.5 × 0.5–1.5 cm, midvein raised, base rounded, apex acute. Flowers numerous, terminal; bracts lanceolate, 5–10 mm, membranous. Pedicel green, 1–3.5 cm, slender, shiny. Sepals 5, lanceolate, 3–5 mm, membranous, 1-veined, base broad, apex long acuminate. Petals 5, subequaling sepals, 2-cleft nearly to base. Stamens shorter than petals; anthers yellow. Ovary ovoid; styles 3, narrowly linear.

• Mixed forests; ca. 2500 m. Xizang.

**18. *Stellaria zangnanensis*** L. H. Zhou, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 56. 1980.

藏南繁缕 zang nan fan lu

Stems yellow, 10–30 cm tall, glandular hairy. Leaves sessile, ovate, 0.5–1.5 cm × 3–7 mm, both surfaces glandular pubescent, base rounded, margin ciliate, apex acute. Flowers numerous, in terminal cymes; bracts ovate-lanceolate, 5–10 × 2–3 mm, both surfaces glandular pubescent, base rounded, apex acuminate. Pedicel 0.5–1.5 cm, densely glandular pubescent. Sepals 5, lanceolate, 3–4 × ca. 1 mm, outside glandular pubescent, base broad, margin membranous, apex acuminate. Petals 5, 2–3 mm, 2-cleft nearly to base; lobes linear. Stamens 8, subequaling petals. Styles 3, linear. Capsules narrowly ovoid, 3–4 × ca. 1 mm, subequaling or slightly longer than persistent sepals. Seeds brown, orbicular-reniform, rugulose. Fl. May–Jul, fr. Jul–Aug.

• Grassy valleys; (1900–)2300–2700 m. Xizang, Yunnan.

**19. *Stellaria tibetica*** Kurz, Flora 55: 285. 1872.

西藏繁缕 xi zang fan lu

Herbs annual, densely glandular pubescent. Stems ascending, 7–13 cm tall, somewhat stout, base glabrous. Leaves sessile, oblong-ovate, 1.2–1.8 cm, veins inconspicuous, apex obtuse or acute. Flowers few, axillary or in terminal cymes, ca. 8 mm in diam.; bracts herbaceous. Pedicel shorter to longer than flowers. Sepals 5, elliptic, margin membranous, apex acute. Petals 5, longer or shorter than sepals, 2-cleft to middle. Styles 3, slender. Capsule broadly ovoid, slightly shorter than persistent sepals, 6-valved. Seeds brown, tuberculate.

- Rocky crevices; 3600–5500 m. Xizang.

**20. *Stellaria lanata*** J. D. Hooker, Fl. Brit. India 1: 232. 1874.

绵毛繁缕 mian mao fan lu

Herbs perennial, densely white woolly. Stems sparsely tufted, ascending, 25–30 cm tall, slender, branched, woolly. Leaves sessile, narrowly lanceolate to linear, 1–3 cm × 2–5 mm, midvein conspicuous, abaxially white woolly, adaxially gray green, sparsely hairy or glabrous, base rounded or cuneate, apex acute. Flowers few, in terminal cymes. Pedicel erect in fruit, longer than leaves, white woolly. Sepals 5, ovate-lanceolate, 5–7 mm, outside lanate, margin membranous, apex acute. Petals 5, shorter than sepals, 2-cleft nearly to base; lobes linear. Stamens 8, shorter than petals. Styles 3. Capsule narrowly ovoid, ca. 2 × as long as persistent sepals, 6-valved. Seeds brown, reniform, granulose. Fl. Jun–Jul, fr. Aug–Sep.

Forests, grasslands, stony banks; 2700–3800(–4100) m. Xizang [Bhutan, India, Nepal, Sikkim].

**21. *Stellaria patens*** D. Don, Prodr. Fl. Nepal. 215. 1825.

白毛繁缕 bai mao fan lu

*Stellaria fenzliana* Klotzsch; *S. longissima* Wallich ex Edgeworth & J. D. Hooker; *S. mollis* Klotzsch.

Herbs diffuse, with long, white filiform hairs. Stems yellow, 10–40 cm, slender, shiny, with long filiform hairs, basally glabrous. Leaves sessile, linear or linear-lanceolate, 1–2.5 cm × 2–5 mm, midvein conspicuously raised, both surfaces with long filiform hairs, base broadly cuneate, apex acute or acuminate. Flowers few to numerous, in dichotomous cymes; bracts ovate-lanceolate, 4–5 mm, with long filiform hairs, margin broadly membranous, apex acute. Pedicel 5–10 mm, with dense long filiform hairs. Sepals 5, ovate-lanceolate or lanceolate, 5–7 × 1–1.5 mm, outside with white filiform hairs, 3-veined, margin narrowly membranous, apex acute. Petals 5, shorter than or subequaling sepals, 2-cleft to base; lobes narrowly ovate. Stamens 10, subequaling petals. Ovary ovoid-orbicular; styles 3, linear, ca. 2 mm. Capsules yellow, narrowly ovoid, shorter than persistent sepals, 6-valved. Seeds brown, reniform to suborbicular, granulose.  $2n = 26$ .

Forests, forest margins; 2200–2800(–3600) m. Xizang [Bhutan, India, Kashmir, Nepal, Sikkim].

**22. *Stellaria dichotoma*** Linnaeus, Sp. Pl. 1: 421. 1753.

叉歧繁缕 cha qi fan lu

Herbs perennial, compressed globose, glandular hairy. Stems tufted, terete, 15–30(–60) cm tall, with numerous dichotomous branches, glandular hairy or pubescent, sometimes with 1 line of hairs. Leaves ovate or ovate-lanceolate, 0.5–2.5 cm × 1–10 mm, both surfaces glandular hairy or pubescent, base rounded or subcordate, somewhat clasping, apex acute or acu-

minate, rarely glabrous. Flowers numerous, in terminal cymes. Pedicel 1–2 cm, slender, pubescent. Sepals 5, lanceolate, 4–5 mm, midvein conspicuous, glandular hairy or pubescent, rarely glabrous outside, margin membranous, apex acuminate. Petals 5, oblanceolate, ca. 4 mm, subequaling sepals, 2-cleft nearly to 1/3 or 1/2; lobes sublinear. Stamens 10, 1/3–1/2 as long as petals. Ovary ovoid or broadly elliptic-oblanceolate; styles 3, linear. Capsule broadly ovoid, ca. 3 mm, shorter than persistent sepals, 6-valved. Seeds 1–5, brown-black, ovoid-orbicular, slightly compressed, tuberculate. Fl. May–Jul, fr. Jul–Aug.  $2n = 28$ .

Slopes, stony and sandy hills and steppes; 200–3100 m. Gansu, Hebei, Heilongjiang, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang [Mongolia, Russia].

1a. Leaves linear, 0.5–2 cm × 1–2 mm 22c. var. *linearis*

1b. Leaves ovate or lanceolate, 0.5–2.5 cm × 1.5–10 mm.

2a. Leaves ovate or ovate-lanceolate, 0.5–2 cm × 3–10 mm ..... 22a. var. *dichotoma*

2b. Leaves linear-lanceolate or oblong-lanceolate, 0.5–2.5 cm × 1.5–5 mm ..... 22b. var. *lanceolata*

**22a. *Stellaria dichotoma* var. *dichotoma***

叉歧繁缕(原变种) cha qi fan lu (yuan bian zhong)

*Stellaria dichotoma* var. *cordifolia* Bunge.

Herbs perennial, compressed globose, glandular hairy. Stems 15–30(–60) cm tall. Leaves ovate or ovate-lanceolate, 0.5–2 cm × 3–10 mm. Capsule broadly ovoid, ca. 3 mm, shorter than persistent sepals, 6-valved. Seeds 1–5, brown-black, ovoid-orbicular, slightly compressed, tuberculate. Fl. May–Jun, fr. Jul–Aug. Slopes, stony and sandy hills; 200–800 m. Gansu, Hebei, Heilongjiang, Liaoning, Nei Mongol, Qinghai, Xinjiang [Mongolia, Russia (Siberia)].

**22b. *Stellaria dichotoma* var. *lanceolata*** Bunge, Verz. Altai Pfl. 34. 1836.

银柴胡 yin chai hu

*Stellaria dichotoma* var. *heterophylla* Fenzl; *S.*

*dichotoma* var. *stephaniana* (Willdenow ex

Schlechtendal) Regel; *S. gypsophiloides* Fenzl; *S.*

*gypsophiloides* var. *lanceolata* (Bunge) Kozhevnikov; *S. stephaniana* Willdenow ex Schlechtendal.

Leaves linear-lanceolate, lanceolate, or oblong-lanceolate, 0.5–2.5 cm × 1.5–5 mm, apex acuminate.

Seed 1. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 28$ .

Stony slopes, stony steppes; 1300–3100 m. Gansu, Liaoning, Nei Mongol, Ningxia, Shaanxi [Mongolia, Russia].

**22c. *Stellaria dichotoma* var. *linearis*** Fenzl in Ledebour, Fl. Ross. 1: 38. 1842.

线叶繁缕 xian ye fan lu

Stems and pedicels with 1 line of short hairs. Leaves linear, 0.5–2 cm × 1–2 mm, glabrous. Sepals oblong, ca. 3 mm, outside glabrous.

• Sandy steppes, slopes; 500–1700 m. Nei Mongol, Shaanxi.

**23. *Stellaria amblyosepala*** Schrenk, Enum. Pl. Nov. 2: 54. 1842.

钝萼繁缕 *dun e fan lu*

*Stellaria dichotoma* Linnaeus var. *rigida* Bunge; *S. potaninii* Krylov.

Herbs perennial, glandular pubescent. Stems tufted, diffuse, quadrangular, 15–30 cm. Leaves sessile, linear to linear-lanceolate, 1–3.5 cm × 1.5–5 mm, both surfaces subglabrous, base narrowed, apex acute. Flowers terminal in few branched dichotomous cymes. Pedicel 1.5–2.5 cm, slender, glandular pubescent. Sepals 5, oblong, 3.5–4 × 1.5–2 mm, outside sparsely glandular pubescent, midvein conspicuous, margin broadly membranous, apex rounded-obtuse. Petals 5, slightly shorter than or subequaling sepals, 2-lobed; lobes oblong-ovate, apex obtuse. Stamens 10, subequaling petals. Styles 3, linear. Capsule ovoid, shorter than persistent sepals, 6-valved. Seeds black-brown, orbicular-ovoid, somewhat compressed, ca. 1.5 mm in diam., tuberculate. Fl. May–Jul.

Stony slopes, stony areas, forests; 500–1800 m. Gansu, Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia].

24. *Stellaria henryi* F. N. Williams, J. Linn. Soc., Bot. 34: 434. 1899.

湖北繁缕 *hu bei fan lu*

Herbs annual. Stem solitary, nearly erect, 15–30 cm tall, slender, apically branched, glabrous or sparsely pubescent. Leaves with petiole short, ca. 2 mm; leaf blade linear-lanceolate, 1–2 cm × 3–5 mm, both surfaces glabrous, 1-veined, base broadly cuneate, margin sometimes slightly undulate, apex acuminate. Flowers axillary, solitary or in cymes. Pedicel 1–2.5 cm. Sepals 5, lanceolate, sometimes with sparse, purplish stiff hairs. Petals 5, ca. 1.5 × as long as sepals, 2-cleft nearly to base. Stamens 5; filaments slender. Ovary ellipsoid; styles 3, shortly linear, slightly shorter than ovary. Capsule globose, 6-valved. Fl. Apr–May, fr. Jun–Sep.

• Slopes. Hubei, Sichuan.

25. *Stellaria ebracteata* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 18: 441. 1901.

无苞繁缕 *wu bao fan lu*

Herbs perennial. Stems solitary, ascending or erect, 15–20 cm tall, simple, narrowly striate, pubescent. Leaves sessile or shortly petiolate, ovate-lanceolate or lanceolate, 2–3 cm × 4–10 mm, abaxially and marginally glabrous or sparsely hairy, apex acute. Flowers solitary, rarely 2, terminal, ca. 8 mm in diam.; bracts absent. Pedicel 2–3 cm, pubescent. Sepals ovate-lanceolate, margin membranous, ciliate, apex acuminate. Petals oblong-cuneate, ca. 2 × as long as sepals, apex retuse. Filaments glabrous; anthers black. Capsule shorter than persistent sepals. Seeds usually 3, small, tuberculate.

Wet valleys. Heilongjiang [Korea, Russia].

26. *Stellaria winkleri* (Briquet) Schischkin in Komarov, Fl. URSS 6: 403. 1936.

帕米尔繁缕 *pa mi er fan lu*

*Cerastium winkleri* Briquet, Annuaire Conserv. Jard. Bot. Genève 13: 382. 1911, based on *C. schizopetalum* H. Winkler, Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn 51. 1902, not Maximowicz (1888).

Stems 3–5(–8) cm tall, slender, glabrous. Leaves sessile, ovate-lanceolate, 5–10 × 2(–3) mm, midvein conspicuous, base cuneate, apex acuminate. Flower solitary, axillary. Pedicel 1–1.2 cm. Sepals ovate-lanceolate, 3–4 mm, margin white, membranous. Petals 2–2.5 mm, subequaling or slightly longer than sepals, 2-cleft nearly to base. Stamens subequaling petals; anthers yellow-brown. Ovary globose, ca. 1 mm; styles 3, linear, ca. 1.5 mm. Capsule ovoid. Fl. Jul–Aug.

Stony slopes; (2500–)3800–4100 m. Xinjiang [Kyrgyzstan, Tajikistan].

27. *Stellaria crassifolia* Ehrhart, Hannover. Mag. 8: 116. 1784.

叶苞繁缕 *ye bao fan lu*

Herbs perennial, glabrous. Stems ascending, quadrangular, 5–14 cm tall, slender, branched. Leaves sessile, ovate-lanceolate or lanceolate, 0.5–1.6(–2) cm × 1–4 mm, midvein conspicuously raised abaxially, base nearly rounded or cuneate, apex acuminate. Flower solitary, axillary or terminal; bracts leaflike, herbaceous, without membranous margin. Pedicel 1–2 cm, to 3.5 cm in fruit, slender. Sepals 5, ovate-lanceolate, 3.5–4 × ca. 2 mm, 3-veined, margin broadly membranous, apex acuminate. Petals 5, subequaling sepals, 2-cleft nearly to base; lobes linear. Stamens 10, shorter than petals. Ovary suborbicular; styles 3. Capsule ellipsoid, 1.5–2 × as long as persistent sepals, 6-valved. Seeds brown, compressed globose, ca. 1 mm in diam., tuberculate. Fl. May–Jul, fr. Jun–Aug.  $2n = 26$ .

River banks, meadows, fields. Nei Mongol, Xinjiang [Japan, Kazakhstan, Mongolia, Russia; Europe, North America].

- 1a. Leaves ovate-lanceolate or lanceolate, 5–15(–20) × 2–4 mm ..... 27a. var. *crassifolia*  
1b. Leaves linear-lanceolate or linear, 7–16(–20) × 1–3 mm ..... 27b. var. *linearis*

27a. *Stellaria crassifolia* var. *crassifolia*

叶苞繁缕(原变种) *ye bao fan lu (yuan bian zhong)*

Leaves sessile, ovate-lanceolate or lanceolate, 5–15(–20) × 2–4 mm, midvein conspicuously raised abaxially, base nearly rounded or cuneate, apex acuminate. Capsule ellipsoid, 2.5–3 × as long as persistent sepals, 6-valved. Seeds brown, compressed globose, ca. 1 mm

in diam., tuberculate. Fl. May–Jun, fr. Jun–Aug.  $2n = 26$ .

River banks, meadows, fields. Nei Mongol [Japan, Kazakhstan, Mongolia, Russia; Europe, North America].

**27b. *Stellaria crassifolia* var. *linearis*** Fenzl in Ledebour, Fl. Ross. 1: 383. 1842.

线形叶苞繁缕 xian xing ye bao fan lu

Leaves linear-lanceolate or linear, 7–16(–20) × 1–3 mm. Petals shorter to slightly longer than sepals. Fl. Jun–Jul, fr. Jul–Aug.

Nei Mongol, Xinjiang [Japan, Russia; Europe].

**28. *Stellaria discolor*** Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 15: 601. 1842.

翻白繁缕 fan bai fan lu

Herbs perennial, glabrous. Stems ascending, quadrangular, 10–40 cm tall, branched, glabrous; sterile axillary branches present. Leaves sessile, lanceolate, 3–4(–5) cm × 3–6(–8) mm, abaxially green, both surfaces glabrous, midvein raised abaxially, base rounded or cuneate, apex acuminate. Flowers in terminal cymes, axillary on rachillae; peduncles long; bracts white, ovate-lanceolate, 2–3(–6) mm, membranous, apex long acuminate. Pedicel 1–1.5 cm. Sepals 5, lanceolate, ca. 5 mm, 3-veined, margin membranous, apex long acuminate. Petals 5, shorter to slightly longer than sepals, 2-cleft nearly to base. Stamens 10, shorter than petals; anthers purplish or yellow-brown. Ovary ovoid-globose; styles 3, linear. Capsule slightly shorter than to as long as persistent sepals, 6-valved. Seeds brown, ovoid, slightly compressed, tuberculate. Fl. Apr–Jul, fr. Jun–Aug.

Montane grasslands, forest margins, wet places in forests; ca. 3000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi [Japan, Mongolia, Russia].

Kozhevnikov described *Stellaria merzbacheri* (Novosti. Sist. Vyssh. Rast. 20: 105. 1983) based on a specimen from the Tian Shan region of Xinjiang. It would key out closest to *S. discolor* based on its glabrous stems and narrowly ovoid leaves (ca. 1.4 cm × 5–6 mm). Other features of this taxon include sepals 2.5–3.5 mm, slightly shorter than the petals, with a broadly membranous margin and indistinct veins. The present authors have seen no material of this taxon.

**29. *Stellaria gyangtseensis*** F. N. Williams, J. Linn. Soc., Bot. 38: 396. 1909.

江孜繁缕 jiang zi fan lu

Herbs green, branched, glabrous. Stems 5–15(–30) cm tall, slender, angular, branched; branchlets with numerous leaves, terete, apically slightly pubescent. Leaves sessile, blackish when dried, narrowly linear, usually sickle-shaped, declinate, 0.5–1.1(–2.5) cm × 1–2.5 mm, apex acuminate; nodes puberulent. Flowers in

dichotomous cymes; bracts usually purplish, lanceolate, dry membranous. Pedicel 0.5–1.5 cm. Sepals purplish, lanceolate, 5–6 × 1–1.5 mm, 1(–3)-veined, base broad, margin narrowly dry-membranous, apex acuminate or acute. Petals subequaling or slightly longer than sepals, 2-cleft. Stamens conspicuously perigynous, shorter than petals. Ovary obovoid-globose; styles 3, linear, ca. 3 mm. Seeds brown, orbicular-reniform, papillose.

Grassland slopes, stony ground; 3900–4600 m. Xizang [Sikkim].

**30. *Stellaria pusilla*** Em. Schmid, Repert. Spec. Nov. Regni Veg. 31: 41. 1932.

小繁缕 xiao fan lu

Herbs perennial. Stems diffuse, tufted, shiny, glabrous, apically sparsely pubescent. Leaves sessile or proximal leaves petiolate, lanceolate or narrowly ovate, 4–12 mm, glabrous, base ciliate, margin cartilaginous, apex acuminate. Flowers 1–3 in cymes; bracts white, ovate-lanceolate, margin broad, apex acute. Pedicel 5–6 mm or longer. Sepals 5, lanceolate, 5–6 mm, margin white, green, or purplish, membranous, apex acuminate. Petals subequaling sepals, 2-cleft. Stamens 10, slightly shorter than petals. Styles 3. Capsule ovoid.

• 4100–5500 m. Xinjiang, Xizang.

**31. *Stellaria mainlingensis*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 693. 1983.

米林繁缕 mi lin fan lu

Stems pale brown, tufted, 10–20 cm tall, slender, pubescent with retrorse hairs. Leaves sessile, brown, ovate-lanceolate, 5–10 × 1.5–3 mm, midvein raised and cartilaginous, glabrous, base rounded, apex acute. Flowers numerous, in dichotomous cymes; bracts small, herbaceous. Pedicel 0.5–3 cm, slender, pubescent with retrorse hairs. Sepals 5, lanceolate, ca. 4 mm, glabrous, inconspicuously 3-veined, margin membranous, apex acute. Petals 5, slightly longer than sepals, 2-cleft to base. Stamens 10; filaments ca. 3 mm; anthers gray-green. Ovary obovoid, ca. 1.5 mm; styles 3, ca. 3 mm.

• Gully slopes, river banks; 2500–3600 m. Xizang.

**32. *Stellaria depressa*** Em. Schmid, Repert. Spec. Nov. Regni Veg. 31: 41. 1932.

凹陷繁缕 ao xian fan lu

Herbs perennial. Stems diffuse, tufted, ca. 12 cm, shiny, glabrous, apically slightly pubescent. Leaves ovate-lanceolate, 3–7 mm, glabrous, 1-veined, margin cartilaginous, apex subobtuse. Flowers 2–7, in cymes; bracts ovate-lanceolate, membranous, apex acuminate. Pedicel 3–4 mm. Sepals 5, ovate-lanceolate, 3–4 mm, glabrous, margin white, green, or purplish, broad, apex subobtuse. Petals slightly shorter than sepals, 2-cleft (rarely absent). Stamens 10, 2.5–3 mm. Styles 3. Capsule ovoid-orbicular.

- 5000–5500 m. ?Xinjiang, Xizang.

Kozhevnikov described *Stellaria depressa* var. *arenicola* (Novosti. Sist. Vyssh. Rast. 20: 105. 1983) based on a specimen from Kaschgaria (Xinjiang). It was described as having smaller, often apetalous flowers (2–2.5 vs. 4–5 mm) and indistinct sepal veins. The present authors have seen no material of this taxon and do not know if it warrants recognition.

**33. *Stellaria alsine*** Grimm, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 3. App. 313. 1767.

雀舌草 que she cao

Herbs annual, glabrous. Stems tufted, slightly diffuse, ascending, 15–25(–35) cm tall, much branched. Leaves sessile, lanceolate to oblong-lanceolate, (0.2–)0.5–2 cm × (1–)2–4 mm, basally sparsely ciliate, both surfaces slightly pinkish green, base cuneate, semiclasping, margin cartilaginous, slightly undulate, apex acuminate. Flowers 3–5 in cymes or solitary, terminal or axillary. Pedicel 0.5–2 cm, slender, glabrous, slightly declinate in fruit. Sepals 5, lanceolate, 2–4 × ca. 1 mm, glabrous, midvein raised, margin membranous, apex acuminate. Petals 5, shorter than or subequaling sepals, 2-cleft nearly to base; lobes linear, apex obtuse. Stamens 5(–10), slightly shorter than petals. Ovary ovoid; styles 3, sometimes 2, linear, short. Capsule ovoid-orbicular, subequaling or slightly longer than persistent sepals, 6-valved. Seeds numerous, brown, reniform, slightly compressed, rugulose. Fl. May–Jun, fr. Jul–Aug.  $2n = 24, 26, 46$ .

Fields, streamsides, wetlands; 500–4000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Nei Mongol, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Japan, Kashmir, Korea, Nepal, Pakistan, Vietnam; Europe].

1a. Flowers 3–5, in cymes; leaves 5–20 × 2–4

mm ..... 33a. var. *alsine*

1b. Flower solitary; leaves ca. 2 × 1 mm 33b. var. *alpina*

**33a. *Stellaria alsine* var. *alsine***

雀舌草(原变种) que she cao (yuan bian zhong)

*Stellaria alsine* var. *phaenopetala* Handel-Mazzetti; *S. alsine* var. *undulata* (Thunberg) Ohwi; *S. uliginosa* Murray; *S. uliginosa* var. *undulata* (Thunberg) Fenzl; *S. undulata* Thunberg.

Flowers 3–5, in terminal or axillary cymes. Leaves lanceolate to oblong-lanceolate, 5–20 × 2–4 mm. Pedicel slightly declinate in fruit, 0.5–2 cm, slender, glabrous. Capsule ovoid-orbicular, subequaling or slightly longer than persistent sepals, 6-valved. Seeds numerous, brown, reniform, slightly compressed, rugulose.

Fields, streamsides, wetlands; 500–4000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Nei Mongol, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Japan, Kashmir, Korea, Nepal, Pakistan, Vietnam; Europe].

**33b. *Stellaria alsine* var. *alpina*** (Schur) Handel-Mazzetti, Symb. Sin. 7: 191. 1929.

高山雀舌草 gao shan que she cao

*Labraea uliginosa* Murray var. *alpina* Schur, Enum. Pl. Transsilv. 115. 1866; *Stellaria uliginosa* Murray var. *alpina* (Schur) Gürke.

Stem slender. Leaves ca. 2 × 1 mm, sometimes lanceolate. Flower solitary, terminal or axillary. Capsule longer than persistent sepals. 3000–4000 m. Sichuan, Yunnan [Europe].

**34. *Stellaria graminea*** Linnaeus, Sp. Pl. 1: 422. 1753.

禾叶繁缕 he ye fan lu

Herbs perennial, often glabrous. Stems densely tufted, slightly erect, quadrangular, 10–30 cm tall, slender, glabrous or with 2 lines of hairs; sterile branches axillary from proximal leaves present. Leaves sessile, pinkish green, linear to lanceolate, 0.5–4(–5) cm × 1.5–3(–4) mm, basal margin sparsely ciliate, midvein inconspicuous, base slightly narrowed, apex acute. Flowers many or sometimes few, in terminal or axillary cymes, 7–11 mm in diam.; bracts lanceolate, 2(–5) mm, midvein conspicuous, margin membranous. Pedicel 0.5–2.5 cm, to 3.8 cm in fruit, slender. Sepals 5, green, lanceolate or narrowly lanceolate, 4–4.5 mm or longer, shiny, 3-veined, margin membranous, apex acuminate. Petals 5, slightly shorter or longer than sepals, 2-cleft nearly to base. Stamens 10; filaments filiform, glabrous, 4–4.5 mm; anthers brown, broadly ellipsoid, ca. 0.3 mm. Ovary ovoid-oblong; styles 3(or 4), ca. 2 mm. Capsule ovoid-cylindric, much longer than persistent sepals. Seeds black-brown, nearly compressed orbicular, granulose. Fl. May–Jul, fr. Aug–Sep.  $2n = 26, 39, 52$ .

Forests, forest margins, grasslands, grassy slopes, rock crevices; 1400–4000(–4200) m. Gansu, Hubei, Qinghai, Shandong, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [Afghanistan, India, Kashmir, Nepal, Pakistan, Russia, ?Sikkim; Europe].

1a. Petals slightly shorter than sepals; stems glabrous.

2a. Flowers ca. 11 mm in diam. 34b. var. *chinensis*

2b. Flowers 7–8 mm in diam. . 34a. var. *graminea*

1b. Petals longer than sepals; stems pubescent or glabrous.

3a. Stems with 2 lines of hairs .. 34c. var. *pilosula*

3b. Stems glabrous ..... 34d. var. *viridescens*

**34a. *Stellaria graminea* var. *graminea***

禾叶繁缕(原变种) he ye fan lu (yuan bian zhong)

?*Stellaria patentifolia* Kitagawa.

Stems densely tufted, slightly erect, quadrangular, 10–30 cm tall, slender. Leaves sessile, linear, 0.5–4(–5) cm × 1.5–3(–4) mm. Flowers 7–8 mm in diam. Petals slightly shorter than sepals. Styles 3(or 4), ca. 2 mm. Capsule ovoid-cylindric, much longer than persistent sepals.  $2n = 26, 39, 52$ .

Forests, grassy slopes, rock crevices; 1400–3700(–4200) m. Gansu, Hubei, Qinghai, Shandong, Shaanxi, Shanxi, Sichuan, Xinjiang, Xi-

zang [Afghanistan, India, Kashmir, Nepal, Pakistan, Russia, ?Sikkim; Europe].

**34b. *Stellaria graminea* var. *chinensis*** Maximowicz, Fl. Tangut. 90. 1889.

中华禾叶繁缕 *zhong hua he ye fan lu*

Leaves larger than in var. *graminea*. Flowers ca. 11 mm in diam. Styles slightly shorter than ovary.

• Qinghai, Sichuan, Xizang.

**34c. *Stellaria graminea* var. *pilosula*** Maximowicz, Fl. Tangut. 91. 1889.

毛禾叶繁缕 *mao he ye fan lu*

Stem pilose, with 2 lines of hairs. Leaves linear-lanceolate, ca. 2.2 cm × 3 mm. Flowers ca. 7 mm in diam. Fruiting pedicel ca. 3.8 cm. Petals longer than sepals.

• Qinghai.

**34d. *Stellaria graminea* var. *viridescens*** Maximowicz, Fl. Tangut. 90. 1889.

常绿禾叶繁缕 *chang lu he ye fan lu*

*Stellaria viridescens* (Maximowicz) Kozhevnikov. Stems taller than in var. *graminea*, glabrous. Flowers numerous. Petals longer than sepals. Styles shorter than ovary.

• Forest margins, grasslands; 2000–4000 m. Gansu, Qinghai, Shaanxi, Sichuan, Xizang.

**35. *Stellaria brachypetala*** Bunge in Ledebour, Fl. Altaic. 2: 161. 1830.

短瓣繁缕 *duan ban fan lu*

*Stellaria graminea* Linnaeus var. *brachypetala* (Bunge) Regel.

Herbs perennial. Stems erect, sometimes diffuse, 10–30 cm tall, basally branched. Leaves sessile, ovate-lanceolate to lanceolate, 1–2 cm × 1.5–4 mm, both surfaces glabrous, base cuneate, apex acuminate, axillary sterile branches from proximal leaves sometimes present. Flowers 1–3, sometimes 6–10, in cymes; bracts herbaceous, margin membranous. Pedicel ca. 1 cm. Sepals 5, ovate-lanceolate, 5–8 × 1–2 mm, margin membranous, apex acuminate. Petals 5, 1/2–2/3 as long as sepals, 2-cleft nearly to base; lobes linear. Stamens 10; filaments short. Ovary ovoid; styles 3. Capsule ovoid-orbicular, 5–7 mm. Seeds orbicular-ovoid, rugulose. Fl. Jun–Aug, fr. Aug–Sep.

Mountains; 1700–2900(–4300) m. Gansu, Nei Mongol, Qinghai, Xinjiang [Kazakhstan, Mongolia, Russia].

Kozhevnikov described *Stellaria brachypetala* var. *magna* (Novosti. Sist. Vyssh. Rast. 20: 106. 1983) based on a specimen from the Tian Shan region of Xinjiang. It was described as being more robust (stems to 25 cm), with the pedicels spreading in fruit. The present authors have seen no material of this taxon and do not know if it warrants recognition.

**36. *Stellaria yunnanensis*** Franchet, Bull. Soc. Bot. France 33: 433. 1886.

千针万线草 *qian zhen wan xian cao*

Herbs perennial. Stems erect, terete, 10–30 cm tall, simple or branched. Leaves sessile, lanceolate or linear-lanceolate, 3–5(–7) × 0.5–1(–1.5) cm, abaxially pinkish green, margin sparsely ciliate, base rounded or slightly narrowed, apex acuminate. Flowers in dichotomous cymes, glabrous; bracts lanceolate, margin membranous, apex acuminate. Pedicel 1–2 cm, longer in fruit, slender. Sepals 5, lanceolate, 4–5 mm, 3-veined, margin membranous, apex acuminate. Petals 5, slightly shorter than sepals, 2-cleft nearly to base; lobes linear. Stamens 10. Ovary ovoid; styles 3, linear. Capsule ovoid-orbicular, slightly shorter than persistent sepals, 6-valved. Seeds 2–6, brown, reniform, slightly compressed, sparsely tuberculate. Fl. Jul–Aug, fr. Sep–Oct.

• Forests, forest margins; 1800–3300 m. Sichuan, Yunnan.

**37. *Stellaria palustris*** Retzius, Fl. Scand. Prodr., ed. 2, 106. 1795.

沼生繁缕 *zhao sheng fan lu*

*Stellaria dilleniana* Moench (1777), not Leers (1775); *S. glauca* Withering; ?*S. hsinganensis* Kitagawa.

Herbs perennial, gray-green, glabrous. Stems tufted, erect, quadrangular, (10–)20–35 cm tall, slender, basally branched, papillose. Leaves sessile, pinkish green, linear to linear-lanceolate, 2–4.5 cm × 2–4 mm, both surfaces glabrous, midvein conspicuous and abaxially papillose, base slightly narrowed, margin papillose, apex acute. Flowers in dichotomous cymes; peduncles 7–10 cm; bracts white, lanceolate to ovate-lanceolate, (3–)5–6(–7) mm, margin membranous. Sepals 5, ovate-lanceolate, (4–)5–7 mm, abaxially with 3 conspicuous veins, margin membranous, apex acuminate. Petals 5, 4–7 mm, subequaling or slightly longer than sepals, 2-cleft nearly to base; lobes nearly linear, apex obtuse. Stamens 10, slightly shorter than sepals. Ovary ovoid; styles 3, filiform, ca. 3 mm. Capsule ovoid-cylindric, subequaling or slightly longer than persistent sepals. Seeds numerous, black-brown, suborbicular, conspicuously rugulose.  $2n = ca. 100, ca. 130, 174–188$ .

Grassland slopes, sparse valley forests; 1000–3600 m. Gansu, Hebei, Heilongjiang, Henan, Liaoning, Nei Mongol, Shandong, Shaanxi, Shanxi, Sichuan, Yunnan [Afghanistan, Japan, Kazakhstan, Mongolia, Russia; SW Asia, Europe].

**38. *Stellaria salicifolia*** Y. W. Tsui & P. Ke, Acta Bot. Yunnan. 7: 77. 1985.

柳叶繁缕 *liu ye fan lu*

Herbs perennial. Stems erect or ascending, quadrangular, 20–30 cm tall, usually simple, glabrous. Leaves lanceolate, 3–6 cm × 4–12 mm, abaxially gray-green, hairy at base, base cuneate, slightly clasping, margin cartilaginous, usually undulate, apex acuminate. Flowers in sparse terminal cymes; peduncles ca. 5 cm; bracts lanceolate, 1–2 mm, membranous. Pedicel 1–2.5 cm, slender, glabrous. Sepals 5, lanceolate, 4–5 mm,



conspicuously 3-veined, base slightly rounded, margin membranous, apex long acuminate. Petals 5, slightly shorter than sepals, 2-cleft nearly to base; lobes narrowly linear. Stamens 10, slightly shorter than petals; anthers brown, cylindric. Ovary ovoid-orbicular; styles 3, linear. Capsules ovoid-orbicular, slightly shorter than or subequating persistent sepals, 6-valved. Seeds narrowly ovoid-orbicular, ca. 1 mm, rugulose. Fl. May–Jun, fr. Jul–Aug.

• Slopes, wet places in sparse forests; 1200–3000 m. Gansu, Hubei, Hunan, Ningxia, Shaanxi, Sichuan, Zhejiang.

**39. *Stellaria dianthifolia*** F. N. Williams, J. Linn. Soc., Bot. 38: 396. 1908.

石竹叶繁缕 shi zhu ye fan lu

*Stellaria yunnanensis* Franchet f. *villosa* C. Y. Wu ex P. Ke.

Herbs perennial, pinkish green, glabrous or sparsely pubescent. Stems diffuse or ascending, (5–)10–40 cm tall, slender, simple or apically branched. Leaves linear, (1–)1.6–4.5 cm × 2–4 mm, midvein conspicuous, abaxially densely pubescent, basal ones with margin ciliate, apex acuminate. Flowers 6–9, in terminal and sparse dichotomous cymes; bracts linear, margin membranous, apex acute. Pedicel 1.2–1.4 cm. Sepals 5, lanceolate-linear, 6–7 mm, 3-veined, margin narrowly membranous, apex acuminate. Petals 5, 2-cleft nearly to base; lobes narrow. Capsule ovoid-orbicular. Seeds brown, minute, compressed, auriculate, rugulose, with granular protuberances. Fl. Jun–Jul, fr. Aug–Sep.

• Forests; (3200–)3400–3800(–4400) m. Gansu, Qinghai, Sichuan, Xizang.

**40. *Stellaria longifolia*** Muhlenberg ex Willdenow, Enum. Pl. 479. 1809.

长叶繁缕 chang ye fan lu

*Stellaria diffusa* Willdenow ex Schlechter; *S. diffusa* f. *ciliolata* Kitagawa; *S. diffusa* var. *ciliolata* (Kitagawa) Kitagawa; *S. friesiana* Seringe; *S. longifolia* f. *ciliolata* (Kitagawa) Y. C. Chu; *S. longifolia* var. *legitima* Regel. Herbs perennial, glabrous. Stems densely tufted, ascending, quadrangular, 15–25 cm tall, branched, diffuse; axillary sterile branches present. Leaves linear or broadly linear, 1.5–3.5 cm × 0.5–2 mm, sometimes sparsely shortly ciliolate, midvein conspicuous, slightly narrowed at base, apex acuminate. Flowers in terminal or mostly axillary cymes; peduncles 3–6 cm, glabrous; bracts white, ovate-lanceolate, 1–2 mm, ciliate, sometimes margin membranous, apex long acuminate. Pedicel 1–1.5 cm, to 2.5 cm after anthesis, slender. Sepals 5, ovate-lanceolate, 2.5–3 mm, 3–4 mm in fruit, inconspicuously 3-veined, margin membranous, apex obtuse or slightly acute. Petals 5, subequating or slightly longer than sepals, 2-cleft nearly to base; lobes sublinear, base narrowed, apex obtuse. Stamens 10; filaments linear; anthers yellow. Ovary ovoid-cylindric; styles 3. Capsule brown-black, ovoid-orbicular, 1.5–2 × as long as persistent sepals, 6-valved. Seeds

numerous, brown, ovoid-orbicular or ellipsoid, 0.8–1 mm, nearly smooth. Fl. Jun–Jul, fr. Jun–Aug.  $2n = 26$ .

Wet meadows, forest margins, forests; ca. 1900 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi [Japan, Korea, Mongolia, Russia; Europe, North America].

**41. *Stellaria imbricata*** Bunge in Ledebour, Fl. Altaic. 2: 159. 1830.

覆瓦繁缕 fu wa fan lu

*Stellaria palustris* Ehrhart var. *imbricata* (Bunge) Krylov.

Herbs perennial. Stems ascending or semidiffuse, quadrangular, ca. 10 cm tall, slender. Leaves imbricate, oblong-lanceolate, 1–1.1 cm, glabrous, smooth, apex slightly obtuse. Flowers solitary, rarely 2, terminal; bracts ovate, membranous. Pedicel short. Sepals 5, ovate, ca. 5 mm, margin broadly membranous. Petals 5, slightly longer than sepals, 2-cleft; lobes ovate-oblong. Capsule cylindric, ca. 1.5 × as long as persistent sepals, tuberculate at maturity, apex acuminate. Seeds orbicular-reniform, ca. 1.2 mm, slightly rugulose. Fl. Jun–Jul.

Montane river banks, slopes. Xinjiang [Russia].

**42. *Stellaria nipponica*** Ohwi, Acta Phytotax. Geobot. 3: 83. 1934.

多花繁缕 duo hua fan lu

*Stellaria florida* Fischer ex de Candolle var. *angustifolia* Maximowicz.

Herbs perennial. Stems nearly tufted, erect, quadrangular, (5–)10–20 cm tall, slender, internodes shorter than leaves, glabrous except sparsely shortly ciliate basally. Leaves linear, 2–3(–4.5) cm × 1–2 mm, both surfaces glabrous, midvein conspicuous, abaxially raised, adaxially retuse, base slightly narrowed, apex acute. Flowers 1–8, in sparse terminal cymes; bracts lanceolate, ca. 5 mm, margin membranous. Pedicel erect, 1.5–4(–6) cm. Sepals 5, lanceolate to oblong-lanceolate, 4–5.5 mm, 3-veined, apex acute. Petals 5, 1.5–2 × as long as sepals, 2-cleft nearly to base. Stamens 10; filaments slender. Styles 3, 2–3 mm. Capsule yellow, ellipsoid to ovoid-orbicular, slightly shorter than or subequating persistent sepals. Seeds brown, compressed, orbicular-reniform, ca. 1 mm, tuberculate. Fl. May–Jun, fr. Jun–Aug.  $2n = 26$ .

Montane rocks; ca. 1800 m. Hubei [Japan].

*Stellaria montioides* (Edgeworth & J. D. Hooker) Ghazanfar (Fl. Pakistan 175: 25. 1986, based on *S. graminea* Linnaeus var.

*montioides* Edgeworth & J. D. Hooker in J. D. Hooker, Fl. Brit. India 1: 233. 1874) may also key out near *S. filicaulis* and *S. nipponica*. It is an alpine plant with glabrous stems, linear leaves with a raised abaxial midvein, and solitary flowers with petals about as long as the sepals. Although Ghazanfar (loc. cit.) gave the taxon as occurring in W Xizang (probably referring to territory now in Pakistan), the present authors have no further information on the occurrence of this species in China.

**43. *Stellaria filicaulis*** Makino, Bot. Mag. (Tokyo) 15: 113. 1901.

细叶繁缕 xi ye fan lu

*Stellaria filicaulis* f. *jaluana* (Nakai) Kitagawa; *S. jaluana* Nakai; ?*S. neopalustris* Kitagawa.

Herbs perennial, glabrous. Stems tufted, erect or ascending, quadrangular, 30–50 cm tall, slender, apically branched. Leaves linear, 2–3 cm × 1–2(–3) mm, marginally sparsely ciliate, midvein abaxially raised, adaxially retuse, base cuneate, slightly clasping, apex acuminate. Flowers solitary or in axillary cymes; bracts lanceolate, 1–2 mm, margin membranous, sometimes herbaceous below, apex acuminate. Pedicel filiform, 2–5 cm. Sepals 5, lanceolate to narrowly lanceolate, 4–5 mm, midvein conspicuous, margin membranous. Petals 5, linear-lanceolate, ca. 1.5 × as long as sepals, 2-cleft nearly to base; lobes linear. Stamens 10, shorter than sepals. Styles 3. Capsule yellow, cylindrical-ovoid, as long as to 1.5 × as long as persistent sepals, 6-valved. Seeds numerous, brown, ellipsoid, 0.7–1 mm, regularly rugulose. Fl. May–Jul, fr. Jun–Aug.

Wet grasslands, river banks; 500–700 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Japan, Korea].

**44. *Stellaria alaschanica*** Y. Z. Zhao, Acta Sci. Nat. Univ. Intramongol. 13(3): 283. 1982.

贺兰山繁缕 he lan shan fan lu

*Stellaria uda* F. N. Williams var. *pubescens* Y. W. Cui & L. H. Zhou.

Herbs perennial. Stems densely tufted, quadrangular, 5–15 cm tall, slender, branched, pubescent with retrorse hairs; sterile axillary branches present. Leaves linear or lanceolate-linear, 0.5–2 cm × 1–2.5 mm, midvein abaxially raised, base narrowed, margin ciliate, apex acuminate. Flowers 1–3, in terminal cymes; bracts ovate-lanceolate, 1.5–3 mm, margin broadly membranous. Pedicel 0.7–1.5 cm, slender, glabrous. Sepals 5, ovate-lanceolate, ca. 3 × 1.2 mm, glabrous, midvein conspicuous, margin membranous, apex acuminate. Petals 5, ca. 2 mm, ca. 2/3 as long as sepals, 2-cleft nearly to base; lobes oblong-linear, base narrowed, apex obtuse. Stamens 10, slightly longer than petals. Styles 3, ca. 1 mm. Capsule cylindrical-ovoid, ca. 4 mm, ca. 1.25 × as long as persistent sepals. Seeds numerous, broadly ovoid or suborbicular, slightly compressed, 0.5–0.8 mm, nearly smooth. Fl. Jul, fr. Aug.

• Slopes, *Picea* forests; 2100–2800(–3200) m. Gansu, Ningxia, Qinghai.

**45. *Stellaria oxycoccoides*** Komarov, Repert. Spec. Nov. Regni Veg. 13: 234. 1914.

莓苔状繁缕 mei tai zhuang fan lu

Stem pale brownish red, diffuse, slender, branched only at base, pubescent with retrorse hairs. Leaves sessile, green, linear-lanceolate, minute, glabrous, apex acute. Flowers in terminal racemes; bracts white, dry, membranous. Sepals purplish or green, long acuminate,

margin white, cartilaginous. Petals slightly shorter than sepals, 2-cleft to base. Styles 4.

• Sandy places on river banks. Sichuan.

**46. *Stellaria uda*** F. N. Williams, J. Linn. Soc., Bot. 34: 435. 1899.

湿地繁缕 shi di fan lu

Herbs perennial. Stems tufted, base diffuse, nearly erect above, 5–15 cm tall, slender, with 1 line of hairs. Leaves dense and small proximally, distal leaves sessile, linear-lanceolate, 5–10 × ca. 1 mm, both surfaces glabrous or sparsely pubescent, midvein raised abaxially, base cuneate, semiclasping, apex acuminate. Flowers in terminal cymes; bracts herbaceous. Sepals 5, lanceolate, ca. 3 mm, midvein conspicuous, 3-veined, margin membranous, apex acuminate. Petals 5, ca. 2/3 as long as sepals, 2-cleft nearly to base. Stamens 10. Ovary ovoid; ovules ca. 10; styles 3, linear. Capsule cylindrical, slightly longer than persistent sepals. Seeds brown, reniform. Fl. May–Jun, fr. Jul–Aug.

• Gullies, slopes, plateaus; 1200–4800 m. Qinghai, Sichuan, Xinjiang, Xizang, Yunnan.

**47. *Stellaria souliei*** F. N. Williams, J. Linn. Soc., Bot. 34: 434. 1899.

康定繁缕 kang ding fan lu

Herbs perennial. Stems tufted, 20–30 cm tall, sparsely pubescent. Leaves sessile, linear-lanceolate, 0.3–3.5 mm × 1.5–2.5 mm, margin sparsely long ciliate, apex long acuminate. Flowers in terminal cymes; peduncles slender; bracts ovate, ca. 2 mm, membranous. Pedicel 0.5–1(–4.5) cm. Sepals 5, lanceolate, 3–4 mm, midvein conspicuous, 3-veined, margin membranous, apex acute. Petals 5, slightly shorter than or subequaling sepals, 2-cleft nearly to base. Stamens 10. Ovary ovoid-orbicular; ovules 7 or 8; styles 3, linear. Capsule shortly obovoid. Fl. Jul, fr. Sep.

• Grassland slopes. Sichuan.

**48. *Stellaria soongorica*** Roshevitz in Komarov, Fl. URSS 6: 881. 1936.

准噶尔繁缕 zhun ga er fan lu

Herbs perennial, glabrous. Stems solitary or tufted, slightly quadrangular, 15–25 cm tall, slender, simple or branched, usually glabrous. Leaves sessile, linear-lanceolate or linear, 2.5–6 cm × 2.5–4 mm, both surfaces glabrous, pubescent at base, midvein raised, base slightly semiclasping, apex long acuminate. Flower solitary, terminal; bracts lanceolate, margin membranous, apex acuminate. Pedicel 1.5–5.5(–8) cm, slender. Sepals 5, ovate-lanceolate, ca. 5 × 2.5 mm, glabrous, midvein conspicuous, margin white, membranous, apex acuminate. Petals 5, ca. 1.2 × as long as sepals, 2-cleft nearly to base; lobes oblong-ob-lanceolate, apex obtuse. Stamens 10, 1–1.2 mm; anthers yellow. Ovary ovoid; styles 3. Capsule brown or nearly

black, cylindric-ovoid, longer than persistent sepals, 6-valved. Seeds brown, reniform-orbicular or ovoid, slightly compressed, minute, tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

*Picea* forest margins, scrublands, grassland slopes; 1600–3500 m. Xinjiang [Kazakhstan, Russia].

**49. *Stellaria irrigua*** Bunge, Verz. Altai Pfl. 35. 1836.

冻原繁缕 *dong yuan fan lu*

Herbs perennial. Stems 2–3 cm tall, simple, glabrous. Leaves ovate-oblong, narrowed at base, apex obtuse. Flowers 3–7, in terminal cymes; bracts membranous. Pedicel filiform, elongated after anthesis. Sepals ovate, apex acute. Petals minute, ca. 0.5 mm, 2-cleft nearly to base; lobes linear. Stamens 10, subequaling sepals. Fl. Jul.

Montane wet places, mossy frozen areas. Xinjiang [Russia].

**50. *Stellaria parvumbellata*** Y. Z. Zhao, Acta Sci. Nat. Univ. Intramongol. 20(2): 226. 1989.

小伞花繁缕 *xiao san hua fan lu*

Herbs perennial. Stems 5–8 cm tall, pilose. Leaves sessile, ovate-lanceolate or ovate-orbicular, 5–11 × 2–4 mm, both surfaces glabrous, ciliate at proximal margin, midvein raised abaxially, base connate, clasping, apex acuminate. Flowers in terminal cymose umbel; bracts 2, opposite, ovate-orbicular, margin white, membranous. Pedicel 3–25 mm, slender, glabrous. Sepals 5, ovate-lanceolate, 2.5–3 mm, 3-veined, margin membranous, apex acuminate. Petals absent. Stamens 10, shorter than sepals. Ovary ovoid-globose; styles 3. Capsule cylindric-ovoid, ca. 3.5 mm, slightly longer than persistent sepals. Seeds black, ellipsoid, compressed, ca. 0.7 × 0.3 mm, with protuberances. Fl. and fr. Jun–Jul.

• Valleys; ca. 2900 m. Gansu, Ningxia, Qinghai, Shaanxi, Xinjiang.

**51. *Stellaria umbellata*** Turczaninow ex Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 173. 1842.

伞花繁缕 *san hua fan lu*

*Stellaria wutaica* Handel-Mazzetti.

Herbs perennial, glabrous. Stem solitary, 5–15 cm tall, branched. Leaves elliptic, 1.5–2 cm × 4–5 mm, both surfaces glabrous, base cuneate, slightly clasping, apex obtuse or acute. Flowers 3–10, in cymose umbel; bracts 3–5, ovate, nearly membranous. Pedicel filiform, 0.5–2 cm, slightly longer in fruit. Sepals 5, green, lanceolate, 2–3 mm, margin membranous, apex acuminate. Petals absent. Stamens 10, shorter than sepals. Ovary cylindric-ovoid; styles 3, linear, short. Capsule subequaling persistent sepals, 6-valved. Seeds reniform, slightly compressed, rugulose, without protuberances. Fl. Jun–Jul, fr. Jul–Aug. *2n* = 26.

Montane grasslands, forests, steppes; 1600–3800(–5000) m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [Kazakhstan, Russia; North America].

**52. *Stellaria subumbellata*** Edgeworth in J. D. Hooker, Fl. Brit. India 1: 233. 1874.

亚伞花繁缕 *ya san hua fan lu*

Herbs annual, glabrous. Stems tufted, ascending, 12(–20) cm tall, slender. Leaves sessile, linear to linear-lanceolate, 5–15 × (0.8–)1.5–2(–4) mm, both surfaces glabrous, midvein conspicuous, base rounded, apex obtuse. Flowers 2–4, in cymose umbel; bracts ovate, ca. 2 mm, membranous. Pedicel 1.2–2.4 cm, slender. Sepals 5, green, ovate-lanceolate, ca. 2 mm, 3-veined, margin broadly membranous, apex acute. Petals absent. Stamens 5; filaments slender. Styles 3, short. Capsule ovoid, ca. 4 mm, ca. 2 × as long as persistent sepals, 6-valved. Seeds pale brown or dark brown, compressed orbicular, with granular protuberances. Fl. Jun–Jul, fr. Jul–Aug.

Montane meadows, rocky crevices, cushionlike scrub; 3500–5000 m. Sichuan, Xizang, Yunnan [India, Kashmir, Nepal, Sikkim].

Species nos. 53–57 are members of *Stellaria* sect. *Adenonema* (Bunge) Turczaninow. This group is in need of thorough revision. There are now several different ideas on which of these taxa should be recognized. It is also possible that additional taxa may (or may not) belong to this section.

In addition, Kozhevnikov described *Stellaria divnogorskajae* (Novosti. Sist. Vyssh. Rast. 20: 103. 1983) based on a specimen from Kaschgaria (Xinjiang). It is similar in size to *S. arenarioides* (stems 5–7 cm), with oblong-elliptic leaves, 4- or 5-merous flowers, 2 styles, and a 4-valved capsule. He also described *S. divnogorskajae* var. *pilosa* (Novosti Sist. Vyssh. Rast. 20: 104. 1983) based on a specimen from Tagdumbasch-Pamir (Xinjiang), noting that the plant is pilose throughout. The present authors have seen no material of either taxon.

**53. *Stellaria arenarioides*** Shi L. Chen et al., Novon 11: 302. 2001.

沙生繁缕 *sha sheng fan lu*

*Stellaria arenaria* Maximowicz, Fl. Tangut. 91. 1889, not Linnaeus (1753).

Herbs perennial. Stems tufted, prostrate, diffuse, yellow basally, green apically, 5–7 cm tall, basally shiny, glabrous, apically pubescent. Leaves sessile, ovate or ovate-lanceolate, 4–6 × 2–3 mm, midvein raised abaxially, base nearly rounded, margin pubescent, apex acute. Flowers 1–5, in terminal cymes; bracts ovate, ca. 3 × 1.5 mm, membranous. Sepals 5, ovate-lanceolate, 3–4 × 1–1.5 mm, midvein conspicuous. Petals 5, 1–1.5 mm, shorter than sepals, 2-cleft nearly to base; lobes linear. Stamens 10, conspicuously shorter than petals. Disc orbicular, with 5 glands. Styles 3, enlarged at apex. Seeds 1 or 2. Fl. Jun–Jul, fr. Aug–Sep.

• Grassland slopes, mountains, river banks; 2500–5200(–5500) m. Gansu, Qinghai, Xinjiang, Xizang.

**54. *Stellaria cherleriae*** (Fischer ex Seringe) F. N. Williams, Bull. Herb. Boissier, sér. 2, 7: 830. 1907.

兴安繁缕 *xing an fan lu*

*Arenaria cherleriae* Fischer ex Seringe in de Candolle, Prodr. 1: 409. 1824; *Stellaria petraea* Bunge var. *fasciculata* Bunge ex Turczaninow; *S. petraea* var. *vegeta* Fenzl; *S. viridiflora* Pax & K. Hoffmann.

Herbs perennial, pubescent with curved hairs. Stems tufted, erect or ascending, 5–12(–18) cm tall, base usually woody, basally branched; short axillary sterile branches present. Leaves subsessile, linear or linear-oblongate, (0.7–)1–2(–2.5) cm × 1–2.5 mm, both surfaces glabrous, lower margin pubescent, base narrowed, apex acute. Flowers few, in terminal cymes; bracts lanceolate, ca. 4 × 1.2 mm, herbaceous, glabrous, margin membranous, apex acute. Pedicel slightly longer than sepals, ca. 1 cm, distally sparsely pubescent. Sepals 5, oblong-lanceolate, ca. 5 × 1–1.5 mm, midvein raised, base sparsely pubescent, margin membranous, apex acute. Petals 5, 1/3–1/2 as long as sepals, 2-cleft nearly to base; lobes linear. Stamens 10, ca. 1/2 as long as petals; anthers yellow, compressed globose. Capsule obovoid, ca. 1/2 as long as persistent sepals. Seeds 2, nearly black, ellipsoid-obovoid, 1–1.5 mm in diam., tuberculate. Fl. Jun–Jul, fr. Jul–Aug.

• Stony slopes, steppes, forests; 2800–3400 m. Hebei, Nei Mongol, Shaanxi, Shanxi.

**55. *Stellaria petraea*** Bunge in Ledebour, Fl. Altaic. 2: 160. 1830.

岩生繁缕 *yan sheng fan lu*

*Adenonema petraeum* (Bunge) Bunge var. *alpinum* Bunge; *Stellaria cherleriae* (Fischer ex Seringe) F. N. Williams var. *alpina* (Bunge) Schischkin; *S. petraea* var. *alpina* (Bunge) Turczaninow; *S. petraea* var. *imbricata* Fenzl.

Herbs perennial, cushionlike. Stems densely tufted, ascending or erect, 2–7 cm tall, glabrous or nearly so. Leaves lanceolate-linear, 4–10 × ca. 1.5 mm, margin nearly imbricate, thick, apex acute, hard, sometimes sickle-shaped; axillary leaves clustered. Flowers 1–3(–12), in terminal cymose umbel, rarely solitary. Sepals lanceolate, 4–5 × 1–1.3 mm, glabrous, apex acuminate. Petals 1/3–2/3 as long as sepals, 2-cleft nearly to base; lobes linear. Capsule subglobose, shorter than persistent petals, base narrowed. Seeds 1 or 2. Fl. Jul–Aug.

Steppe hills to montane stony slopes. Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia].

**56. *Stellaria decumbens*** Edgeworth, Trans. Linn. Soc. London 20: 35. 1846.

偃卧繁缕 *yan wo fan lu*

Herbs perennial, cushionlike. Stems 10–20 cm tall, stout or slender, densely white pubescent, glandular, or glabrous. Leaves sessile, ovate-lanceolate to linear-lanceolate, 3–4 × 1–1.5 mm, margin glabrous or ciliate, hard, midvein conspicuously raised, base nearly rounded, apex acuminate. Flowers solitary or few in (sometimes dense) cymes. Pedicel ca. 4 mm or less. Sepals (4 or)5, ovate-lanceolate or oblong-lanceolate, ca. 4 × 1.5 mm, herbaceous, 3-veined, base truncate, apex acuminate. Petals 5, ca. 1/2 as long as sepals, 2-cleft nearly to base; lobes linear or absent. Stamens (5–)8–10. Styles 3. Capsule shorter than persistent sepals,

6-valved. Seeds 2–8, suborbicular, smooth. Fl. Jun–Aug, fr. Jul–Oct.  $2n = 18$ .

Scrub, montane meadows, stony areas, slopes, mossy areas, roadsides; 3000–5600 m. Qinghai, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

1a. Stems glabrous ..... 56b. var. *pulvinata*

1b. Stems pubescent.

2a. Stems with glandular hairs 56c. var. *arenarioides*

2b. Stems with nonglandular hairs.

3a. Leaves ovate-lanceolate; flower solitary or few in cymes 56a. var. *decumbens*

3b. Leaves subulate-lanceolate or subulate-ovate; flowers in dense headlike cymes ..... 56d. var. *polyantha*

**56a. *Stellaria decumbens* var. *decumbens***

偃卧繁缕(原变种) *yan wo fan lu* (yuan bian zhong)

*Stellaria cherleriae* (Fischer ex Seringe) F. N. Williams var. *minor* (Edgeworth & J. D. Hooker) Majumdar; *S. decumbens* var. *edgeworthii* Edgeworth & J. D. Hooker; *S. decumbens* var. *minor* Edgeworth & J. D. Hooker.

Stems stout or slender, densely white pubescent. Leaves ovate-lanceolate, 3–4 × 1–1.5 mm. Flower solitary or few in cymes. Stamens 8–10. Capsule shorter than persistent sepals, 6-valved. Seeds 2–8, suborbicular, smooth. Fl. Jul–Aug, fr. Sep–Oct.

Slopes, roadsides; 3000–5600 m. Qinghai, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

**56b. *Stellaria decumbens* var. *pulvinata*** Edgeworth & J. D. Hooker in J. D. Hooker, Fl. Brit. India 1: 235. 1875.

垫状偃卧繁缕 *dian zhuang yan wo fan lu*

*Stellaria maximowiczii* Kozhevnikov.

Plant densely cushionlike. Stems glabrous. Leaves ovate-lanceolate, margin ciliate. Flower solitary.  $2n = 18$ .

Montane meadows, stony areas, scrub; (4600–)4900–5600 m. Qinghai, Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Sikkim]. In his original description of *Stellaria maximowiczii*, Kozhevnikov (Novosti Sist. Vyssh. Rast. 20: 104. 1983) stated that the plant has 4-merous flowers, with only two styles. The present authors have been unable to verify his statements.

**56c. *Stellaria decumbens* var. *arenarioides*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 703. 1983.

错那繁缕 *cuo na fan lu*

*Stellaria cuonaensis* L. H. Zhou.

Stems slender, glandular pubescent. Leaves linear-subulate, margin ciliate. Petals absent. Stamens 5. Fl. Jun–Jul, fr. Jul–Aug.

• Scrub, mossy areas; 3800–4100 m. Sichuan, Xizang, Yunnan.

**56d. *Stellaria decumbens* var. *polyantha*** Edgeworth & J. D. Hooker in J. D. Hooker, Fl. Brit. India 1: 235. 1874.

多花偃卧繁缕 *duo hua yan wo fan lu*

*Stellaria cherleriae* (Fischer ex Seringe) F. N. Williams var. *polyantha* (Edgeworth & J. D. Hooker) R. R. Stewart.

Leaves subulate-lanceolate or subulate-ovate, margin ciliate or glabrous. Flowers in dense headlike cymes. Stony areas; 4600–5000 m. Xizang [India, Kashmir, Nepal, Sikkim].

57. *Stellaria congestiflora* H. Hara, J. Jap. Bot. 52: 195. 1977.

密花繁缕 mi hua fan lu

*Stellaria semivestita* Edgeworth var. *brevipetala* L. H. Zhou.

Herbs perennial. Stems densely tufted, 3–20 cm tall, apically white pilose. Leaves nearly sessile, pale green, linear-lanceolate, 0.7–1.3 cm × 1–3.5 mm, both surfaces glabrous, sometimes distal leaves pubescent, margin glabrous or sometimes ciliate, apex acuminate. Flowers numerous, in dense terminal cymes. Pedicel short, rarely 6 mm, white pilose; bracts herbaceous. Sepals 5, green, lanceolate, (4–)5–6 mm, glabrous or densely white pilose, 3-veined, margin white, apex acuminate. Petals 5, 1.5–3 mm, shorter than sepals, 2-cleft nearly to base; lobes linear. Stamens 10, 1.5–3.5 mm; filaments broadened and glandular at base; anthers purplish, ovoid, ca. 0.3 mm. Ovary ovoid, 0.5–1 mm; carpels 6; styles 3, ca. 2 mm.

Scrub; 3800–4100 m. Xizang [Bhutan, Nepal, Sikkim].

58. *Stellaria radians* Linnaeus, Sp. Pl. 1: 422. 1753.

瘰瓣繁缕 sui ban fan lu

*Cerastium fimbriatum* Ledebour (1815), not E. Pritzel (1900); *Fimbripetalum radians* (Linnaeus) Ikonnikov; *Stellaria radians* f. *fimbriata* (Ledebour) Kitagawa; *S. radians* var. *ovato-oblonga* Koidzumi.

Herbs perennial, woolly, densely so above. Stems erect or ascending, quadrangular, 40–60 cm tall, basally branched, densely woolly. Leaves oblong-lanceolate to ovate-lanceolate, 3–12 × 1.5–2.5 cm, both surfaces lanate, midvein raised abaxially, base narrowed into short petiole, apex acuminate. Flowers in large terminal, dichotomous cymes; bracts lanceolate, herbaceous, densely lanate. Pedicel 1–3 cm, densely woolly, pendulous after anthesis. Sepals oblong-ovate or narrowly ovate, 6–8 × 2–2.5 mm, outside densely lanate. Petals 5, broadly obovate-cuneate, 8–10 mm, 5–7-cleft to middle or below; lobes nearly linear. Stamens 10, shorter than petals. Ovary broadly ellipsoid-ovoid; styles 3, linear. Capsule ovoid, slightly longer than persistent sepals, 6-valved. Seeds 2–5, black-brown, reniform, slightly compressed, scrobiculate. Fl. Jun–Aug, fr. Jul–Sep.

Hill scrublands, forest margins; 300–500 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

59. *Stellaria martjanovii* Krylov, Trudy Imp. S.-Peterburgsk. Bot. Sada 21: 3. 1902.

长裂繁缕 chang lie fan lu

*Mesostemma martjanovii* (Krylov) Ikonnikov.

Herbs perennial, glandular hairy. Stems 3–6 cm tall, simple or sparsely branched. Leaves congested, sessile, oblong-ovate, 5–7 × ca. 3 mm, midvein conspicuous, apex acuminate. Flowers axillary or terminal. Pedicel 5–7 mm or longer, pendulous at anthesis. Sepals 4, ovate-lanceolate, ca. 4 × 2 mm, margin narrowly membranous, apex acute. Petals 4, ca. 1.5 × as long as sepals, ca. 6 × 4 mm, 2-cleft to 2/3 length; lobes

oblong-obovate. Stamens 8. Capsule ovoid, 4-valved to base, slightly longer than persistent sepals. Fl. Apr–Jul. Stony slopes; Xinjiang (Altai Mts.) [Russia].

*Stellaria alexeenkoana* Schischkin (in Komorov, Fl. URSS 6: 882.

1936; *Mesostemma alexeenkoana* (Schischkin) Ikonnikov) was described based on a specimen from Tagdumbasch Pamir (Xinjiang). It is similar to *S. martjanovii*, but has linear-oblong leaves, pubescent sepals, and petals shorter than the sepals. The present authors have seen no material of this taxon.

60. *Stellaria monosperma* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 215. 1825.

独子繁缕 du zi fan lu

Herbs perennial. Stems yellow, quadrangular, 50–80 (–120) cm tall, stout, shiny, pubescent with 1 or 2 rows of glandular hairs above. Leaves short or long petiolate, lanceolate or oblong-lanceolate to elliptic, 4–11 (–23) × 1.2–2.5 (–6) cm, broadest from middle to base, base nearly rounded, semiclasping, adaxially pubescent or glabrous, midvein raised, pale yellow, margin crisp, apex long acuminate. Flowers numerous, in paniculate cymes, bisexual or unisexual; bisexual flowers large, female flowers small; bracts lanceolate. Pedicel 2–9 mm, slender, densely glandular pubescent. Sepals 5, gray-green, ovate-lanceolate to linear-lanceolate, (3–)5–6 (–8) × 1–2 mm, sparsely glandular pubescent, margin narrowed, dry, membranous, apex acuminate or rarely obtuse. Petals 5, 1/2–1 × as long as sepals, 2-cleft to middle; lobes sometimes sickle-shaped, apex acute. Stamens 5 or 10; filaments 5–6 mm; anthers yellow, ca. 0.3 mm in diam. Ovary ca. 2 mm, 1-loculed; ovules 3; styles 3, linear, ca. 4 mm. Seed 1 maturing per carpel, brown, globose, ca. 3 mm, somewhat rugulose or granular. Fl. Aug–Sep, fr. Sep–Oct.  $2n = 36, 44, 52$ .

Forests, mixed forests, montane forests, grassland slopes; 1200–2900 (–3300) m. Fujian, Guangdong, Guizhou, Hubei, Taiwan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Kashmir, Myanmar, Nepal, Pakistan, Sikkim, Thailand, Vietnam].

1a. Stamens 10 ..... 60a. var. *monosperma*  
1b. Stamens 5.

2a. Sepals lanceolate ..... 60b. var. *paniculata*

2b. Sepals ovate-lanceolate ..... 60c. var. *japonica*

60a. *Stellaria monosperma* var. *monosperma*

独子繁缕(原变种) du zi fan lu (yuan bian zhong)

*Stellaria crispata* Wallich ex D. Don; *S. glandulifera* Klotzsch; *S. nyalamensis* L. H. Zhou.

Stems yellow, quadrangular, 50–80 (–120) cm tall, stout, shiny, glandular pubescent, with 1 or 2 rows of hairs above. Seed 1 maturing per carpel, brown, globose, ca. 3 mm, somewhat rugulose or granular. Fl. Aug–Sep, fr. Sep–Oct.  $2n = 36, 52$ .

Forests; 2700–2800 m. Xizang [Afghanistan, Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

60b. *Stellaria monosperma* var. *paniculata* (Edgeworth) Majumdar, J. Indian Bot. Soc. 44(1): 141. 1965.

锥花繁缕 zhui hua fan lu

*Stellaria paniculata* Edgeworth, Trans. Linn. Soc. London 20: 35. 1846.

Leaves variously shaped, oblong-lanceolate to elliptic, adaxially rough, margin usually glabrous, base narrowed into short or long petiole, apex long acuminate. Female flowers small. Sepals lanceolate, ca. 4 mm. Petals 1/2–1 × as long as sepals. Stamens 5. Mixed forests, grassland slopes; 1500–2900(–3300) m. Xizang, Yunnan [Afghanistan, Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim, Thailand, Vietnam].

**60c. *Stellaria monosperma* var. *japonica*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 18(4): 384. 1873.

皱叶繁缕 *zhou ye fan lu*

*Stellaria paniculigera* Makino.

Stems with 1 line of hairs. Leaves oblong-lanceolate, broadly lanceolate, or oblanceolate, subglabrous or adaxially pubescent, midvein abaxially pubescent, base cuneate, narrowed into a short petiole, apex acuminate. Sepals ovate-lanceolate, soft, apex acuminate. Petals shorter than sepals, narrow, 2-cleft to base; lobes nearly sickle-shaped, apex acute. Stamens 5.  $2n = 44$ . Montane forests; 1200–1500 m. Fujian, Guangdong, Guizhou, Hubei, Taiwan, Zhejiang [Japan].

**61. *Stellaria ovatifolia*** (Mizushima) Mizushima, J. Jap. Bot. 41: 259. 1966.

卵叶繁缕 *luan ye fan lu*

*Brachystemma ovatifolium* Mizushima, Acta Phytotax. Geobot. 16: 42. 1955.

Herbs perennial. Stems diffuse, basally purplish, apically yellow-green, 1–2 m, slightly shiny, branched, pubescent with 2 lines of recurved hairs, somewhat densely pubescent above. Proximal and middle leaves usually broadly ovate or elliptic; distal leaves ovate-lanceolate to lanceolate, (2–)3–10 × (1–)1.5–2.5 cm, both surfaces glabrous, margin ciliate, midvein conspicuous, base nearly rounded, apex acute or acuminate. Flowers numerous in dichotomous, nearly subglobose cymes; distal bracts narrow, membranous, others herbaceous, usually shorter than pedicel, densely ciliate, subglabrous on both surfaces. Pedicel 3–5 mm after anthesis, densely pubescent. Sepals yellow-green, oblong to long ovate, 3–4(–6) × 1–1.5 mm, basal margin pubescent, pubescent outside, subglabrous inside, 3-veined, lateral veins conjoined at apex, base nearly rounded, margin dry, membranous, apex obtuse. Petals minute, ca. 1 mm, ca. 1/3 as long as sepals, 2-cleft nearly to base; lobes nearly linear, forked, base entire or undulate-crenate. Stamens 10; filaments ca. 2 mm, base broad, ca. 1/2 as long as sepals, glabrous; anthers pale yellow. Ovary globose or compressed globose, 1-loculed, ca. 1 mm, base narrowed, apex umbonate; ovules 3 or 4; styles 2 or 3, longer than ovary, apex curved. Capsule globose, shorter than persistent sepals, ca. 2.5 mm in diam., 4- or 6-valved. Seed 1, reniform-globose, densely papillate, papillate cells much branched, rotate. Fl. Jul, fr. Nov.

Forest margins, river banks; 2600–2800 m. Xizang [Nepal].

**62. *Stellaria delavayi*** Franchet, Pl. Delavay. 97. 1889.

大叶繁缕 *da ye fan lu*

Herbs perennial. Stems ca. 1 m tall, basally branched, sparsely pubescent, apically densely pubescent. Leaves sessile or shortly petiolate; leaf blade oblong-lanceolate or lanceolate, 3–10 × 2–4 cm, marginal veins conspicuous, ciliate, abaxially densely pubescent, adaxially sparsely pubescent, base rounded, apex long acuminate. Flowers in broad cymes, densely glandular pubescent; bracts narrowly lanceolate, densely pubescent and ciliate, apex acute. Pedicel 0.5–1.2 cm, slender, densely glandular pubescent. Sepals 5, lanceolate, ca. 5 mm, outside glandular pubescent, midvein conspicuous, margin membranous, apex acute. Petals 5, slightly shorter than or subequaling sepals, 2-cleft. Stamens 5, alternating with petals, subequaling petals. Styles 3. Capsule 6-valved. Seeds 2 or 3. Fl. Aug–Sep, fr. Sep–Oct.

• Forest margins, grassland slopes; 1800–2900(–3400) m. Sichuan, Yunnan.

**63. *Stellaria bistyla*** Y. Z. Zhao, Bull. Bot. Res., Harbin 5(4): 142. 1985.

二柱繁缕 *er zhu fan lu*

*Stellaria bistylata* W. Z. Di & Y. Ren.

Herbs perennial. Stems densely tufted, diffuse, purplish, subterete, 10–30 cm tall, dichotomously branched, densely glandular hairy. Leaves oblong-lanceolate, 1–2 cm × 2–10 mm, margin hairy or glabrous, midvein conspicuous, raised abaxially, impressed adaxially, base narrowed, apex acute. Flowers in terminal dichotomous cymes; bracts lanceolate, 1.5–3 mm, both surfaces glandular hairy. Pedicel 0.3–2 cm. Sepals 5, oblong-lanceolate, 4–5 × ca. 1 mm, outside shortly hairy or glabrous, margin broadly membranous, apex acute. Petals 5, obovate, ca. 3 × 2 mm, shorter than sepals, apex 2-cleft to 1/4–1/3 length, base cuneate. Stamens 10, ca. 3 mm. Ovary globose, 1-loculed; ovules 4 or 5; styles 2(or 3), 2–3 mm. Capsule obovoid, ca. 2.5 mm, shorter than persistent sepals, 4(or 6)-valved. Seeds 1(or 2), black-brown, ovoid to obovoid, 1.5–1.8 mm, tuberculate. Fl. Jul, fr. Aug.

• Dry gullies; 2000–2600 m. Nei Mongol, Ningxia.

**64. *Stellaria stronglylosepala*** Handel-Mazzetti, Oesterr. Bot. Z. 88: 301. 1939.

圆萼繁缕 *yuan e fan lu*

Herbs perennial. Stems tufted, nearly erect, quadrangular, ca. 20 cm tall, ca. 2 mm in diam., dry after anthesis, basally branched, with short branchlets and axillary leaf clusters; proximal leaves and inflorescences white papillate with stiff hairs. Leaves crowded below, distant above; leaf blade green, lanceolate-linear, ca. 1.5 cm × 1.2 mm, somewhat thick, margin erose, midvein slightly raised abaxially, impressed adaxially, apex acute. Flowers 5–16 in dichotomous cymes; branches nearly forked, sparse; bracts herbaceous, distal ones ca. 2 mm. Pedicel 0.5–1.5 cm, slender. Sepals 5, white, oblong, ca. 1.5 mm wide, glabrous or papillate-pubescent, veins 3 and dichotomously branched, margin broadly membranous,

apex rounded, green; calyx ca. 9 mm in diam. Petals ca. 2/3 as long as sepals, 2-cleft to middle; lobes oblong. Stamens 10, slightly shorter than petals, inserted on carnose, semiorbicular, separated disc lobes; anthers pale yellow, nearly rectangular. Ovules few; styles 4.

Capsule 4-valved. Seeds 2 or 3. Fl. Aug–Sep, fr. Sep–Oct.

• Nei Mongol.

## 11. MINUARTIA Linnaeus, Sp. Pl. 1: 89. 1753.

米努草属 mi nu cao shu

Lu Dequan (鲁德全); John McNeill

Herbs annual or perennial. Stems caespitose or solitary, prostrate; branches ascending or erect. Leaves linear, linear-subulate, or setaceous, 1- or 3-veined. Inflorescence cymose or flowers solitary. Sepals 5, 1- or 3-veined. Petals 5, white, rarely reddish, apex entire or emarginate. Stamens 10. Ovary 1-loculed; ovules numerous. Styles 3. Capsule narrowly ovoid or ovoid-cylindric, 3-valved. Seeds ovoid, reniform, or discoid; raphe sometimes tuberculate or fimbriate tuberculate.

About 120 species: Arctic regions to the Himalayas, also Chile (one species), Ethiopia, and Mexico; nine species in China.

- 1a. Plants annual; petals shorter than sepals ..... 1. *M. regeliana*  
 1b. Plants perennial; petals equaling or longer than sepals.  
 2a. Plants 10–30 cm tall.  
 3a. Capsule ca. 2 × as long as sepals; sepal apex obtuse; seeds rugulose striate, raphe fimbriate tuberculate ..... 2. *M. laricina*  
 3b. Capsule equaling sepals; sepal apex long acuminate; seeds subsmooth ..... 3. *M. kryloviana*  
 2b. Plants 3–10(–13) cm tall.  
 4a. Flowers solitary; sepals 5–7 mm, apex obtuse.  
 5a. Seed raphe bluntly tuberculate ..... 4. *M. arctica*  
 5b. Seed raphe fimbriate tuberculate ..... 5. *M. macrocarpa*  
 4b. Flowers borne in sparse cymes; sepals 3–5 mm, rarely longer and then apex acute.  
 6a. Petals subequaling sepals.  
 7a. Petals oblong, base cuneate; sepal apex obtuse; seeds smooth or rugose ..... 6. *M. biflora*  
 7b. Petals ovate, base abruptly contracted into a very short claw; sepal apex acute to shortly acuminate; seeds sharply tuberculate ..... 7. *M. verna*  
 6b. Petals 2–3 × as long as sepals.  
 8a. Leaves 4–5(–10) mm; sepals lanceolate; capsule narrowly ellipsoid, subequaling sepals ..... 8. *M. litwinowii*  
 8b. Leaves 10–20 mm; sepals ovate-lanceolate; capsule ovoid, longer than sepals ..... 9. *M. kashmirica*

1. *Minuartia regeliana* (Trautvetter) Mattfeld, Bot. Jahrb. Syst. 57(Beibl. 126): 29. 1921.

米努草 mi nu cao

*Alsine tenuifolia* Crantz var. *regeliana* Trautvetter, Bull. Soc. Imp. Naturalistes Moscou 33(1–2): 156. 1860.

Herbs annual, 5–10 cm tall. Stem solitary, branched from base, slender, glabrous. Leaves linear, 2–10 × 0.3–0.5 mm, 3- or 5-veined, base often ciliate. Cyme sparsely flowered. Pedicel filiform, 3–12 mm. Sepals ovate-lanceolate, 2.5–3.5 × 0.5–1 mm, 3-veined in proximal 1/2, base rounded, margin broadly scarious, apex mucronate. Petals oblong, shorter than sepals. Stamens 3–10. Ovary broadly ovoid. Capsule suboblong-ovoid, usually exserted. Seeds brown, compressed globose, ca. 0.5 mm, finely tuberculate. Fl. Apr–May, fr. Jun–Jul.

Steppes, wastelands, saline-alkaline soils; 600–700 m. Xinjiang [Kazakhstan, Mongolia, Russia, Turkmenistan; SW Asia].

2. *Minuartia laricina* (Linnaeus) Mattfeld, Bot. Jahrb. Syst. 57(Beibl. 126): 33. 1921.

石米努草 shi mi nu cao

*Spergula laricina* Linnaeus, Sp. Pl. 1: 441. 1753.

Herbs perennial, 10–30 cm tall. Stems caespitose, procumbent, many branched; branches ascending, glabrous or pubescent. Leaves sessile, linear-subulate, 0.8–1.5 cm × 0.5–1.5 mm, 1-veined, margin sparsely ciliate, apex acuminate. Inflorescence cymose. Pedicel 1–2 cm, shortly hairy; bracts lanceolate. Sepals oblong-lanceolate, 4–5(–6) mm, 3-veined, margin membranous, apex obtuse. Petals white, obovate-oblong, ca. 1.5 × as long as sepals, apex entire or emarginate. Filaments gradually broadened. Capsule suboblong-conical, 7–10 mm, ca. 2 × as long as sepals, 3-valved. Seeds brownish, compressed globose, rugulose striate; raphe fimbriate tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

*Betula* forests, coniferous forest margins; 400–1600 m. Heilongjiang, Jilin, Nei Mongol [Korea, Mongolia, Russia (Far East, E Siberia)].

3. *Minuartia kryloviana* Schischkin, Sist. Zametki Mater. Gerb. Krylova Tomsk. Gosud. Univ. Kuybysheva 1: 1. 1930.

新疆米努草 xin jiang mi nu cao

Herbs perennial, 10–18(–20) cm tall. Stems prostrate, base woody; branches erect, glabrous. Leaves linear, 0.5–1.5 cm × 0.3–1 mm, glabrous or glandular pubescent, 3-veined, apex acuminate. Inflorescence

cymose. Pedicel 1.5–3 cm, glabrous. Sepals ovate-lanceolate, 3.5–5 mm, adaxially pilose, 3-veined, apex acute. Petals white, oblong-obovate, ca. 7 × 1.5 mm, base attenuate, apex entire, emarginate, or toothed. Stamens 10, shorter than petals; anthers yellow. Styles 3. Capsule ovoid-suboblong, equalling sepals. Seeds reniform, ca. 1 mm, smooth. Fl. May–Jun, fr. Jun–Jul. Mountain slopes, rocks; 1200–2500(–3400) m. Xinjiang [Afghanistan, Kazakhstan, Russia (W Siberia)].

**4. *Minuartia arctica*** (Steven ex Seringe) Graebner in Ascherson & Graebner, Syn. Mitteleur. Fl. 5(1): 772. 1918.

北极米努草 bei ji mi nu cao

*Arenaria arctica* Steven ex Seringe in de Candolle, Prodr. 1: 404. 1824.

Herbs perennial, 5–9 cm tall. Stems densely caespitose, glandular pubescent. Leaves linear, 0.6–1.6 cm × ca. 1 mm, those on flowering stems smaller. Flowers solitary, rarely 2. Sepals linear-oblong, 5–7 mm, glandular pubescent. Petals ca. 2 × as long as sepals. Capsule 1.5–2 × as long as sepals. Seeds brownish, reniform-globose, 1–1.5 mm; raphe obtusely tuberculate. Fl. and fr. Jul–Aug.

Hillside rocks; 2200–2400 m. S Jilin (Changbai Shan) [Kazakhstan, Mongolia, N Russia (Far East, Siberia); North America].

**5. *Minuartia macrocarpa*** (Pursh) Ostenfeld var. **koreana** (Nakai) H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 6: 43. 1952.

长百米努草 chang bai mi nu cao

*Alsine macrocarpa* (Pursh) Fenzl var. *koreana* Nakai, Bot. Mag. (Tokyo) 32: 36. 1918.

Herbs perennial, 4–13 cm tall. Stems densely caespitose, prostrate; branches ascending, glandular pubescent. Leaves fascicled, linear or subulate-linear, ± flat, 0.5–1.5 cm × ca. 1 mm, abaxially pubescent, 3-veined, base connate into a sheath, margin spiny ciliate, apex subacute, sometimes falcately curved. Flower solitary; pedicel 1.5–4.5 cm, densely glandular pubescent, 2-bracteolate. Sepals linear-oblong or ovate-lanceolate, 4–5 × ca. 1 mm, abaxially glandular pubescent, 3-veined, margin membranous, apex obtuse. Petals oblong or obovate-oblong, 7–9 mm, ca. 2 × as long as sepals, apex obtuse. Stamens 10, slightly longer than sepals. Ovary ovoid; styles 3. Capsule oblong, 8–10 mm, ca. 2 × as long as sepals. Seeds dark brown, subreniform, 1.5–1.7 mm, both surfaces rugose; raphe long fimbriate tuberculate. Fl. Jun–Aug, fr. Aug–Sep. Rocky slopes; ca. 2400 m. Jilin [N Korea].

**6. *Minuartia biflora*** (Linnaeus) Schinz & Thellung, Bull. Herb. Boissier, sér. 2, 7: 404. 1907.

二花米努草 er hua mi nu cao

*Stellaria biflora* Linnaeus, Sp. Pl. 1: 422. 1753; *Alsine biflora* (Linnaeus) Wahlenberg.

Herbs perennial, 3–7 cm tall. Stems caespitose, erect, slender. Leaves linear, 6–10 × 0.5–1 mm, glabrous

except for a few short cilia at base, apex acute. Flowers 1–3, terminal; pedicel 2–12 mm. Sepals ovate-oblong, 2.5–3.5 mm, 3-veined, apex obtuse. Petals white, oblong, subequalling sepals. Stamens 10; anthers yellow. Capsule yellow-green, ovoid, ca. 4 × 2.5 mm, slightly longer than sepals. Seeds reniform, 0.7–0.8 mm, smooth or rugose. Fl. Jun–Aug, fr. Aug–Sep.

Mountains; ca. 3600 m. Xinjiang (Bogda Shan) [Afghanistan, Kazakhstan, N Mongolia, Pakistan, Russia (Far East, Siberia); Europe, North America].

**7. *Minuartia verna*** (Linnaeus) Hiern, J. Bot. 37: 320. 1899.

春米努草 chun mi nu cao

*Arenaria verna* Linnaeus, Syst. Nat., ed. 12, 2: 313. 1767 & Mant. Pl. 1: 72. 1767; *Alsine verna* (Linnaeus) Wahlenberg.

Herbs perennial, 3–10 cm tall. Stems caespitose, basally usually woody, distally glandular pubescent. Leaves linear or subulate, 5–12 × 0.7–1 mm, glandular pubescent, rarely glabrous, abaxially prominently 3-veined. Cyme lax, 1–7-flowered. Pedicel longer than sepals, glandular pubescent. Sepals ovate, 3–4 mm, glandular pubescent, prominently 3-veined, margin narrowly membranous, apex acute to shortly acuminate. Petals ovate, ca. 5 × 3 mm, base abruptly contracted into a very short claw. Stamens shorter than petals. Styles 3. Capsule ovoid, slightly exceeding sepals, 3-valved. Seeds brown, reniform, 0.6–0.7 mm, almost smooth to acutely tuberculate. Fl. Jul–Aug, fr. Sep–Oct.

Rocky hillsides, rock crevices; 200–3600 m. Xinjiang (Bogda Shan) [Japan, Kazakhstan, Mongolia, N Russia; Europe, North America].

**8. *Minuartia litwinowii*** Schischkin in Komarov, Fl. URSS 6: 885. 1936.

西北米努草 xi bei mi nu cao

Herbs perennial, 5–10 cm tall. Stems brown, woody at base, glandular pubescent. Leaves linear-subulate, 4–5(–10) × 0.5–2 mm, usually hard, 3-veined, apex obtuse or acute. Bracts ovate, glandular pubescent, 3-veined, apex acute or acuminate. Flowers 1–3, terminal; pedicel 2–10 mm, glandular pubescent or subglabrous. Sepals lanceolate, 5–6.5 mm, glandular pubescent, 3-veined, apex acute. Petals obovate-oblong, ca. 2.5 × as long as sepals, apex emarginate. Capsule narrowly ellipsoid, nearly equalling sepals. Seeds reniform, finely tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

Cliffs, rocky places; ca. 2400 m. Xinjiang [Kazakhstan, Turkmenistan; SW Asia (Iran, Turkey)].

**9. *Minuartia kashmirica*** (Edgeworth) Mattfeld, Bot. Jahrb. Syst. 57(Beibl. 126): 32. 1921.

克什米尔米努草 ke shi mi er mi nu cao

*Arenaria kashmirica* Edgeworth in J. D. Hooker, Fl. Brit. India 1: 236. 1874; *Minuartia lineata* Bornmuller f. *kashmirica* (Edgeworth) R. R. Stewart.

Herbs perennial, glandular pubescent, rarely glabrous. Stems densely caespitose, many branched; branches



leafy. Leaves linear-subulate, 1–2 cm, strongly spreading 3-veined, apex acute. Cymes pedunculate, subumbellate; bracts ovate-subulate, strongly veined. Pedicel usually shorter than sepals. Sepals ovate-lanceolate, shorter than petals, strongly 3-veined, apex

acuminate. Petals white, ca. 8 mm, ca. 2 × as long as sepals, apex entire. Capsule ovoid, slightly longer than sepals, valves recurved. Rock crevices; 1500–5000 m. Xizang [E Afghanistan, N India, W Nepal, N Pakistan].

## 12. LEPYRODICLIS Fenzl in Endlicher, Gen. Pl. 966. 1840.

薄蒴草属 *bao shuo cao shu*

Lu Dequan (鲁德全); Richard K. Rabeler

Herbs annual. Stems ascending or diffuse, branched. Leaves linear-lanceolate or lanceolate; stipules absent. Inflorescence a panicle of cymes; bracts immediately subtending calyx absent. Sepals 5. Petals 5, white or reddish, margin entire or emarginate. Stamens (7–)10(–14). Ovary 1-loculed; ovules few; styles 2(or 3). Capsule globose, 2(or 3)-valved. Seeds 1 or 2(or 3), small, testa thick, tuberculate; embryo curved.

Three species: Asia; two species in China.

- 1a. Petals white, broadly obovate, entire ..... 1. *L. holosteoides*  
1b. Petals reddish, oblanceolate, emarginate ..... 2. *L. stellarioides*

**1. *Lepyrodiclis holosteoides*** (C. A. Meyer) Fenzl ex Fisher & C. A. Meyer, Enum. Pl. Nov. 1: 93, 110. 1841.

薄蒴草 *bao shuo cao*

*Gouffeia holosteoides* C. A. Meyer, Verz. Caucasus Pfl. 217. 1831; *Arenaria holosteoides* (C. A. Meyer) Edgeworth.

Stems 40–100 cm tall, longitudinally striate, middle and distal internodes ca. 10 cm, glandular pubescent. Leaves linear-lanceolate, 3–7 cm × 2–5(–10) mm, adaxially pilose, densely so at midvein, base attenuate, margin glandular pubescent, apex acuminate. Panicle of cymes terminal or axillary, spreading; bracts lanceolate or linear-lanceolate, herbaceous. Pedicel 1–2 (–3) cm, slender, densely glandular pubescent. Sepals linear-lanceolate, 4–5 mm, abaxially sparsely glandular pubescent, margin narrowly membranous, apex acute. Petals white, broadly obovate, subequaling or slightly longer than sepals, margin entire. Styles 2. Capsule globose-ovoid, shorter than sepals, 2-valved. Seeds reddish-brown, compressed ovate. Fl. May–Jul, fr. Jul–Aug. *2n* = 34, 68.

Mountain slope grasslands, farmland, wastegrounds, forest margins, ditch sides, Gobi Desert; 1200–4100 m. Gansu, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, Xizang [Afghanistan,

NW India, Kashmir, Kazakhstan, Mongolia, Nepal, Pakistan; C and SW Asia].

This species is used medicinally.

**2. *Lepyrodiclis stellarioides*** Schrenk ex Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 93. 1841.

繁缕薄蒴草 *fan lu bao shuo cao*

*Arenaria holosteoides* (C. A. Meyer) Edgeworth var. *stellarioides* (Schrenk ex Fischer & C. A. Meyer) F. N. Williams; *L. holosteoides* (C. A. Meyer) Fenzl ex Fischer & C. A. Meyer var. *stellarioides* (Schrenk ex Fischer & C. A. Meyer) Kozhevnikov.

Stems ascending or procumbent, 10–60 cm tall, branched. Leaves linear-lanceolate, 2–5 × ca. 1 cm, base attenuate, apex acuminate. Panicle of cymes spreading. Sepals linear-lanceolate, 4–8 mm, glandular pubescent, margin membranous, apex acuminate. Petals reddish, oblanceolate, apex emarginate. Ovary ovoid; styles 2. Capsule globose, ca. 5 mm, longer than sepals. Seeds brown, reniform. Fl. Jun–Aug, fr. Aug–Oct. *2n* = 68.

Mountain slope grasslands, scrub; 1900–3500 m. Xinjiang [Afghanistan, Kazakhstan; SW and C Asia].

Kozhevnikov (Novosti Sist. Vyssh. Rast. 22: 97. 1985) considered this species to be a variety of *Lepyrodiclis holosteoides*.

## 13. CERASTIUM Linnaeus, Sp. Pl. 1: 437. 1753.

卷耳属 *juan er shu*

Lu Dequan (鲁德全); John K. Morton

Herbs annual or perennial, pubescent and/or glandular pubescent, rarely glabrous. Stems usually caespitose, sometimes slightly woody at base. Leaves ovate, elliptic, or lanceolate. Inflorescence terminal, a dichasial cyme, dense or lax, sometimes flowers solitary. Sepals (4 or)5, free. Petals (4 or)5, sometimes absent, white, apex usually 2-lobed or retuse, rarely entire. Stamens (3 or 5 or)10; nectaries present. Ovary 1-loculed; ovules numerous. Styles 3–5, inserted opposite sepals. Capsule golden yellowish, cylindric, sometimes subequaling but usually exceeding calyx, hard, thin, brittle, dehiscing by 2 × as many teeth as styles; teeth slightly curved, sometimes straight or revolute. Seeds numerous, globose or reniform, compressed, usually tuberculate; embryo annular.

About 100 species: almost cosmopolitan, most abundant in temperate and cold regions: 23 species (nine endemic) in China.

The identities of the taxa to which the following three names apply could not be ascertained. All were described from China, but none of the types has been seen by the present authors: *Cerastium calcicola* Ohwi (Repert. Spec. Nov. Regni Veg. 36: 46. 1934), described from Taiwan; *C. kaoi*

Shimizu (J. Fac. Text. Sci. & Techn. Shinshu Univ. No. 36, Biol., No. 12 [Stud. Limest. Fl. Jap. & Taiwan, Pt. 2]: 23. 1963), also described from Taiwan; and *C. sinicum* Nakai (J. Jap. Bot. 15: 526. 1939), described from Hebei.

The record of *Cerastium perfoliatum* Linnaeus in FRPS (p. 83), from Zhejiang, requires confirmation. No specimens of this species have been seen by the current authors.

- 1a. Styles 3; capsule teeth 6.
  - 2a. Leaves linear-lanceolate; petals obovate, longer than sepals; stamens 10 ..... 1. *C. cerastoides*
  - 2b. Leaves ovate-elliptic; petals ovate, shorter than sepals; stamens 5 ..... 2. *C. parvipetalum*
- 1b. Styles (4 or)5; capsule teeth (8 or)10.
  - 3a. Plants up to 20 cm tall.
    - 4a. Leaves elliptic, oblong, ovate, or obovate-elliptic.
      - 5a. Cyme densely clustered, headlike ..... 3. *C. glomeratum*
      - 5b. Cyme not as above.
        - 6a. Stems ascending; pedicel 5–8 mm, usually nutant after anthesis ..... 4. *C. pusillum*
        - 6b. Stems erect; pedicel to 15 mm.
          - 7a. Leaf apex obtuse; flowers sparse; sepals oblong, 4–5 mm ..... 5. *C. limprichtii*
          - 7b. Leaf apex acute; flowers dense; sepals oblong-lanceolate, 7–8 mm ..... 6. *C. thomsonii*
    - 4b. Leaves linear-lanceolate, lanceolate, or ovate-lanceolate.
      - 8a. Leaves ovate-lanceolate.
        - 9a. Plants annual; leaves 1–3 cm × 2–5 mm; flowers borne in a lax dichasium; calyx strongly inflated in fruit; capsule conical-cylindric ..... 7. *C. dichotomum*
        - 9b. Plants perennial; leaves 1–2.5 cm × 3–10 mm; flower solitary; calyx not inflated in fruit; capsule cylindric ..... 8. *C. lithospermifolium*
      - 8b. Leaves linear-lanceolate or lanceolate.
        - 10a. Leaf apex obtuse; petals slightly shorter than or equaling sepals ..... 9. *C. szechuense*
        - 10b. Leaves apex acute; petals longer than sepals.
          - 11a. Leaves 1.3–2 cm × 2–4 mm; petals ca. 0.5 cm ..... 10. *C. baischanense*
          - 11b. Leaves 0.5–1 cm × 1–2 mm; petals 1–1.3 cm ..... 11. *C. morrisonense*
  - 3b. Plants at least 15 cm tall.
    - 12a. Leaves ovate, oblong, or elliptic.
      - 13a. Plants stout, 40–100 cm tall; leaves 5–8 × 1.5–4 cm.
        - 14a. Leaves and bracts opposite ..... 12. *C. davuricum*
        - 14b. Leaves and bracts 3-verticillate ..... 13. *C. verticifolium*
      - 13b. Plants slender, 15–60 cm tall; leaves 1–4 × 0.3–1.5 cm.
        - 15a. Stems glabrescent; petals ca. 2 × as long as sepals ..... 14. *C. wilsonii*
        - 15b. Stems pilose and/or glandular pubescent; petals slightly shorter than or equaling sepals ..... 15. *C. fontanum*
    - 12b. Leaves linear-lanceolate, lanceolate, ovate-lanceolate, or oblanceolate.
      - 16a. Leave ovate-lanceolate or oblanceolate.
        - 17a. Plants perennial; leaves ovate-lanceolate; sepals oblong-lanceolate, ca. 5 mm; petals oblong or obovate, apex bifid ..... 16. *C. furcatum*
        - 17b. Plants annual; leaves oblanceolate; sepals ovate, 2–3 mm; petals spatulate, apex entire ..... 17. *C. takasagomontanum*
      - 16b. Leaves lanceolate or linear-lanceolate.
        - 18a. Leaves lanceolate.
          - 19a. Leaves 0.2–1 cm wide; sepals lanceolate; petal apex 2-lobed ..... 18. *C. falcatum*
          - 19b. Leaves 1–2 cm wide; sepals ovate-oblong; petal apex entire ..... 19. *C. pauciflorum*
        - 18b. Leaves linear-lanceolate.
          - 20a. Leaves 1–2.5 cm; petals apically 2-lobed for 1/4–1/3 their length ..... 20. *C. arvense*
          - 20b. Leaves 3–8 cm; petals apically entire, retuse, or crenately 2-lobed.
            - 21a. Petals spatulate, apex entire ..... 21. *C. subpilosum*
            - 21b. Petals obovate, apex retuse or crenately 2-lobed.
              - 22a. Leaves 3–5 cm × 3–6 mm; sepals lanceolate; petals slightly longer than sepals; capsule ca. 2 × as long as sepals ..... 22. *C. tianschanicum*
              - 22b. Leaves 4–8 cm × 5–15 mm; sepals ovate; petals 2–3 × as long as sepals; capsule 2.5–3 × as long as sepals ..... 23. *C. maximum*

**1. *Cerastium cerastoides*** (Linnaeus) Britton, Mem. Torrey Bot. Club 5: 150. 1894.

六齿卷耳 liu chi juan er

*Stellaria cerastoides* Linnaeus, Sp. Pl. 1: 422. 1753;  
*Cerastium cerastoides* var. *foliosum* Kozhevnikov;  
*Dichodon cerastoides* (Linnaeus) Reichenbach.

Herbs perennial, 10–20 cm tall. Stems caespitose, creeping basally, decumbent or ascending, branched distally, pubescent. Leaves linear-lanceolate, 8–20 × 1.5–2(–3) mm, apex acuminate. Cyme 3–7-flowered, rarely solitary; bracts leaflike, lanceolate. Pedicel 1.5–2 cm, glandular pubescent, recurved in fruit. Sepals broadly lanceolate, 4–6(–7) mm, 1-veined, margin membranous. Petals obovate, 8–12 mm, 2-lobed for ca. 1/4 their length. Stamens 10. Styles 3. Capsule cylindrical, 10–12 mm, 6-toothed. Seeds reniform-globose, tuberculate. Fl. May–Aug, fr. Aug–Sep.

Mountain valleys near moist grasslands; 1000–2400 m (3300–5100 m in Xizang). Jilin, Liaoning, Qinghai, Xinjiang, Xizang [Afghanistan, India, ?Kashmir, Kazakhstan, Mongolia, ?Nepal, Pakistan, Russia (Siberia); N Africa, SW Asia, Europe, North America].

**2. *Cerastium parvipetalum*** Hosokawa, Trans. Nat. Hist. Soc. Taiwan 22: 227. 1932.

小瓣卷耳 xiao ban juan er

Herbs annual or biennial, 10–20 cm tall. Stems slender, pilose. Leaves subsessile, ovate-elliptic, ca. 3 × 1 cm, adaxially pubescent, base abruptly attenuate, apex acuminate. Cyme terminal, lax. Pedicel filiform, ca. 8 mm, viscous pilose. Sepals 5, ovate-lanceolate, ca. 3 mm, abaxially pilose, apex acuminate. Petals 5, ovate, ca. 2 mm; claw short; limb apex shortly 2-toothed, teeth acuminate at tip. Stamens 5. Ovary ovoid, ca. 1 mm. Styles 3, ca. 2 mm. Capsule cylindrical-globose, ca. 2 mm, apex truncate, 6-toothed.

• Mountains; 1000–1500 m. S Taiwan.

**3. *Cerastium glomeratum*** Thuillier, Fl. Env. Paris, ed. 2, 226. 1799.

球序卷耳 qiu xu juan er

Herbs annual, 10–20 cm tall. Stems simple or caespitose, densely villous, distally glandular pubescent. Proximal leaves spatulate; distal leaves obovate-elliptic, 1.5–2.5 × 0.5–1 cm, base attenuate into a short petiole, both surfaces villous, midvein prominent, margin ciliate. Inflorescence of compact, cymose clusters (glomerules); rachis densely glandular pubescent; bracts leaflike, ovate-elliptic, densely pubescent. Pedicel 1–3 mm, densely pubescent. Sepals 5, lanceolate, ca. 4 mm, abaxially densely long glandular pubescent, margin narrowly membranous, apex acute. Petals 5, white, oblong, subequaling or slightly longer than sepals, base pilose, apex 2-lobed. Stamens shorter than sepals.

Styles 5. Capsule cylindrical, subequaling or 1.5–2 × as long as calyx, 10-toothed. Seeds brown, compressed triangular, tuberculate. Fl. Mar–Apr, fr. May–Jun.

Forest margins, mountain slope grasslands, sandy riversides; 100–3700 m. Fujian, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Xizang, Yunnan, Zhejiang [cosmopolitan weed].

1a. Capsule 1.5–2 × as long as calyx 3a. var. *glomeratum*  
1b. Capsule subequaling calyx . 3b. var. *brachycarpum*

**3a. *Cerastium glomeratum* var. *glomeratum***

球序卷耳(原变种) qiu xu juan er (yuan bian zhong)

*Cerastium vulgatum* Linnaeus var. *glomeratum*  
(Thuillier) Edgeworth & J. D. Hooker.

Capsule 1.5–2 × as long as calyx.

Mountain slope grasslands; below 3700 m. Fujian, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Xizang, Yunnan, Zhejiang [cosmopolitan weed].

**3b. *Cerastium glomeratum* var. *brachycarpum*** L. H. Zhou & Q. Z. Han, Bull. Bot. Res., Harbin 15: 49. 1995.

短果卷耳 duan guo juan er

Capsule subequaling calyx.

• Forest margins, sandy riversides; ca. 100 m. Liaoning.

The status of this variety needs further study. In other parts of the range of *Cerastium glomeratum*, plants growing in very dry conditions often have short capsules.

**4. *Cerastium pusillum*** Seringe in de Candolle, Prodr. 1: 418. 1824.

山卷耳 shan juan er

*Cerastium vulgatum* Linnaeus var. *leiopetalum* Fenzl.

Herbs perennial, 5–15 cm tall. Roots slender, fibrous. Stems caespitose, ascending, densely pubescent. Proximal leaves spatulate, long pubescent; distal leaves oblong to ovate-elliptic, 5–15 × 3–7 mm, both surfaces white pubescent, midvein conspicuous, base cuneate, margin ciliate, apex obtuse. Cyme terminal; bracts leaflike. Pedicel 5–8 mm, densely glandular pubescent, after anthesis usually nutant. Sepals 5, lanceolate-oblong, 5–6 mm, abaxially densely pubescent, margin broadly membranous, sometimes purplish. Petals 5, white, oblong, 1.3–1.5 × as long as sepals, 2-lobed for ca. 1/4 their length. Styles 5. Capsule narrowly cylindrical, ca. 2 × as long as calyx, 10-toothed. Seeds brown, compressed globose, tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

Mountain summit grasslands; 2800–3800 m. Gansu, SW Nei Mongol (Helan Shan), Ningxia, Qinghai, Xinjiang, Yunnan [Afghanistan, Kazakhstan, Mongolia, Russia].

**5. *Cerastium limprichtii*** Pax & K. Hoffmann in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 365. 1922.

椭圆叶卷耳 tuo yuan ye juan er

Herbs perennial, 10–15(–20) cm tall. Stems simple, spreading whitish pilose, distally glandular. Leaves elliptic, 5–7 × 2–4 mm, margin remotely ciliate, apex obtuse. Dichasium few flowered; bracts leaflike. Flowers 8–10 mm in diam.; pedicel ca. 1.5 cm, glandular. Sepals oblong, 4–5 mm, pilose, margin white, apex obtuse. Petals obovate, ca. 7 mm, glabrous, apex 2-lobed. Stamens 10. Styles 5. Capsule ca. 2 × as long as calyx. Fl. and fr. Jul–Sep.

• Forests, mountain slope grasslands and summit rocks, roadsides; 3000–3500 m. W Hebei (Xiaowutai Shan), S Shaanxi (Taibai Shan).  
**6. *Cerastium thomsonii*** J. D. Hooker, Fl. Brit. India 1: 228. 1874.

藏南卷耳 zang nan juan er

Herbs perennial, 5–15 cm tall. Stems caespitose, erect, slender, densely glandular pubescent. Leaves elliptic or oblong, 0.5–1.5 × 0.3–1 cm, both surfaces long pilose, midvein prominent, base attenuate into a short petiole on proximal leaves, broader and amplexicaul on distal leaves, apex subacute. Cyme subumbellate, few flowered; bracts with narrowly scarious margin. Flowers large; pedicel 3–15 mm, densely glandular pubescent. Sepals oblong-lanceolate, 7–8 × ca. 2 mm, abaxially laxly glandular pubescent, margin broadly membranous, apex subacute. Petals white, broadly obovate, 8–9 mm, apex 2-lobed. Stamens shorter than sepals. Ovary ovoid. Styles 5. Capsule cylindrical, ca. 1 cm. Seeds brown, reniform, ca. 1 mm, tuberculate.

Forests, scrub, mountain slope grasslands, mire meadows; 2500–3500 m. Xizang [Afghanistan, NW India, ?Kashmir, Nepal, Pakistan].

**7. *Cerastium dichotomum*** Linnaeus subsp. ***inflatum*** (Link) Cullen in Hedge & al., Notes Roy. Bot. Gard. Edinburgh 27: 211. 1967.

膨萼卷耳 peng e juan er

*Cerastium inflatum* Link in Desfontaines, Tabl. Ecole Bot., ed. 3, 462. 1829.

Herbs annual, 10–15 cm tall. Stems simple or few branched, erect, pubescent, mixed with glandular hairs distally. Leaves ovate-lanceolate, 1–3 cm × 2–5 mm, pilose, base amplexicaul, margin ciliate, apex acuminate. Dichasium terminal, somewhat lax; bracts leaflike, ovate-lanceolate, pilose. Calyx ovate, 1–1.2 cm × ca. 3.5 mm, strongly inflated in fruit, abaxially glandular pubescent, margin membranous. Petals oblong-obovate, ca. 1.5 × as long as calyx, apex retuse. Stamens 10. Styles 5. Capsule erect, conical-cylindrical, ca. 1.5 × as long as calyx, teeth flat. Fl. May–Jul.

Coniferous forests, hilly meadows; ca. 1500 m. Xinjiang [Kazakhstan; SW Asia].

Some authors treat this taxon at specific rank, as *Cerastium inflatum*. It differs from typical *C. dichotomum* (from N Africa, C and SW Asia, and S Europe) in having the dichasium somewhat lax and the calyx strongly inflated in fruit.

**8. *Cerastium lithospermifolium*** Fischer, Mém. Soc. Imp. Naturalistes Moscou 3: 81. 1812.

紫草叶卷耳 zi cao ye juan er

Herbs perennial, 5–15 cm tall, glandular pubescent. Stems sparsely caespitose. Leaves ovate-lanceolate, 1–2.5 × 0.3–1 cm, both surfaces white pilose, apex acute. Flower solitary, terminal; pedicel erect, 1–3 cm. Sepals 5, oblong-elliptic or ovate-lanceolate, 7–8 × ca. 3 mm, apex acuminate. Petals white, broadly obovate, 14–16 mm, apex retuse. Styles 5. Capsule cylindrical, ca. 2 × as long as calyx, 10-toothed, teeth revolute. Seeds light brown, compressed globose, tuberculate. Fl. Jul–Aug, fr. Aug–Oct.

Mountain slope grasslands; 300–3600 m. Xinjiang [Kazakhstan, Mongolia, Russia].

**9. *Cerastium szechuense*** F. N. Williams, J. Linn. Soc., Bot. 34: 433. 1899.

四川卷耳 si chuan juan er

Herbs annual, 17–20 cm tall, glandular pubescent. Stems simple or basally branched. Leaves sessile, lanceolate, apex obtuse. Cyme terminal, many flowered, inflexed after anthesis; bracts leaflike. Sepals oblong-lanceolate, margin membranous, apex acute. Petals white, narrowly elliptic-cuneate, slightly shorter than or equaling sepals, apex 2-lobed. Stamens 10. Capsule narrowly cylindrical, 10-toothed, ca. 2 × as long as calyx. Seeds few.

• Mountain slope grasslands; 2100–3500 m. N and W Sichuan.

**10. *Cerastium baischanense*** Y. C. Chu, Fl. Pl. Herb. Chin. Bor.-Orient. 3: 227. 1975.

长白卷耳 chang bai juan er

Herbs perennial, 6–20 cm tall, densely pubescent. Stems caespitose, ascending, slender. Proximal leaves oblanceolate, small, pilose, base attenuate into a short petiole, apex acute; middle and distal leaves lanceolate or linear-lanceolate, larger, 1.3–2 cm × 2–4 mm, midvein conspicuous, base cuneate, apex acute; leaf axils with dwarf, sterile shoots. Cyme terminal, 3–5-flowered; bracts leaflike, broadly lanceolate, pilose, apex acute. Pedicel 4–15 mm, densely spreading hairy. Sepals oblong-lanceolate or suboblong, 4–5 mm, abaxially pilose, margin membranous, apex obtuse. Petals white, oblong-obovate, 5–5.5 × 2–2.5 mm, slightly longer than sepals, 2-lobed for 1/5–1/4 their length. Stamens 10, shorter than petals. Styles 5. Capsule cylindrical, 8–10 mm, 10-toothed, teeth erect. Seeds broadly ovoid, slightly compressed, tuberculate. Fl. Jun–Aug, fr. Jul–Aug.

• Alpine tundra, moist stony slopes, near hot springs; ca. 1700 m. S Jilin (Changbai Shan).

**11. *Cerastium morrisonense*** Hayata, J. Coll. Sci. Imp. Univ. Tokyo 25: 57. 1908.

玉山卷耳 yu shan juan er

*Cerastium formosanum* (Ohwi) Ohwi; *C. morrisonense* var. *formosanum* Ohwi; *C. trigynum* Villars var. *morrisonense* (Hayata) Hayata; *C. trigynum* var. *taiwanianum* S. S. Ying.

Herbs perennial or biennial, glandular pubescent when young. Leaves linear-lanceolate, 5–10 × 1–2 mm, base attenuate, semiamplexicaul, apex acute, aristate. Cyme ca. 3-flowered or flower solitary; bracts scalelike.

Pedicel 1–1.5 cm, glandular pubescent. Sepals lanceolate, 6–7 mm, abaxially glandular pubescent, adaxially glabrous, margin membranous. Petals white, obovate, 1–1.3 cm, apex 2-lobed. Stamens 10, inserted opposite sepals; filaments 5–6 mm, 2-glandular at base. Ovary ovoid, ca. 2 mm, 1-loculed; ovules numerous. Styles 5, inserted opposite sepals, ca. 3 mm. Capsule erect, cylindrical, ca. 7 × 1–2 mm, 10-toothed. Seeds reniform-globose, compressed, ca. 1 mm, tuberculate.

• Forests, slopes, rocks; 2500–4000 m. Taiwan.

**12. *Cerastium davuricum*** Fischer ex Sprengel, Pl. Min. Cogn. Pug. 2: 65. 1815.

达乌里卷耳 *da wu li juan er*

*Cerastium amplexicaule* Sims.

Herbs perennial, 50–100 cm tall, subglabrous or proximally villous. Stems stout, longitudinally striate. Leaves sessile, oblong to elliptic or ovate, 5–8 × 1.5–3 cm, base amplexicaul, apex subobtuse or acute. Cyme large, spreading; bracts leaflike, ovate. Flowers ca. 3 cm in diam.; pedicel 1–2.5(–6) cm. Sepals 5, glossy, elliptic-oblong or ovate-lanceolate, 0.8–1.2 cm × 3.5–5 mm, margin membranous, apex acute. Petals white, obovate, 1.5–2 × as long as sepals; claw bearded; limb apex 2-lobed. Stamens equaling sepals. Styles 5. Capsule cylindrical, straight, 1.5–2 × as long as calyx. Seeds dark brown, oblate, ca. 1.5 mm, acutely tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

Coniferous forests, hill scrub, meadows; (1000–)1900–2400 (–2800) m. N Xinjiang [Kazakhstan, Mongolia, Pakistan, Russia; SW Asia].

The specific epithet was spelled “*dahuricum*” in FRPS; however, the protologue used the spelling “*davuricum*.”

The flowers are large and ornamental.

**13. *Cerastium verticifolium*** R. L. Dang & X. M. Pi, Bull. Bot. Res., Harbin 15: 431. 1995.

轮叶卷耳 *lun ye juan er*

Herbs perennial, 40–100 cm tall, glabrous or sparsely villous. Stems stout, longitudinally striate. Leaves 3-verticillate, sessile, oblong or elliptic, 6–8 × 1.5–4 cm, base cuneate or amplexicaul, apex obtuse. Cyme terminal; bracts 3-verticillate, leaflike, elliptic-lanceolate. Flowers large; pedicel 1–4 cm. Sepals glossy, oblong-lanceolate, 0.9–1.1 cm × 4–5 mm, margin membranous, apex acute. Petals white, obcordate, 2-lobed for ca. 1/3 their length. Stamens 10, equaling sepals. Styles 5. Capsule not seen.

• Mountain valleys; 1800–2000 m. Xinjiang.

**14. *Cerastium wilsonii*** Takeda, Bull. Misc. Inform. Kew 1910: 381. 1910.

卵叶卷耳 *luan ye juan er*

Herbs perennial, 25–35 cm tall. Roots slender. Stems ascending, glabrescent. Basal leaves spatulate, base attenuate into a long petiole; cauline leaves sessile, ovate or ovate-elliptic, 1.5–2.5 cm × 8–12 mm, midvein and base villous, apex acute. Cyme terminal, many flowered; bracts leaflike, small, pilose. Pedicel slender, to 3 cm, glandular pubescent. Sepals lanceolate or

broadly so, ca. 6 mm, abaxially pilose, margin membranous, apex acute. Petals narrowly obovate, ca. 2 × as long as sepals, 2-lobed for ca. 1/2 their length, lobes lanceolate, apex acuminate. Stamens slightly longer than sepals. Styles 5, linear. Capsule cylindrical, slightly longer than calyx, 10-toothed. Seeds numerous, brown, subtriangular-globose, slightly compressed, ca. 1 mm, tuberculate. Fl. Apr–May, fr. Jun–Jul.

• Forest margins, mountain slopes; 1100–2000 m. Anhui, Gansu, Henan, Hubei, S Shaanxi, Sichuan, Yunnan.

**15. *Cerastium fontanum*** Baumgarten, Enum. Stirp. Transsilv. 1: 425. 1816.

喜泉卷耳 *xi quan juan er*

Herbs short-lived perennial or annual, 15–40 cm tall. Stems caespitose or simple, suberect; sterile stems decumbent; flowering stems pilose and/or glandular pubescent all round. Basal leaves ovate, obovate-lanceolate, ovate-spatulate, or spatulate, 5–13 × 3–10 mm, both surfaces pilose, base attenuate into a petiole; cauline leaves subsessile, ovate, oblong, or narrowly ovate-oblong, 1–3(–4) × 0.3–1(–1.2) cm, both surfaces pilose or pubescent, margin densely ciliate, apex acute. Cyme terminal, spreading, lax, up to 40-flowered; bracts leaflike, ovate, 3–5 mm, both surfaces glandular pubescent. Pedicel slender, 0.5–2.5 cm, densely glandular pubescent, recurved after anthesis. Sepals oblong- or ovate-lanceolate, 5–6 mm, abaxially densely glandular pubescent, margin membranous or narrowly so. Petals obovate or obovate-oblong, shorter than to 2 × as long as sepals, apex 2-lobed. Stamens shorter than petals. Ovary ovoid, ca. 2 mm. Styles 5, linear, slightly longer than ovary. Capsule cylindrical, 8–10 mm, ca. 2 × as long as calyx, 10-toothed, teeth usually recurved. Seeds brown, usually 0.4–0.8 mm in diam., tuberculate. Fl. Apr–Jun, fr. May–Jul.

Forests, forest margins, mountain slopes, hilltop grasslands, fields, sandy soils, rock crevices, roadsides; 100–4300 m. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [cosmopolitan weed].

- 1a. Herbs short-lived perennial; petals shorter than or equaling sepals ..... 15a. subsp. *vulgare*  
1a. Herbs annual; petals 7–9 mm, 1.5–2 × as long as sepals 15b. subsp. *grandiflorum*

**15a. *Cerastium fontanum*** subsp. *vulgare* (Hartman) Greuter & Burdet in Greuter & Raus, Willdenowia 12: 37. 1982.

簇生泉卷耳 *cu sheng quan juan er*

*Cerastium vulgare* Hartman, Handb. Skand. Fl. 182. 1820; *C. caespitosum* Gilibert ex Ascherson, nom. illeg. (included *C. viscosum* Linnaeus and *C. vulgatum* Linnaeus); *C. caespitosum* subsp. *triviale* (Spencer) Hiitonen; *C. fontanum* var. *angustifolium* (Franchet) H. Hara; *C. fontanum* subsp. *holosteoides* (Fries) Salman

et al.; *C. fontanum* var. *tibeticum* (Edgeworth & J. D. Hooker) C. Y. Wu & L. H. Zhou; *C. fontanum* subsp. *triviale* (Spencer) Jalas; *C. holosteoides* Fries; *C. holosteoides* var. *hallaisanense* (Nakai) Mizushima; *C. holosteoides* subsp. *triviale* (Spencer) Möschl; *C. ianthes* F. N. Williams; *C. triviale* Link, nom. illeg. (included *C. viscosum* and *C. vulgatum*); *C. vulgatum* Linnaeus var. *angustifolium* Franchet; *C. vulgatum* subsp. *caespitosum* Dostál; *C. vulgatum* var. *hallaisanense* Nakai; *C. vulgatum* var. *tibeticum* Edgeworth & J. D. Hooker.

Herbs short-lived perennial. Petals shorter than or equaling sepals.

Forest margins, mountain slopes, hilltop grasslands, fields, sandy soils, rock crevices, roadsides; 100–2300 m. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [cosmopolitan weed].

**15b. *Cerastium fontanum* subsp. *grandiflorum*** H. Hara, J. Jap. Bot. 52: 353. 1977.

大花泉卷耳 da hua quan juan er

*Cerastium grandiflorum* Hamilton ex D. Don, Prodr. Fl. Nepal. 216. 1825, not Gilibert (1782), nor Waldstein & Kitaibel (1803–1805); *C. holosteoides* subsp. *triviale* var. *grandiflorum* Majumdar; *C. nipaulense* Wallich ex G. Don, nom. illeg. (included *C. grandiflorum* Hamilton ex D. Don); *C. triviale* var. *nipaulense* F. N. Williams, nom. illeg.; *C. vulgatum* var. *grandiflorum* Edgeworth & J. D. Hooker.

Herbs annual. Petals 7–9 mm, 1.5–2 × as long as sepals. Forested mountain slopes; 3100–4300 m. Xizang [Nepal].

The placement of this variety under *Cerastium fontanum* requires further study.

**16. *Cerastium furcatum*** Chamisso & Schlechtendal, Linnaea 1: 61. 1826.

缘毛卷耳 yuan mao juan er

*Cerastium amurense* Ohwi; *C. ciliatum* Ohwi; *C. ciliatum* var. *acutifolium* (Franchet) Handel-Mazzetti; *C. ciliatum* var. *brevifolium* (Franchet) Handel-Mazzetti; *C. rigidum* Ledebour (1815), not (Scopoli) Vitman (1789); *C. rubescens* Mattfeld; *C. vulgatum* Linnaeus var. *acutifolium* Franchet; *C. vulgatum* var. *brevifolium* Franchet.

Herbs perennial, 15–55 cm tall. Stems caespitose or simple, suberect, villous, distally both villous and glandular pubescent. Basal leaves spatulate; cauline leaves ovate-lanceolate, 1–3 × 0.4–1.1 cm, base rounded or cuneate, apex obtuse or acute. Cyme spreading; bracts leaflike. Pedicel slender, 1–3.5 cm, densely pubescent and glandular pubescent, recurved in fruit. Sepals oblong-lanceolate, ca. 5 mm, pubescent, margin broadly membranous. Petals oblong or obovate, 1.5–2 × as long as sepals, base ciliate, apex 2-lobed. Stamens sparsely villous. Styles 5. Capsule cylindrical, ca. 2 × as long as calyx. Seeds brown, compressed globose, tuberculate. Fl. May–Aug, fr. Jul–Sep.

Forest margins, mountain valleys, hillsides and summits, meadows; 1200–3800 m. Gansu, Henan, S Jilin (Changbai Shan), Ningxia, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan [N Korea, E Russia].

**17. *Cerastium takasagomontanum*** Masamune, Trans. Nat. Hist. Soc. Taiwan 28: 120. 1938.

高山卷耳 gao shan juan er

*Arenaria takasagomontana* (Masamune) S. S. Ying;

*Cerastium subpilosum* Hayata var. *takasagomontanum* (Masamune) S. S. Ying.

Herbs annual, usually densely glandular pubescent. Stems erect. Leaves oblanceolate, 1–3.5 cm × 3–8 mm, base attenuate, semiamplexicaul, apex acute. Cyme terminal; bracts ovate, margin ciliate. Pedicel 1–2 cm. Sepals ovate, 2–3 × 1–1.5 mm, apex obtuse. Petals spatulate, ca. 2 × as long as sepals, apex entire. Stamens 1.5–2 mm. Ovary ovoid, ca. 1 mm. Styles 1–1.5 mm. Capsule erect, cylindrical-ovoid, 2.5–3 mm, acutely 8–10-toothed.

• Mountain slopes and rocks; 2500–3400 m. C Taiwan.

**18. *Cerastium falcatum*** Bunge ex Fenzl in Ledebour, Fl. Ross. 1: 398. 1842.

披针叶卷耳 pi zhen ye juan er

*Cerastium maximum* Linnaeus var. *falcatum* Grenier.

Herbs perennial, 15–40 cm tall, sparsely glandular pubescent. Stems ascending or erect. Leaves sessile, lanceolate, 2–6 × 0.2–1 cm, both surfaces and margin pilose, midvein conspicuous, base cuneate, apex acute. Cyme terminal; bracts ovate-lanceolate. Pedicel slender, 2.5–3 cm, glandular pubescent, usually pendent in fruit. Sepals lanceolate, 3–5 mm, glandular pubescent, margin membranous, apex sharply pointed. Petals obovate-oblong, 1.5–2 × as long as sepals, apex 2-lobed. Stamens shorter than petals. Styles 5. Capsule oblong-ovoid, 10-toothed. Seeds brown, reniform-globose, obtusely tuberculate. Fl. May–Aug, fr. Jul–Sep.

Scrub forests, grassy forest margins, mountain slopes, ravines, edges of farmland; 800–2800 m. Gansu, Hebei, Nei Mongol, Shanxi, Xinjiang [Afghanistan, Kazakhstan, Pakistan, Russia].

**19. *Cerastium pauciflorum*** Steven ex Seringe in de Candolle, Prodr. 1: 414. 1824.

疏花卷耳 shu hua juan er

Herbs perennial, 20–60 cm tall. Roots slender. Stems caespitose, erect or ascending, pubescent, distally glandular hairy. Basal leaves spatulate, small; cauline leaves sessile, lanceolate, 3–8 × 1–2 cm, both surfaces hairy, base attenuate, margin ciliate, apex acute or acuminate. Cyme terminal; bracts leaflike, ovate-lanceolate. Flowers 1.5–1.8 cm in diam.; pedicel slender, 0.5–3 cm, densely glandular pubescent. Sepals ovate-oblong, ca. 6 × 2 mm, abaxially glandular pubescent, margin membranous. Petals obovate or obovate-oblong, 1–1.3 cm, 1.5–3 × as long as calyx, glabrous or pilose at base, apex entire. Stamens glabrous or filaments pilose at base. Styles 5. Capsule cylindrical, ca. 2 × as long as calyx, 10-toothed, teeth revolute. Seeds yellow-brown, triangular-reniform, tuberculate. Fl. May–Jun, fr. Jul–Aug.

Forests, hillside scrub forests, meadows, wet river banks, wet mountain roadsides; 200–2500 m. Gansu, Heilongjiang, Jilin, Liaoning, Xinjiang [Japan, Kazakhstan, Korea, Mongolia, Russia].

1a. Leaves 3–6 cm; petals 1.5–2 × as long as calyx;

petals and filaments glabrous 19a. var. *pauciflorum*

1a. Leaves 4–8 cm; petals 2.5–3 × as long as calyx;

petals and filaments pilose at base 19b. var. *oxalidiflorum*

**19a. *Cerastium pauciflorum* var. *pauciflorum***

疏花卷耳(原变种) shu hua juan er (yuan bian zhong)

*Cerastium ledebourianum* Seringe; *C. pilosum* Ledebour (1815), not Smith (1809).

Leaves 3–6 cm. Petals 1.5–2 × as long as calyx. Petals and filaments glabrous. Fl. May–Jun, fr. Jul–Aug.

Hillside scrub forests, wet river banks; 1000–2500 m. Gansu, Xinjiang [Japan, Kazakhstan, Korea, Mongolia, Russia].

**19b. *Cerastium pauciflorum* var. *oxalidiflorum*** (Makino) Ohwi, Acta Phytotax. Geobot. 11: 254. 1942.

毛蕊卷耳 mao rui juan er

*Cerastium oxalidiflorum* Makino, Bot. Mag. (Tokyo) 19: 102. 1905; *C. pauciflorum* var. *amurense* (Regel) Mizushima; *C. pilosum* var. *amurense* Regel.

Leaves 4–8 cm. Petals 2.5–3 × as long as calyx. Petals and filaments pilose at base. Fl. May–Jul, fr. Jul–Aug.

Forests, meadows, wet mountain roadsides; 200–800 m. Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia (Far East)].

**20. *Cerastium arvense*** Linnaeus subsp. ***strictum*** Gaudin, Fl. Helv. 3: 245. 1828.

卷耳 juan er

*Cerastium arvense* var. *angustifolium* Fenzl; *C. arvense* var. *strictum* W. D. J. Koch; *C. strictum* Haenke (1789), not Linnaeus (1753).

Herbs perennial, 15–35 cm tall. Stems sparsely caespitose, creeping proximally, erect distally, retrorsely purplish red hairy, distally both retrorsely hairy and glandular pubescent, or glabrous throughout. Leaves linear to narrowly lanceolate, 0.5–2.5 cm × 1–4 mm, pilose or glabrous, base cuneate, amplexicaul, margin sometimes ciliate, apex acute or acuminate; leaf axils with dwarf, sterile shoots. Cyme terminal, 3–7-flowered; bracts leaflike, lanceolate, pilose, margin scarious. Pedicel 1–1.5 cm, densely white glandular pubescent. Sepals lanceolate, ca. 6 × 1.5–2 mm, abaxially densely villous, margin membranous. Petals obovate, ca. 2 × as long as sepals, 2-lobed for 1/4–1/3 their length. Stamens shorter than petals. Styles 5. Capsule cylindrical, ca. 1.3 × as long as calyx, 10-toothed. Seeds numerous, brown, reniform, slightly compressed, tuberculate. Fl. May–Aug, fr. Jul–Sep.  $2n = 36$ .

Sand dunes under forests of *Pinus sylvestris* var. *mongolica*, forest margins, sand dune scrub, hillsides, grassy mountain valleys and hilltops, steppes, ditches; 600–4300 m. Gansu, Hebei, Henan, Jiangxi, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan,

Xinjiang, Yunnan [Japan, Kazakhstan, Korea, Mongolia, Russia; Europe, North and South America].

In FRPS, *Cerastium arvense* var. *arvense* was recorded from China, as well as var. *angustifolium* (a synonym of the widespread subsp. *strictum*) and var. *glabellum*. The identity of Chinese material as subsp. *arvense* needs confirmation: this taxon is native to W Europe and has been introduced into several other temperate regions, where it grows as a weed in grassy places. Its chromosome number is haploid ( $2n = 72$ ), as compared with diploid ( $2n = 36$ ) in subsp. *strictum*. These two subspecies are very difficult to separate morphologically, especially in the herbarium, but a chromosome count can provide a strong indication of identity. *Cerastium arvense* var. *glabellum* (Turczaninow) Fenzl (in Ledebour, Fl. Ross. 1: 413. 1842, based on *C. glabellum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 15: 614. 1842) is probably only a glabrous form of subsp. *strictum*.

**21. *Cerastium subpilosum*** Hayata, Icon. Pl. Formos. 3: 39. 1913.

毛卷耳 mao juan er

*Arenaria subpilosa* (Hayata) Ohwi; *Cerastium taiwanense* T. S. Liu.

Herbs perennial. 15–40 cm tall. Stems slender, somewhat prostrate, pilose. Leaves sessile, linear-lanceolate, 3–4.5 cm × 3–4 mm, adaxially aristate pilose, abaxially subglabrous, base attenuate, margin remotely ciliate, apex acute. Cyme terminal, lax. Pedicel slender, 1–3 cm, pubescent. Sepals ovate-oblong, 2–4 × 1–1.5 mm, margin ciliate, apex obtuse. Petals spatulate, ca. 2 × as long as sepals, base attenuate, apex rounded, entire. Ovary 1–1.5 mm. Styles 4 or 5. Capsule cylindrical, 3–4 × 2–2.5 mm, 8–10-toothed. Seeds brown-red, oblong-globose, slightly compressed, ca. 1 mm, tuberculate.

• Mountains; 3000–3900 m. C Taiwan.

**22. *Cerastium tianschanicum*** Schischkin, Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast. 2: 136. 1936. 天山卷耳 tian shan juan er

*Cerastium vulgatum* Linnaeus var. *tianschanicum* (Schischkin) Kozhevnikov.

Herbs perennial, 15–35 cm tall, densely pubescent. Stems ascending, distally branched. Leaves sessile, linear-lanceolate, 3–5 cm × 3–6 mm, base semiamplexicaul. Cyme lax; bracts ovate-triangular, small, margin ciliate. Pedicel equaling or 2–3 × as long as sepals. Sepals lanceolate, 6–7.5 × 2–3 mm, abaxially glandular pubescent, margin membranous. Petals oblong-obovate, ca. 9 × 5 mm, ca. 1.5 × as long as sepals, apex retuse. Stamens shorter than petals; anthers yellow, ovoid. Styles 5. Capsule erect, oblong, ca. 2 × as long as calyx, 10-toothed. Seeds deep brown, reniform or globose, ca. 1 mm, finely and obtusely tuberculate. Fl. May–Jun, fr. Jun–Jul.

Coniferous forests, subalpine meadows, river banks, gullies; 700–2700 m. Xinjiang [Afghanistan, Kazakhstan].

**23. *Cerastium maximum*** Linnaeus, Sp. Pl. 1: 439. 1753. 大卷耳 da juan er

Herbs perennial, 20–40 cm tall, tomentellous, distally glandular pubescent. Stems simple, erect. Leaves linear-lanceolate to lanceolate, 4–8 × 0.5–1.5 cm, apex

acuminate. Cyme terminal; bracts leaflike. Pedicel glandular hairy. Sepals oblong-ovate or ovate, 6–10 × 3–4 mm, glandular pubescent, margin membranous, apex obtuse. Petals obovate, 2–3 × as long as sepals, apex crenately 2-lobed. Styles 5. Capsule conical,

**14. PSEUDOCERASTIUM** C. Y. Wu, X. H. Guo & X. P. Zhang in X. P. Zhang & X. H. Guo, *Acta Bot. Yunnan.* 20: 395. 1998.

假卷耳属 *jia juan er shu*

Lu Dequan (鲁德全); Richard K. Rabeler

Herbs perennial. Stems erect or ascending. Leaves ovate to obovate-spatulate; stipules absent. Inflorescence a leafy dichasium; bracts immediately subtending calyx absent. Sepals 5. Petals 5, white, deeply bifid. Stamens 10. Ovary 1-loculed; ovules numerous; styles 5, opposite sepals, attached to deciduous disc. Capsule shortly cylindrical, dehiscent with 10 apical teeth. Seeds numerous, reniform, tuberculate; embryo curved.

• One species.

**1. Pseudocerastium stellarioides** X. H. Guo & X. P. Zhang, *Acta Bot. Yunnan.* 20: 396. 1998.

假卷耳 *jia juan er*

Stems 5–25 cm tall, villous, sometimes with intermixed glandular hairs. Proximal leaves petiolate, distal leaves sessile; leaf blade 1.5–3 × 1–2 cm, pubescent, base rounded or cordate, apex acuminate. Flowers terminal; bracts leaflike, margin pubescent, sometimes glandular

straight, 1.5–2 × as long as calyx, teeth revolute. Seeds brown, ca. 2 mm, obtusely tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

Scrub, grassy river banks. Xinjiang [Russia; North America].

hairy; pedicel slender, densely glandular hairy. Sepals ovate-oblong, 5–7 mm, abaxially glandular pubescent, margin membranous, apex acuminate. Petals obovate-oblong, 1–1.2 cm; lobes 3–4 mm. Stamens shorter than petals. Ovary globose; styles linear. Capsule included in sepals. Seeds brown. Fl. and fr. Jul.

• 800–1000 m. Anhui.

**15. MYOSOTON** Moench, *Methodus* 225. 1794.

鹅肠菜属 *e chang cai shu*

Lu Dequan (鲁德全); Richard K. Rabeler

*Malachium* Fries.

Herbs perennial. Stems decumbent or ascending. Leaves ovate; stipules absent. Inflorescence a leafy dichasium; bracts immediately subtending calyx absent. Sepals 5. Petals 5, white, deeply bifid. Stamens 10. Ovary 1-loculed; ovules numerous; styles 5, alternating with sepals. Capsule ovoid, dehiscent nearly to 1/2 with 5 shortly bifid valves. Seeds numerous, reniform, tuberculate; embryo curved.

One species: temperate Asia and Europe.

**1. Myosoton aquaticum** (Linnaeus) Moench, *Methodus* 225. 1794.

鹅肠菜 *e chang cai*

*Cerastium aquaticum* Linnaeus, *Sp. Pl.* 1: 439. 1753;  
*Malachium aquaticum* (Linnaeus) Fries; *Stellaria aquatica* (Linnaeus) Scopoli.

Stems 20–80 cm, weak, apically glandular hairy. Proximal leaves petiolate; distal leaves sessile; leaf blade 2.5–5.5 × 1–3 cm, pubescent or glabrous, base rounded or subcordate, margin undulate, apex acute. Flowers terminal or axillary; bracts leaflike, margin glandular hairy; pedicel 1–2 cm, slender, densely

glandular hairy. Sepals ovate-lanceolate, 4–5 mm, to ca. 7 mm in fruit, abaxially glandular pubescent, margin narrowly membranous. Petals bifid to base; lobes lanceolate, 3–3.5 mm. Stamens shorter than petals. Ovary ovoid; styles linear. Capsule pendent from spreading pedicel, exceeding sepals. Seeds rusty brown, globose, ca. 1 mm, mammillate. Fl. May–Jun, fr. Jun–Aug.  $2n = 20^*$ , 28.

Mountain slopes, valleys, forests, floodlands, field margins; 300–2700 m. Throughout China [cosmopolitan].

This species is used medicinally, as a wild vegetable, and as fodder.

**16. THYLACOSPERMUM** Fenzl in Endlicher, *Gen. Pl.* 967. 1840.

囊种草属 *nang zhong cao shu*

Lu Dequan (鲁德全); Michael G. Gilbert

Cushion shrubs, perennial. Taproot woody. Stems densely caespitose, becoming woody when old. Leaves densely imbricate, sessile, small; leaf blade ovate, small; stipules absent. Inflorescence a solitary flower in terminal leaf axil. Flower 5(or 4)-merous. Pedicel nearly absent. Sepals connate below middle, tube obconic. Petals entire. Stamens ca. 2 × as many as sepals; filaments glandular at base, inserted at disc edges. Ovary 1-loculed with several ovules; styles



3(or 2), linear. Fruit a capsule, globose, leathery, 6(or 4)-toothed, several seeded. Seeds reniform, large; testa spongy, ± smooth.

One species: C Asia, W China, Himalayas.

**1. Thylacospermum caespitosum** (Cambessèdes) Schischkin, Sched. Herb. Fl. Ross. 9: 90. 1932.

囊种草 nang zhong cao

*Periandra caespitosa* Cambessèdes, Voy. Inde: 27.

1836; *Arenaria caespitosa* (Cambessèdes)

Kozhevnikov; *A. rupifraga* (Karelin & Kirilov) Fenzl ex Ledebour; *Bryomorpha rupifraga* Karelin & Kirilov; *Thylacospermum rupifragum* (Karelin & Kirilov) Schrenk.

Cushions ± semiglobose to nearly mat-forming, glabrous, 30–50 cm in diam. Stems very densely branched, 2–6 cm tall. Leaf blade ovate-lanceolate, 2–4

× ca. 2 mm, rigid, glossy, base joined to sheath, margin ciliate, apex mucronate. Flowers ca. 4 mm in diam. Sepals green, lanceolate, ca. 2.5 × 1 mm, 3-veined, apex obtuse or acuminate. Petals ovate-oblong, margin entire. Disc yellow, orbicular, fleshy. Stamens shorter than sepals. Capsule glossy yellow, globose, 2.5–3 mm. Seed light brown, ca. 1.5 mm. Fl. Jun–Jul, fr. Jul–Aug. Exposed level or gently sloping stony areas, often in rock crevices; (3600–)4300–6000 m. Gansu, Qinghai, Sichuan, Xinjiang, Xizang [NW India, Kazakhstan, Kyrgyzstan, Nepal, Sikkim]. This is one of the most prominent high-alpine cushion plants.

## 17. MOEHRINGIA Linnaeus, Sp. Pl. 1: 359. 1753.

种阜草属 zhong fu cao shu

Lu Dequan (鲁德全); Richard K. Rabeler

Herbs annual or perennial. Stems straggling, caespitose, ascending, or erect, slender. Leaves sessile or shortly petiolate, oblong, obovate, or ovate-lanceolate to linear; stipules absent. Flowers solitary or in lax, few-flowered cymes; bracts immediately subtending calyx absent. Sepals 4 or 5. Petals 4 or 5, white, margin entire. Stamens (5 or 8) or 10. Ovary 1-loculed; ovules numerous; styles (2 or)3. Capsule ovoid, (4 or)6-toothed. Seeds few, reddish black, smooth, lucid, with a membranous strophiole; embryo curved.

About 25 species: N temperate regions; three species in China.

1a. Petals 1/3–1/2 as long as sepals; leaves 3-veined, ovate or broadly ovate ..... 3. *M. trinervia*

1b. Petals ca. 2 × as long as sepals; leaves 1-veined.

2a. Leaves elliptic or oblong ..... 1. *M. lateriflora*

2b. Leaves lanceolate or oblong-lanceolate ..... 2. *M. umbrosa*

**1. Moehringia lateriflora** (Linnaeus) Fenzl, Vers. Darstell. Alsin. 38. 1833.

种阜草 zhong fu cao

*Arenaria lateriflora* Linnaeus, Sp. Pl. 1: 423. 1753.

Herbs perennial, with rhizomes. Stems erect, 10–20 cm tall, pubescent. Leaves subsessile, elliptic or oblong, 1–2.5 cm × 4–10 mm, ciliate at margin and veins hairy at base, 1-veined, apex obtuse. Flowers solitary or in cymes, axillary. Pedicel 6–11(–15) mm, slender, puberulent. Sepals ovate or elliptic, ca. 2 mm, glabrous, margin scarious, apex obtuse. Petals obovate, ca. 2 × as long as sepals. Stamens shorter than petals. Capsule 3.5–5.5 mm, apex 6-toothed. Seeds black-brown, subreniform, ca. 1 mm; strophiole small. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 48$ .

Woods, forest margins; 800–2300 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shanxi, Xinjiang [Japan, Kazakhstan, Korea, Mongolia, Russia; SW Asia, Europe].

**2. Moehringia umbrosa** (Bunge) Fenzl, Vers. Darstell. Alsin. 38. 1833.

新疆种阜草 xin jiang zhong fu cao

*Arenaria umbrosa* Bunge in Ledebour, Fl. Altaic. 2: 173. 1830.

Herbs perennial. Stems caespitose, 5–18 cm tall, pubescent. Leaves sessile, oblong-lanceolate or lanceolate, 1–3 cm × 2–5 mm, pubescent, 1-veined, base attenuate,

apex acute. Flower solitary, axillary or terminal. Pedicel 1.2–1.7 cm, slender, pubescent. Sepals ovate-lanceolate, 2–3 mm, hairy at base, apex acute. Petals oblong-obovate, ca. 2 × as long as sepals. Capsule 5–6 mm. Seeds brown, reniform, ca. 0.3 mm, slightly flat, strophiolate. Fl. Jun–Jul, fr. Jul–Aug.

Grasslands, woods, scrub; 1800–2700 m. Xinjiang [Kazakhstan, Russia].

**3. Moehringia trinervia** (Linnaeus) Clairville, Man. Herbor. Suisse 150. 1811.

三脉种阜草 san mai zhong fu cao

*Arenaria trinervia* Linnaeus, Sp. Pl. 1: 423. 1753; *Stellaria anhweiensis* Migo.

Herbs annual. Stems erect or ascending, 10–40 cm tall, pubescent, branched at base. Proximal leaves petiolate, distal leaves subsessile; leaf blade ovate to broadly ovate, 1–2.5 cm × 5–2 mm, 3-veined, both surfaces pilose, ciliate, base cuneate, apex acute. Flowers solitary and axillary or in terminal or axillary cymes. Pedicel 5–25 mm, slender, pubescent. Sepals 4 or 5, lanceolate, 3–4(–5) mm, with rigid hairs, 1-veined, margin broad, scarious, apex acuminate. Petals 4 or 5, sometimes reduced, obovate-oblong, 1/3–1/2 as long as sepals. Stamens 8–10, shorter than petals. Capsule 2.5–

3 mm, teeth reflexed at apex. Seeds black, globose, shiny, with small lacinate strophiole. Fl. May–Jun, fr. Jun–Jul.  $2n = 24$ .

Shaded forests, mountain slopes, forest margins, meadows; 1400–2400 m. Anhui, Gansu, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Xinjiang, Zhejiang [Japan, Kazakhstan, Russia; SW Asia, Europe].

### 18. HOLOSTEUM Linnaeus, Sp. Pl. 1: 88. 1753.

硬骨草属 ying gu cao shu

Lu Dequan (鲁德全); Richard K. Rabeler

Herbs annual. Stems ascending to erect. Leaves oblanceolate to elliptic; stipules absent. Inflorescences terminal, umbellate; bracts immediately subtending calyx absent. Sepals 5. Petals 5, irregularly toothed. Stamens 3–5 (or 8–10). Ovary 1-loculed; ovules numerous; styles 3(4 or 5). Capsule cylindrical, opening by 6 (or 8 or 10) revolute teeth. Seeds numerous, dorsiventrally compressed, rugulose; embryo straight.

About four species: Europe and Mediterranean region to C Asia; one species in China.

#### 1. *Holosteum umbellatum* Linnaeus, Sp. Pl. 1: 88. 1753.

硬骨草 ying gu cao

Stems erect, 5–20 cm tall, simple or branched, usually glaucous toward base, glandular viscid. Basal leaves narrowed into petiole, oblanceolate; cauline ones sessile, elliptic, 1–3 cm × 3–6 mm, abaxially pubescent, margin ciliate, apex acute. Flowers in umbels. Pedicel deflexed after anthesis, erect in fruit, 1–1.5 cm, slender, pubescent. Sepals oblong, 3–4 mm, abaxially pubescent,

margin membranous, apex obtuse. Petals white or pale pink, oblong, subequaling or longer than sepals, apex dentate. Stamens 5. Capsule cylindrical, somewhat narrowed above, ca. 2 × as long as sepals. Seeds reddish brown, 0.5–1 mm. Fl. May–Jul, fr. Jun–Jul.  $2n = 20$ .

Shady mountain grassland slopes; ca. 2300 m. Xinjiang [Afghanistan, India, Kashmir, Kazakhstan, Pakistan, Russia; Europe, SW Asia].

Chinese plants belong to subsp. *umbellatum*.

### 19. ARENARIA Linnaeus, Sp. Pl. 1: 423. 1753.

无心菜属 wu xin cai shu

Wu Zhengyi (吴征镒 Wu Cheng-yih), Zhou Lihua (周丽华); Warren L. Wagner

Herbs annual or perennial, rarely biennial. Stems erect or rarely creeping, often caespitose or pulvinate. Leaves opposite, rarely whorled; leaf blade linear to elliptic, ovate, or orbicular, usually flat, margin entire. Flowers solitary or numerous in cymes, actinomorphic. Sepals 4 or 5, apex entire, rarely emarginate. Petals 4 or 5, sometimes absent, apex entire to toothed, 2-cleft, or fimbriate. Stamens (2–5 or 8 or 10). Ovary 1-loculed; ovules numerous. Styles 2 or 3(–5). Capsule ovoid, obovoid, or globose, usually shorter than persistent sepals, rarely equaling or longer than them, 3- or 6-valved. Seeds reniform or subovoid, flattened, smooth, tuberculate, or narrowly winged.

More than 300 species: N temperate to arctic regions; 102 species (79 endemic) in China.

*Arenaria* has been subdivided into ten subgenera, several of which were further divided into sections and series (McNeill, Notes Roy. Bot. Gard. Edinburgh 24: 79–155. 1962). Six subgenera are represented in China, one of which (*A. subgen. Odontostemma*) contains more than half the species.

*Arenaria ladyginii* Kozhevnikov (Novosti Sist. Vyssh. Rast. 21: 67. 1984) was described from Xizang. However, the type has not been seen by the present authors and its identity could not be ascertained.

1a. Styles usually 3 and capsules 6-valved or -toothed, or styles rarely 2 and capsules 4-valved or -toothed; petal apex entire or slightly emarginate; sepals never truncate and saccate at base, not excurved.

2a. Sepals not incrassate at base, veins not obviously impressed; leaf blade subulate to ovate, margin and apex incrassate, apex not setiform but spinose.

3a. Sepal apex obtuse, margin scarious; basal leaf blade subulate to linear-lanceolate, cauline leaf blade imbricate in 4 rows (decussate), ovate, less than 5 mm, persistent; flowers solitary or 3 in cymes; plants congested caespitose or pulvinate (4. *A. subgen. Dolophragma*).

4a. Plants densely caespitose; stems 10–20 cm, glandular villous ..... 33. *A. przewalskii*

4b. Plants densely pulvinate; stems 2.5–15 cm, glandular villous or glabrous.

5a. Stems 4–15 cm, villous or glandular hairy.

6a. Stems 10–15 cm, villous; sepals ovate to lanceolate-ovate ..... 34. *A. smithiana*

6b. Stems 4–9 cm, glandular villous; sepals elliptic ..... 35. *A. oreophila*

5b. Stems 2.5–6 cm, glabrous.

7a. Pedicels 2–4 cm; petals ca. 2 × as long as sepals; anthers violet ..... 36. *A. densissima*

7b. Pedicels absent (flowers sessile); petals slightly longer than sepals; anthers yellow 37. *A. polytrichoides*

- 3b. Sepal apex acute, acuminate, or obtuse, apex and margin usually hard; leaf blade remote or sometimes approximate (covering each other), but never imbricate in 4 rows, lanceolate, elliptic, ovate, or orbicular, more than 5 mm, deciduous, rarely persistent; flower solitary; plants densely caespitose but never pulvinate  
(5. *A.* subgen. *Solitaria*).
- 8a. Floral disc large, with 5 obvious glands.
- 9a. Stems 1–15 cm, villous on one side; leaf blade glabrous except ciliate at base; petals white or pink ..... 42. *A. forrestii*
- 9b. Stems 2–6 cm, villous all round; leaf blade glandular pubescent; petals violet ..... 43. *A. glanduligera*
- 8b. Floral disc small or not impressed, glands small or degenerate.
- 10a. Petals violet; anthers violet ..... 41. *A. rhodantha*
- 10b. Petals white or pink; anthers pale yellow, green, or black.
- 11a. Plants hairy throughout; stems diffuse; leaf blade ovate or ovate-orbicular, margin long hairy; petals white; anthers dark green or black ..... 38. *A. ciliolata*
- 11b. Plants not hairy throughout; stems erect; leaf blade lanceolate or narrowly orbicular, margin shortly hairy or glabrous; petals white or pink; anthers yellow or green.
- 12a. Stems 4–6 cm; leaf blade lanceolate or ovate-lanceolate, margin shortly hairy; inflorescence rachis bracteate proximally; sepal apex excurved; petals white or pink; anthers pale yellow ..... 39. *A. ramellata*
- 12b. Stems 2–5 cm; leaf blade narrowly orbicular, margin glabrous; inflorescence rachis ebracteate proximally; sepal apex erect; petals white; anthers green ..... 40. *A. stracheyi*
- 2b. Sepals usually (rarely not) incrassate at base, veins usually obvious (rarely not); leaf blade variously shaped, margin and apex not incrassate, or margin scarious, apex spinose when blade aristate.
- 13a. Leaf blade linear to orbicular, or aristate and narrowly linear, margin not obviously scarious; sepal veins inconspicuous; plants solitary or caespitose, rarely compacted pulvinate; leaves deciduous, rarely persistent.
- 14a. Sepals slightly or not incrassate at base; leaf blade usually linear to ovate, rarely needle-shaped  
(1. *A.* subgen. *Arenaria*).
- 15a. Seeds with a flat wing; petals slightly shorter than or equaling sepals ..... 6. *A. compressa*
- 15b. Seeds wingless; petals shorter than bracts, slightly shorter to longer than sepals.
- 16a. Seeds tuberculate with raised papillae; petals usually slightly shorter than sepals ..... 1. *A. serpyllifolia*
- 16b. Seeds not tuberculate with raised papillae; petals equaling or longer than sepals.
- 17a. Seeds with curls; inflorescence usually axillary; leaf blade elliptic to ovate or orbicular.
- 18a. Leaf blade elliptic, ovate, or suborbicular; sepals glabrous abaxially ..... 2. *A. orbiculata*
- 18b. Leaf blade elliptic-lanceolate or obovate; sepals sparsely white villous on veins abaxially ..... 3. *A. neelgherrensis*
- 17b. Seeds reticulate; inflorescence of terminal cymes; leaf blade linear to ovate-saccate.
- 19a. Capsule 1-seeded; leaf blade linear; sepals with papillose spots abaxially ..... 4. *A. monosperma*
- 19b. Capsule several seeded; leaf blade elliptic to elliptic-ovate; sepals white glandular villous abaxially ..... 5. *A. puranensis*
- 14b. Sepals markedly incrassate or woody at base; leaf blade linear or linear-subulate, graminoid, rarely aristate with a spinose tip (2. *A.* subgen. *Eremogone*).
- 20a. Plants completely woody at base; sepals not herbaceous, veins inconspicuous, apex usually acuminate.
- 21a. Leaf blade apex acute; pedicels glabrous, rarely sparsely glandular hairy ..... 14. *A. griffithii*
- 21b. Leaf blade apex spinose; pedicels densely glandular hairy ..... 15. *A. androsacea*
- 20b. Plants not completely woody at base; sepals herbaceous throughout or only at middle, veins impressed, apex usually obtuse, rarely acute or acuminate.
- 22a. Sepals herbaceous only at middle, apex long acuminate, with (1–)3 or more parallel veins ..... 7. *A. potaninii*
- 22b. Sepals herbaceous ± throughout, apex obtuse, 1-veined.

- 23a. Stems with congested, pale brown, long, hardened, dead leaves at base; leaves forming a sheath at base ..... 8. *A. juncea*
- 23b. Stems without basal leaves as above; leaves not forming a sheath at base.
- 24a. Plants pulvinate; stems 4–10 cm; leaf blade linear to subulate, 1.5–5 cm.
- 25a. Stems 4–10 cm, white glandular hairy distally; sepals ± glandular villous ..... 12. *A. formosa*
- 25b. Stems 6–10 cm, villous distally; sepals glabrous ..... 13. *A. haitzeshanensis*
- 24b. Plants congested caespitose; stems 4–20 cm; leaf blade linear, 2–6 cm.
- 26a. Stems 4–10 cm, glandular pubescent distally ..... 11. *A. grueningiana*
- 26b. Stems 10–20 cm; all or only peduncle proximally glandular hairy, or glabrous.
- 27a. Stems glabrous proximally, becoming glandular hairy or villous distally; sepals glabrous ..... 9. *A. capillaris*
- 27b. Stems hirsutulous throughout; sepals densely glandular hairy ..... 10. *A. acicularis*
- 13b. Leaf blade subulate to linear, never setiform or graminoid, margin obviously scarios; sepal veins impressed; plants caespitose to compacted pulvinate; leaves persistent (3. *A.* subgen. *Eremogoneastrum*).
- 28a. Flowers few, in cymes.
- 29a. Stems sparsely villous, 2–3 cm; leaf blade 5–6 mm; sepals 3-veined ..... 31. *A. taibaishanensis*
- 29b. Stems glandular villous, to 8 cm; leaf blade 0.7–20 mm; sepals usually 1-veined ..... 32. *A. festucoides*
- 28b. Flowers solitary, rarely paired.
- 30a. Flowers sessile.
- 31a. Sepals violet abaxially; petals pink, lanceolate or orbicular ..... 27. *A. shannanensis*
- 31b. Sepals green; petals white, ovate, obovate, or saccate.
- 32a. Flowers ca. 1.8 cm in diam.; sepals ovate-lanceolate; petals broadly obovate, ca. 1.5 × as long as sepals ..... 28. *A. edgeworthiana*
- 32b. Flowers ca. 0.8 cm in diam.; sepals elliptic-lanceolate or lanceolate; petals narrowly obovate or saccate, shorter or slightly longer than sepals.
- 33a. Sepals elliptic-lanceolate; petals narrowly obovate, slightly longer than sepals; anthers equal; styles equaling ovary ..... 29. *A. bryophylla*
- 33b. Sepals lanceolate; petals saccate, shorter than sepals; anthers 5 long and 5 short; styles ca. 2.5 × as long as ovary ..... 30. *A. zadoiensis*
- 30b. Flowers pedicellate.
- 34a. Pedicels glandular villous or villous.
- 35a. Pedicels villous.
- 36a. Sepals lanceolate, glabrous ..... 19. *A. kansuensis*
- 36b. Sepals narrowly lanceolate, sparsely pilose, at least at base ..... 20. *A. ischnophylla*
- 35b. Pedicels glandular villous.
- 37a. Sepals ovate-lanceolate, 3-veined; petals ovate, ca. 1/3–1/2 as long as sepals ..... 16. *A. brevipetala*
- 37b. Sepals lanceolate or ovate-lanceolate, 1-veined; petals elliptic, slightly longer than sepals.
- 38a. Flowers solitary, rarely paired, pedicel 2.5–5 × as long as bracts; anthers yellow ..... 17. *A. baxoiensis*
- 38b. Flowers solitary, never paired, pedicel shorter than bracts; anthers black ..... 18. *A. kumaonensis*
- 34b. Pedicels glabrous.
- 39a. Pedicels 4–10 mm.
- 40a. Pedicels 5–10 mm; sepals lanceolate, ca. 5 mm; anthers yellow; petals not callose at base ..... 21. *A. roborowskii*
- 40b. Pedicels ca. 4 mm; sepals elliptic, 3 mm; anthers white; petals with a yellow, oblong callus at base ..... 22. *A. lancangensis*
- 39b. Pedicels 1–2 mm.
- 41a. Sepals hard, 1-veined, base ciliate, apex greenish brown ..... 23. *A. gerzensis*
- 41b. Sepals soft, 1–3-veined, base not ciliate, apex green.
- 42a. Flowers 6–7 mm in diam. .... 26. *A. pulvinata*
- 42b. Flowers ca. 15 mm in diam.
- 43a. Sepals linear-lanceolate, 7–8 mm, 1–3 veined; petals elliptic-ovate, 8–9 mm; anthers yellow ..... 24. *A. qinghaiensis*

- 43b. Sepals lanceolate, 6–7 mm, closely 3-veined; petals obovate, 4–5 mm; anthers violet 25. *A. aksayqingensis*
- 1b. Styles usually 2, sometimes 3 (or 4 or 5); capsule 4-valved or -toothed, rarely 6-, 8-, or 10-valved or -toothed;  
petal apex entire to fimbriate; sepals truncate and ± saccate at base, excurved (6. *A.* subgen. *Odontostemma*).
- 44a. Petal apex toothed or fimbriate; filaments opposite sepals with a gland at base; styles 2.
- 45a. Petals fimbriate or toothed.
- 46a. Roots conic.
- 47a. Leaf blade 0.5–1.5 × 0.2–1 cm; sepals 4–10 mm; petals slightly longer than sepals ..... 101. *A. delavayi*
- 47b. Leaf blade 1–3 × 0.5–0.6 cm; sepals 3–6 mm; petals ca. 2 × as long as sepals ..... 102. *A. yunnanensis*
- 46b. Roots fusiform, solitary or caespitose, rarely each node of rhizome globose or clavate, forming a moniliform chain.
- 48a. Roots moniliform ..... 106. *A. monilifera*
- 48b. Roots fusiform.
- 49a. Leaves glabrous; sepal margin black ciliate ..... 92. *A. salweenensis*
- 49b. Leaves often glandular pubescent; sepals glandular pubescent but margin not black ciliate.
- 50a. Anthers yellow, rarely green.
- 51a. Stems 10–25 cm; leaf blade narrowly elliptic, orbicular-elliptic, or orbicular-lanceolate; pedicels villous or glandular hairy ..... 97. *A. fimbriata*
- 51b. Stems 40–60 cm; leaf blade narrowly elliptic-saccate, ovate-elliptic, or ovate; pedicels multicellular pubescent or glandular hairy.
- 52a. Plants annual or biennial; stems 30–60 cm; leaves to 40 cm; seeds 2 or 3 ..... 98. *A. debilis*
- 52b. Plants perennial; stems 10–40 cm; leaves to 15 cm; seeds 11 or 12 ..... 99. *A. polysperma*
- 50b. Anthers black, violet, or yellowish brown (rarely yellow in *A. iochanensis*).
- 53a. Plants hispid; leaf blade ovate or orbicular-elliptic ..... 93. *A. trichophora*
- 53b. Plants glandular or shortly villous; leaf blade broadly lanceolate, orbicular-ovate, or orbicular.
- 54a. Stem solitary, branched below middle; leaf blade orbicular-obovate or orbicular, 3–10 mm wide; seeds 2–4, wingless; roots several clustered together ..... 96. *A. barbata*
- 54b. Stems branched at base, procumbent, diffuse, or erect; leaf blade lanceolate, 1–4 mm wide; seeds numerous, with a narrow wing; root solitary.
- 55a. Stems procumbent or erect; leaf blade usually broadly lanceolate, 2–4 mm wide; pedicels 0.5–1.5 cm; petal apex fimbriate; anthers violet or black ..... 94. *A. yulongshanensis*
- 55b. Stems diffuse; leaf blade narrowly lanceolate, 1–3 mm wide; pedicels 0.5–2 cm; petal apex slightly toothed; anthers yellow ..... 95. *A. iochanensis*
- 45b. Petal apex toothed.
- 56a. Roots solitary or several clustered together, spinose, rarely conic.
- 57a. Stems slender; leaves glabrous or sparsely hairy; petal apex 4-toothed.
- 58a. Stems glandular pubescent with 2 lines of hairs; leaves sparsely hairy; petals obovate or narrowly elliptic ..... 80. *A. quadridentata*
- 58b. Stems and leaves glabrous; petals obovate or cuneate ..... 81. *A. giraldii*
- 57b. Stems rigid; leaves variously hairy; petal apex with small teeth.
- 59a. Leaf blade ovate or ovate-orbicular; sepals orbicular-ovate or orbicular-lanceolate ..... 85. *A. fridericae*
- 59b. Leaf blade mostly ovate-lanceolate or ovate; sepals lanceolate, rarely ovate.
- 60a. Sepals long villous; petals longer than sepals, but less than 2 × as long as them ... 82. *A. trichophylla*
- 60b. Sepals villous or glandular hairy; petals more than 1.5 × as long as sepals.
- 61a. Stems to 1.5 cm, with numerous branches; flower solitary, terminal, to 1.5 cm in diam.; anthers violet to yellow-brown ..... 83. *A. pogonantha*
- 61b. Stems to 30 cm, distally with branched, dichasial cymes; flowers small, to 0.8 cm in diam.; anthers blue-green to yellow ..... 84. *A. dimorphitricha*
- 56b. Roots conic, fleshy, rarely fibrous.

- 62a. Roots fibrous; stems brown glandular villous; leaf blade tuberculate on both surfaces, petiole 2–5 mm ..... 86. *A. longicaulis*
- 62b. Roots conic, fleshy; stems glabrous, subglabrous, or glandular hairy; leaf blade not tuberculate, petiole 1–2 cm or leaves sessile.
- 63a. Stems glabrous or subglabrous; petiole 1–2 cm (at least proximal cauline leaves petiolate) ..... 87. *A. longipetiolata*
- 63b. Stems villous or glandular hairy; leaves sessile or shortly petiolate.
- 64a. Stems pale brown, villous.
- 65a. Stems 4–7 cm; leaf blade elliptic or obovate-elliptic; sepals long villous abaxially ..... 88. *A. leucasteria*
- 65b. Stems 10–15 cm; leaf blade elliptic to broadly elliptic-saccate; sepals sparsely glandular pubescent abaxially ..... 89. *A. nivalomontana*
- 64b. Stems green, glandular hairy.
- 66a. Leaf blade thin, glabrous or glandular hairy; sepals narrowly ovate, glabrous; petals ca. 1.5 × as long as sepals; cymes spreading ..... 90. *A. omeiensis*
- 66b. Leaf blade thick, villous with yellowish, small, nodose hairs; sepals orbicular-lanceolate, long pubescent abaxially; petals slightly longer than sepals; cymes compact ..... 91. *A. auricoma*
- 44b. Petal apex entire, slightly emarginate, or shallowly 2-cleft, rarely lobes with 3 shallow, round teeth; filaments opposite sepals with a gland at base or not; styles 2 or 3(–5).
- 67a. Filaments opposite sepals with a gland at base; seeds globose or reniform, smooth or tuberculate.
- 68a. Stems villous with 2 lines of hairs; sepals glabrous or only ciliate at margin.
- 69a. Styles 6–7 mm; petal apex entire; leaves aggregated at stem apex, leaf blade broadly linear or linear-lanceolate ..... 75. *A. longistyla*
- 69b. Styles ca. 1.5 mm; petal apex 2-cleft; leaves in several distant pairs, leaf blade saccate .. 76. *A. ionandra*
- 68b. Stems glandular villous, or with long, nodose bristles; sepals glandular villous or glandular villous mixed with long, nodose bristles.
- 70a. Stems and sepals densely hairy mixed with long, nodose bristles; petals ca. 10 mm ..... 77. *A. longiseta*
- 70b. Stems and sepals hairy, without nodose bristles; petals 5–8 mm.
- 71a. Leaf blade obsaccate, petiole short; sepals 2–3 mm ..... 78. *A. chamdoensis*
- 71b. Leaf blade linear-lanceolate, petiole absent; sepals 5–6 mm ..... 79. *A. szzechuensis*
- 67b. Filaments opposite sepals without a gland at base or gland not obvious; seeds oblate or reniform, glabrous or with small, raised tubercles, or flat but margin with a narrow wing.
- 72a. Seeds usually flat, with a narrow wing.
- 73a. Stems diffuse; flowers usually several in cymes.
- 74a. Stems sparsely villous; petals oblanceolate or obovate, apex 2- or 3-toothed ..... 67. *A. euodonta*
- 74b. Stems glandular hairy; petals obovate or broadly ovate, apex entire or emarginate.
- 75a. Leaf blade orbicular-lanceolate or orbicular; petals broadly ovate, apex emarginate ..... 65. *A. melanandra*
- 75b. Leaf blade linear-lanceolate; petals ovate, apex entire ..... 66. *A. pseudostellaria*
- 73b. Stems erect or suberect; flowers solitary, rarely paired.
- 76a. Stems 3–6 cm, glabrous proximally ..... 68. *A. dsharaensis*
- 76b. Stems 4–25 cm, villous or glandular hairy.
- 77a. Plants to 6 cm tall, white villous in 2 lines or white, yellow, or black nodose villous; petals white.
- 78a. Plants 5–6 cm tall; stems white villous in 2 lines; petal apex entire ..... 74. *A. monantha*
- 78b. Plants to 4 cm tall; stems white, yellow, or black nodose villous; petal apex emarginate, often with a few small teeth ..... 73. *A. inornata*
- 77b. Plants 4–25 cm tall, glandular villous; petals white, pink, or violet.
- 79a. Petal apex entire or emarginate; cauline leaf blade lanceolate, elliptic, ovate, or orbicular.
- 80a. Stems white; leaf blade violet; petal apex entire ..... 69. *A. melandryoides*
- 80b. Stems violet; leaf blade green; petal apex slightly emarginate ..... 70. *A. rockii*
- 79b. Petal apex entire or shallowly 2-cleft; cauline leaf blade linear-lanceolate or lanceolate, sometimes elliptic.
- 81a. Petals pink, apex shallowly 2-cleft ..... 71. *A. roseiflora*
- 81b. Petals white, apex entire ..... 72. *A. melandryiformis*

- 72b. Seeds reniform, subglobose, globose, or obovate, smooth or tuberculate, wingless.
- 82a. Plants usually 8–20 cm tall; proximal flowers of stem with petals and anthers reduced, distal flowers of stem with petals and anthers not reduced.
- 83a. Styles 3(or 5).
- 84a. Principal root napiform or conic, unbranched.
- 85a. Petals white; stems white; leaves glabrous ..... 47. *A. filipes*
- 85b. Petals white or pink; stems white or violet; leaves ciliate at base, otherwise glabrous 46. *A. napuligera*
- 84b. Principal root conic, fleshy, many branched.
- 86a. Petal apex shallowly 2-lobed, lobes with small, irregular teeth; stems and leaves with septate hairs ..... 45. *A. setifera*
- 86b. Petal apex rounded, emarginate, or bifid to near middle of petal; stems and leaves with non-septate hairs ..... 44. *A. weissiana*
- 83b. Styles 2.
- 87a. Leaf blade linear-lanceolate, to 1.5 cm, glabrous, margin not cartilaginous; stamens 5 51. *A. schneideriana*
- 87b. Leaf blade lanceolate to orbicular, to 4 cm, subglabrous, margin cartilaginous; stamens 10.
- 88a. Leaf blade narrowly elliptic to suborbicular, 8–15 mm wide ..... 48. *A. nigricans*
- 88b. Leaf blade lanceolate to oblanceolate, 1–5 mm wide.
- 89a. Leaf blade lanceolate or oblanceolate, 1–2 cm × 2–5 mm; sepals lanceolate, pubescent or with white, septate, glandular hairs, margin hairy; petal apex 2-cleft .... 49. *A. zhongdianensis*
- 89b. Leaf blade oblanceolate, 0.5–2.5 cm × 1–5 mm; sepals ovate or ovate-lanceolate, densely shortly hairy at base; petal apex entire ..... 50. *A. xerophila*
- 82b. Plants rarely more than 8 cm tall, or very slender when more than 8 cm tall; petals and stamens sometimes degenerate or reduced to various degrees, petals (when present) ca. 2/3 as long as or equaling sepals.
- 90a. Petals absent or only 2 or 3 developed, reduced to various degrees.
- 91a. Sepals 5; petals absent.
- 92a. Stamens 5; leaf blade rhomboid-elliptic to saccate; stem with 1 or 2 lines of hairs ... 61. *A. reducta*
- 92b. Stamens 2 or 3; leaf blade linear to linear-lanceolate; stem with 2 lines of hairs .... 62. *A. pharensis*
- 91b. Sepals 4; petals present or absent.
- 93a. Petals absent; stamens 2 or 3; sepals and leaves fleshy; pedicels and sepals glabrous 63. *A. littledalei*
- 93b. Petals present; stamens 8; sepals and leaves not fleshy; pedicels and sepals hairy 64. *A. saginoides*
- 90b. All floral parts present.
- 94a. Styles 3.
- 95a. Leaf blade subulate, 4–5 × ca. 1 mm ..... 52. *A. minima*
- 95b. Leaf blade saccate, 5–12 × 2–3 mm ..... 53. *A. bomiensis*
- 94b. Styles 2(or 3).
- 96a. Petals shorter than sepals.
- 97a. Cauline leaf blade ovate, petiole 0.5–1.5 cm; sepals white villous abaxially, margin membranous; petals ca. 2/3 as long as sepals, apex entire; styles 2 ..... 54. *A. longipes*
- 97b. Cauline leaf blade lanceolate, petiole absent or inconspicuous; sepals hairy abaxially and at margin; petals shorter than sepals, apex entire, sometimes 2-cleft; styles 2 or 3 55. *A. inconspicua*
- 96b. Petals equaling or longer than sepals.
- 98a. Petals 1.5–2 × as long as sepals; sepals leathery ..... 56. *A. amdoensis*
- 98b. Petals equaling or up to 1.5 × as long as sepals; sepals herbaceous.
- 99a. Roots conic, fleshy; leaf blade linear or saccate.
- 100a. Leaf blade linear; sepals glabrous, with wide membranous margin; petal apex entire ..... 68. *A. membranispala*
- 100b. Leaf blade saccate; sepals densely glandular pubescent abaxially; petal apex slightly emarginate or shallowly lobed ..... 57. *A. spathulifolia*
- 99b. Roots slender, fibrous, or with a rhizome; leaf blade linear-lanceolate or elliptic.
- 101a. Leaf blade linear-lanceolate, herbaceous, margin ciliate; petal apex erose 59. *A. karakorensis*
- 101b. Leaf blade elliptic, leathery, margin glabrous; petal apex entire ..... 60. *A. tumenglaensis*

1. *Arenaria* subgen. *Arenaria*

无心菜亚属 wu xin cai ya shu

Herbs annual or perennial. Stems single or sparsely caespitose, prostrate to diffuse or erect. Leaf blade usually lanceolate to ovate, rarely linear or subulate, herbaceous, rarely leathery. Inflorescence various, terminal or axillary, sometimes reduced to 1–3 flowers. Petals white, often shorter than sepals. Sepals not incrassate or only slightly so at base.

At least 106 species: centered in Europe but extending to Africa, Asia, and North America; six species (two endemic) in China.

McNeill (Notes Roy. Bot. Gard. Edinburgh 24: 79–155. 1962) subdivided *Arenaria* subgen. *Arenaria* into 11 sections, four of which occur in China: *A. sect. Arenaria* (species no. 1); *A. sect. Rotundifoliae* McNeill (loc. cit.: 113; species nos. 2 and 3); *A. sect. Rariflorae* F. N. Williams (Bull. Herb. Boissier 3: 602. 1895; species nos. 4 and 5); and *A. sect. Compressae* McNeill (loc. cit.: 118; species no. 6).

1. *Arenaria serpyllifolia* Linnaeus, Sp. Pl. 1: 423. 1753.

无心菜 wu xin cai

*Arenaria leptoclados* Gussone; *A. petiolata* Hayata.

Herbs annual or biennial. Principal roots slender, with numerous smaller branches. Stems caespitose, erect or diffuse, 10–30 cm, densely white villous. Leaves sessile; leaf blade ovate, 4–12 × 3–7 mm, both surfaces glabrous or sparsely villous, 3-veined abaxially, base attenuate, margin ciliate, apex acute; proximal cauline leaves larger, distal ones smaller. Cymes many flowered; bracts ovate, 3–7 mm, herbaceous, usually densely villous. Pedicel slender, ca. 1 cm, densely villous or glandular pubescent. Sepals 5, lanceolate, 3–4 mm, villous abaxially, veins 3, impressed, margin membranous, apex acute. Petals 5, white, obovate, 1/3–1/2 as long as sepals, apex obtuse. Stamens 10, shorter than sepals. Ovary ovoid. Styles 3, linear. Capsule ovoid, equaling persistent sepals. Seeds pale brown, reniform, small, tuberculate with raised papillae. Fl. Jun–Aug, fr. Aug–Sep.

Mountain grassland slopes, sandy or stony barrens, fields, gardens; 600–4000 m. Widespread in China [N Africa, Asia, Australia, Europe, North America].

This species is used medicinally.

2. *Arenaria orbiculata* Royle ex Edgeworth & J. D. Hooker in J. D. Hooker, Fl. Brit. India 1: 240. 1874.

圆叶无心菜 yuan ye wu xin cai

Herbs biennial or perennial. Stems erect or prostrate, dichotomously branched, slender, 5–40 cm, pubescent along 1 side. Leaves sessile or petiolate; leaf blade elliptic, ovate, or suborbicular, 2–10 × 2–7 mm, both surfaces glabrous, or sparsely villous only on petiole, 1-veined, base rounded, apex obtuse or mucronulate. Cymes axillary and few flowered or flower solitary; bracts similar to leaves but smaller. Pedicel 5–10 mm, glabrous or very sparsely pubescent. Sepals 5, lanceolate, ovate-lanceolate, or ovate, 3–4 mm, glabrous, margin narrowly membranous, apex acute. Petals 5, white, obovate, shorter than sepals, base attenuate, apex obtuse. Stamens 10, shorter than sepals. Ovary ovoid. Styles 3, linear. Fl. May–Jul.

Forests, scrub meadows, alpine meadows, stony valleys; 2300–4500 m. S Sichuan, SE Xizang, Yunnan [Bhutan, India, ?Kashmir, Nepal, Sikkim].

3. *Arenaria neelgherrensis* Wight & Arnott, Prodr. Fl. Ind. Orient. 1: 43. 1834.

尼盖无心菜 ni gai wu xin cai

Herbs annual. Stems prostrate, many branched, 10–20 cm, white pubescent along 1 side. Leaves basally attenuate into a short petiole; leaf blade elliptic, elliptic-lanceolate, or obovate, 5–10 × 1.5–2 mm, midvein raised, base cuneate, margin ciliate, apex obtuse or mucronulate. Cymes axillary, few to many flowered; bracts elliptic or ovate, ca. 5 × 1 mm, herbaceous, villous along veins, midvein raised, base cuneate, apex acute or acuminate. Pedicel 2–8 mm, white pubescent. Sepals 5, ovate, ca. 3 × 1 mm, white villous on veins abaxially, 1-veined, margin white, membranous, apex acuminate. Petals 5, white, oblong, equaling or slightly longer than sepals. Stamens 10, shorter than sepals. Ovary ovoid, ca. 0.7 mm. Styles 3, linear. Fl. Jul.

*Abies* forests, riverside grasslands, alpine meadows, mountain rock crevices; 3200–4100 m. W Xizang [India, Nepal, Pakistan].

4. *Arenaria monosperma* F. N. Williams, J. Linn. Soc., Bot. 38: 398. 1909.

单子无心菜 dan zi wu xin cai

*Stellaria monosperma* (F. N. Williams) Kozhevnikov (1983), not Buchanan-Hamilton ex D. Don (1825); *S. williamsiana* Kozhevnikov.

Herbs perennial. Roots cylindrical, fleshy. Stems branched at base, violet proximally, cylindrical, slender, 10–20 cm; nodes and internodes coarsely glandular puberulent or glabrous. Leaves numerous, congested; leaf blade effuse, linear, 5–10 mm, slightly coarsened with ± short, glandular hairs, 1-veined. Cymes terminal, many flowered. Pedicel 5–10 mm, white pubescent. Sepals 5, elliptic, ca. 4 mm, ± papillose spotted abaxially, margin slightly incrassate, sometimes membranous, apex acuminate. Petals 5, white, narrowly obovate, shorter than sepals. Ovary ovoid. Styles 3, linear. Capsule ovoid, equaling persistent sepals, apex 6-lobed. Seed 1, yellow-brown, reniform, reticulate. Fl. and fr. Jun–Oct.

• Sands, mountain rock crevices; 3300–3500 m. E Xizang.

This species may belong to *Stellaria*. Kozhevnikov (Novosti Sist. Vyssh. Rast. 20: 94–107. 1983) transferred *Arenaria monosperma* to *Stellaria*, but published a later homonym.

5. *Arenaria puranensis* L. H. Zhou in C. Y. Wu, Fl. Xizang, 1: 686. 1983.

普兰无心菜 pu lan wu xin cai



Herbs perennial. Stems many branched at base, usually yellowish, sometimes violet, 8–16 cm, glabrous and lustrous proximally, sparsely white villous distally. Leaves sessile; leaf blade elliptic-ovate, ovate-lanceolate, or elliptic, 5–10 × 1.5–5 mm, densely glandular pubescent abaxially, glabrous adaxially, 1-veined, base rounded, margin ciliate, apex acuminate. Cymes terminal, dichasial, many flowered; bracts herbaceous, similar to leaves but smaller, villous abaxially. Pedicel 1–1.5 cm, densely white glandular hairy. Sepals (4 or)5, ca. 5 × 1 mm, white glandular villous abaxially, margin broadly membranous, apex long acuminate. Petals (4 or)5, white, ovate, apex 2-cleft. Stamens (4 or)5; anthers yellow. Ovary ovoid. Styles 3, linear. Fl. Jul.

• Mountain gravelly and muddy soils. SW Xizang.

**6. *Arenaria compressa*** McNeill, Notes Roy. Bot. Gard. Edinburgh 24: 118. 1962.

扁翅无心菜 *bian chi wu xin cai*

**2. *Arenaria* subgen. *Eremogone*** (Fenzl) Fenzl in Ledebour, Fl. Ross. 1: 360. 1842.

老牛筋亚属 *lao niu jin ya shu*

*Eremogone* Fenzl, Vers. Darstell. Alsin. 13. 1833.

Herbs perennial. Rhizome branched, robust. Stems pulvinate. Leaves long linear, graminoid or shortly setiform, apex spinose. Cymes terminal, occasionally contracted into a head or cymose clusters, rarely reduced to a solitary flower. Sepals conspicuously hardened at base, sometimes whole receptacle and calyx proximally becoming woody in fruit. Petals usually white.

About 70 species: primarily in C and SW Asia and North America, but extending to N Africa and Europe; nine species (three endemic) in China. McNeill (Notes Roy. Bot. Gard. Edinburgh 24: 120–127. 1962) subdivided *Arenaria* subgen. *Eremogone* into seven sections, three of which occur in China: *A. sect. Monogone* Maximowicz (Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 26: 436. 1880; species no. 7); *A. sect. Capillares* McNeill (loc. cit.: 122; species nos. 8–13); and *A. sect. Sclerophyllae* (Boissier) McNeill (loc. cit.: 126; species nos. 14 and 15).

**7. *Arenaria potaninii*** Schischkin in Komarov, Fl. URSS 6: 536. 1936.

五蕊老牛筋 *wu rui lao niu jin*

*Arenaria pentandra* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 26: 429. 1880, not Dufour (1820), nor Wallroth (1822), nor Turczaninow (1834), nor (J. Gay) Ardoino (1867).

Herbs perennial. Roots compacted, robust, woody. Stems pulvinate, many branched, 20–30 cm, slightly woody, glabrous. Leaves congested; leaf blade subcylindric-subulate, basal ones 2.5–4 cm, cauline ones 1–1.2 cm, base membranous, margin slightly coarsened, apex cuspidate. Cymes terminal, trichotomous; bracts lanceolate, 2.5–3 mm, transparent membranous except at midvein. Pedicel 1–2 cm, glabrous. Sepals 5, lanceolate, 4–4.5 mm, margin broadly membranous, apex long acuminate. Petals 5, white, orbicular, equaling or slightly longer than sepals, apex subtruncate or obtuse. Stamens 5 (also with 5 reduced stamens). Capsule ovoid, enveloped by persistent sepals. Seeds with concentrically ringed tubercles. Fl. Jun–Jul.

Shaded mountain forests; ca. 2400 m. Xinjiang [Kazakhstan, Russia].

**8. *Arenaria juncea*** Marschall von Bieberstein, Fl. Taur.-Caucas. 3: 309. 1819.

*Arenaria trichotoma* Royle ex Edgeworth & J. D.

Hooker in J. D. Hooker, Fl. Brit. India 1: 235. 1874, not Boissier (1856); *A. lanceolatifolia* L. H. Zhou.

Herbs perennial. Roots robust, woody. Stems caespitose, trichotomously branched, 50–60 cm, glandular villous. Leaf blade lanceolate, 1–2.5 cm × 1–4 mm, glandular villous, base clasping, apex acute. Cymes trichotomously branched, conic, many flowered; bracts ovate-lanceolate, similar to leaves but smaller, margin broadly membranous. Pedicel 0.5–3 cm, glabrous. Sepals 5, ovate, 3.3–5 × 1.5–3 mm, glabrous, midvein raised, base broadened, margin narrowly membranous, apex acute. Petals 5, white, obovate or elliptic, equaling or slightly longer than sepals. Stamens 10, 5 long and 5 short. Ovary obovoid, ca. 3 mm. Styles 3, linear, ca. 2 mm. Seeds with flat wings. Fl. Jun–Jul.

Mountain gravels; 2600–3500 m. W Xizang [Afghanistan, NW India, Pakistan].

老牛筋 *lao niu jin*

Herbs perennial. Roots gray-brown or pale, conic, fleshy. Stems erect, 30–60 cm, hardened, glabrous at base, glandular hairy near cymes, with or without persistent, pale brown, hardened, withered leaves at base. Leaf blade narrowly linear, 1–2.5 cm × ca. 1 mm, 1-veined, base broadened, clasping and sheathing, margin sparsely dentate, shortly ciliate, often involute or flat, apex acuminate. Cymes few to many flowered; bracts ovate, 3–4 × ca. 2 mm, glandular pubescent abaxially, margin broadly membranous, apex acute. Pedicel 1–2 cm, densely glandular villous or glabrous. Sepals 5, ovate, ca. 5 × 2 mm, glabrous or glandular villous abaxially, 1–3-veined, margin broadly membranous, apex acute or acuminate. Petals 5, white, 8–10 mm, elliptic-orbicular or obovate, base shortly clawed, apex obtuse. Stamens 10; filaments ca. 4 mm, those opposite sepals with a gland at base; anthers yellow. Ovary ovoid, ca. 2 mm. Styles 3, ca. 3 mm. Capsule ovoid, equaling or slightly longer than persistent sepals, apex 3-valved; valves 2-cleft at apex. Seeds brown or black, triangular-reniform, tuberculate. Fl. and fr. Jul–Sep.

Open forest margins, mountain grasslands, sandy montane grasslands, low-elevation grassland slopes, steppes, desert steppes, rock crevices; 800–2200 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, NW Shaanxi, Shanxi [Korea, Mongolia, Russia].

This species is used medicinally.

- 1a. Stems with persistent, pale brown, hardened, withered leaves at base; pedicel densely glandular villous ..... 8a. var. *juncea*  
1b. Stems without persistent, pale brown, hardened, withered leaves at base; pedicel glabrous ..... 8b. var. *glabra*

**8a. *Arenaria juncea* var. *juncea***

老牛筋(原变种) lao niu jin (yuan bian zhong)

*Arenaria dahurica* Fischer ex Seringe.

Stems with persistent, pale brown, hardened, withered leaves at base. Pedicel densely glandular villous.

Open forest margins, mountain grasslands, steppes, desert steppes, rock crevices; 800–2200 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, NW Shaanxi, Shanxi [Korea, Mongolia, Russia].

**8b. *Arenaria juncea* var. *glabra* Regel, Bull. Soc. Imp. Naturalistes Moscou 35: 246. 1862.**

无毛老牛筋 wu mao lao niu jin

*Arenaria tonsa* Kitagawa.

Stems without persistent, pale brown, hardened, withered leaves at base. Pedicel glabrous.

Sandy montane grasslands, low-elevation grassland slopes. N Hebei [Russia].

**9. *Arenaria capillaris* Poirlet in Lamarck, Encycl. 6: 380. 1804.**

毛叶老牛筋 mao ye lao niu jin

*Arenaria capillaris* var. *glabra* Fenzl; *A. capillaris* var. *glabrata* (Seringe) Schischkin; *A. subulata* Seringe var. *glabrata* Seringe.

Herbs perennial. Stems 12–15 cm; mature branches woody, with withered, persistent leaves at base; new branches slender, firm, glabrous proximally, becoming glandular pubescent distally. Leaf blade linear, 2–5 cm, base broadened, margin coarsely and weakly serrate, apex acute; basal leaves densely fasciculate; cauline leaves sheathing at base, clasping at inflated nodes. Cymes few to many flowered; bracts ovate, 2–3 × ca. 1.5 mm, scarious, 1-veined, base clasping, apex long acuminate. Pedicel slender, stiff, glabrous. Sepals 5, yellow abaxially, ovate, ca. 5 × 2 mm, glabrous, 3-veined. Petals 5, white, obovate, ca. 7 × 3 mm, base shortly clawed, apex obtuse. Stamens 10; filaments opposite sepals with a gland at base. Ovary ovoid. Styles 3, linear. Fl. Jul–Aug.

Open montane grasslands, gravelly mountain summits; ca. 900 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia, Russia; North America].

**10. *Arenaria acicularis* F. N. Williams, J. Linn. Soc., Bot. 38: 400. 1909.**

针叶老牛筋 zhen ye lao niu jin

Herbs perennial. Roots long, robust, woody. Stems in compact clusters, 6–20 cm, hirsutulous. Leaf blade linear-lanceolate, 3-veined, lateral veins close to margin; distal cauline leaf blade with base broadened, membranous, forming a short sheath, margin scarious, apex acute. Cymes dichasial, densely clustered, 6–9-flowered; rachis long. Pedicel sparsely glandular hairy. Sepals 5, erect, usually violet, lanceolate, membranous, glandular hairy, with 3 slender veins close together abaxially, margin broadly membranous, apex acuminate. Petals 5, white, obovate, 5–6 mm. Stamens 10; anthers yellow. Ovary obovoid. Styles 3. Capsule obovoid-globose, 3-valved; valves 2-cleft at apex. Fl. and fr. Jul–Aug.

• River valley grasslands; 300–4600(–5200) m. SE Xizang.

**11. *Arenaria gruenigiana* Pax & K. Hoffmann in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 366. 1922.**

华北老牛筋 hua bei lao niu jin

*Arenaria formosa* Fischer ex Seringe var. *angustipetala* Maximowicz.

Herbs perennial. Principal roots slender, woody; rootlets fibrous. Stems densely clustered, erect, 4–10 cm, glandular pubescent distally, with dense, withered, persistent leaves at base. Basal leaf blade linear, 1–3 cm × 0.5–1 mm, glabrous, midvein impressed, base membranous, sheathing, apex acute; cauline leaf blade lanceolate, 3–5 mm, base broadened, margin narrowly membranous, apex acute. Flower solitary, terminal; bracts lanceolate, 3–4 × ca. 1 mm, base broadened, margin membranous, ciliate, apex obtuse or acute. Pedicel 3–10 mm, densely brown glandular hairy. Sepals 5, ovate-oblong, 4–5 × 2–2.5 mm, glandular hairy abaxially, margin narrowly membranous, apex obtuse or acute. Petals 5, white, obovoid-saccate, 5–7 × 1.5–2 mm, base attenuate, cuneate, apex obtuse. Floral disc saucer-shaped, with 5 orbicular glands. Stamens 10; filaments ca. 5 mm; anthers yellow. Ovary stipitate, obovoid, ca. 1.5 mm. Styles 3, ca. 2 mm; stigmas clavate. Fl. Jul.

• Alpine meadows; ca. 3000 m. Hebei, Nei Mongol, Shanxi.

**12. *Arenaria formosa* Fischer ex Seringe in de Candolle, Prodr. 1: 402. 1824.**

美丽老牛筋 mei li lao niu jin

*Arenaria formosa* var. *latipetala* Maximowicz.

Herbs perennial. Principal roots hard, woody; rootlets slender. Stems densely pulvinate, erect, 4–10 cm, white glandular hairy distally, with dense, brown, withered, persistent leaves at base. Leaf blade linear or linear-subulate, 1.5–4 cm × ca. 1 mm, broadened and forming a short sheath at base, margin not involute, apex acuminate. Cymes 1–3-flowered; bracts ovate-lanceolate, 2–3 × 1–1.5 mm, glandular hairy, base broadened, margin narrowly membranous, apex acuminate. Pedicel 5–10 mm, glandular hairy. Sepals 5, ovate-lanceolate or ovate, 5–6 × 2–3 mm, ± glandular hairy, base broadened, apex acute. Petals 5, white, obovate or obovate-orbicular, 0.8–1.2 cm. Floral disc

with 5 glands; glands at base of filaments opposite sepals pale brown, orbicular. Stamens 10, 5 long and 5 short; anthers yellow. Ovary obovoid, ca. 2 mm. Styles 3, ca. 6 mm. Fl. Jul–Aug.

Mountain grasslands; 2000–2200 m. Gansu, Nei Mongol, Ningxia, Xinjiang [Kazakhstan, Mongolia, Russia].

**13. *Arenaria haitzeshanensis*** Y. W. Tsui ex L. H. Zhou, Acta Biol. Plateau Sin. 13: 1. 1997.

海子山老牛筋 hai zi shan lao niu jin

Herbs perennial. Roots black-brown, conic, woody. Stems densely clustered, pulvinate, 6–10 cm, villous distally. Basal leaf blade linear, 2–5 cm × ca. 1 mm, base broadened, apex acute; cauline leaves in 2 or 3 pairs; leaf blade subulate or linear-subulate, 1.1–2 cm × 1–2 mm, midvein raised, base broadened, margin narrowly membranous, apex spinose. Cymes 1–3-flowered; rachis densely hairy; bracts lanceolate, 6–7 mm, base broadened, margin membranous, apex spinose. Sepals 5, lanceolate, 6–7(–8) mm, 1–3-veined, base incrassate, margin narrowly membranous, apex acute. Petals 5, white, ovate, ca. 3/5 as long as sepals. Ovary obovoid, ca. 2 mm. Styles 3, 2–3 mm. Fl. Jul–Aug.

• Alpine meadows; 3700–4400 m. NW Sichuan (Dêgê Xian), E Xizang (Jomda Xian).

**14. *Arenaria griffithii*** Boissier, Diagn. Pl. Orient., ser. 2, 1: 89. 1853.

裸茎老牛筋 luo jing lao niu jin

Herbs perennial. Principal roots many branched, robust. Stems sparsely clustered, 5–20 cm, glabrous, with withered, persistent leaves at base. Leaves crowded; leaf blade linear-subulate or subulate, 8–10 × ca. 1 mm, midvein raised abaxially, margin hairy, apex acute. Cymes 1–3-flowered; bracts ovate or ovate-subulate, ca.

3 × 1.2 mm, margin membranous. Pedicel 1–1.8 cm, glabrous or ± glandular hairy with erect or slightly curved hairs. Sepals 5, orbicular-lanceolate, 3–5 × ca. 2 mm, glabrous or glandular hairy, veins not obvious abaxially, margin membranous, apex acute. Petals 5, white, sometimes pink, obovate or ovate-elliptic, 1.5–2 × as long as sepals, apex obtuse. Floral disc with 5 impressed glands. Ovary ovoid, ca. 3 mm. Styles 3, ca. 3 mm. Capsule globose, 4–6 mm, 3-valved; valves 2-cleft at apex. Seeds brown, reniform, slightly flattened, ca. 1 mm in diam., smooth. Fl. Jun–Jul.

Mountains; 2200–3000 m. Xinjiang [Afghanistan, Kazakhstan].

**15. *Arenaria androsacea*** Grubov, Bot. Mater. Gerb. Bot. Inst. Komarova Acad. Nauk SSSR 17: 12. 1955.

点地梅状老牛筋 dian di mei zhuang lao niu jin

Herbs perennial. Roots robust; rootlets many. Stems pulvinate, with numerous branches, slender, 5–10 cm × ca. 1 mm, glabrous. Leaf blade linear-subulate, 0.5–1.5 cm × ca. 1 mm, margin slightly reflexed, apex spinose. Cymes 1–3-flowered; rachis densely glandular hairy; bracts ovate-lanceolate, 2–3 mm, margin broadly white scarious, apex acute. Pedicel densely glandular hairy. Sepals 5, ovate-lanceolate, 3–5 × 1–2 mm, glandular hairy abaxially, 1-veined, base broadened, margin narrowly membranous, apex acute. Petals 5, white, orbicular-obovate, longer than sepals, apex slightly undulate. Floral disc with 5 glands. Stamens 10; filaments equaling sepals. Ovary ovoid. Styles 3, ca. 2 mm. Capsule ovoid, slightly longer than persistent sepals, 3-valved; valves 2-cleft at apex. Fl. and fr. Jul–Sep.

Mountains; 2300–4200 m. Gansu, Nei Mongol, Ningxia, Qinghai, Xinjiang [Mongolia, Russia].

### 3. *Arenaria* subgen. *Eremogoneastrum* F. N. Williams, Bull. Herb. Boissier 3: 598. 1895.

雪灵芝亚属 xue ling zhi ya shu

Herbs perennial. Principal roots robust, woody. Stems pulvinate or caespitose. Leaves sessile, subulate to linear, always persistent, margin narrowly membranous, apex aristate. Flowers solitary or paired, rarely more in terminal inflorescences. Sepals lanceolate to ovate-lanceolate, 3-veined, midvein raised, lateral veins not obvious, margin white membranous, apex acute. Petals white, rarely pink, shorter than or equaling sepals, rarely longer than them. Floral disc scalloped lobed, glands 5, conspicuous.

About 20 species: Asia and North America; 17 species (12 endemic) in China.

**16. *Arenaria brevipetala*** Y. W. Tsui & L. H. Zhou in L. H. Zhou, Acta Phytotax. Sin. 18: 360. 1980.

雪灵芝 xue ling zhi

Herbs perennial. Principal roots robust, woody. Stems pulvinate, 5–8 cm, with numerous withered, persistent leaves at base; flowering branches much taller than vegetative ones. Leaf blade needle-shaped to linear, 1.5–2 cm × ca. 1 mm, veins raised abaxially, impressed adaxially, base broadened, clasping, margin narrowly membranous, reflexed, apex acuminate, aristate; basal leaves congested, cauline ones in 2 or 3 pairs. Flowers solitary or paired, terminal; bracts lanceolate, ca. 5 × 1–1.5 mm, herbaceous. Pedicel 0.5–1.5 mm, glandular

villous, apex nutant. Sepals 5, ovate-lanceolate, 6–7 × ca. 2 mm, 3-veined, midvein raised, lateral veins not obvious, base broadened, margin white membranous, apex acute. Petals 5, white, ovate, 3–4 × ca. 2 mm. Floral disc cupular, with 5 glands. Stamens 10; anthers yellow. Ovary globose, ca. 2 mm in diam. Styles 3, ca. 3 mm. Fl. Jun–Aug.

• Alpine meadows and gravels; 3400–4600 m. SE Qinghai, NW Sichuan, NE Xizang.

This species is used medicinally.

**17. *Arenaria baxoiensis*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 676. 1983.

八宿雪灵芝 ba su xue ling zhi

Herbs perennial. Principal roots robust, woody. Stems pulvinate, 3–8 cm, glandular hairy. Basal leaves

congested; leaf blade spinose-linear, 1–1.5 cm × ca. 1 mm, veins 3, raised, base broadened, clasping, membranous, apex acute, pillar-shaped. Cauline leaves in 1 or 2 pairs; leaf blade subulate, 5–10 × ca. 0.5 mm, 3-veined, base broadened, clasping, membranous, apex erect or curved, acute. Flowers solitary, rarely paired, terminal; bracts ovate-lanceolate, ca. 4 × 1 mm, margin broadly membranous, apex acuminate. Pedicel 1–2 cm, densely glandular villous. Sepals 5, ovate-lanceolate, 6–7 × ca. 1.5 mm, glandular hairy abaxially, 1–3-veined, base broadened, margin narrowly membranous, apex acute. Petals 5, white, ovate, equaling sepals, apex obtuse. Stamens 10, shorter than petals; anthers yellow. Ovary ovoid. Styles 3, linear. Fl. Jun–Jul.

• Mountain grasslands; 4000–4500 m. Sichuan, E Xizang.

**18. *Arenaria kumaonensis*** Maximowicz, Fl. Tangut. 86. 1889.

库莽雪灵芝 *ku mang xue ling zhi*

Herbs perennial. Stems densely clustered, pulvinate, 2–3 cm. Leaf blade subulate, 2–5 × ca. 1 mm, base broadened, margin not glandular ciliate. Flower solitary. Pedicel shorter than bracts, glandular hairy. Sepals 5, lanceolate, 4–5 mm, 1-veined, base broadened, margin broadly membranous, apex obtuse. Petals 5, white, elliptic, slightly longer than sepals. Stamens 10; anthers black. Ovary obovoid, ca. 1.5 mm. Styles 3, linear. Fl. Jul–Aug.

Icy steppes; ca. 4700 m. Xizang [NW India].

**19. *Arenaria kansuensis*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 3, 26: 428. 1880.

甘肃雪灵芝 *gan su xue ling zhi*

*Arenaria kansuensis* var. *acropetala* Y. W. Tsui & L. H. Zhou.

Herbs perennial. Principal roots robust, woody. Stems pulvinate, 4–5 cm, with withered, persistent leaves at base. Leaves congested; leaf blade spinose-linear, triangular in cross section, 1–2 cm × ca. 1 mm, hardened, veins raised abaxially, impressed adaxially, base slightly broadened, clasping, margin slightly reflexed, narrowly membranous, with small teeth near base, apex acute, aristate. Flower solitary, terminal; bracts lanceolate, 3–5 × 1–1.5 mm, 1-veined, base forming a short sheath, margin broadly membranous, apex acute. Pedicel 2.5–4 mm, glandular villous. Sepals 5, lanceolate, 5–6 mm, glabrous, 1-veined, base broadened, margin broadly membranous, apex acute. Petals 5, white, obovate, 4–5 mm, base narrowed, cuneate, apex obtuse. Floral disc cupular, with 5 glands. Stamens 10; filaments ca. 4 mm; anthers brown. Ovary globose, 1-loculed; ovules numerous. Styles 3, linear, ca. 3 mm. Fl. Jul.

• Alpine meadows, mountain grasslands and gravels; 3500–5300 m. S Gansu, Qinghai, W Sichuan, E Xizang, NW Yunnan.

**20. *Arenaria ischnophylla*** F. N. Williams, J. Linn. Soc., Bot. 38: 400. 1909.

瘦叶雪灵芝 *shou ye xue ling zhi*

Herbs perennial. Stems pulvinate, branched at base, 4–5 cm; caudex (root crown) woody, with brown, withered, persistent leaves at base. Leaves congested; leaf blade subulate or linear-subulate, triangular in cross section, 5–10 × ca. 1 mm, veins raised abaxially, impressed adaxially, base broadened, membranous, sheathing, margin thickened, hardened, apex spinose. Flower solitary, terminal. Pedicel ca. 5 mm, villous. Sepals 5, narrowly lanceolate, ca. 4 mm, usually sparsely pilose abaxially, 3-veined, margin narrowly membranous, apex erect, acute. Petals 5, white, ovate-elliptic, ca. 5 mm, base not obviously clawed, apex obtuse. Stamens 10, shorter than sepals; filaments opposite sepals with a gland at base. Ovary globose. Styles 3. Fl. Jul.

• Alpine meadows; 4500–4900(–5100) m. SE Xizang.

**21. *Arenaria roborowskii*** Maximowicz, Fl. Tangut. 87. 1889. 青藏雪灵芝 *qing zang xue ling zhi*

Herbs perennial. Roots robust, woody. Stems densely clustered, 5–8 cm, with crowded, withered, persistent leaves at woody base. Leaves congested; leaf blade linear, triangular in cross section, 1–1.5 cm × ca. 1 mm, veins raised abaxially, impressed adaxially, base broadened, clasping, hardened, margin slightly reflexed, narrowly membranous, sparsely hairy, apex acute. Flower solitary, terminal; bracts linear-lanceolate, 4.5–5 × ca. 1.5 mm, 1-veined, base broadened, margin narrowly membranous, apex acute. Pedicel 5–10 mm, glabrous. Sepals 5, lanceolate, ca. 5 × 1.5 mm, 1–3-veined, base broadened, margin narrowly membranous, apex acute. Petals 5, white, elliptic, ca. 4 × 1.4 mm, base cuneate, apex acute. Floral disc patelliform, with 5 large, impressed glands. Stamens 10; filaments shorter than petals; anthers yellow. Ovary globose, slightly flattened, ca. 1.5 mm in diam., 1-loculed; ovules numerous. Styles 3, linear, ca. 1.5 mm. Fl. Jul–Aug.

• Alpine meadows, shifting screes; 4200–5100 m. S Qinghai, W Sichuan, E Xizang.

**22. *Arenaria lancangensis*** L. H. Zhou, Acta Phytotax. Sin. 18: 357. 1980.

澜沧雪灵芝 *lan cang xue ling zhi*

Herbs perennial. Stems caespitose, pulvinate, 4–11 cm, with crowded, withered, persistent leaves at woody base. Leaf blade subulate, 6–8 × ca. 1 mm, base broadened, clasping, apex acute. Flower solitary, terminal; bracts ovate, ca. 2 × 1 mm. Pedicel slightly curved, ca. 4 mm, glabrous. Sepals 5, elliptic, ca. 3 × 1.2 mm, 3-veined, apex obtuse or acute. Petals 5, white, elliptic, 3–3.5 × ca. 1.2 mm, with a yellow, oblong callus at base. Stamens 10; filaments less than 1 mm, those opposite sepals with a gland at base; anthers white. Ovary obovate, ca. 2 mm in diam., smooth; ovules 5 or 6. Styles 3. Capsule globose, ca. 3 mm, 3-valved; valves 2-cleft at apex. Seeds 1–3, gray, triangular-obovate, less than 1 mm in diam., glabrous. Fl. and fr. Jun–Sep.

• Alpine meadows, gravelly areas; 3500–4800 m. SE Qinghai, W Sichuan, SE Xizang, SW Yunnan.

**23. *Arenaria gerzensis*** L. H. Zhou, Rep. Invest. Fl. Fauna Ah Li Reg. Tibet, 126. 1979.

改则雪灵芝 *gai ze xue ling zhi*

Herbs perennial. Principal roots robust, woody. Stems clustered, pulvinate, 2–5 cm, with crowded, withered, persistent leaves at woody base. Leaf blade linear, triangular in cross section, 6–10 × ca. 1 mm, subleathery, veins raised abaxially, impressed adaxially, base broadened, clasping, margin with small teeth, apex acute, awned. Flower solitary, terminal; bracts ovate-lanceolate, 2–3 × ca. 1.5 mm, 1-veined, margin membranous, apex acute. Pedicel ca. 1 mm. Sepals 5, lanceolate, 5–6 × 1.5–2 mm, subleathery, 3-veined, midvein raised, lateral veins inconspicuous, base ciliate, apex greenish brown. Petals 5, white, saccate, 8–10 × 2–3 mm. Stamens 10; filaments opposite sepals with a gland at base. Ovary narrowly ovoid, ca. 4 × 1.5 mm, apex yellow-brown. Styles 3, linear. Fl. Jun–Jul.

• Alpine meadows; 4500–4700 m. NW Xizang (Ngari Diqu).

**24. *Arenaria qinghaiensis*** Y. W. Tsui & L. H. Zhou in L. H. Zhou, Acta Phytotax. Sin. 18: 358. 1980.

青海雪灵芝 *qing hai xue ling zhi*

Herbs perennial. Roots robust, woody. Stems clustered, pulvinate, 5–8 cm, with crowded, withered, persistent leaves at woody base. Leaf blade linear, 1–1.5 cm × ca. 1 mm, base broadened, clasping, membranous, margin narrowly membranous, sparsely ciliate, apex slightly reflexed, acute. Flower solitary, terminal; bracts linear-elliptic, 3–4 × ca. 1 mm. Pedicel ca. 1 mm, glabrous. Sepals 5, linear-lanceolate, 7–8 × 1.5–2 mm, 1–3-veined, base broadened, margin membranous, apex acute. Petals 5, white, elliptic-ovate, 8–9 × 2.5–3 mm, apex obtuse. Floral disc patellate, with 5 large, impressed, elliptic glands. Stamens 10; filaments 4–5 mm; anthers yellow. Ovary ovoid, 2–3 mm, 1-loculed; ovules numerous. Styles 3, linear, 2.5–3 mm. Fl. Jun–Jul.

• Alpine meadows; ca. 4200 m. WC Qinghai (Dulan Xian).

**25. *Arenaria aksayqingensis*** L. H. Zhou, Acta Biol. Plateau Sin. 6: 25. 1987.

阿克赛钦雪灵芝 *a ke sai qin xue ling zhi*

Herbs perennial. Principal roots robust, woody. Stems clustered, pulvinate, 3–4 cm, with crowded, withered, persistent leaves at woody base. Leaf blade subulate, 5–10 × ca. 1 mm, base broadened, clasping, membranous, margin narrowly membranous, sparsely ciliate, apex acute. Flower solitary, terminal; bracts subulate, 3–4 × ca. 1 mm. Pedicel ca. 1 mm, glabrous. Sepals 5, lanceolate, 6–7 × 1.5–2 mm, closely 3-veined near margin, base broadened, margin membranous, apex acute. Petals 5, white, obovate, 4–5 mm, apex obtuse. Floral disc patellate, with 5 ovoid glands. Stamens 10; filaments shorter than petals; anthers violet. Ovary ovoid, ca. 1.5 mm. Styles 3, linear, 2–3 mm. Fl. Jul.

• River beaches; ca. 4900 m. Xinjiang.

**26. *Arenaria pulvinata*** Edgeworth in J. D. Hooker, Fl. Brit. India 1: 238. 1874.

垫状雪灵芝 *dian zhuang xue ling zhi*

*Arenaria perlevis* (F. N. Williams) Handel-Mazzetti; *A. polytrichoides* Edgeworth var. *perlevis* F. N. Williams. Herbs perennial. Roots conic, slender. Stems in small, compact, subglobose clusters, pulvinate, branched at base, 4–5 cm, with crowded, withered, persistent leaves at base. Leaf blade subulate-elliptic or ovate-subulate, 3–6 × ca. 1 mm, base clasping, membranous, margin flat distally, hard, ciliate, apex acute, mucronulate. Flower solitary, terminal, 6–7 mm in diam. Sepals 5, ovate or ovate-lanceolate, 2–2.5 × ca. 1 mm, ca. 1/2 as long as petals, 3-veined, midvein raised, lateral veins short, base rounded, incrassate, margin hard, scarious, apex obtuse. Petals 5, white, saccate or obovate, 4–5 × ca. 1.5 mm. Stamens 10; filaments opposite sepals with a gland at base; anthers yellow. Ovary obovoid, ca. 1.5 × 1 mm. Styles 3, less than 1 mm. Fl. Jul.

Alpine meadows, gravels; 4200–5000 m. SE Xizang [Bhutan, India, Nepal, Sikkim].

**27. *Arenaria shannanensis*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 677. 1983.

粉花雪灵芝 *fen hua xue ling zhi*

Herbs perennial. Roots slender, woody. Stems pulvinate, 3–6 cm, with crowded, withered, persistent leaves at base and distally. Leaf blade subulate, 5–7 cm, 3-veined, base broadened, membranous, apex acute. Flower solitary, terminal, sessile. Sepals 5, violet abaxially, ovate-lanceolate, 5–6 × ca. 1.5 mm, 3-veined, margin white membranous, apex acute. Petals 5, pink, lanceolate or orbicular, 6–7 × 1.5–2 mm, apex obtuse. Stamens 10; filaments shorter than sepals, those opposite sepals with a gland at base. Ovary ovoid, ca. 2 mm. Styles 3, linear, ca. 2 mm.

• Alpine meadows; ca. 4300 m. S Xizang.

**28. *Arenaria edgeworthiana*** Majumdar, J. Indian Bot. Soc. 44: 141. 1965.

山居雪灵芝 *shan ju xue ling zhi*

*Arenaria monticola* Edgeworth in J. D. Hooker, Fl. Brit. India 1: 238. 1874, not Buckley (1862).

Herbs perennial. Roots robust, woody. Stems pulvinate, densely branched, 4–8 cm, glabrous. Leaves crowded; leaf blade subulate-linear, 0.8–2 cm, with 1 raised vein, base broadened, margin sheathing, incrassate, membranous, hairy, apex cuspidate. Flower solitary, terminal, sessile, ca. 1.8 cm in diam. Sepals 5, lanceolate or ovate-lanceolate, 7–8 × ca. 2 mm, closely 3-veined, base broadened, margin broadly membranous, apex acute. Petals 5, white, broadly ovate, 0.9–1.2 cm, base clawed, apex obtuse. Stamens 10; filaments shorter than sepals, those opposite sepals with a gland at base. Ovary ovoid. Styles 3, linear. Capsule ovoid,

shorter than persistent sepals, 3-valved; valves 2-cleft at apex. Seeds obovoid-reniform. Fl. Jun–Jul, fr. Jul–Aug. Alpine meadows, grasslands, river beaches; 4200–5100 m. Xizang [Bhutan, Nepal, Sikkim].

**29. *Arenaria bryophylla*** Fernald, *Rhodora* 21: 5. 1919.

藓状雪灵芝 xian zhuang xue ling zhi

*Arenaria musciformis* Wallich ex Edgeworth & J. D.

Hooker in J. D. Hooker, *Fl. Brit. India* 1: 237. 1874, not Triana & Planchon (1862).

Herbs perennial. Roots robust, woody. Stems clustered, pulvinate, 3–5 cm, woody, with crowded, withered, persistent leaves proximally. Leaves crowded; leaf blade linear, triangular in cross section, 4–9 × ca. 1 mm, veins raised abaxially, impressed adaxially, base clasping, broadened, hard, margin slightly involute, narrowly membranous, sparsely ciliate, apex spreading or reflexed, acute. Flower solitary, sessile; bracts lanceolate, ca. 3 × 1 mm, 1-veined, base broadened, margin membranous, apex acute. Sepals 5, elliptic-lanceolate, ca. 4 × 1.5 mm, 3-veined, base broadened, margin membranous, apex acute. Petals 5, white, narrowly obovate, slightly longer than sepals. Floral disc patellate, with 5 orbicular glands. Stamens 10; filaments ca. 3 mm; anthers yellow. Ovary ovoid-globose, ca. 1.5 mm, 1-loculed; ovules numerous. Styles 3, linear, ca. 1.5 mm. Fl. Jun–Jul.

Alpine meadows, stony slopes, gravelly sands along rivers; 4200–5200 m. S Qinghai, Xizang [Nepal, Sikkim].

**30. *Arenaria zadoiensis*** L. H. Zhou, *Acta Biol. Plateau Sin.* 6: 26. 1987.

杂多雪灵芝 za duo xue ling zhi

Herbs perennial. Roots robust, woody. Stems clustered, pulvinate, 2–3 cm, woody at base, with crowded, withered, persistent leaves proximally. Leaf blade subulate, 4–5 × ca. 1 mm, base membranous, margin involute, apex spinose. Flower solitary, sessile; bracts lanceolate, 4–5 × ca. 1 mm. Sepals 5, lanceolate, 4–5 × ca. 2 mm, 1-veined, apex acuminate. Petals 5, white, saccate, shorter than sepals. Floral disc with 5 glands. Stamens 10, 5 long and 5 short. Ovary obovoid, ca. 1.5 mm. Styles 3, linear, ca. 3.5 mm. Fl. Jun–Jul.

• Beneath rocky cliffs; ca. 4400 m. SE Qinghai.

**31. *Arenaria taibaishanensis*** L. H. Zhou, *Acta Phytotax. Sin.* 18: 361. 1980.

太白雪灵芝 tai bai xue ling zhi

Herbs perennial. Roots with numerous wiry branches at base. Stems pulvinate, 2–3 cm, sparsely hairy. Leaf blade subulate-linear, 5–6 × ca. 1 mm, 1-veined, margin slightly involute, apex acute. Cymes 2- or 3-flowered; bracts ovate, ca. 3 × 1 mm. Pedicel 2–3 mm, sparsely hairy. Sepals 5, lanceolate, ca. 3 × 0.6 mm, sparsely hairy abaxially, with 3 raised veins, base broadened, apex obtuse. Petals white, saccate, ca. 4 × 1 mm.

**4. *Arenaria* subgen. *Dolophragma*** (Fenzl) McNeill, *Notes Roy. Bot. Gard. Edinburgh* 24: 127. 1962.

福祿草亚属 fu lu cao ya shu

*Dolophragma* Fenzl, *Ann. Wiener Mus. Naturgesch.* 1: 63. 1836.

Stamens 10; filaments ca. 2 mm; anthers yellow. Ovary bottle-shaped, ca. 2 × 1 mm. Styles 3, ca. 2 mm. Fl. Jun–Jul.

• Alpine scrub, meadows; ca. 4000 m. Shaanxi.

**32. *Arenaria festucoides*** Bentham ex Royle, *Ill. Bot. Himal. Mts.* 1: 81. 1834.

狐茅状雪灵芝 hu mao zhuang xue ling zhi

Herbs perennial. Principal roots robust, woody; lateral roots smaller. Stems densely clustered, pulvinate, 5–8 cm, glandular villous, with crowded, withered, persistent leaves at woody base. Leaf blade linear, 0.7–2 cm × ca. 1 mm, 1-veined, base broadened, clasping, margin narrowly membranous, proximally sparsely ciliate, apex acute; proximal cauline leaves congested, distal middle ones gradually sparser. Cymes 1–3- or more flowered; bracts ovate-lanceolate, 3–4 × 1–1.5 mm, glandular hairy, 1-veined, margin membranous, apex acuminate. Pedicel to 7 mm, densely glandular hairy. Sepals 5, sometimes 4, ovate-lanceolate or broadly ovate, 3–7 × 2.5–3.5 mm, densely glandular hairy, 1–3-veined, base rounded, margin usually involute, broadly membranous, apex acuminate. Petals 5, white, obovate, 7–9 × 4–5 mm, apex truncate or obtuse, sometimes emarginate. Floral disc patellate, with 5 glands. Stamens 10; filaments 4–6 mm; anthers yellow. Ovary ovoid, ca. 2 mm. Styles 3, sometimes 4, linear, ca. 2.5 mm. Fl. Jun–Jul.

Mountain grasslands; 2000–4700 m. Qinghai, SW Xinjiang, Xizang [India, ?Kashmir, ?Nepal, Pakistan].

Two varieties have been recognized. The distinguishing characters seem to be only a matter of degree, and the variation pattern should be studied in the field. Perhaps this variation should not be the basis for formal recognition of taxa.

1a. Leaf blade 1–2 cm; pedicel 5–7

mm ..... 32a. var. *festucoides*

1b. Leaf blade ca. 0.7 cm; pedicel to 5

mm ..... 32b. var. *imbricata*

**32a. *Arenaria festucoides* var. *festucoides***

狐茅状雪灵芝(原变种) hu mao zhuang xue ling zhi  
(yuan bian zhong)

Leaf blade 1–2 cm. Pedicel 5–7 mm.

Mountain grasslands; 2000–4700 m. Qinghai, SW Xinjiang, Xizang [India, ?Kashmir, ?Nepal, Pakistan].

**32b. *Arenaria festucoides* var. *imbricata*** Edgeworth & J. D. Hooker in J. D. Hooker, *Fl. Brit. India* 1: 237. 1874.

小狐茅状雪灵芝 xiao hu mao zhuang xue ling zhi

Leaf blade ca. 0.7 cm. Pedicel to 5 mm.

• S Xizang.

Herbs perennial. Roots often slender, woody. Stems usually densely pulvinate, sometimes caespitose. Leaves sessile, linear to subulate or linear-lanceolate, leathery, usually persistent, margin slightly swollen, apex usually acuminate. Inflorescence terminal, 1–3-flowered. Sepals ovate to ovate-lanceolate or elliptic, 3-veined, margin membranous, apex obtuse. Petals white, longer than sepals, sometimes only slightly so. Floral disc with 5 glands.

Seven species: Asia; five species (three endemic) in China.

**33. *Arenaria przewalskii*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 3, 26: 428. 1880.

福祿草 fu lu cao

Herbs perennial. Principal roots slender, woody; lateral roots brittle. Stems densely caespitose, prostrate at base, erect distally, 10–20 cm, densely pale brown glandular villous, with withered, persistent leaves. Basal leaf blade linear, 2–3 cm × 1–2 mm, both surfaces glabrous, midvein raised, base broadened, membranous, sheathing, margin slightly involute, denticulate, apex obtuse or acute. Cauline leaf blade lanceolate or narrowly so, 1–1.5 cm × 2–3 mm, margin slightly involute, denticulate, apex obtuse. Cymes 3-flowered; bracts ovate-elliptic, 4–7 × 1–2 mm, glandular hairy abaxially, base narrowed, apex obtuse. Pedicel 3–4 mm, densely glandular hairy. Sepals 5, violet, broadly ovate, 4–5 × 2–3 mm, densely glandular hairy, base broadened, margin membranous, usually ciliate proximally, apex obtuse or sometimes emarginate. Petals 5, white, obovate, 8–10 × ca. 4 mm, base cuneate, apex obtuse or emarginate. Floral disc patellate, with 5 elliptic glands. Stamens 10; filaments ca. 5 mm; anthers yellow. Ovary stipitate, globose-obovoid. Styles 3, linear, ca. 3 mm. Fl. Jul–Aug.

• Alpine meadows, cirques; 2600–4200 m. Gansu, Qinghai.

The whole plant is used medicinally.

**34. *Arenaria smithiana*** Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 334. 1932.

大花福祿草 da hua fu lu cao

*Arenaria oresbia* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 197. 1920, not Greenman (1904).

Herbs perennial. Stems densely pulvinate, 10–15 cm, sparsely villous; mature branches woody, with crowded, withered, persistent leaves. Basal leaf blade linear or subulate-linear, 0.6–1.5 cm × 1–2 mm, 3-veined, midvein raised, base broadened, sheathing, margin involute, denticulate, apex acute, spinose. Cauline leaves in 2 or 3 pairs; leaf blade linear-lanceolate or ovate, 3–8 × 1–2 mm, shortly villous, base broadened, sheathing, margin involute, yellow, ciliate, apex hard. Flower solitary, terminal. Pedicel 1–2 cm, shortly villous. Sepals 5, ovate or lanceolate-ovate, 6–10 × 3–4 mm, sparsely white hairy abaxially, inconspicuously 3-veined, base broadened, margin membranous, apex obtuse. Petals 5, white or yellowish, obovate, 1.2–1.5 cm × 4–6 mm, apex obtuse. Stamens 10; filaments equaling sepals, those opposite sepals with a gland at base. Ovary ovoid. Styles 3, linear. Fl. Jul.

• Alpine meadows; 4000–4500 m. SE Xizang, NW Yunnan.

**35. *Arenaria oreophila*** J. D. Hooker, Fl. Brit. India 1: 238. 1874.

山生福祿草 shan sheng fu lu cao

*Arenaria lichiangensis* W. W. Smith.

Herbs perennial. Stems densely pulvinate, 4–9 cm, densely glandular hairy. Basal leaf blade linear, 1–2 cm × ca. 1.5 mm, midvein raised, base broadened, membranous, margin white, hard, apex acute. Cauline leaves in 2 or 3 pairs; leaf blade ovate or ovate-lanceolate, ca. 5 × 1.5 mm, margin hairy, apex obtuse. Flower solitary, terminal. Pedicel 5–8 mm, densely glandular hairy. Sepals 5, elliptic, ca. 5 × 2 mm, glandular villous, 3-veined, margin narrowly membranous, apex obtuse. Petals 5, white, narrowly obovate, 7–8 mm. Stamens 10; filaments 5–8 mm, those opposite sepals with a gland at base; anthers yellow. Ovary obovoid, ca. 3 mm. Styles 3, linear, ca. 2 mm. Capsule ovoid, equaling persistent sepals, 3-valved; valves 2-cleft at apex. Seeds brown, reniform-horseshoe-shaped, ca. 1 mm in diam., smooth. Fl. Jun–Jul, fr. Jul–Aug.

Alpine meadows, shifting screes; 3500–5000 m. SE Qinghai, SW Sichuan, NW Yunnan [Sikkim].

**36. *Arenaria densissima*** Wallich ex Edgeworth & J. D. Hooker in J. D. Hooker, Fl. Brit. India 1: 239. 1874.

密生福祿草 mi sheng fu lu cao

*Cherleria juniperina* D. Don, Prodr. Fl. Nepal. 214.

1825, not *Arenaria juniperina* Linnaeus (1767), nor Villars (1789), nor Pursh (1813); *Dolophragma juniperinum* Fenzl.

Herbs perennial. Stems densely pulvinate, densely branched, 4–5 cm. Leaves congested, imbricate; leaf blade subulate, 5–10 × ca. 1 mm, veins raised abaxially, impressed adaxially, margin involute, apex excurved, spinose. Flower solitary, terminal; bracts lanceolate, ca. 2 × 1 mm. Pedicel 2–4 mm, glabrous. Sepals 5, elliptic or ovate, ca. 2.5 × 1.5 mm, 3-veined, base broadened, margin membranous, apex obtuse or acute. Petals 5, white, saccate or narrowly so, ca. 5 × 2 mm. Stamens 10; filaments ca. 2 mm, those opposite sepals with a gland at base; anthers violet. Ovary obovate, ca. 1.2 mm in diam. Styles 3. Capsule ovoid, ca. 2.5 mm, 3-valved; valves 2-cleft at apex. Seeds brown, trigonous-reniform, glabrous. Fl. and fr. Jun–Aug.

Alpine meadows, shifting screes; 3600–5300 m. SE Qinghai, W Sichuan, S Xizang [Bhutan, India, Nepal, Sikkim].

**37. *Arenaria polytrichoides*** Edgeworth in J. D. Hooker, Fl. Brit. India 1: 237. 1874.

团状福祿草 tuan zhuang fu lu cao

Herbs perennial. Principal roots robust, woody. Stems densely clustered, 2.5–11 cm, forming hemispheric cushions 1–1.5 cm in diam.; branches cylindrical, woody at base, with congested, withered, persistent leaves along their length. Leaves imbricate; leaf blade subulate, 5–10 × ca. 1 mm, veins raised abaxially, impressed

adaxially, base broadened, clasping, membranous, margin involute distally, thickened, sparsely ciliate near base, apex cuspidate. Flower solitary, terminal, sessile; bracts lanceolate, 2.5–3 × ca. 1 mm, base broadened, clasping, forming a membranous sheath, margin reflexed, hard, apex spinose. Sepals 5, ovate, ovate-elliptic, or broadly elliptic, ca. 3 mm, obscurely 3-veined, base broadened, apex obtuse. Petals 5, white, ovate or broadly obovate, slightly longer than sepals.

5. *Arenaria* subgen. *Solitaria* McNeill, Notes Roy. Bot. Gard. Edinburgh 24: 128. 1962.

单花亚属 dan hua ya shu

Herbs perennial. Stems clustered, short. Leaves lanceolate to ovate-orbicular, base narrowed, margin usually slightly hard, cartilaginous. Flowers solitary, rarely paired, terminal, showy. Sepals elliptic or lanceolate to narrowly orbicular, margin membranous, usually cartilaginous, apex acute. Petals white, pink, or violet, obovate to obovate-elliptic.

Six species: Asia; six species (two endemic) in China.

38. *Arenaria ciliolata* Edgeworth in J. D. Hooker, Fl. Brit. India 1: 240. 1874.

缘毛无心菜 yuan mao wu xin cai

Herbs perennial, hairy throughout. Roots conic, branched at base. Stems densely clustered, yellow, 5–8 cm, white villous. Leaves sessile (rarely petiole 2–3 mm), ovate or ovate-orbicular, 5–10 × 2–5 mm, adaxially sparsely brown hairy, base cuneate, margin thick, ciliate, apex cuspidate or acuminate. Flower solitary, terminal. Pedicel 5–10 mm, white villous. Sepals 5, elliptic or orbicular-lanceolate, 7–8 mm, sparsely hairy abaxially, margin thick, ciliate, apex acuminate. Petals 5, white, obovate or broadly so, 9–10 mm, apex obtuse. Stamens 10; filaments shorter than sepals; anthers dark green or black. Ovary ovoid. Styles 3, linear. Fl. Jul–Aug.

Alpine meadows; 4000–4600 m. S Xizang [Bhutan, Nepal, Sikkim].

39. *Arenaria ramellata* F. N. Williams, J. Linn. Soc., Bot. 38: 399. 1909.

嫩枝无心菜 nen zhi wu xin cai

Herbs perennial, glabrous. Stems branched at base, 4–6 cm; branches ascending. Leaves congested, sessile, lanceolate or ovate-lanceolate, 5–9 mm, veins inconspicuous, base attenuate, margin ciliate, apex acute. Flower solitary, terminal. Pedicel 5–10 mm. Sepals 5, elliptic or lanceolate, 5–6 × ca. 2 mm, margin narrowly membranous, ciliate, apex excurved, obtuse. Petals 5, white or pink, obovate, ca. 1.5 × as long as sepals, base shortly clawed, apex obtuse. Stamens 10; filaments ca. 2/3 as long as sepals; anthers pale yellowish. Ovary ovoid. Styles 3, linear, ca. 5 mm. Fl. May.

• Alpine scrub or meadows; 4200–5000 m. S Xizang.

40. *Arenaria stracheyi* Edgeworth in J. D. Hooker, Fl. Brit. India 1: 240. 1874.

藏西无心菜 zang xi wu xin cai

Herbs perennial, dwarf, glabrous. Stems sparsely clustered, suberect, 2–5 cm. Leaf blade narrowly orbicular, flat, 5–6 × 2–3 mm, fleshy, veins inconspicuous, base narrowed, margin not thickened,

Floral disc patellate, with 5 dark glands. Stamens 10; filaments ca. 1.5 mm; anthers yellow. Ovary ovoid or obovoid, ca. 1 mm. Styles 3, ca. 1 mm. Capsule ovoid, ca. 1.5 mm, 3-valved; valves 2-cleft at apex. Seeds ellipsoid, black-brown, slightly ridged. Fl. Jun–Jul, fr. Aug–Sep.

• Alpine meadows, shifting screes; 3500–5300 m. SE Qinghai, W Sichuan, Xizang.

apex acute or acuminate. Flower solitary, terminal. Pedicel 5–8 mm, apex erect or nutant. Sepals 5, suberect, narrowly orbicular, 4–5 × 3–4 mm, margin membranous, apex acute. Petals 5, white, broadly obovate, 1.5–2 × as long as sepals, apex obtuse. Stamens 10; filaments longer than sepals; anthers green. Ovary ovoid. Styles 3, linear. Capsule ovoid, shorter than persistent sepals, apex 6-valved. Seeds subreniform, small, smooth, not lustrous. Fl. and fr. Jul–Aug. Swamp meadows, gravelly mountain grasslands, river beaches, broken alpine rocks; 3000–5300 m. W Xizang [India, ?Nepal].

41. *Arenaria rhodantha* Pax & K. Hoffmann in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 366. 1922.

红花无心菜 hong hua wu xin cai

Herbs perennial. Stems sparsely clustered, erect, slender, 2–5 cm, glabrous. Leaf blade elliptic, ovate, or lanceolate, 5–6 × 2–3 mm, margin thick, ciliate, rarely narrowly membranous, apex acute, cuspidate. Flower solitary, terminal. Pedicel 0.7–1.5 cm, glandular pubescent. Sepals 5, violet or green, lanceolate or orbicular, ca. 5 × 2 mm, midvein and margin nodose hairy, apex obtuse or acute. Petals 5, violet, obovate or broadly so, 8–9 mm, apex obtuse. Stamens shorter than petals; anthers violet. Ovary ovoid. Styles 3, linear. Fl. Jun–Jul.

• Alpine meadows, gravels, exposed rocks; 4000–5000 m. W Sichuan, E Xizang [?India, ?Nepal].

42. *Arenaria forrestii* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 181. 1912.

西南无心菜 xi nan wu xin cai

*Arenaria forrestii* f. *cernua* (F. N. Williams) C. Y. Wu; *A. forrestii* f. *micrantha* (F. N. Williams) C. Y. Wu; *A. forrestii* f. *roseotincta* (W. W. Smith) C. Y. Wu; *A. glanduligera* F. N. Williams var. *cernua* F. N. Williams; *A. glanduligera* var. *micrantha* F. N. Williams; *A. roseotincta* W. W. Smith.

Herbs perennial. Stems clustered, 1–15 cm, glabrous or sparsely white villous along 1 side. Proximal cauline leaf blade scalelike, 3–4 × 1–1.5 mm; distal cauline leaf



blade orbicular-lanceolate or orbicular-ovate, 5–12 × 1.5–3 mm, leathery, glabrous, midvein raised, base narrowed, margin slightly hard, cartilaginous, apex acute. Flower solitary, terminal. Pedicel 0.5–1.5 cm, villous in a line. Sepals 5, yellow, orbicular-lanceolate, 5–8 × 2–3 mm, base narrowed, margin membranous, apex acute. Petals 5, white or pink, obovate-elliptic, 0.7–1.5 cm × 4–6 mm, base narrowed, cuneate, apex obtuse, sometimes truncate or emarginate. Stamens 10; filaments 5–6 mm; anthers yellow. Ovary ovoid, slightly flattened, ca. 2 mm; ovules 6–8. Styles 3, linear, ca. 2.5 mm. Fl. Jul–Aug.

Mountains, alpine meadows, swamp meadows, shifting screes, broken rocks, limestone crevices; 2900–5300 m. S Gansu, SE Qinghai, W Sichuan, SE Xizang, NW Yunnan [Nepal].

**43. *Arenaria glanduligera*** Edgeworth in J. D. Hooker, Fl. Brit. India 1: 240. 1874.

小腺无心菜 xiao xian wu xin cai

**6. *Arenaria* subgen. *Odontostemma*** (Bentham ex G. Don) F. N. Williams, Bull. Herb. Boissier 3: 603. 1895.

齿瓣亚属 chi ban ya shu

*Odontostemma* Bentham ex G. Don, Gen. Hist. 1: 449. 1831; *Gooringia* F. N. Williams.

Herbs annual, biennial, or perennial. Leaf blade linear to ovate, rarely subulate. Inflorescences various, but often with vegetative branches arising within them. Sepals curved, often saccate, veins inconspicuous, margin broadly membranous, apex truncate. Petals usually longer than sepals (but sometimes smaller, cleistogamous flowers present), apex emarginate or shallowly bifid or toothed. Styles usually 2, rarely 3. Seeds often inflated, roughened, without reticulate striae.

About 65 species: Asia; 59 species (57 endemic) in China.

McNeill (Notes Roy. Bot. Gard. Edinburgh 24: 129. 1962) mentioned that *Arenaria* subgen. *Odontostemma* is heterogeneous, but did not further subdivide it. The following five groups have been recognized in China: *A.* sect. *Pseudoenthalia* C. Y. Wu (in W. T. Wang et al., Vasc. Pl. Hengduan Mount. 1: 396. 1993, but invalid as without Latin diagnosis; species nos. 44–51); *A.* sect. *Reductae* C. Y. Wu (loc. cit., but invalid as without Latin diagnosis; species nos. 52–64); *A.* sect. *Moehringella* Franchet (Pl. Delavay. 96. 1889; species nos. 65–74); *A.* sect. *Macrogynae* Franchet (Bull. Soc. Bot. France 33: 432. 1885; species nos. 75–79); and *A.* sect. *Odontostemma* (G. Don) Pax (in Engler & Prantl, Nat. Pflanzenfam. 3(1b): 84. 1889; species nos. 80–102).

**44. *Arenaria weissiana*** Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 57: 47. 1920.

多柱无心菜 duo zhu wu xin cai

Herbs perennial. Roots fusiform or conic. Stems clustered, 2–10 cm, glandular hairy in 2 lines or yellow or densely white glandular hairy. Leaves diffusely paired; petiole 2–5 mm; leaf blade lanceolate, elliptic, obovate, or saccate, 5–10 × 3–5 mm, granular, sparsely glandular pubescent or densely villous, midvein impressed, base cuneate, apex rounded or obtuse. Flower solitary or cymes few flowered; bracts similar to leaves but smaller. Pedicel 1–4 cm, sparsely glandular hairy. Sepals 5, greenish abaxially, ovate or lanceolate, 4–7 × 2–3 mm, sparsely glandular pubescent or densely villous, midvein impressed, base broadened, margin narrowly membranous, ciliate, apex acute. Petals 5, white, obcordate, ca. 2 × as long as sepals, base narrowly cuneate, apex rounded or bifid nearly to middle. Floral disc with 5 fleshy glands. Stamens 10, longer than sepals; anthers brown or green. Ovary ovoid, ca. 1.5 × 1.2 mm. Styles 4 or 5 (in female flowers), ca. 1.5 mm. Fl. Jul–Aug.

Herbs perennial. Roots conic, branched at base. Stems clustered, yellow, lustrous, slender, 2–6 cm, glabrous proximally, white glandular hairy distally. Leaf blade greenish, ovate-lanceolate, ovate, or elliptic-orbicular, flat, 5–6 × 2–3 mm, both surfaces white glandular pubescent, veins inconspicuous, base attenuate into petiole, margin ciliate, apex acute or acuminate. Flowers solitary or paired, terminal; bracts similar to leaves but smaller. Pedicel yellow, slender, 0.5–2 cm, sparsely white villous. Sepals 5, spreading or excurved, lanceolate or ovate-lanceolate, 4–5 × ca. 1.5 mm, glandular hairy abaxially, veins inconspicuous, margin narrowly membranous, apex obtuse or acute. Petals 5, violet, obovate or ovate-elliptic, 5–7 × 2–3 mm, apex obtuse. Stamens 10; filaments ca. 3 mm; anthers greenish or yellow. Ovary ovoid. Styles 3, linear, pillar-shaped or clavate.

Alpine meadows, shifting screes; 4500–5500 m. Xizang [Bhutan, Nepal, Sikkim].

• Alpine meadows, shifting screes, rock crevices; 2800–4800 m. Sichuan, NW Yunnan.

A related species, which has not been validly published (*Arenaria galiiformis* C. Y. Wu in W. T. Wang et al., Vasc. Pl. Hengduan Mount. 1: 402. 1993), differs from *A. weissiana* in having stems dichotomously branched, slender, hard; leaves usually in whorls of 4, blade 5–10 × 3–8 mm, thickened, both surfaces white powdery, densely hairy, base attenuate, apex obtuse; sepals densely and shortly glandular pubescent; petals broadly ovate or suborbicular, apex emarginate; ovary ovoid, 2–3 mm; and styles 3, ca. 2.5 × as long as ovary. It grows in rock crevices, from 4200–4300 m, in SW Sichuan. Three varieties of *Arenaria weissiana* have been recognized. Field studies are needed to better characterize these entities.

1a. Petal apex bifid nearly to middle .... 44b. var. *bifida*

1b. Petal apex rounded, entire.

2a. Plants glandular hairy in 2 lines

..... 44a. var. *weissiana*

2b. Plants densely white glandular

hairy ..... 44c. var. *puberula*

**44a. *Arenaria weissiana* var. *weissiana***

多柱无心菜(原变种) duo zhu wu xin cai (yuan bian zhong)

Plants glandular hairy in 2 lines. Petal apex rounded, entire.

- Alpine meadows, shifting screes; 2800–4800 m. SW Sichuan, NW Yunnan.

**44b. *Arenaria weissiana* var. *puberula*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 34. 1987.

微毛无心菜 *wei mao wu xin cai*

Plants densely white glandular hairy. Leaves and sepals densely villous. Petal apex rounded, entire.

- Rock crevices; ca. 3900 m. Sichuan.

**44c. *Arenaria weissiana* var. *bifida*** H. Chuang in C. Y. Wu et al, Fl. Yunnan. 6: 836. 1995.

裂瓣无心菜 *lie ban wu xin cai*

Plants glandular hairy. Petal apex bifid nearly to middle.

- Alpine meadows; ca. 3700 m. NW Yunnan.

**45. *Arenaria setifera*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 37. 1987.

刚毛无心菜 *gang mao wu xin cai*

Herbs. Roots conic. Stems slender, 5–10 cm, hard, densely glandular pubescent and with hard, multicellular hairs. Leaf blade ovate, 5–6 × 2.5–3 mm, base rounded, margin villous with sparse, hard, multicellular hairs, apex acuminate. Cymes several flowered; bracts similar to leaves but smaller. Pedicel 1–2.5 cm, with hard, multicellular hairs. Sepals 5, lanceolate, 4–5 × 1–1.5 mm, with hard, multicellular hairs abaxially, apex long acuminate. Petals 5, white, obovate, ca. 2 × as long as sepals, apex 2-cleft; lobes shallowly toothed. Stamens 10, nearly equaling sepals. Ovary ovoid, ca. 2 mm. Styles 3, linear, longer than ovary. Fl. Jun–Jul.

- Alpine meadows, rock crevices; 3600–4200 m. SW Yunnan.

**46. *Arenaria napuligera*** Franchet, Bull. Soc. Bot. France 33: 429. 1886.

滇藏无心菜 *dian zang wu xin cai*

Herbs annual. Roots napiform. Stems branched proximally or unbranched, slender, 5–15 cm, hard, white or violet glandular villous. Leaf blade orbicular, narrowly so, or linear, 5–8 × 1.5–4 mm, base cuneate, margin ciliate proximally, apex obtuse. Cymes sometimes conic, few to many flowered, or sometimes flower solitary. Pedicel erect, slender, 0.5–2.5 cm, hard, glandular villous. Sepals 5, violet or green, lanceolate or ovate-lanceolate, 6–7 × ca. 2 mm, glandular pubescent abaxially, margin broadly membranous, apex obtuse. Petals 5, white or pink, ca. 2 × as long as sepals, apex entire, emarginate, or 2-cleft. Stamens 10, ca. 3/4 as long as petals. Ovary obovoid, ca. 2 mm. Styles 2 or 3, linear, ca. 3 mm. Fl. Jun–Jul.

- Alpine grasslands and meadows; 3000–5100 m. W Sichuan, E Xizang, NW Yunnan.

1a. Stems branched proximally; flowers few to many per cyme; styles 3 .... 46a. var. *napuligera*

1b. Stems unbranched; flower solitary; styles 2 ..... 46b. var. *monocephala*

**46a. *Arenaria napuligera* var. *napuligera***

滇藏无心菜(原变种) *dian zang wu xin cai* (*yuan bian zhong*)

Stems branched proximally. Flowers few to many per cyme. Styles 3.

- Alpine grasslands; 3000–5000 m. W Sichuan, E Xizang, NW Yunnan.

**46b. *Arenaria napuligera* var. *monocephala*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 196. 1920.

单头无心菜 *dan tou wu xin cai*

Stems unbranched. Flower solitary. Styles 2.

- Alpine meadows; 3600–5100 m. SE Xizang, NW Yunnan.

**47. *Arenaria filipes*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 34. 1987.

细柄无心菜 *xi bing wu xin cai*

Herbs. Roots napiform, branched at base. Stems clustered, branched distally, 8–12 cm, shortly villous in 1 line. Leaf blade decurved, saccate-oblongate or saccate-orbicular proximally, orbicular-lanceolate distally, 5–10 × 2–3 mm, glabrous, base obtuse, apex attenuate. Cymes few to many flowered; bracts similar to leaves but smaller. Pedicel 2.5–5 cm, densely glandular pubescent. Sepals 5, orbicular-lanceolate, 3–4 mm, sparsely pubescent, base broadened, margin white, apex acute. Petals 5, white, obovate, ca. 2 × as long as sepals, apex entire or emarginate. Stamens 10; anthers yellowish green. Ovary ovoid; ovules numerous. Styles 3, filiform. Fl. Jul–Aug.

- Montane forest margins; ca. 2800 m. SW Sichuan.

**48. *Arenaria nigricans*** Handel-Mazzetti, Symb. Sin. 7: 196. 1929.

变黑无心菜 *bian hei wu xin cai*

Herbs. Root solitary, small; rootlets white, long, fibrous. Stems branched at base, 10–25 cm, black glandular hairy. Basal leaves petiolate; leaf blade suborbicular. Cauline leaves with sheathing petiole; leaf blade narrowly elliptic to suborbicular, 1–4 × 0.7–1.5 cm, thick, bullate, both surfaces glabrous, base attenuate, margin ciliate, apex obtuse. Cymes many flowered; bracts ovate or broadly so, 5–8 mm, apex acute. Pedicel erect in fruit, 1–4 cm, becoming shorter distally on cymes, glandular villous. Sepals 5, orbicular, 4–5 mm, glandular pubescent abaxially, base narrowed, margin membranous, apex rounded. Petals 5, white, obovate, 1–2 × as long as sepals, apex truncate or emarginate. Floral disc small, with 5 subglobose glands. Stamens 10, equaling sepals; anthers yellow. Ovary turbinate-obovoid, ca. 1/3 as long as sepals. Styles 2, equaling ovary. Capsule 4-valved. Seeds brown, large, smooth, narrowly fimbriate. Fl. Jul–Sep.

- Limestone and montane rock crevices; 2600–3500 m. W Yunnan.

Two varieties have been recognized. The distinguishing characters seem to be only a matter of degree or ecologically induced, and the

variation pattern should be studied in the field. Perhaps this variation should not be the basis for formal recognition of taxa.

- 1a. Leaves 1.5–4 × 0.8–1.5 cm, changing to black when dry; petals 1.5–2 × as long as sepals ..... 48a. var. *nigricans*  
1b. Leaves 1–3 × ca. 0.7 cm, not changing to black when dry; petals subequaling sepals ..... 48b. var. *zhenkangensis*

**48a. *Arenaria nigricans* var. *nigricans***

变黑无心菜(原变种) *bian hei wu xin cai* (*yuan bian zhong*)

Leaves 1.5–4 × 0.8–1.5 cm, changing to black when dry. Petals 1.5–2 × as long as sepals.

- Limestone crevices; 2600–3200 m. NW Yunnan.

**48b. *Arenaria nigricans* var. *zhenkangensis*** (C. Y. Wu ex L. H. Zhou) C. Y. Wu in C. L. Tang, Fl. Reipubl. Popularis Sin. 26: 209. 1996.

镇康无心菜 *zhen kang wu xin cai*

*Arenaria zhenkangensis* C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 36. 1987.

Leaves 1–3 × ca. 0.7 cm, not changing to black when dry. Petals subequaling sepals.

- Montane rock crevices; 2800–3500 m. SW Yunnan.

**49. *Arenaria zhongdianensis*** C. Y. Wu in C. Y. Wu et al., Fl. Yunnan. 6: 835. 1995.

中甸无心菜 *zhong dian wu xin cai*

Herbs. Stems dichotomously branched at base, yellow or violet, 15–20 cm, sparsely and shortly hairy. Leaf blade lanceolate or oblanceolate, 1–2 cm × 2–5 mm, thick, both surfaces with raised granulosities, glabrous or with sparse, hard hairs, base attenuate, apex obtuse. Cymes often capitate; bracts ovate, 3–5 × 2–4 mm, base broadened, both surfaces with raised granulosities, margin hairy, apex obtuse. Pedicel 2–5 mm, densely white villous. Sepals 5, lanceolate, 3–5 mm, abaxially shortly white nodose glandular hairy or white pubescent, margin narrowly membranous, apex obtuse. Petals 5, white, obovate, equaling sepals, apex 2-cleft. Stamens 10. Ovary globose. Styles 2. Fl. Jul–Aug.

- Ravine margins; ca. 3300 m. NW Yunnan (Zhongdian Xian).

**50. *Arenaria xerophila*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 198. 1920.

旱生无心菜 *han sheng wu xin cai*

Herbs perennial. Roots conic or shortly fusiform. Stems suberect or ascending, branched at base, violet, 5–20 cm; branchlets numerous, diffuse, pseudodichotomously branched, slender, hard, sparsely white villous or glabrous. Leaf blade oblanceolate, 0.5–2.5 cm × 1–5 mm, papery, adaxially with or without small, clavate protuberances, base attenuate into a short sheath, apex acute, not cuspidate. Cymes conic, sparsely many flowered; bracts similar to leaves but smaller. Pedicel slender, 0.5–1.5 cm, soft, hairy. Sepals 5, green abaxially, ovate-lanceolate or ovate, 2–6 × 1–3 mm, midvein and basal veins hairy, base broadened, margin white, ciliate, apex obtuse. Petals 5, white,

obovate or broadly so, 3–8 mm, equaling or slightly longer than sepals, apex obtuse. Stamens 10. Ovary ovoid-globose. Styles 2 or 3, 2–5 mm. Fl. Aug–Sep.

- *Pinus* forest margins, mountain grasslands; 2600–3600 m. Sichuan, NW Yunnan.

Two weakly distinguished varieties have been recognized.

- 1a. Styles 2 ..... 50a. var. *xerophila*  
1b. Styles 3 ..... 50b. var. *xiangchengensis*

**50a. *Arenaria xerophila* var. *xerophila***

旱生无心菜(原变种) *han sheng wu xin cai* (*yuan bian zhong*)

Sepals 2–6 × 1–3 mm. Petals slightly longer than the sepals. Styles 2.

- Mountain grasslands; 2600–3600 m. Sichuan, NW Yunnan.

**50b. *Arenaria xerophila* var. *xiangchengensis*** (L. H. Zhou) C. Y. Wu in W. T. Wang et al., Vasc. Pl. Hengduan Mount. 1: 404. 1993.

乡城无心菜 *xiang cheng wu xin cai*

*Arenaria xiangchengensis* L. H. Zhou, Acta Biol. Plateau Sin. 6: 36. 1987.

Sepals 4–5 × 1–1.5 mm. Petals equaling sepals. Styles 3.

- *Pinus* forest margins; ca. 3000 m. W Sichuan (Xiangcheng Xian).

**51. *Arenaria schneideriana*** Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 57: 46. 1920.

雪山无心菜 *xue shan wu xin cai*

Herbs. Roots conic, wiry toward tip. Stems erect, dichotomously branched, yellowish or violet, slender, cylindric, 4–8 cm, white pubescent on 1 or 2 sides. Basal leaf blade ligulate, gradually inflated distally, small, soon withering. Distal cauline leaf blade often excurved, linear-lanceolate, ca. 1.5 cm × 2 mm, slightly fleshy, glabrous, 1-veined, base attenuate into a very short sheath, apex obtuse. Cymes few flowered. Pedicel recurved at anthesis, suberect in fruit, 4–13 mm, wiry, glandular villous. Sepals 5, elliptic, ca. 4 mm, glandular pubescent abaxially, veins absent, margin membranous, apex often excurved. Floral disc orbicular, with 5 elliptic, flat glands. Petals 5, white or rose, narrowly obovate, shorter than or equaling sepals, with very slender veins, base clawed, apex emarginate or shallowly 2-cleft. Stamens 5; filaments slightly shorter than petals; anthers yellow or green. Ovary obovoid, ca. 0.5 mm. Styles 2, ca. 1/2 as long as ovary. Capsule ovoid, ca. 4 mm, 4-lobed, apex subacute. Seeds 8, large, obtusely tuberculate. Fl. and fr. Jul–Aug.

- Alpine meadows; 4400–4700 m. NW Yunnan.

**52. *Arenaria minima*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 35. 1987.

微无心菜 *wei wu xin cai*

Herbs small. Roots gray, conic. Stems densely dichotomously branched at base, 3–6 cm; branchlets violet, subglabrous. Leaf blade subulate, 4–5 × ca. 1 mm, base broadened into a sheath, apex acute. Cymes several flowered; bracts similar to leaves but smaller. Pedicel 3–10 mm, stiff. Sepals 5, lanceolate, ca. 2 × 1 mm, base broadened, margin ciliate, apex obtuse. Petals 5, white, narrowly lanceolate, shorter than sepals, apex obtuse. Stamens 10, equaling petals. Ovary ovoid. Styles 3, equaling ovary. Capsule ovoid, longer than sepals, 3-valved; valves 2-cleft at apex. Fl. and fr. Jul–Aug.

• Mountain rock crevices; ca. 4000 m. SW Sichuan.

**53. *Arenaria bomiensis*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 685. 1983.

波密无心菜 bo mi wu xin cai

Herbs small, soft. Stems yellow, slender, 5–6 cm, soft, sparsely white pubescent. Petiole 2–6 mm, sparsely villous at base. Leaf blade saccate, 0.5–1.2 cm × 2–3 mm, base attenuate into petiole, margin crisped-undulate, apex acute. Flower solitary, terminal; bracts similar to leaves but smaller. Pedicel slender, 5–9 mm, white villous in 1 line. Sepals 5, ovate, ca. 5 mm, base broadened, margin ciliate at base, apex obtuse. Petals 5, white, obovate, ca. 6 mm, apex emarginate. Stamens 10, shorter than sepals. Ovary ovoid. Styles 3, linear, ca. 4 mm. Fl. Jul.

• Mountain grasslands; ca. 3700 m. E Xizang.

A presumably related species, which has not been validly published (*Arenaria microstella* C. Y. Wu in C. L. Tang, Fl. Reipubl. Popularis Sin. 26: 213. 1996), differs from *A. bomiensis* in having long hairs and small retrorse bristles; leaf blade 2–4 × 1–2 mm, both surfaces raised granular, base attenuate, margin retrorsely ciliate, apex acute; cymes several flowered; and styles 3. It is known from shifting screes, from 4200 to 4300 m, in SW Sichuan.

**54. *Arenaria longipes*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 39. 1987.

长梗无心菜 chang geng wu xin cai

Herbs annual. Roots slender. Stems branched at base, yellow, slender, 5–10 cm, glandular villous. Petiole 0.5–1.5 cm; leaf blade ovate, 4–5 × 2–4 mm, both surfaces glabrous, apex rounded or obtuse. Cymes dichasial, many flowered; bracts similar to leaves but smaller. Pedicel 0.5–1.5 cm, sparsely white villous. Sepals 5, lanceolate-ovate or ovate, ca. 2 × 1.5 mm, white villous abaxially, margin membranous, apex obtuse or acuminate. Petals 5, white, obovate, ca. 2/3 as long as sepals, apex entire. Stamens 10. Ovary ovoid; ovules numerous. Styles 2. Capsule ovoid, ca. 1.5 × as long as persistent sepals. Seeds gray-black, subglobose. Fl. and fr. Jul–Sep.

• Rocky cliffs; ca. 3500 m. SW Sichuan (Muli Zang Zu Zizhixian).

**55. *Arenaria inconspicua*** Handel-Mazzetti, Symb. Sin. 7: 197. 1929.

不显无心菜 bu xian wu xin cai

Herbs perennial. Roots napiform. Stems 1 or 2, branched at base, 1–5 cm, with black, hard hairs. Basal leaf blade saccate; cauline leaf blade lanceolate, 8–10 × 1–2.5 mm, glabrous or with sparse, short, hard hairs, midvein inconspicuous, apex obtuse or acute. Flower solitary, terminal, or cymes few flowered. Pedicel robust, ca. 1 cm. Sepals 5, lanceolate or orbicular, 2–3 mm, herbaceous, abaxially with sparse, brown, hard hairs, base saccate, margin membranous, apex acute. Petals 5, white, elliptic or narrowly ovate, shorter than sepals, apex rounded, acute, or dentate to 2-cleft. Stamens 10; filaments unequal; anthers pale brown. Ovary ovoid. Styles 2 or 3. Capsule ovoid, equaling persistent sepals, 4-lobed. Seeds brown, oblate. Fl. and fr. Jul–Sep.

• Alpine meadows; 3600–4600 m. NW Yunnan.

**56. *Arenaria amdoensis*** L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 688. 1983.

安多无心菜 an duo wu xin cai

Herbs small, glandular pubescent. Roots numerous, conic, slender. Stems erect, densely dichotomously branched at base, proximally yellowish and lustrous, distally green or violet, 2–4 cm, glandular villous. Petiole short; leaf blade saccate, 4–10 × 1–3.5 mm, leathery, both surfaces sparsely glandular villous, base attenuate, margin densely ciliate, apex obtuse. Cymes 3–5-flowered, rarely flower solitary. Pedicel green or brown, 2–7 mm, densely glandular villous. Sepals 5, ovate, 2–3 × ca. 1 mm, leathery, glandular villous abaxially, 1-veined, base broadened, margin narrowly membranous, apex obtuse. Petals 5, white, broadly obovate, 1.5–2 × as long as sepals, apex emarginate or 2-cleft. Stamens 10, longer than sepals; anthers black. Ovary ovoid, ca. 1.3 mm. Styles 2, linear, ca. 1 mm. Fl. Jul.

• River beaches; 4800–5000 m. E Xizang (Amdo Xian).

**57. *Arenaria spathulifolia*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 35. 1987.

匙叶无心菜 chi ye wu xin cai

*Arenaria muliensis* C. Y. Wu ex L. H. Zhou.

Herbs small. Roots conic. Stems dichotomously branched at base, 3–10 cm; branches violet, slender, hard, glandular hairy. Leaf blade saccate, 5–6 × 2–3 mm, both surfaces glandular villous, base attenuate, margin ciliate, apex obtuse. Cymes few flowered; bracts similar to leaves but smaller. Pedicel slender, 0.5–1.5 cm, densely glandular villous. Sepals 5, lanceolate, ca. 3 × 1 mm, glandular villous abaxially, base connate, margin ciliate, apex acute. Petals 5, white, obovate, 3–4 mm, apex emarginate or dentate lobed. Stamens 10, shorter than sepals; anthers yellow. Ovary obovoid. Styles 2, linear. Fl. Jul–Aug.

• Mountain grasslands; 3500–4200 m. SW Sichuan, NW Yunnan.

**58. *Arenaria membranisejala*** C. Y. Wu in C. Y. Wu et al., Fl. Yunnan. 6: 835. 1995.

膜萼无心菜 mo e wu xin cai

Herbs slender. Roots conic. Stems dichotomously branched at base, ca. 10 cm, white pubescent, shortly glandular villous. Leaves in several pairs; leaf blade linear, 3–8 × 0.5–1.5 mm, both surfaces glabrous, veins inconspicuous, base shortly sheathed, apex obtuse. Cymes terminal or axillary; rachis slender, 1.5–2.5 cm, densely pubescent, also shortly glandular pubescent in 1 line. Sepals 5, lanceolate-orbicular, 3–4 × 1–1.5 mm, glabrous, veins inconspicuous, margin broadly membranous, apex obtuse. Petals 5, white, obovate, equaling sepals, base clawed, apex entire. Stamens 10, equaling sepals. Ovary globose, ca. 1 mm; ovules numerous. Styles 2, equaling ovary. Capsule globose, 3–4 mm, deeply 4-valved. Seeds 2 or 3, flat, orbicular, 1.5–2 mm.

• NW Yunnan (Lijiang Naxi Zu Zizhixian).

**59. *Arenaria karakorensis*** Em. Schmid, Repert. Spec. Nov. Regni Veg. 31: 42. 1932.

克拉克无心菜 ke la ke wu xin cai

*Sagina karakorensis* (Em. Schmid) Kozhevnikov.

Herbs annual. Stems branched at base, ca. 3 cm, glandular hairy. Petiole narrow; leaf blade linear-lanceolate, 1-veined, margin ciliate, apex obtuse. Cymes few flowered; flowers nutant. Pedicel glandular hairy. Sepals 5, narrowly ovate, ca. 1.8 mm, 1-veined, margin white membranous, glandular ciliate. Petals 5, white, narrowly ovate, 2–2.5 mm, apex erose. Floral disc with 5 glands. Stamens 10; filaments ca. 2 mm. Ovary ovoid. Styles 2, sparsely villous. Capsule nutant, 3–3.5 mm, 4-lobed. Seeds gray, flat, ca. 1.5 × 1 mm.

• Mountains; 5000–5100 m. Xizang.

**60. *Arenaria tumengelaensis*** L. H. Zhou, Acta Phytotax. Sin. 18: 357. 1980.

土门无心菜 tu men wu xin cai

Herbs perennial. Stems branched at base, slender, 2–10 cm. Leaf blade greenish, elliptic, 0.7–1.5 cm × 2–5 mm, leathery, midvein and lateral veins raised and green, base cuneate, margin glabrous, apex obtuse. Cymes compound, corymbose, 3-flowered. Sepals 5, violet, ovate, 5–6 mm, leathery, glabrous abaxially, 3-veined, base broadened, margin ciliate, apex cymbiform. Petals 5, white, broadly obovate or suborbicular, 7–9 mm, apex entire. Stamens 10; filaments 3–5 mm, those opposite sepals with a gland at base; anthers yellow. Ovary obovoid, ca. 2.5 × 1.5 mm. Styles 2, ca. 2 mm, clavate. Fl. Jun–Jul.

• Riverside grasslands; 4600–5300 m. NE Xizang.

**61. *Arenaria reducta*** Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 57: 47. 1920.

减缩无心菜 jian suo wu xin cai

Herbs small. Roots conic, slender, short. Stems dichotomously branched at base, often violet, slender, 2–4 cm, sparsely pubescent or glabrous. Leaf blade rhomboid-elliptic or saccate, 1–3 mm, base narrowed, apex acute. Cymes many flowered; bracts similar to leaves but smaller. Pedicel often violet, 2–5 mm, hard, sparsely

white pubescent or glabrous. Sepals 5, violet, ovate-lanceolate or ovate, ca. 2 mm, base broadened, margin narrowly membranous, ciliate, apex acute. Petals absent. Stamens 5. Ovary ovoid, equaling sepals. Styles 2, equaling ovary. Capsule ovoid, 4-lobed. Seeds pale brown, triangular-reniform. Fl. and fr. Jul–Sep.

• *Abies* forests, alpine meadows, chalky soils; 3500–4200 m. SW Sichuan, NW Yunnan.

**62. *Arenaria pharensis*** McNeill & Majumdar, Bot. J. Linn. Soc. 80: 373. 1980.

帕里无心菜 pa li wu xin cai

Herbs annual. Roots conic or spinose. Stems densely branched at base, 2–4 cm; branches slender, ca. 0.5 mm in diam., retrorsely white pubescent in 2 lines. Petiole absent or short; leaf blade linear or linear-lanceolate, 4–5 × 1–2 mm, tuberculate, 1–3-veined, midvein impressed proximally. Pedicel 3–5.5 mm. Sepals 5, narrowly elliptic, hooded, 1.5–3 × 0.5–1 mm, villous abaxially, 3-veined, midvein impressed, lateral veins inconspicuous, base broadened, margin narrowly membranous, apex obtuse or acute. Petals absent. Stamens 2 or 3, ca. 1 mm. Capsule ellipsoid-ovoid, 2.5–3 mm, deeply 4-valved; valves ellipsoid, ca. 1 mm in diam. Seeds brown, subglobose, ca. 0.6 mm in diam., narrowly and irregularly parallel striate.

• Plateaus; ca. 4400 m. S Xizang.

No specimens have been seen by the present authors; the above description is based on literature and a photograph of the type.

**63. *Arenaria littledalei*** Hemsley, Bull. Misc. Inform. Kew 1896: 209. 1896.

古临无心菜 gu lin wu xin cai

*Goorigia littledalei* (Hemsley) F. N. Williams.

Herbs small. Stems violet, 4–5 cm, glabrous, with numerous slender branches. Leaf blade semiterete, to 8.5 × 0.2 mm, fleshy, base membranous, connate into a short sheath. Flowers axillary or pseudoterminal, small. Pedicel elongating to 1.6 cm in fruit, glabrous. Sepals 4, narrowly lanceolate, ca. 2 mm, fleshy, base connate, margin membranous, apex acute. Petals absent. Floral disc cupular, with inconspicuous glands. Stamens 2 or 3. Ovary narrowly ovoid. Styles 2. Capsule globose-ovoid, flattened on sides, deeply 4-lobed; fruiting pedicel long, glabrous. Seeds small, ca. 0.5 mm in diam. Fl. and fr. Jul–Sep.

• Valleys; 5000–5300 m. C Xizang.

**64. *Arenaria saginoides*** Maximowicz, Fl. Tangut. 87. 1889.

漆姑无心菜 qi gu wu xin cai

Herbs annual. Roots slender. Stems erect, dichotomously branched at base, 2–4 cm, glabrous, rarely sparsely glandular pubescent proximally on inflorescence. Leaf blade linear-saccate, 4–5 × 1–2 mm, midvein inconspicuous, base narrowed, apex obtuse. Flowers terminal, or axillary in trichotomous cymes; bracts similar to leaves but smaller, 2–3 × ca. 1 mm, base narrowed, apex acute. Pedicel shorter than bracts at anthesis, longer than them in fruit. Sepals 4, rarely 5 (when 2 sepals wider), narrowly ovate, 2–2.5 × 1–1.5

mm, sparsely glandular villous, 1-veined, base thickened, saccate, margin membranous, apex obtuse. Petals 4(or 5), only 2 or 3 fully developed, white, narrowly saccate or obovate, 2–2.5 × ca. 1 mm, apex emarginate or irregularly dentate. Floral disc saucer-shaped, with 4 green glands. Stamens 8, sometimes 5, 2/3–3/4 as long as sepals; anthers ochre-colored. Ovary ellipsoid, ca. 1.5 mm; ovules 6. Styles 2, ca. 1 mm; stigma ellipsoid. Capsule ovoid-conic, longer than persistent sepals, 2-valved; valves 2-cleft at apex. Seeds 6, flat, ca. 1 mm in diam. Fl. and fr. Jul–Sep.

• SW Qinghai, W Sichuan, SW Xinjiang, E and N Xizang.

**65. *Arenaria melanandra*** (Maximowicz) Mattfeld ex Handel-Mazzetti, Symb. Sin. 7: 202. 1929.

黑蕊无心菜 *hei rui wu xin cai*

*Cerastium melanandrum* Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 3, 26: 429. 1880.

Herbs annual. Roots slender. Stems inclined proximally, simple or dichotomously branched at base, brown, 6–10 cm, glandular pubescent, with sterile, axillary branches. Proximal cauline leaves shortly petiolate; distal cauline leaves sessile; leaf blade orbicular-lanceolate or orbicular, 1–1.8 cm × 3–5 mm, midvein impressed, base narrowed, margin sparsely ciliate, apex obtuse. Cymes 1–3-flowered; flowers erect; bracts ovate-lanceolate, 6–10 × 2–3 mm, base narrowed, margin ciliate, apex acute. Pedicel 0.5–2 cm, densely glandular villous. Sepals 5, green abaxially, elliptic, 5–6 × ca. 2 mm, sparsely dark violet glandular villous, 1-veined, base broadened, margin narrowly membranous, ciliate, apex obtuse. Petals 5, white, broadly ovate, 1–1.2 cm × 5–6 mm, base narrowly clawed, apex emarginate. Floral disc saucer-shaped, with 5 elliptic glands. Stamens 10; filaments usually longer than sepals; anthers dark violet. Ovary ovoid, ca. 3 mm. Styles 2 or 3, ca. 3 mm; stigma clavate. Capsule stipitate, globose-ovoid, 4–5 mm, slightly shorter than persistent sepals, 4–6-valved. Seeds gray-brown, ovoid, ca. 1 mm, with curls on surface. Fl. Jul, fr. Aug.

• Alpine meadows, shifting screens; 3700–5000 m. Gansu, Qinghai, SW Sichuan, Xizang [?Nepal, ?Sikkim].

This species is used medicinally.

**66. *Arenaria pseudostellaria*** C. Y. Wu, Lihua Zhou & W. L. Wagner, *nom. nov.*

线叶无心菜 *xian ye wu xin cai*

Replaced synonym: *Arenaria linearifolia* Franchet, Pl. Delavay. 97. 1889, not Poiret (1804), nor Desvaux (1816); *A. leptophylla* C. Y. Wu ex L. H. Zhou (1987), not Chamisso & Schlechtendal (1830); *Moehringella linearifolia* Neumayer; *Moehringia linearifolia* F. N. Williams.

Herbs annual. Roots solitary, spinose or conic. Stems branched at base, violet, slender, 10–12 cm, pubescent.

Leaf blade linear-lanceolate, 0.5–1.5 cm × 1–2 mm, both surfaces tuberculate, base cuneate, margin sparsely ciliate, apex acute. Cymes few flowered (sometimes a small, female flower arising from stem base); bracts similar to leaves but smaller. Pedicel 1–1.5 cm, shortly glandular hairy. Sepals 5, lanceolate, 4–5 × 1–1.5 mm, sparsely shortly glandular hairy abaxially (with nodose hairs in female flower from stem base), base broadened, margin membranous, apex acute. Petals 5, white, obovate, 8–9 mm, apex entire (equaling sepals and denticulate in female flower from stem base). Stamens 10, slightly shorter than sepals. Ovary ellipsoid (ovoid in female flower from stem base). Styles 3 (or 4 in female flower from stem base), linear. Fl. Jul–Aug.

• Rock crevices at forest margins; 3000–3700 m. SW Sichuan, NW Yunnan.

**67. *Arenaria euodonta*** W. W. Smith, Notes Roy. Bot Gard. Edinburgh 11: 195. 1920.

真齿无心菜 *zhen chi wu xin cai*

Herbs perennial. Principal root branched, conic, robust. Stems erect or diffuse, branched at base, slender, 10–35 cm, sparsely villous. Petiole short; leaf blade linear or linear-lanceolate, 1–2.5 cm × 1–2 mm, margin hairy or not, apex subobtuse; proximal cauline leaf blade often lanceolate or narrowly orbicular, leaf axils usually with sterile branches at anthesis. Flower solitary or cymes 3–5-flowered; bracts similar to leaves but smaller. Pedicel 2–3(–6) cm, glandular pubescent. Sepals 5, lanceolate or orbicular-lanceolate, 8–11 mm, sparsely black villous below middle abaxially, margin membranous, ciliate, apex acute. Petals 5, white or pink, oblanceolate or obovate, 2–2.5 × as long as sepals, base shortly clawed, apex 2- or 3-toothed. Stamens 10; equaling or slightly longer than sepals; anthers red, ca. 1 mm. Ovary globose, 3–4 mm. Styles 2, linear, ca. 4 mm. Fl. Jul–Aug.

• Alpine meadows; 3000–4200 m. NW Yunnan.

**68. *Arenaria dsharaensis*** Pax & K. Hoffmann in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 366. 1922.

察龙无心菜 *cha long wu xin cai*

Herbs perennial. Stems diffuse, 3–6 cm, basally glabrous, with withered leaves, distally slightly villous, with congested leaves; internodes elongate. Leaf blade lanceolate or saccate-orbicular, 5–14 mm, base narrowed, margin hairy, apex acute. Flower solitary. Pedicel ca. 5 mm. Sepals ovate, ca. 4 mm, villous abaxially, margin membranous. Petals 5, white, obovate, 6–7 mm, base clawed, apex emarginate or obtuse. Styles 2, equaling sepals.

• Alpine streamsides; ca. 4700 m. W Sichuan.

**69. *Arenaria melandryoides*** Edgeworth in J. D. Hooker, Fl. Brit. India 1: 241. 1874.

桃色无心菜 tao se wu xin cai

Herbs perennial. Roots slender. Stems sparsely clustered or solitary, branched at base, 5–10 cm, white glandular villous. Leaves sessile, dark green or violet, ovate- or orbicular-lanceolate or orbicular-elliptic, 0.8–1.5 cm × 1.5–3 mm, leathery, glandular pubescent or both surfaces glabrous, 1-veined, base cuneate, apex obtuse. Flower solitary, terminal, rarely lateral. Pedicel recurved, 1–3 cm, white glandular pubescent. Sepals 5, erect or reflexed, ovate-lanceolate, 4–8 mm, sparsely glandular pubescent or glabrous, veins inconspicuous abaxially, margin blue-brown, not membranous, ciliate, apex acute. Petals 5, white or pink, narrowly obovate, ca. 2 × as long as sepals, apex entire. Stamens 10, slightly longer than sepals. Ovary ovoid. Styles 2(or 3). Capsule 2-valved; valves 2-cleft at apex. Seeds brown, with a ± thin, membranous wing. Fl. Jun–Jul, fr. Jul–Aug.

Alpine meadows; (3700–)4300–4800(–5000) m. E and S Xizang, NW Yunnan [Bhutan, Nepal, Sikkim].

**70. *Arenaria rockii*** Diels, Notizbl. Bot. Gart. Berlin-Dahlem 9: 1027. 1926.

紫红无心菜 zi hong wu xin cai

Herbs perennial. Stems branched at base, 4–10 cm; underground part white, with small, white scales; aerial part violet, pubescent and violet glandular villous, with axillary, sterile branches. Leaves sessile, lanceolate or narrowly elliptic, 0.5–1.5 cm × 1–2 mm, thick, glabrous except sparsely glandular pubescent abaxially and at margin, 1-veined or vein inconspicuous, base cuneate, apex obtuse. Flower solitary, terminal. Sepals 5, green or violet, orbicular, 5–8 × 1–2 mm, 3-veined, base saccate, margin broadly membranous, apex obtuse. Petals 5, violet or white, broadly obovate, ca. 1.5 cm × 6–7 mm, base attenuate, apex emarginate. Stamens 10; filaments equaling sepals. Styles 2. Fl. Jul–Aug.

• Mountains; 3800–4700 m. NW Yunnan.

**71. *Arenaria roseiflora*** Sprague, Bull. Misc. Inform. Kew 1916: 33. 1916.

粉花无心菜 fen hua wu xin cai

*Arenaria atuntziensis* C. Y. Wu ex L. H. Zhou var. *stenopetala* Y. W. Tsui ex L. H. Zhou; *A. roseiflora* f. *albiflora* C. Y. Wu; *Moehringella roseiflora* (Sprague) Neumayer.

Herbs perennial. Stems violet, 10–25 cm, distally with recurved, brown, short hairs and long, glandular hairs. Basal leaves attenuate into a petiole at base; leaf blade saccate, 1–2 cm × 3–5 mm, apex obtuse. Cauline leaves sessile, lanceolate or elliptic, 0.7–1.5 cm × 2–5 mm, midvein raised abaxially, violet, base rounded, margin

ciliate from middle to apex, apex obtuse. Flower solitary, terminal. Pedicel recurved pubescent or long capitate glandular. Sepals 5, violet, lanceolate, 5–10 × 2–3 mm, violet glandular hairy abaxially, base cuneate, apex obtuse. Petals 5, pink or white, obovate, ca. 2 × as long as sepals, apex shallowly 2-cleft; lobes very narrow, irregularly 2- or 3-toothed. Stamens 10, shorter to slightly longer than sepals; anthers violet. Ovary ovoid, ca. 1/2 as long as sepals. Styles 2, linear. Fl. Jun–Jul.

• Mountains, alpine meadows, shifting screes, barrens; (2700–)3300–4100(–4500) m. NW Yunnan.

**72. *Arenaria melandryiformis*** F. N. Williams, J. Linn. Soc., Bot. 38. 399. 1909.

女娄无心菜 nu lou wu xin cai

Herbs perennial. Roots branched, slender; lateral roots pale brown. Stems 10–20 cm, white glandular pubescent. Basal leaves shortly petiolate; leaf blade linear-saccate or saccate, 1–2 cm × 3–5 mm, glabrous, base cuneate, apex obtuse. Cauline leaf blade linear-lanceolate or lanceolate, base cuneate, margin ± ciliate, apex acute. Flower solitary, terminal. Pedicel 1–5 mm, robust, glandular hairy. Sepals 5, green or violet, lanceolate, 4–5 mm, ± glandular hairy abaxially, inconspicuously 3-veined, margin narrowly membranous, apex obtuse. Petals 5, white, obovate, ca. 2 × as long as sepals, apex entire. Stamens 10; filaments slightly longer than sepals; anthers yellow. Ovary ovoid. Styles 2, linear. Fl. Jun–Jul.

• Shifting screes, barrens; 4000–4900 m. Xizang.

**73. *Arenaria inornata*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 196. 1920.

无饰无心菜 wu shi wu xin cai

Herbs perennial. Roots conic, or numerous, spinose, and fleshy; primary one lepidote. Stems 1–3, erect or suberect, to 4 cm, white, yellow, or black villous. Proximal cauline leaves imbricate, lepidote; distal cauline leaf blade lanceolate or elliptic-lanceolate, 1–1.3 cm × 3–4 mm, both surfaces glabrous, tuberculate, base attenuate into petiole, margin ciliate or glabrous, apex subobtuse or acute. Flower solitary or cymes ca. 3-flowered; bracts leaflike, small. Pedicel ca. 1 cm, densely black nodose hairy. Sepals 5, orbicular-lanceolate, ca. 5 × 1–1.5 mm, margin membranous, ciliate, apex obtuse. Petals 5, white, obovate, ca. 1 cm, apex emarginate, often few toothed. Stamens 10, longer than sepals. Ovary ca. 2 mm. Styles 2, ca. 4 mm. Fl. Jul.

• Mountains; 4000–4200 m. NW Yunnan.

**74. *Arenaria monantha*** F. N. Williams, J. Linn. Soc., Bot. 38: 401. 1909.

山地无心菜 shan di wu xin cai

Herbs perennial. Stems sparsely clustered, 5–6 cm, proximally hairy in 2 lines, distally retrorsely hairy. Leaf blade elliptic-linear, ca. 8 mm, villous abaxially, glabrous adaxially, veins inconspicuous, margin ciliate,

apex acute. Flower solitary, erect; bracts in 2 pairs at base of pedicel. Pedicel slender, ± hairy. Sepals 5, elliptic, villous abaxially, veins inconspicuous, base connate, margin membranous, apex acute. Petals 5, white, ovate, ca. 1.5 × as long as sepals, veins impressed, base shortly clawed, apex entire. Floral disc with raised, yellow-green glands. Fl. Aug.

- Mountains. S Xizang (near Lhasa Shi).

No specimens have been seen by the present authors; the above description is based on the protologue.

**75. *Arenaria longistyla*** Franchet, Bull. Soc. Bot. France 33: 433. 1886.

长柱无心菜 *chang zhu wu xin cai*

Herbs small. Roots slender, with numerous branches. Stems slender, 4–10 cm, villous in 2 lines, or brown glandular villous. Leaves aggregated at stem apex; leaf blade broadly linear or linear-lanceolate, 0.5–2 cm × to 2 mm, base connate into a sheath, margin sparsely hairy, apex mucronate. Flowers axillary. Pedicel 0.6–5 cm, glandular pubescent. Sepals 5, lanceolate, 5–10 × 1–1.5 mm, glabrous or glandular pubescent abaxially, base saccate after anthesis, margin broadly white membranous, apex acute, mucronate. Petals 5, white, obovate-orbicular, 5–10 mm, apex obtuse. Stamens 10, slightly shorter than petals; anthers yellow. Ovary subglobose, ca. 2 mm. Styles 2, subulate, 5–7 mm. Fl. Jun–Jul.

- Forest margins, alpine meadows, mountain grasslands, shifting screes; 2800–5000 m. W Sichuan, S Xizang, NW Yunnan.

Three weakly distinguished varieties have been recognized. The distinguishing characters seem to be only a matter of degree, and the variation pattern should be studied in the field. Perhaps this variation (at least for the first two varieties) should not be the basis for formal recognition of taxa.

- 1a. Leaf blade less than 1 mm wide 75b. var. *eugonophylla*  
1b. Leaf blade 1–2 mm wide.  
2a. Pedicel 2–5 cm ..... 75a. var. *longistyla*  
2b. Pedicel 0.6–0.7 mm . 75c. var. *pleurogynoides*

**75a. *Arenaria longistyla* var. *longistyla***

长柱无心菜(原变种) *chang zhu wu xin cai* (yuan bian zhong)

Stems 4–5 cm. Leaf blade 0.5–1.5 cm × 1–2 mm. Pedicel 2–5 cm. Petals 5–6 mm. Styles 6–7 mm.

- Forest margins, alpine meadows; 3600–5000 m. W Sichuan, SE Xizang, NW Yunnan.

**75b. *Arenaria longistyla* var. *eugonophylla*** Fernald, Rhodora 21: 5. 1919.

棱长柱无心菜 *leng chang zhu wu xin cai*

Leaf blade slender, less than 1 mm wide. Pedicel very slender, 2–4 cm.

- Mountain grasslands; 2800–4500 m. SW Sichuan, NW Yunnan.

**75c. *Arenaria longistyla* var. *pleurogynoides*** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 182. 1912.

侧长柱无心菜 *ce chang zhu wu xin cai*

Stems 7.5–10 cm. Leaf blade 1.2–2 cm × 1–2 mm. Pedicel 0.6–0.7 cm. Sepals 6–7 mm. Petals to 10 mm. Styles 5–6 mm.

- Alpine meadows, shifting screes; (3200–)3900–4800(–5000) m. SW Xizang, NW Yunnan.

**76. *Arenaria ionandra*** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 182. 1912.

紫蕊无心菜 *zi rui wu xin cai*

Herbs small. Roots branched, conic. Stems branched at base, yellow or violet, 4–10 cm, densely glandular hairy in 2 lines or glabrous. Petiole short; leaf blade saccate or ovate, 3–7 × 1–3 mm, thick, both surfaces glabrous, base attenuate, apex obtuse. Flower solitary, terminal; bracts similar to leaves but smaller. Pedicel 1–2.5 mm, glandular villous. Sepals 5, dark violet at base abaxially, orbicular-lanceolate or orbicular, 3–5 × 1.5–2.5 mm, glabrous or black glandular hairy, base broadened, margin broadly membranous, apex obtuse. Petals 5, white or partly violet, broadly ovate or obovate-elliptic, ca. 2 × as long as sepals, base shortly clawed, apex 2-cleft. Stamens 10; filaments ca. 4 mm; anthers violet or dark violet. Ovary subglobose, ca. 1.5 mm in diam. Styles 2, ca. 1.5 mm. Fl. Jul–Aug.

- Mountains, alpine shifting screes; 3600–5300 m. SW Sichuan, NW Yunnan.

- 1a. Sepals glabrous; petals white .... 76a. var. *ionandra*  
1b. Sepals black glandular hairy; petals partly violet ..... 76b. var. *melanotricha*

**76a. *Arenaria ionandra* var. *ionandra***

紫蕊无心菜(原变种) *zi rui wu xin cai* (yuan bian zhong)

Sepals glabrous. Petals white.

- Mountains; 3600–5300 m. SW Sichuan, NW Yunnan.

**76b. *Arenaria ionandra* var. *melanotricha*** H. F. Comber, Notes Roy. Bot. Gard. Edinburgh 18: 229. 1934.

黑毛无心菜 *hei mao wu xin cai*

Sepals black glandular hairy. Petals partly violet.

- Alpine shifting screes; 3600–4200 m. NW Yunnan.

**77. *Arenaria longiseta*** C. Y. Wu in C. Y. Wu et al., Fl. Yunnan. 6: 835. 1995.

长刚毛无心菜 *chang gang mao wu xin cai*

Herbs. Stems violet, ca. 10 cm, densely glandular pubescent and long nodose bristly. Petiole short; leaf blade obovate, 5–8 mm, both surfaces violet nodose bristly, base attenuate, margin densely ciliate, apex obtuse, Cymes 2- or 3-flowered or flower solitary, terminal; rachis and pedicel densely long bristly; bracts ovate, 3–5 mm, long nodose bristly, base rounded, apex obtuse. Sepals 5, violet, ovate, 4–6 × 1–2 mm, densely nodose bristly abaxially, base broadened, margin narrowly membranous, apex obtuse. Petals 5, white, obovate, ca.



1 cm, apex 2-cleft. Stamens 10; filaments opposite sepals with a gland at base. Ovary globose. Fl. Jul–Aug.

• Alpine meadows; 3800–3900 m. NW Yunnan.

**78. *Arenaria chamdoensis*** C. Y. Wu ex L. H. Zhou in S. W. Liu, Fl. Qinghai. 1: 506. 1997.

昌都无心菜 *chang du wu xin cai*

Herbs. Roots gray, conic, with slender branches at base. Stems whitish proximally, violet distally, 4–7 cm, densely violet glandular pubescent. Petiole short; leaf blade violet, oblanceolate, both surfaces pubescent, base attenuate, margin ciliate, apex rounded; axils of proximal cauline leaves with reduced flowers. Cymes conic; rachis and pedicels densely glandular pubescent. Pedicel 0.5–2 mm. Sepals 5, green, ovate, 2–3 mm, black glandular villous abaxially, margin membranous, ciliate, apex obtuse. Petals 5, white, obovate, 6–8 mm. Stamens 10; anthers yellow. Ovary obovoid. Styles 2. Fl. Jul–Aug.

• Shifting screes; 4500–4700 m. SE Qinghai (Nangqên Xian), W Sichuan, E Xizang (Qamdo Xian).

**79. *Arenaria szechuensis*** F. N. Williams, J. Linn. Soc., Bot. 34: 437. 1899.

四川无心菜 *si chuan wu xin cai*

Herbs perennial. Stems clustered, diffuse or erect, 3–8 cm, glandular pubescent. Leaves sessile, linear-lanceolate, 1–2 cm, base broadened, clasping, margin sparsely hairy, apex obtuse. Cymes 3- or 4-flowered. Pedicel 2–3 cm, ± glandular pubescent. Sepals 5, lanceolate, 5–6 × 1–1.5 mm, glandular pubescent abaxially, base broadened, margin narrowly membranous. Petals 5, white, ovate, 1.5–2.5 × as long as sepals, apex emarginate. Stamens 10; filaments equaling sepals. Ovary ovoid. Styles 3, subulate, longer than sepals; stigmas recurved. Fl. Jun–Jul.

• Scrub meadows, alpine meadows; (3000–)4000–4700 m. Sichuan.

**80. *Arenaria quadridentata*** (Maximowicz) F. N. Williams, J. Linn. Soc., Bot. 33: 432. 1898.

四齿无心菜 *si chi wu xin cai*

*Lepyrodiclis quadridentata* Maximowicz, Fl. Tangut. 84. 1889.

Herbs. Roots spinose. Stems clustered, yellow, slender, 10–40 cm, glabrous or glandular hairy in 2 lines.

Proximal cauline leaf blade saccate or orbicular-saccate; distal cauline leaf blade ovate-elliptic or lanceolate, 1–2 cm × 3–5 mm, base attenuate, apex acute. Cymes few flowered; bracts similar to leaves but smaller. Pedicel 1–2 cm. Sepals 5, lanceolate or orbicular, 4–5 × ca. 1.5 mm, glandular pubescent abaxially, base broadened, margin narrowly membranous, ciliate, apex obtuse. Petals 5, white, narrowly elliptic or obovate, apex 4-toothed. Stamens 10; filaments longer than sepals, those opposite sepals wider than others. Ovary ovoid; ovules 4 or 5. Styles 2, linear. Capsule globose, apex 4-lobed. Seeds orbicular, flat, obtusely tuberculate. Fl. and fr. Jul–Sep.

• 3000–3500 m. Gansu, N Sichuan.

**81. *Arenaria giraldii*** (Diels) Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 336. 1932.

秦岭无心菜 *qin ling wu xin cai*

*Lepyrodiclis giraldii* Diels, Bot. Jahrb. Syst. 36(Beibl. 82): 38. 1905.

Herbs soft. Roots spinose. Stems lustrous yellowish or violet, 20–25 cm. Leaves sessile, narrowly elliptic, elliptic-lanceolate, or ovate, 0.5–2 cm × 2–5 mm, thin, base broadened, margin membranous, apex obtuse or acute. Cymes few to many flowered; bracts similar to leaves but smaller. Pedicel slender, 1–2.5 cm. Sepals 5, lanceolate or narrowly so, 4–5 mm, glandular villous abaxially, base broadened, margin membranous, apex obtuse. Petals 5, white, cuneate or obovate, ca. 2 × as long as sepals, base attenuate, apex 4-toothed. Stamens 10, shorter than petals. Ovary ovoid, 2–2.5 mm. Styles 2, to 5 mm. Capsule globose, apex 4-valved. Seeds brown, ovoid, with curls. Fl. and fr. Jul–Sep.

• Scrub meadow margins, mountain grasslands; 2500–3800 m. SE Gansu, Shaanxi.

**82. *Arenaria trichophylla*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 27. 1987.

毛叶无心菜 *mao ye wu xin cai*

Herbs perennial. Roots spinose or conic. Stems sparsely clustered, lustrous yellow or violet, 8–12 cm, nodose hairy and long hairy. Leaf blade ovate, 4–6 × 2–3 mm, both surfaces glandular pubescent, base cuneate, apex obtuse. Cymes few flowered; bracts lanceolate, 3–4 × ca. 1 mm, sparsely glandular pubescent along veins, base broadened, margin ciliate, apex obtuse. Pedicel 5–10 mm, densely glandular pubescent. Sepals 5, lanceolate, 4–5 × ca. 1.5 mm, glandular pubescent abaxially, base broadened, margin narrowly membranous, apex acute. Petals 5, white, obovate, 8–10 mm, apex weakly toothed. Stamens 10, longer than sepals; anthers yellowish. Ovary ovoid, ca. 3 mm. Styles 2, linear, ca. 3.5 mm. Fl. Jul–Aug.

• Mountain grasslands; ca. 3900 m. SW Sichuan.

**83. *Arenaria pogonantha*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 198. 1920.

须花无心菜 *xu hua wu xin cai*

Herbs perennial. Roots spinose or long conic. Stems clustered, erect or suberect, 7–15 cm, long nodose villous and black glandular villous. Proximal cauline leaves with petiole 1–2 mm; distal cauline leaves sessile; leaf blade ovate or ovate-lanceolate, 5–10 × 3–7 mm, both surfaces villous, base cuneate, apex obtuse. Cymes terminal, few flowered, or flower solitary; bracts leaflike, smaller than leaves. Pedicel 0.5–2.5 cm, densely glandular pubescent. Sepals 5, lanceolate or ovate, 4–5 × ca. 1.5 mm, densely glandular pubescent abaxially, margin membranous, apex obtuse. Petals 5, white, broadly obovate, 5–8 mm, apex weakly toothed. Stamens 10, slightly longer than sepals; anthers violet to yellow-brown. Ovary ovoid, ca. 3 mm. Styles 2, ca. 2.5 mm. Fl. Jun–Jul.

• Alpine meadows, rock crevices; (3000–)3300–4200(–4400) m. W Sichuan, NW Yunnan, E Xizang.

**84. *Arenaria dimorphitricha*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 28. 1987.

滇蜀无心菜 dian shu wu xin cai

Herbs annual or biennial. Roots spinose. Stems sparingly branched, erect, brown or violet, 15–30 cm, long hairy proximally, nodose hairy and sparsely villous distally. Leaves opposite, sometimes in whorls of 3; petiole 2–4 mm; leaf blade narrowly elliptic, orbicular-lanceolate, or ovate-orbicular, rarely elliptic, 1–2.5 cm × 5–12 mm, both surfaces villous, base attenuate, apex obtuse. Cymes many flowered; bracts ovate, 5–10 mm, both surfaces villous, base broadened. Pedicel 0.5–2.5 cm, glandular pubescent. Sepals 5, lanceolate, 5–6 × ca. 2 mm, glandular pubescent abaxially, margin membranous, apex acute. Petals 5, white, obovate, ca. 1.5 × as long as sepals, apex irregularly toothed. Stamens 10; filaments slightly longer than sepals; anthers blue-green to yellow. Ovary ovoid; ovules few. Styles 2, linear. Capsule ovoid, slightly shorter than persistent sepals, apex 4-lobed. Seeds 3 or 4, black, flat, with curls. Fl. and fr. Aug–Sep.

• Subalpine forests, scrub, mountain grasslands; 2800–3900 m. SW Sichuan, NW Yunnan.

**85. *Arenaria fridericæ*** Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 57: 142. 1920.

玉龙山无心菜 yu long shan wu xin cai

Herbs perennial, villous and glandular hairy. Roots conic or spinose. Stems usually dichotomously branched, 4-angled, 10–20 cm, soft; internodes 1–2.5 cm. Petiole short or absent; leaf blade ovate or ovate-orbicular, 0.8–1.7 cm × 4–8 mm, both surfaces hairy, densely so on midvein and margin abaxially, base rounded. Cymes monochasial, few flowered, or flower solitary; bracts leaflike, smaller than leaves. Pedicel recurved, 1–2 cm, hairy. Sepals 5, orbicular-lanceolate or orbicular-ovate, 5–6 × ca. 2 mm, herbaceous, hairy abaxially, midvein broadened at base, margin narrowly membranous, apex acute. Petals 5, white, broadly obovate, ca. 1.5 × as long as sepals, 5–6 mm wide, apex dentate lobed or lacerate. Floral disc with 5 glands; glands 2-cleft. Stamens 10; anthers yellow-brown. Ovary ovoid. Styles 2 or 3, ca. 3 mm. Fl. Jun–Jul.

• Scrub, shifting screes, rock crevices on cliffs; 2800–4000 (–4700) m. SE Xizang, NW Yunnan.

**86. *Arenaria longicaulis*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 38. 1987.

长茎无心菜 chang jing wu xin cai

Herbs annual. Roots fibrous. Stems prostrate, yellowish, slender, 10–30 cm, brown glandular villous. Petiole 2–5 mm; leaf blade elliptic or ovate, 5–10 × 3–5 mm, thin, both surfaces tuberculate, midvein raised, base cuneate, margin sparsely hairy, apex acute. Cymes few flowered; bracts narrowly ovate, 3–5 × 1–3 mm, base cuneate,

apex acute. Pedicel slender, 0.5–1.5 cm, glandular pubescent. Sepals 5, lanceolate, 1–3 × ca. 1 mm, nodose glandular pubescent abaxially, base broadened, margin narrowly membranous, ciliate, apex acute. Petals 5, white, obovate, equaling or slightly longer than sepals, apex dentate lobed. Stamens 10; anthers yellow. Ovary subglobose, ca. 1.5 mm in diam. Styles 3, ca. 4 mm. Fl. Jul–Aug.

• NW Yunnan.

**87. *Arenaria longipetiolata*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 29. 1987.

长柄无心菜 chang bing wu xin cai

Herbs. Roots conic, fleshy. Stems branched proximally, yellow, 30–35 cm, soft, glabrous or subglabrous. Petiole 1–3 mm; leaf blade saccate, 1–1.5 cm × 5–8 mm, both surfaces glabrous or sparsely pubescent, apex acute. Cymes conic, many flowered; bracts lanceolate or ovate, 3–5 × 1–3 mm, margin ciliate, apex acute. Pedicel linear, 1–2.5 cm, densely glandular hairy. Sepals 5, lanceolate, 4–5 mm, sparsely pubescent abaxially, base broadened, margin membranous, ciliate, apex acuminate. Petals 5, white, saccate, 1.5–2 × as long as sepals, apex toothed. Stamens shorter than sepals; anthers yellow-green. Ovary ovoid. Styles 2, linear, equaling sepals. Fl. Jul–Aug.

• Forests; ca. 2800 m. SW Sichuan.

**88. *Arenaria leucasteria*** Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 334. 1932.

毛萼无心菜 mao e wu xin cai

Herbs perennial. Roots conic, robust. Stems sparsely branched, 4–7 cm, villous, hairs shorter and sparser proximally. Proximal cauline leaves shortly petiolate; distal leaves sessile; leaf blade elliptic or obovate-elliptic, 4–14 × 2–6 mm, both surfaces sparsely villous, 3-veined, midvein raised, lateral veins impressed, apex acute. Cymes few flowered. Sepals 5, lanceolate or ovate-lanceolate, 5–6 × ca. 2 mm, villous abaxially, 3-veined, margin membranous. Petals 5, white, obovate or obovate-flabellate, 7–11 × 5–7 mm, apex irregularly toothed or lobed; teeth 0.2–0.8 mm. Stamens 10; filaments ca. 6 mm, those opposite sepals with a globose gland at base; anthers violet. Ovary ovoid, ca. 2 × 1.5 mm. Styles 2, ca. 3.5 mm, papillose. Fl. Jul–Aug.

• Mountains; 4000–5400 m. W Sichuan.

**89. *Arenaria nivalomontana*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 29. 1987.

大雪山无心菜 da xue shan wu xin cai

Herbs. Roots conic, slender. Stems erect or ascending, many branched, slender, 10–15 cm, nodose glandular villous. Petiole short; leaf blade elliptic to broadly elliptic-saccate, 5–10 mm, both surfaces tuberculate, margin nodose ciliate, apex obtuse. Cymes few flowered; bracts ovate, 2–4 × 1–2 mm, margin ciliate, apex acute. Pedicel 0.5–2 cm, densely glandular pub-

escent. Sepals 5, lanceolate, 4–5 × 1–2 mm, sparsely glandular pubescent abaxially, base broadened, margin membranous, apex obtuse. Petals 5, obovate, ca. 1 cm, apex irregularly shortly toothed. Stamens 10, longer than sepals; anthers dark yellow. Ovary ovoid, ca. 2 mm. Styles 2. Fl. Jul–Aug.

• Mountains; ca. 2900 m. W Yunnan.

**90. *Arenaria omeiensis*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 30. 1987.

峨眉无心菜 *e mei wu xin cai*

Herbs. Roots conic, slender. Stems erect, 15–20 cm, nodose glandular hairy and nodose villous. Leaf blade ovate, 5–10 × 4–6 mm, glabrous or glandular hairy, midvein raised, base broadened, apex obtuse. Cymes few flowered; bracts narrowly ovate, 4–5 × 1–2 mm, both surfaces sparsely glandular villous, base broadened, apex acute. Pedicel 1–2 cm, densely glandular pubescent. Sepals 5, narrowly ovate, sparsely glandular pubescent abaxially, base broadened, margin membranous, apex obtuse. Petals 5, white, obovate, 8–9 mm, base long clawed, apex dentate lobed. Stamens 10, longer than sepals; anthers dark. Ovary ovoid, ca. 1.5 mm. Styles 2, linear, ca. 2 × as long as ovary. Fl. Aug.

• Forests, scrub; ca. 3100 m. C Sichuan.

**91. *Arenaria auricoma*** Y. W. Tsui ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 31. 1987.

黄毛无心菜 *huang mao wu xin cai*

Herbs perennial, yellowish hairy. Roots conic, robust. Stems densely clustered, ca. 8 cm, villous. Leaf blade ovate, 4–6 × 3–5 mm, thick, both surfaces densely yellowish villous, base rounded or broadly cuneate, apex obtuse; 2 pairs of leaves aggregated at stem apex below cyme. Cymes few to many flowered; bracts leaflike. Pedicel 3–10 mm, densely yellowish hairy. Sepals 5, orbicular-lanceolate, ca. 4 × 1.5 mm, weakly yellowish hairy abaxially, base broadened, margin membranous, apex obtuse. Petals 5, white, obovate, slightly longer than sepals, apex 2-cleft; lobes 3-toothed at apex. Stamens 10, 5 long and 5 short; anthers yellow. Ovary ovoid. Styles 2, linear. Fl. Jul–Aug.

• Mountain sands; 4200–4800 m. NW Yunnan.

**92. *Arenaria salweenensis*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 194. 1920.

怒江无心菜 *nu jiang wu xin cai*

Herbs perennial. Roots long, spinose. Stems densely dichotomously branched at base, suberect, 12–20 cm, yellow or black nodose villous. Petiole short or absent; leaf blade orbicular-lanceolate, 3–5 cm × 5–7 mm, glabrous, surface raised and coarse adaxially, midvein impressed, lateral veins inconspicuous, base attenuate, margin narrowly membranous, apex acute. Cymes dichotomously branched, many flowered; bracts

leaflike, smaller than leaves. Pedicel 1–1.5 cm, densely black long nodose villous. Sepals 5, black-red, orbicular, ca. 5 × 1.5 mm, margin membranous, black ciliate, apex obtuse. Petals 5, white or pinkish, obovate, ca. 1 cm, apex somewhat weakly toothed. Stamens 10, equaling sepals. Ovary ca. 2 mm. Styles 2, ca. 2 mm. Fl. Aug.

• Grasslands. W Yunnan (Tengchong Xian).

**93. *Arenaria trichophora*** Franchet, Bull. Soc. Bot. France 33: 431. 1886.

具毛无心菜 *ju mao wu xin cai*

*Arenaria yunnanensis* Franchet var. *trichophora* (Franchet) F. N. Williams.

Herbs perennial. Roots conic or spinose. Stems clustered, simple or branched at base, prostrate or erect, 10–30 cm, long hard hispid and glandular pubescent. Proximal cauline leaves sessile; middle and distal cauline leaves shortly petiolate; leaf blade green abaxially, ovate or orbicular-elliptic, 0.8–2 cm × 3–10 mm, thick, midvein raised, base narrowed, apex obtuse. Cymes few to many flowered; bracts leaflike, very small. Pedicel 0.8–2 cm, densely stiffly hairy and glandular pubescent, hairs erect or recurved. Sepals 5, lanceolate, 5–6 mm, glandular pubescent abaxially, base broadened, margin white membranous, apex acute. Petals 5, white, obovate, ca. 2 × as long as sepals, apex fimbriate. Stamens 10; anthers black or yellow-brown, globose. Ovary ovoid; ovules numerous. Styles 2. Fl. Jul–Sep.

• Alpine scrub, grasslands, shifting screes, sands; 2500–4700 m. SW Sichuan, SE Xizang, N Yunnan.

**94. *Arenaria yulongshanensis*** L. H. Zhou ex C. Y. Wu in W. T. Wang et al., Vasc. Pl. Hengduan Mount. 1: 410. 1993.

狭叶无心菜 *xia ye wu xin cai*

*Arenaria trichophora* Franchet var. *angustifolia* Franchet, Bull. Soc. Bot. France 33: 431. 1886, not *A. angustifolia* McNeill (1961).

Herbs perennial. Roots conic or spinose. Stems branched at base, procumbent or erect, 10–20 cm, glandular pubescent. Leaf blade usually broadly lanceolate, 1–2 cm × 2–4 mm, base attenuate, apex acute. Cymes few to many flowered; bracts leaflike, small. Pedicel 0.5–1.5 cm, densely glandular hairy. Sepals 5, lanceolate, 5–6 mm, glandular hairy abaxially, base broadened, margin white membranous, apex acute. Petals 5, white, obovate, ca. 2 × as long as sepals, apex fimbriate. Stamens 10; anthers violet or black. Ovary ovoid; ovules numerous. Styles 2. Capsule shorter than persistent sepals, 2-valved; valves 2-cleft at apex. Seeds flat, narrowly winged. Fl. and fr. Jul–Oct.

• Alpine meadows; 4000–4500 m. NW Yunnan.

**95. *Arenaria iochanensis*** C. Y. Wu in C. L. Tang, Fl. Reipubl. Popularis Sin. 26: 241. 1996.

药山无心菜 yao shan wu xin cai

*Cerastium mairei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 13: 341. 1914, not *Arenaria mairei* Emberger (1933); *A. yunnanensis* Franchet var. *linearifolia* C. Y. Wu ex L. H. Zhou; *Drymaria mairei* H. Léveillé.

Herbs. Roots spinose. Stems branched proximally, often diffuse, violet, 10–15 cm, densely violet glandular pubescent in 1 line. Leaf blade narrowly lanceolate, 1–2 cm × 1–3 mm, both surfaces glabrous, midvein raised abaxially, base cuneate, apex obtuse or acute. Flower solitary, terminal, or cymes 2–5-flowered; rachis densely violet glandular pubescent; bracts ovate-lanceolate, midvein raised abaxially, base rounded, margin ciliate, apex obtuse. Pedicel 0.5–2 cm, densely violet glandular pubescent. Sepals 5, lanceolate, 4–5 × 1–2 mm, glandular pubescent abaxially, base broadened, apex obtuse. Petals 5, obovate, apex toothed. Stamens 10; anthers yellow. Ovary ovoid. Styles 2. Seeds flat, narrowly winged. Fl. Jul–Aug.

• Alpine scrub, meadows; 3200–3400 m. NE Yunnan.

**96. *Arenaria barbata*** Franchet, Bull. Soc. Bot. France 33: 430. 1886.

髯毛无心菜 ran mao wu xin cai

Herbs perennial, long nodose hairy and shortly glandular hairy. Roots clustered, spinose or conic. Stems usually solitary, branched below middle, 10–30 cm, densely glandular hairy. Leaf blade pale green abaxially, greenish adaxially, orbicular-obovate or orbicular, 0.5–1.5 cm × 3–10 mm, both surfaces glandular pubescent, base attenuate, margin long white ciliate, apex obtuse or acute. Cymes dichotomously branched, few to many flowered; bracts leaflike, small. Pedicel 1–2.5 cm, densely glandular pubescent. Sepals 5, lanceolate, 4–5 mm, densely glandular pubescent abaxially, 3-veined. Petals 5, white or pink, more than 2 × as long as sepals, apex fimbriate. Stamens 10; 5 filaments inflated at base; anthers dark violet or yellow-brown. Ovary ovoid; ovules numerous. Styles 2, linear. Capsule 4-valved. Seeds 2–4. Fl. and fr. Jul–Sep.

• Scrub, alpine meadows, grasslands, shifting screes; 2400–4800 m. SW Sichuan, NW Yunnan.

Two varieties have been recognized. The distinguishing characters seem to be only a matter of degree, and the variation pattern should be studied in the field. Perhaps this variation should not be the basis for formal recognition of taxa.

- 1a. Stems, leaves, bracts, and sepals white nodose hairy and shortly glandular hairy 96a. var. *barbata*  
1b. Stems, leaves, bracts, and sepals densely white nodose hairy ..... 96b. var. *hirsutissima*

**96a. *Arenaria barbata* var. *barbata***

髯毛无心菜(原变种) ran mao wu xin cai (yuan bian zhong)

Stems, leaves, bracts, and sepals white nodose hairy and shortly glandular hairy.

• Scrub, alpine meadows, grasslands, shifting screes; 2400–4800 m. SW Sichuan, NW Yunnan.

**96b. *Arenaria barbata* var. *hirsutissima*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 195. 1920.

硬毛无心菜 ying mao wu xin cai

Stems, leaves, bracts, and sepals densely white nodose hairy.

• Alpine meadows, shifting screes; (2600–)2800–3200 m. NW Yunnan.

**97. *Arenaria fimbriata*** Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 335. 1932.

瘰瓣无心菜 sui ban wu xin cai

*Cerastium fimbriatum* E. Pritzl, Bot. Jahrb. Syst. 29: 320. 1900, not Ledebour (1815).

Herbs. Roots spinose. Stems simple or sometimes branched at base, often violet, 10–25 cm, white villous or black glandular lanate. Proximal cauline leaves shortly petiolate; leaf blade narrowly elliptic, slightly fleshy. Distal cauline leaf blade orbicular-lanceolate or orbicular-elliptic, 0.8–2 cm × 2–7 mm, slightly fleshy, sparsely white villous, base cuneate, apex acute. Cymes 3–5-flowered; bracts herbaceous. Pedicel 1.5–4.5 cm, villous or glandular hairy. Sepals 5, white, lanceolate, 5–7 mm, villous or glandular hairy, margin narrowly membranous, apex excurved, acute. Petals 5, white, obovate-elliptic, ca. 2 × as long as sepals, apex fimbriate toothed. Stamens 10; filaments ca. 6 mm; anthers yellow. Ovary ovoid; ovules numerous. Styles 2, linear. Capsule equaling or longer than persistent sepals, apex 4-toothed. Seeds brown, depressed triangular-globose, ca. 2 mm, smooth or with curls. Fl. Jul–Aug.

• Forests, mountain grasslands; 3000–4000 m. SE Gansu, Shaanxi.

**98. *Arenaria debilis*** J. D. Hooker, Fl. Brit. India 1: 242. 1874.

柔软无心菜 rou ruan wu xin cai

*Arenaria aureocaulis* C. Y. Wu ex L. H. Zhou; *A. benthamii* Edgeworth (1874), not Fenzl ex Torrey & A. Gray (1840); *A. glandulosa* (Bentham ex G. Don) F. N. Williams (1895), not Jacquin (1798); *A. sikkimensis* Majumdar; *A. stellarioides* C. Y. Wu ex L. H. Zhou (1987), not Persoon (1805), nor Willdenow ex D. F. K. Schlechtendal (1816); *A. yunnanensis* Franchet f. *angustifolia* F. N. Williams; *Lepyrodiclis debilis* H. Ohba; *L. glandulosa* H. Ohba; *Odontostemma glandulosum* Bentham ex G. Don.

Herbs annual or biennial, violet multicellular glandular hairy. Roots spinose or conic. Stems sparsely

clustered or solitary, yellow, 30–60 cm. Proximal cauline leaves shortly petiolate; distal cauline leaves sessile; leaf blade elliptic or ovate-elliptic, 1–4 cm × (0.5–)1–2 mm, both surfaces sparsely glandular hairy, midvein raised abaxially, base cuneate, apex acute. Cymes dichotomously branched, few flowered; bracts ovate-lanceolate, 3–5 mm, glandular hairy. Pedicel 1–2(–3) cm, densely glandular hairy. Sepals 5, lanceolate, 5–6 mm, densely glandular pubescent abaxially, margin narrowly membranous, apex acute. Petals 5, white, obovate or obovate-saccate, 7–8 mm, apex fimbriate. Stamens 10, slightly longer than sepals; anthers yellowish. Ovary ovoid. Styles 2, linear. Capsule ovoid, slightly shorter than or equaling persistent sepals, apex 4-valved. Seeds 2 or 3, flat, ca. 2 mm in diam., weakly striate. Fl. Jul–Aug, fr. Aug–Sep.

Scrub, alpine meadows, mountain grasslands; (2500–)3200–4500 m. SE Xizang, NW Yunnan [Bhutan, India, Nepal, Sikkim].

**99. *Arenaria polysperma*** C. Y. Wu ex L. H. Zhou, Acta Biol. Plateau Sin. 6: 33. 1987.

多子无心菜 *duo zi wu xin cai*

Herbs perennial. Roots brown, spinose or conic. Stems sparsely clustered or solitary, yellow or violet, 10–40 cm, glandular pubescent. Leaf blade elliptic-ovate, 1–1.5 cm × 4–6 mm, thin, both surfaces tuberculate, base cuneate, apex obtuse. Cymes few flowered; bracts leaflike, small. Pedicel 1–3 cm, soft, glandular pubescent. Sepals 5, lanceolate, 5–6 × 1.5–2 mm, sparsely glandular pubescent abaxially, base broadened, margin narrowly membranous, apex obtuse. Petals 5, white, obovate, 1.5–2 × as long as sepals, apex lacerate. Stamens 10, longer than sepals; anthers yellow, rarely green. Ovary ovoid. Styles 2, linear. Capsule shorter than or equaling persistent sepals. Seeds 11 or 12. Fl. and fr. Jul–Sep.

• Mountain grasslands; 3000–4000 m. NW Yunnan.

**100. *Arenaria monilifera*** Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 334. 1932.

念珠无心菜 *nian zhu wu xin cai*

Herbs perennial. Roots moniliform. Stems dichotomously branched, ca. 20 cm, white villous proximally, curled red hairy distally; internodes ca. 5 cm. Proximal cauline leaves with petiole ca. 5 mm; distal cauline leaves sessile; leaf blade broadly elliptic or obovate-elliptic, rarely ovate-elliptic, 1–1.8 cm × 6–9 mm, hirsutulous (on distally cauline leaves), midvein robust, lateral veins inconspicuous. Pedicel erect at anthesis, curved in fruit, 1–4 cm. Sepals 5, elliptic or ovate-lanceolate, 4–5 × ca. 2 mm, densely curved white or red long hairy, also glandular hairy, 3-veined, surface raised abaxially, minutely pitted adaxially, margin broadly membranous, apex obtuse or acute. Petals 5, white, obovate, 5.5–7 × 2.5–4 mm, base cuneate, apex lacerate; lobes 0.8–1 mm. Floral disc funnellform, with 5 globose, septate glands. Ovary

ovoid, ca. 2 × 1.8 mm; ovules numerous. Styles 2, relatively long, papillate above middle. Fl. Jun–Jul.

• Mountains; 3000–4000 m. W Sichuan, E Xizang.

**101. *Arenaria delavayi*** Franchet, Bull. Soc. Bot. France 33: 432. 1886.

大理无心菜 *da li wu xin cai*

Herbs perennial. Roots branched at base, gray-brown, conic, robust, fleshy. Stems clustered, solitary or branched at base, often violet, slender, 10–20 cm, sparsely glandular pubescent. Proximal cauline leaves shortly petiolate, larger; distal cauline leaves sessile, smaller; leaf blade gray abaxially, ovate-lanceolate, ovate, elliptic, saccate, or orbicular, 0.5–1.5 cm × 2–10 mm, thick, ± papillate adaxially, ± villous, midvein raised, pale brown. Cymes 3–5-flowered; bracts lanceolate, small, herbaceous, margin membranous, apex excurved, acute. Pedicel slender, 1–2.5 cm, densely violet glandular pubescent. Sepals 5, lanceolate or ovate-lanceolate, 4–10 mm, glandular pubescent abaxially, margin membranous, apex acute or acuminate. Petals 5, white, obovate, slightly longer than sepals, apex ciliate. Stamens 10; anthers violet-black, yellow, or yellowish. Ovary ovoid; ovules numerous. Styles 2, linear. Capsule equaling persistent sepals, apex 4-lobed. Seeds 10, brown. Fl. and fr. Jul–Sep.

• Mountains; 3600–4000 m. E Xizang, NW Yunnan.

**102. *Arenaria yunnanensis*** Franchet, Bull. Soc. Bot. France 33: 431. 1886.

云南无心菜 *yun nan wu xin cai*

Herbs. Roots spinose, nodose. Stems diffuse, many branched, slender, 15–30 cm, glabrous at base, violet nodose glandular hairy in 1 line distally. Proximal cauline leaves shortly petiolate; distal cauline leaves sessile; leaf blade linear-lanceolate to orbicular, 1–3 cm × 5–6 mm, adaxially coarse, granular, hairy along veins, base attenuate, margin ciliate, apex obtuse, mucronate. Cymes conic, many flowered; bracts similar to leaves but smaller. Pedicel slender, glandular hairy. Sepals 5, lanceolate, 3–6 mm, glandular pubescent abaxially, apex acuminate. Petals 5, white, obovate or orbicular, 6–10 mm, apex fimbriate. Stamens 10; anthers yellow-green. Ovary ovoid; ovules numerous. Styles 2. Capsule slightly shorter than persistent sepals, apex 4-valved. Seeds 3 or 4, reniform. Fl. and fr. Jul–Sep.

• Alpine forest margins, subalpine meadows, mountain grasslands; 2900–3800 m. SW Sichuan, NW Yunnan.

Two varieties have been recognized. The distinguishing characters seem to be only a matter of degree, and the variation pattern should be studied in the field. Perhaps this variation should not be the basis for formal recognition of taxa.

1a. Leaves lanceolate to orbicular 102a. var. *yunnanensis*  
1b. Leaves linear-lanceolate ..... 102b. var. *caespitosa*

**102a. *Arenaria yunnanensis* var. *yunnanensis***

云南无心菜(原变种) *yun nan wu xin cai* (*yuan bian zhong*)

*Arenaria yunnanensis* f. *robusta* C. Y. Wu ex L. H. Zhou.

Leaves lanceolate to orbicular.

- Alpine forest margins, mountain grasslands; 2900–3800 m. SW Sichuan, NW Yunnan.

**102b. *Arenaria yunnanensis* var. *caespitosa*** C. Y. Wu in C. Y. Wu et al., Fl. Yunnan. 6: 835. 1995.

簇生无心菜 *cu sheng wu xin cai*

Leaves linear-lanceolate.

- Subalpine meadows; ca. 3500 m. NW Yunnan.

## 20. BRACHYSTEMMA D. Don, Prodr. Fl. Nepal. 216. 1825.

短瓣花属 *duan ban hua shu*

Lu Dequan (鲁德全); Michael G. Gilbert

Herbs annual. Stems subscentent, branched. Leaves opposite, petiolate; leaf blade ovate-lanceolate; stipules absent. Inflorescence a thyrse, terminal or axillary. Flowers numerous, 5-merous, pedicellate. Sepals free, subscarios, persisting in fruit. Petals lanceolate, much shorter than sepals, margin entire. Stamens ca. as many as sepals, alternating with anther-less staminodes. Ovary 1-loculed, with 3 or 4 ovules; styles 2. Fruit a capsule, oblate, 4-valved, 1-seeded. Seed reniform or globose; testa tuberculate.

One species: SE Asia, China, Himalayas.

**1. *Brachystemma calycinum*** D. Don, Prodr. Fl. Nepal. 216. 1825.

短瓣花 *duan ban hua*

Stems diffuse or climbing among shrubs, to 6 m, glabrous or upper parts pilose, 4-angled, glossy, epidermis fragile. Petiole ca. 1 cm; leaf blade 3.5–7.5 × 1–1.5 cm, apex acuminate. Thyrse lax, many flowered. Pedicel 2–5 mm. Sepals narrowly ovate, 4–6.5 mm,

apex obtuse. Petals white, lanceolate, 1/3–1/2 as long as sepals, margin entire. Stamens and staminodes short. Ovary globose. Capsule globose, ca. 2.5 mm, shorter than sepals. Seed ca. 1.5 mm. Fl. Apr–Jul, fr. Aug–Dec.

Grasslands on mountain slopes, in open forests; 500–2700 m. W Guangxi, S Guizhou, SW Sichuan, SE Xizang, Yunnan [Bhutan, Cambodia, NE India, Laos, Nepal, Sikkim, Thailand, Vietnam].

## 21. SILENE Linnaeus, Sp. Pl. 1: 416. 1753.

蝇子草属 *ying zi cao shu*

Zhou Lihua (周丽华), Wu Zhengyi (吴征镒 *Wu Cheng-yih*); Magnus Lidén, Bengt Oxelman *Cucubalus* Linnaeus; *Elisanthe* (Fenzl) Reichenbach; *Gastrolychnis* (Fenzl) Reichenbach; *Melandrium* Röhlings; *Otites* Adanson; *Physolychnis* (Benth) Ruprecht; *Pleconax* Adanson; *Viscago* Zinn.

Herbs annual, biennial, or perennial, rarely plants suffrutescent. Stems erect, ascending, or creeping. Leaves subulate, linear or lanceolate to ovate-lanceolate, or elliptic. Flowers bisexual or unisexual; male-sterile flowers frequent in otherwise hermaphroditic plants. Male-sterile flowers often have markedly shorter androgynophores and petal limbs than hermaphroditic flowers. Inflorescence a monochasium, dichasium, thyrse or flower solitary. Calyx tubular, funnel-shaped, campanulate, or ovoid, usually 10-veined, with 5 teeth with ciliate membranous margin; the form of this margin usually varies between teeth in a single calyx. Petals 5, each with a sometimes auriculate claw; limb entire, bifid, 4-fid, or lacinate, variously colored; coronal scales present. Androgynophore ± conspicuous. Stamens 10. Ovary usually with 3 or 5 basal septa; ovules numerous; styles 3 or 5. The protrusion of stamens and styles from calyx mouth are correlated in perfect flowers. Fruit usually a capsule dehiscent with 6 or 10, rarely 5, teeth. Seeds reniform, minute, ± tuberculate, sometimes with abaxial spinose processes or a marginal wing.

About 600 species: mainly in N temperate regions, but also in Africa and South America; 110 species (67 endemic) in China.

Two species are cultivated in China for their attractive flowers, including *Silene pendula* Linnaeus and *S. gallica* Linnaeus.

The phylogenetic relationships within *Silene* are currently under investigation, clearly showing deficiencies in recent subgeneric classifications.

Therefore, we refrain from using any formal ranks between genus and species. However, 59 of the 110 species of *Silene* in China can be attributed to one of three informal groups that approximately correspond to *Silene* sect. *Cucubaloideae* Edgeworth & J. D. Hooker, *S.* sect. *Odontopetalae* Schischkin ex Chowdhuri, and *S.* sect. *Physolychnis* (Benth) Bocquet. As circumscribed here, the “*Cucubaloideae*” group is probably monophyletic (characterized by ± creeping habit and fleshy, fasciculate root tubers). However, the character used (carpel number) to distinguish the “*Odontopetalae*” and “*Physolychnis*” groups almost certainly results in a paraphyletic “*Odontopetalae*” group. Moreover, it is probable that the transformation between three and five carpels has occurred more than once in these groups. Nevertheless, we believe that keying out these informal groups separately will aid in identifying species in China.

Much taxonomic research is still needed at the species level, and we have tried to highlight the most obvious, serious problems. We found it impossible to infer the identity of the taxon pertaining to *Melandrium chailaricum* A. I. Baranov & Skvortsov (Quart. J. Taiwan Mus. 19: 158. 1966).

### Key 1 (main key, species nos. 1–51)

- 1a. Calyx with 30 veins ..... 48. *S. conoidea*  
1b. Calyx with 10, rarely 20 veins.

- 2a. Calyx with 20 veins, at least at base.
- 3a. Flowers female; plants green, pubescent ..... 46. *S. latifolia*
- 3b. Flowers bisexual; plants glaucous, glabrous ..... 32. *S. vulgaris*
- 2b. Calyx with 10 veins.
- 4a. Fruit a black pseudoberry, irregularly dehiscent ..... 33. *S. baccifera*
- 4b. Fruit a capsule dehiscing by teeth.
- 5a. Styles 5.
- 6a. Flowers unisexual (plants dioecious) ..... 46. *S. latifolia*
- 6b. Flowers bisexual or plants gynomonoecious.
- 7a. Calyx funnel-shaped in flower; flowers in  $\pm$  regular terminal dichasia ..... 1. *S. linnaeana*
- 7b. Calyx tubular or campanulate in flower; inflorescence an irregular thyrse composed of unequal cymules, or flower solitary ..... Key 2
- 5b. Styles 3.
- 8a. Petals (including limb) together forming a short tube exerted beyond calyx by 1–3 mm ... 49. *S. tubulosa*
- 8b. Petal limbs not forming a tube.
- 9a. Leaves petiolate throughout, usually  $\pm$  cordate.
- 10a. Cyme capitate ..... 38. *S. capitata*
- 10b. Cymes not capitate.
- 11a. Leaves ovate to lanceolate; petal limbs bifid ..... 39. *S. seoulensis*
- 11b. Leaves broadly ovate or suborbicular; petal limbs 4-lobed ..... 40. *S. qiyunshanensis*
- 9b. At least distal leaves not petiolate, not cordate.
- 12a. Seeds with a rim of long protuberances or winged abaxially; flowers 1 to few.
- 13a. Seeds with an entire marginal wing.
- 14a. Plants perennial ..... Key 3
- 14b. Plants annual ..... 45. *S. nana*
- 13b. Seeds with a rim of spinulose protuberances.
- 15a. Flowers in an irregular thyrse, or solitary; petaline claws auriculate ..... Key 3
- 15b. Flowers in terminal lax, regular dichasia; petaline claws not auriculate.
- 16a. Leaves lanceolate ..... 41. *S. salicifolia*
- 16b. Leaves linear.
- 17a. Calyx narrowly tubular ..... 44. *S. tubiformis*
- 17b. Calyx campanulate.
- 18a. Leaves 2–3.5 cm; flowers solitary; petals white ..... 42. *S. morrisonmontana*
- 18b. Leaves 5–8 cm; usually more than one flower in each cyme; petals pale red 43. *S. hupehensis*
- 12b. Seeds without long marginal protuberances or wings.
- 19a. Flowers in terminal dichasia or monochasia, or solitary.
- 20a. Plants annual or biennial ..... 47. *S. noctiflora*
- 20b. Plants perennial.
- 21a. Cushion- or mat-forming herbs, usually less than 10 cm tall; leaves small, 1–3 mm wide; flower solitary.
- 22a. Leaves glabrous except for marginal cilia ..... 50. *S. davidii*
- 22b. Plants hairy throughout ..... 51. *S. gracilentia*
- 21b. Plants taller, not forming cushions; leaves broader; 1- to many flowered.
- 23a. Roots fleshy, fasciculate; inflorescence a many-flowered dichasium ..... Key 4
- 23b. Roots not as above; inflorescence 1–3-flowered.
- 24a. Androgynophore pubescent.
- 25a. Calyx 2–2.5 cm; androgynophore 8–10 mm ..... 35. *S. incurvifolia*
- 25b. Calyx 1–1.8 cm; androgynophore 3–6 mm ..... 34. *S. subcretacea*
- 24b. Androgynophore glabrous.
- 26a. Basal rosettelike clusters of sterile shoots absent; calyx ca. 2 cm or more 36. *S. moorcroftiana*
- 26b. Basal rosettelike clusters of sterile shoots present; calyx less than 2 cm 37. *S. karaczukuri*
- 19b. Inflorescence a regular or irregular thyrse composed of dichasial or 1-flowered cymules.
- 27a. Flowers unisexual (plants dioecious); calyx less than 6 mm; plants biennial.
- 28a. Calyx 4–6 mm; petals greenish ..... 29. *S. otites*
- 28b. Calyx 2–3.5 mm; petals white.
- 29a. Calyx hairy; petaline claws and filaments hairy ..... 30. *S. borysthenica*
- 29b. Calyx glabrous; petaline claws and filaments glabrous ..... 31. *S. wolgensis*
- 27b. Flowers bisexual; calyx usually longer than 6 mm; plants annual, biennial, or perennial.
- 30a. Plants annual or biennial.

- 31a. Calyx tubular in flower; cymules 1-flowered.
- 32a. Petals 4-lobed ..... 24. *S. quadriloba*
- 32b. Petals with numerous lobes ..... 25. *S. suaveolens*
- 31b. Calyx ovoid-campanulate; cymules many flowered.
- 33a. Stamens and styles exserted ..... 15. *S. koreana*
- 33b. Stamens and styles included.
- 34a. Androgynophore glabrous; stalks of cymules very short ..... 26. *S. firma*
- 34b. Androgynophore hairy; at least proximal cymules with prominent stalks, ca. as long as or longer than pedicels.
- 35a. Calyx densely glandular hairy ..... 28. *S. orientolimongolica*
- 35b. Calyx not glandular hairy ..... 27. *S. aprica*
- 30b. Plants perennial.
- 36a. Cymules very unequal; basal rosette of large broad leaves usually present ..... Key 3
- 36b. Cymules  $\pm$  equal, forming a  $\pm$  symmetric thyrse; basal rosette of large broad leaves usually absent.
- 37a. Cymules densely clustered; thyrse appearing capitate ..... 6. *S. pseudofortunei*
- 37b. Cymules clearly separated; thyrse appearing paniculate or racemose.
- 38a. Cymules long stalked, thyrse appearing paniculate; petals usually pink.
- 39a. Calyx shorter than 1.2 cm ..... Key 4
- 39b. Calyx at least 1.2 cm.
- 40a. Petal limbs bifid, lobes entire or erose.
- 41a. Calyx less than 1.8 cm; leaves oblanceolate ..... 2. *S. esquamata*
- 41b. Calyx more than 2.5 cm; leaves linear or linear-lanceolate.
- 42a. Petal lobes entire ..... 3. *S. dawoensis*
- 42b. Petal lobes erose ..... 4. *S. incisa*
- 40b. Petal limbs bifid, lobes multifid or lacinate ..... 5. *S. fortunei*
- 38b. Cymules shortly stalked, thyrse appearing racemose at least distally; petals white or yellowish white.
- 43a. Basal leaves caespitose, not withered at anthesis; cauline leaves few, without axillary sterile short shoots.
- 44a. At least some cymules with more than 1 flower ..... 20. *S. jensseensis*
- 44b. Cymules very rarely with more than 1 flower.
- 45a. Petal auricles ciliate ..... 21. *S. graminifolia*
- 45b. Petal auricles not ciliate.
- 46a. Plants 10–20 cm tall, villous; leaves 3–6 cm; calyx 1.5–1.7 cm, hairy at veins ..... 23. *S. dumetosa*
- 46b. Plants 20–50 cm, glabrous; leaves 6–18 cm; calyx less than 1.2 cm (1.5–1.8 cm in var. *rubescens*), usually glabrous at veins ..... 22. *S. gracilicaulis*
- 43b. Basal leaves withered at anthesis; cauline leaves many, with axillary sterile short shoots.
- 47a. Petals entire.
- 48a. Leaves ovate-lanceolate, 15–30 mm wide ..... 16. *S. kungessana*
- 48b. Leaves lanceolate or linear, 1.5–10 mm wide.
- 49a. Leaves linear, 1–3 cm  $\times$  1.5–3 mm ..... 19. *S. holopetala*
- 49b. Leaves oblanceolate or lanceolate, 3–8 cm  $\times$  more than 4 mm.
- 50a. Stems multibranching; calyx 8–12 mm; petals yellowish white .. 17. *S. komarovii*
- 50b. Stems usually not branching; calyx 6–9 mm; petals pinkish abaxially 18. *S. pseudotenuis*
- 47b. Petals lobed.
- 51a. Plants glabrous; petals 4-lobed ..... 12. *S. odoratissima*
- 51b. Plants pubescent; petals 2-lobed.
- 52a. Cymules alternate.
- 53a. Leaves linear or subulate, nearly spiniform at maturity.
- 54a. Calyx 1.2–1.5 cm ..... 7. *S. altaica*
- 54b. Calyx 2–2.5 cm ..... 8. *S. alexandrae*
- 53b. Leaves linear, never spiniform.
- 55a. Calyx shortly pubescent ..... 34. *S. subcretacea*



- 55b. Calyx glabrous.
  - 56a. Calyx 1–1.2 cm; androgynophore ca. 3 mm ..... 9. *S. tianschanica*
  - 56b. Calyx 1.4–1.7 cm; androgynophore ca. 5 mm ..... 10. *S. ningxiaensis*
- 52b. Cymules opposite.
  - 57a. Calyx tubular or club-shaped; androgynophore longer than 3 mm .. 11. *S. repens*
  - 57b. Calyx ovoid or campanulate; androgynophore not longer than 2 mm.
    - 58a. Calyx broadly campanulate, 4–6 mm ..... 13. *S. macrostyla*
    - 58b. Calyx ovoid-campanulate, 6–8 mm ..... 14. *S. foliosa*

**Key 2 (species nos. 52–80, “Physolychnis” group)**

- 1a. Calyx inflated, loose in fruit.
  - 2a. Seeds ± tuberculate.
    - 3a. Calyx with short reflexed eglandular hairs ..... 80. *S. multifurcata*
  - 3b. Calyx with glandular hairs.
    - 4a. Basal leaves persistent; cauline leaves smaller.
      - 5a. Leaves 4–10 cm; calyx 1.5–2.2 cm; petals slightly exerted beyond calyx; coronal scales small, not obvious; seeds with prominent tubercles ..... 63. *S. bungei*
      - 5b. Leaves 1–4 cm; calyx 1.3–1.7 cm; petals prominently exerted; coronal scales lacinate; seeds faintly tuberculate ..... 64. *S. rubricalyx*
    - 4b. Basal leaves early withered; cauline leaves well developed.
      - 6a. Inflorescence few flowered; stems whitish pubescent ..... 79. *S. cashmeriana*
      - 6b. Inflorescence 7–30-flowered; stems green.
        - 7a. Stem leaves ovate to lanceolate, in 4–8 pairs ..... 77. *S. indica*
        - 7b. Stem leaves broadly ovate, in 2 pairs ..... 78. *S. tibetica*
- 2b. Seeds with wings (unknown in *S. zhoui*).
  - 8a. Petals entire or bifid.
    - 9a. Petals entire; calyx 1.3–1.5 cm ..... 55. *S. zhoui*
    - 9b. Petals bifid; calyx 1.5–2 cm ..... 56. *S. nigrescens*
  - 8b. Petals 4-lobed (lateral lobes often small).
    - 10a. Leaves linear ..... 57. *S. chodatii*
    - 10b. Leaves not linear.
      - 11a. Pedicel 5–15 mm; plants 2–7-flowered ..... 61. *S. karekirii*
      - 11b. Pedicel 10–50 mm; plants 1–3-flowered.
        - 12a. Petal limb hairy ..... 60. *S. wardii*
        - 12b. Petal limb glabrous.
          - 13a. Calyx ca. 1.5 cm ..... 62. *S. puranensis*
          - 13b. Calyx 2–2.7 cm.
            - 14a. Stems ascending, creeping at base; petaline claws ciliate at base ..... 59. *S. atsaensis*
            - 14b. Stems erect, caespitose; petaline claws not ciliate ..... 58. *S. namlaensis*
  - 1b. Calyx appressed to capsule in fruit.
    - 15a. Seeds large with broad marginal wings (unknown in *S. zhongbaensis*); plants 5–40 cm with persistent basal leaves.
      - 16a. Flowers solitary, rarely 2 or 3; calyx 1.3–1.5 cm, veins not cohering at apex ..... 52. *S. gonosperma*
      - 16b. Flowers (1–)3–8; calyx to 1.3 cm, veins cohering at calyx teeth.
        - 17a. Pedicel 2–8 mm ..... 54. *S. zhongbaensis*
        - 17b. Pedicel 10–50 mm ..... 53. *S. himalayensis*
    - 15b. Seeds minutely tuberculate (unknown in *S. muliensis*); plants 20–80 cm; basal leaves usually withered at anthesis.
      - 18a. Leaves grasslike, linear; calyx 6–7 mm ..... 74. *S. caespitella*
      - 18b. Leaves broader; calyx usually longer.
        - 19a. Petals prominently exerted beyond calyx (4 mm or more).
          - 20a. Fruiting calyx ca. 2 × as long as broad ..... 76. *S. huguetiae*
          - 20b. Fruiting calyx 1–1.5 × as long as broad.
            - 21a. Androgynophore 2–3 mm ..... 73. *S. muliensis*

- 21b. Androgynophore shorter.
  - 22a. Calyx 12–15 mm ..... 70. *S. yetii*
  - 22b. Calyx 7–11 mm.
    - 23a. Seeds ca. 1.5 mm; inflorescence 1–4-flowered ..... 72. *S. alaschanica*
    - 23b. Seeds ca. 1 mm; inflorescence 5–10-flowered ..... 71. *S. herbilegorum*
- 19b. Petals not exerted or exerted less than 4 mm.
  - 24a. Glandular hairs present.
    - 25a. Calyx 1–1.2 cm ..... 69. *S. chungtienensis*
    - 25b. Calyx ca. 1.5 cm ..... 66. *S. nangqenensis*
  - 24b. Glandular hairs absent.
    - 26a. Calyx 10–15 mm.
      - 27a. Calyx with retrorse hairs; androgynophore to 1 mm ..... 65. *S. songarica*
      - 27b. Calyx with spreading hairs; androgynophore 1.5–2 mm ..... 68. *S. kialensis*
    - 26b. Calyx 6–10 mm.
      - 28a. Plants 30–60 cm; basal leaves lanceolate, 5–10 cm; cymules 3–7-flowered; corolla limb broader than long, shallowly bifid or irregularly 4-fid ..... 67. *S. nepalensis*
      - 28b. Plants 20–25 cm; basal leaves elliptic, ca. 3 cm; cymules 1–3-flowered; corolla limb narrow, deeply bifid ..... 75. *S. sveae*

**Key 3 (species nos. 81–90, “Odontopetalae” group)**

- 1a. Calyx subcylindric, closed in fruit.
  - 2a. Corolla limbs slightly emarginate or shallowly bifid, margin erose above ..... 87. *S. delavayi*
  - 2b. Corolla limbs deeply 4-lobed, lobes entire or bifid, margin not erose.
    - 3a. Petal claw auricles inconspicuous; petal lobes subequal ..... 90. *S. lineariloba*
    - 3b. Petal claw auricles prominent, orbicular, with erose margin; petal lobes unequal.
      - 4a. Petal claws prominently exerted; limb ca. 10 mm ..... 88. *S. longicornuta*
      - 4b. Petal claws not or slightly exerted; limb ca. 5 mm ..... 89. *S. oblanceolata*
- 1b. Calyx campanulate, loose in fruit.
  - 5a. Corolla limbs bifid, seeds not winged.
    - 6a. Androgynophore 1–2 mm; seeds striate ..... 81. *S. lamarum*
    - 6b. Androgynophore 2–3 mm; seeds minutely tuberculate ..... 82. *S. pubicalycina*
  - 5b. Corolla limbs 4-lobed; seeds winged.
    - 7a. Basal leaves 3–4 cm wide ..... 83. *S. atrocastanea*
    - 7b. Basal leaves less than 2 cm wide.
      - 8a. Calyx 2–2.5 cm ..... 84. *S. stewartiana*
      - 8b. Calyx ca. 1.5 cm.
        - 9a. Corolla limb oblanceolate; auricles entire ..... 85. *S. scopulorum*
        - 9b. Corolla limb obovate; auricles with erose margin ..... 86. *S. melanantha*

**Key 4 (species nos. 91–110, “Cucubaloideae” group)**

- 1a. Calyx 8 mm or less; androgynophore to 1 mm ..... 109. *S. phoenicodonta*
- 1b. Calyx and androgynophore longer.
  - 2a. Leaves linear or linear-lanceolate; middle leaves less than 5 mm wide.
    - 3a. Calyx campanulate.
      - 4a. Petal limb rounded, very slightly emarginate ..... 106. *S. principis*
      - 4b. Petal limb deeply 4-lobed ..... 107. *S. bilingua*
    - 3b. Calyx cylindric to tubular-clavate.
      - 5a. Calyx eglandular ..... 99. *S. grandiflora*
      - 5b. Calyx glandular hairy.
        - 6a. Calyx 12–15 mm; androgynophore ca. 3 mm ..... 104. *S. batangensis*
        - 6b. Calyx and androgynophore longer ..... 105. *S. napuligera*
  - 2b. Leaves ovate, lanceolate, or elliptic; middle leaves at least 5 mm wide.
    - 7a. Calyx teeth and bracts blackish pointed ..... 110. *S. otodonta*
    - 7b. Calyx teeth and bracts not blackish pointed.
      - 8a. Calyx eglandular.
        - 9a. Androgynophore 5–8 mm.

- 10a. Leaves lanceolate, 30–60 × 4–15 mm; calyx ca. 2 cm ..... 99. *S. grandiflora*  
 10b. Leaves elliptic, 20–40 × 7–15 mm; calyx 1.5–1.8 cm ..... 100. *S. cardiopetala*  
 9b. Androgynophore 2–4 mm.  
 11a. Leaves ovate, usually with five parallel veins ..... 92. *S. platyphylla*  
 11b. Leaves lanceolate, 1–3-veined.  
 12a. Leaves narrowly lanceolate, 1-veined; flowers pink ..... 93. *S. yunnanensis*  
 12b. Leaves broadly lanceolate to ovate, 1–3-veined; flowers pale pink or white ..... 91. *S. tatarinowii*  
 8b. Calyx glandular hairy.  
 13a. Leaves cuneate at base, usually with 1 prominent vein.  
 14a. Androgynophore ca. 5 mm ..... 102. *S. monbeigii*  
 14b. Androgynophore 1–2 mm.  
 15a. Calyx tubular to funnel-shaped ..... 103. *S. rosiflora*  
 15b. Calyx campanulate.  
 16a. Calyx 13–15 mm; pedicels subequaling or longer than calyx ..... 101. *S. lichiangensis*  
 16b. Calyx 8–13 mm; pedicels shorter than or subequaling calyx ..... 108. *S. viscidula*  
 13b. Leaves rounded to subcordate at base, often with 3–5 parallel veins.  
 17a. Calyx tubular, 13–17 mm.  
 18a. Petal limb to 6 mm, lobes 1–1.5 mm wide ..... 94. *S. adenocalyx*  
 18b. Petal limb to 10 mm, lobes to 3 mm wide ..... 95. *S. trachyphylla*  
 17b. Calyx campanulate, 8–12 mm.  
 19a. Leaves undulate ..... 98. *S. lhassana*  
 19b. Leaves not undulate.  
 20a. Petal limbs 2-lobed ..... 97. *S. khasiana*  
 20b. Petal limbs 4-lobed ..... 96. *S. asclepiadea*

**1. *Silene linnaeana*** Voroschilov in A. K. Skvortsov, Florist. Issl. V. Razn. Raionakh SSSR, 167. 1985.

林奈蝇子草 *lin nai ying zi cao*

*Lychnis sibirica* Linnaeus, Sp. Pl. 1: 437. 1753, not *Silene sibirica* (Linnaeus) Persoon (1805, based on *Cucubalus sibiricus* Linnaeus); ?*L. yunnanensis* E. G. Baker; *Melandrium sibiricum* (Linnaeus) A. Braun. Herbs perennial, 15–20 cm tall, pubescent with a mixture of glandular and eglandular hairs. Rootstock sturdy. Stems caespitose, erect, apically branched. Basal leaves oblanceolate to oblong; cauline leaves lanceolate, 1.5–2.5 cm × 3–6 mm. Dichasium several flowered, lax. Pedicel 4–30 mm; bracts leaflike. Calyx funnel-shaped, 5–7 × 2.5–3 mm, sparsely glandular hairy, veins obscure, teeth very obtuse, margin membranous. Petals white, to 1.3 cm; claw cuneate, shorter than sepals or slightly longer, without auricles; limb broadly obovate, bifid for 1/4–1/3 its length; lobes entire, sometimes with a lateral tooth on each side; coronal scales rounded. Stamens slightly exerted. Styles 5. Androgynophore ca. 1 mm.

*Pinus* forests, sandy steppes, rocky foothill grasslands. Nei Mongol [Mongolia, Russia (Far East, Siberia)].

*Lychnis yunnanensis* was described from material allegedly collected in Yunnan and received from Max Leichtlin. The plant evidently belongs in the *Silene linnaeana* group, but differs from *S. linnaeana sensu stricto* in having broader flowers with larger petals that sometimes have prominent lateral teeth, and in having a much denser indumentum. The other Siberian taxa also always lack the lateral teeth, which might indicate that *L. yunnanensis* is something different. Indeed, Wu Zhengyi (editor's note) believes that it is distinct because of the wide geographic disjunction and morphological differences. However, until more records of this plant are made from the Yunnan

area, the record is best regarded as doubtful. *Lychnis yunnanensis* is sometimes erroneously placed in the synonymy of *S. huguetiae*.

The *Lychnis sibirica* group has recently been demonstrated to belong to *Silene* by molecular and morphological studies (Oxelman et al., Nordic J. Bot. 20: 513–518. 2001).

**2. *Silene esquamata*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 223. 1920.

无鳞蝇子草 *wu lin ying zi cao*

Herbs perennial, 30–60 cm tall. Roots robust, lignified. Stems erect, multibranched from base, sparsely pubescent with short retrorse hairs at base, apically viscid. Basal leaves spatulate-oblanceolate, early withered. Cauline leaves with short sterile axillary branches, broadly oblanceolate, 2–7 cm × 5–11(–15) mm, abaxially antrorse-scabrid or with short hairs at veins and margin, adaxially not hairy, coarse, midvein sunken, base attenuate into short petiole or cuneate, apex acute to acuminate. Flowers erect, in a lax ± regular thyrese; cymules long stalked, opposite, 1–3-flowered. Pedicel 1.5–4 cm, slender, viscid; bracts linear to linear-lanceolate, 3–8 mm, herbaceous, ciliate. Calyx tubular, clavate in fruit, 1.2–1.7 cm × 2–3 mm, subglabrous, sometimes with sparse short hairs at veins, veins green or violet; calyx teeth ca. 1 mm, ciliate. Androgynophore 5–8 mm, glabrous. Petal claws included or slightly exerted beyond calyx, narrowly cuneate, glabrous, auricles not obvious; limbs pale red, obovate, 8–11 mm, deeply bifid, lobes oblong; coronal scales very small. Stamens and styles long exerted; filaments glabrous. Styles 3. Capsule ca. 1 cm. Seeds dark brown, globose-reniform, ca. 1 mm. Fl. Jul–Aug, fr. Sep.

• Mountain stony grasslands, scrub; (1800–)2700–3300(–4000) m. Sichuan, Yunnan.

**3. *Silene dawoensis*** Limpricht in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 363. 1922.

道孚蝇子草 *dao fu ying zi cao*

*Silene longiuscula* C. Y. Wu & C. L. Tang.

Herbs perennial, 30–80 cm tall. Roots robust, conical, lignified. Stems erect or ascending, multibranched from woody base, glabrous or sparsely hairy, apically viscid. Basal leaves withered at anthesis. Cauline leaves with short sterile axillary branches, linear or linear-lanceolate, (1.5–)3–5(–6) cm × 2–5 mm, base cuneate or attenuate, glabrous, midvein prominent. Flowers erect, in a lax, few-flowered thyrses; cymules with peduncles subequaling pedicels, opposite or alternate, often 1-flowered. Pedicel 2–4 cm, slender, glabrous, viscid; bracts linear, 5–10 mm, ciliate. Calyx tubular, clavate in fruit, 2.5–3.5 cm × ca. 3 mm, glabrous, veins green or violet; calyx teeth ca. 1.5 mm.

Androgynophore 1.5–2 cm, glabrous. Petal claws slightly exerted beyond calyx, narrowly lanceolate, 1–1.5 cm, glabrous, not auriculate, limbs pale red, obcordate or obovate, 1–1.4 cm, divided to about halfway, lobes narrowly ovate; coronal scales very small. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule 1–1.5 cm. Seeds dark brown, reniform, slightly flat, ca. 1.2 mm. Fl. Jul–Aug, fr. Aug–Sep.

• Grasslands, cliffs; 1400–3100 m. W Sichuan, NW Yunnan. The type specimen of *Silene longiuscula* deviates from *S. dawoensis* in its glandular hairy calyx.

**4. *Silene incisa*** C. L. Tang, Acta Bot. Yunnan. 2: 428. 1980.

齿瓣蝇子草 *chi ban ying zi cao*

Herbs perennial, 30–60 cm tall. Roots robust, lignified. Stems sparsely caespitose, suberect, slender, glabrous, apically viscid. Basal leaves oblanceolate, withered at anthesis, 5–8 cm × 5–10(–12) mm, both surfaces glabrous, slightly coarse, margin sometimes ciliate, midvein prominent, base attenuate into long petiole. Cauline leaves with short sterile axillary branches, gradually smaller than basal leaves. Flowers 2(–2.5) cm in diam., erect, in a lax, few-flowered thyrses; cymules with peduncles shorter than or subequaling pedicels, opposite, 1–3-flowered. Pedicel 1–2.5(–3) cm, slender, glabrous or sparsely and shortly hairy, viscid; bracts linear or linear-lanceolate, ciliate. Calyx tubular, ca. 30 × 3 mm, glabrous, clavate in fruit, longitudinal veins green or violet, teeth 1–2 mm. Androgynophore ca. 2 cm, glabrous. Petal claws cuneate-oblanceolate, glabrous, auricles not obvious, limbs exerted beyond calyx, pale red, triangular-oblanceolate, 1–1.5 cm, divided to about halfway, lobes band-shaped, uneven; coronal scales papillate. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule globose-ovoid, 1–1.2 cm, shorter than calyx, rarely subequaling calyx. Seeds reddish brown, globose-reniform, ca. 1.5 mm. Fl. Jul–Sep, fr. Sep–Oct.

• Mountain stony grasslands; 1700–1800 m. Sichuan.

It is difficult to find consistent and non-overlapping differences between this species and *Silene dawoensis*. The petal lobes of the type specimen of *S. incisa* are slightly crumpled or undulate along the margin, but otherwise similar to those of *S. dawoensis*, and hardly incised.

**5. *Silene fortunei*** Visiani, Linnaea 24: 181. 1851.

鹤草 *he cao*

*Silene argyi* H. Léveillé; *S. fissipetala* Turczaninow; *S. kiiruninsularis* Masamune.

Herbs perennial, 50–80(–100) cm tall. Roots robust, lignified. Stems caespitose, erect, multibranched, shortly villous or subglabrous, viscid. Basal leaves oblanceolate or lanceolate, withered at anthesis, 3–8 cm × 7–12(–15) mm, both surfaces glabrous or villous when young, margin ciliate, midvein prominent, base attenuate into short petiole. Cauline leaves with short sterile axillary branches, gradually smaller than basal leaves. Flowers 2(–2.5) cm in diam., erect, in a lax, few-flowered thyrses; cymules with peduncles shorter than or subequaling pedicels, opposite, 1–3-flowered. Pedicel 3–12(–15) mm, slender; bracts linear, 5–10 mm, ciliate. Calyx narrowly tubular, (2.2–)2.5–3 cm × ca. 3 mm, glabrous, inflated above and clavate in fruit, longitudinal veins green or violet; teeth 1.5–2 mm.

Androgynophore 1–1.5(–1.7) mm in fruit, glabrous. Petal claws slightly exerted beyond calyx, oblanceolate, 1–1.5 cm, glabrous; limbs exerted, pale red, cuneate-obovate, ca. 1.5 cm, deeply bifid to middle or more; lobes lacinate; coronal scales ligulate, small. Stamens and styles slightly exerted; filaments glabrous. Styles 3. Capsule 1.2–1.5 cm × ca. 4 mm, shorter than or equaling calyx. Seeds dark brown, orbicular-reniform, slightly flattened, ca. 1 mm. Fl. Jun–Aug, fr. Jul–Sep.  $2n = 30^*$ .

• Scrub, plateaus, low mountain scrub grasslands. Anhui, Fujian, Gansu, Hebei, Jiangxi, S Shaanxi, Shandong, Shanxi, Sichuan, Taiwan.

The present authors have not seen type material of *Silene fissipetala* or *S. kiiruninsularis*.

This species is used medicinally.

**6. *Silene pseudofortunei*** Y. W. Tsui & C. L. Tang, Acta Bot. Yunnan. 2: 429. 1980.

团伞蝇子草 *tuan san ying zi cao*

Herbs perennial, 25–50 cm tall. Roots robust, lignified. Stems sparsely caespitose, erect, branched, glabrous or sparsely short villous. Basal leaves withered at anthesis. Cauline leaves with short sterile axillary branches, oblanceolate, 2–6 cm × 5–13 mm, both surfaces glabrous to slightly pubescent, margin shortly ciliate, midvein prominent, base attenuate into short petiole, apex acute. Flowers erect, in a densely capitate, few-flowered thyrses. Pedicel 5–18 mm, slender, subglabrous; bracts linear, 2–3 mm, glabrous to sparsely ciliate. Calyx narrowly tubular, 1.5–2 cm × ca. 2 mm, glabrous or sparsely short hairy, clavate in fruit, longitudinal veins violet or green; calyx teeth ca. 1.5 mm. Androgynophore 1–1.2 cm, glabrous. Petal claws

narrowly oblanceolate, glabrous, auricles not obvious; limbs exerted beyond calyx, violet, bifid to middle or more; lobes rounded, subentire or 2- or 3-laciniate toothed. Stamens exerted; filaments glabrous. Styles exerted. Styles 3. Capsule 8–10 mm. Seeds grayish brown, triangular-reniform, ca. 1 mm, with angular pit on one side. Fl. Jun–Jul, fr. Jul–Aug.

• Mountain grasslands, stony scrub; 600–1300 m. S Shanxi, E Sichuan.

**7. *Silene altaica*** Persoon, Syn. Pl. 1: 497. 1805.

阿尔泰蝇子草 a er tai ying zi cao

*Cucubalus fruticulosus* Pallas; *Physolychnis altaica* (Persoon) Ruprecht; *S. fruticulosa* (Pallas) Schischkin ex Krylov (1931), not Siebold ex Otth (1824), nor M. Bieberstein (1825).

Herbs suffruticose, 15–50 cm tall. Roots robust. Stems caespitose, erect, basally lignified, not branched or only branched at base, basally slightly coarse, shortly pubescent, apically viscid. Leaves with short, sterile axillary branches, linear or subulate, 1.5–3 cm × 0.5–1 mm, hard, margin coarse, ciliate at base, apex acute, triangular in cross section at maturity, pungent. Flowers erect, in a racemiform thyrse with usually alternate, 1-flowered cymules. Pedicel 1–1.5 cm, glabrous, viscid; bracts ovate, margin membranous, ciliate, apex acuminate. Calyx tubular, clavate in fruit, 1.2–1.5 cm, subglabrous, longitudinal veins green or violet; calyx teeth ca. 1 mm. Androgynophore 4–6 mm, shortly hairy. Petal claws slightly exerted beyond calyx, narrowly oblanceolate, without auricles; limbs white, bifid to 1/2; lobes linear, apex obtuse; coronal scales minute. Stamens and styles included or slightly exerted; filaments glabrous. Styles 3. Capsule 8–10 mm. Seeds brown, triangular-reniform, ca. 1.5 mm. Fl. Jun–Jul, fr. Jul–Aug.

Stony mountains, desert grasslands; 1400–1900 m. N Xinjiang [Kazakhstan, Russia].

The type of *Silene altaica* has not been seen by the present authors.

**8. *Silene alexandrae*** B. Keller, Trav. Soc. Naturalistes Kazan. 44(5):71. 1912.

斋桑蝇子草 zhai sang ying zi cao

*Silene altaica* Persoon var. *grandiflora* C. A. Meyer; *S. altaica* var. *hystrix* Trautvetter.

Herbs suffruticose, 25–45 cm tall. Stems caespitose, erect, basally lignified, simple or branched, basally sometimes hirtellous, apically viscid. Leaves with short, sterile axillary branches, linear, spiniform, 3–8 cm × 2–3 mm, pungent, basal margin ciliate, midvein prominent. Flowers erect, in a racemiform thyrse, with usually alternate, 1-flowered cymules. Pedicel shorter to slightly longer than calyx, glabrous, usually viscid; bracts ovate, margin membranous, ciliate. Calyx tubular, clavate in fruit, 2–2.5 cm × 2.5–3 mm, shortly pubescent, longitudinal veins green or violet; calyx

teeth ca. 1 mm. Androgynophore 8–10 mm, glabrous. Petals white, claws oblanceolate, glabrous, limbs bifid to 3/4 length of petals, lobes obovate; coronal scales minute. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule 1–1.5 cm. Seeds dark brown, triangular-ovoid. Fl. Jun–Jul, fr. Aug.

N Xinjiang [Kazakhstan].

The type of *Silene alexandrae* has not been seen by the present authors.

**9. *Silene tianschanica*** Schischkin, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 8: 56. 1940.

天山蝇子草 tian shan ying zi cao

Herbs suffruticose, 30–40 cm tall. Roots robust, multi-crowned. Stems densely clustered, erect, basally lignified, solitary or sparsely branched, basally pubescent, apically glabrous. Leaves with short, sterile axillary branches, linear, 3–5 cm × 1–2 mm, both surfaces glabrous, sparsely ciliate at base, base attenuate, slightly clasping, apex acute. Flowers erect, in a racemiform thyrse, with alternate, 1-flowered cymules, slightly nutant at early stage. Pedicel 4–15 mm, slender, glabrous; bracts ovate-lanceolate, 3–3.5 mm, margin membranous, shortly ciliate. Calyx tubular, clavate in fruit, 10–12 × ca. 3 mm, glabrous, slightly inflated above in fruit, longitudinal veins green or violet; calyx teeth broadly triangular-ovate, short, ciliate, apex obtuse. Androgynophore 2–3 mm, glabrous. Petal claws narrowly cuneate, without cilia and auricles; limbs slightly exerted beyond calyx, white, bifid to base, lobes narrowly obovate; coronal scales minute. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule ovoid, ca. 9 × 5 mm. Seeds triangular-reniform, ca. 1.2 mm. Fl. Jun–Jul, fr. Jul–Aug.

Stony mountains; 1100–2100 m. N Xinjiang [Kazakhstan].

The type has not been seen by the present authors.

**10. *Silene ningxiaensis*** C. L. Tang, Acta Bot. Yunnan. 2: 431. 1980.

宁夏蝇子草 ning xia ying zi cao

Herbs perennial, 20–45 cm tall. Roots robust, slightly lignified. Stems sparsely caespitose, rarely solitary, erect, slender, basally lignified, simple or branched at base, glabrous or with short robust hairs at base. Basal leaves clustered, linear, 3–5(–8) cm × 1–2.5 mm, glabrous, basally ciliate at margin, base attenuate, apex acuminate; cauline leaves few, small. Flowers erect, in a racemiform thyrse, with alternate, 1-flowered cymules. Bracts ovate-lanceolate, margin ciliate in lower part. Calyx tubular, 1.5–1.7 cm × ca. 2.5 mm, glabrous, slightly clavate in fruit, longitudinal veins sometimes violet; calyx teeth triangular-lanceolate. Androgynophore 5–6 mm, glabrous. Petal claws slightly exerted beyond calyx, narrowly oblanceolate, glabrous, auricle not obvious, limbs white, bifid to 2/3 of petal; lobes linear, apex obtuse; coronal scales minute. Stamens and styles exerted; filaments glabrous.

Styles 3. Capsule ovoid, 8–10 mm, shorter than calyx. Seeds grayish brown, triangular-reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug.  $2n = 24^*$ .

• Mountains; 1700–2400 m. Gansu, Nei Mongol, Ningxia.

**11. *Silene repens*** Patr. in Persoon, Syn. Pl. 1: 500. 1805.

蔓茎蝇子草 wan jing ying zi cao

*Silene pachyrrhiza* Franchet; *S. repens* var. *angustifolia* Turczaninow ex Regel f. *sinensis* F. N. Williams; *S. repens* var. *latifolia* Turczaninow; *S. repens* var. *sinensis* (F. N. Williams) C. L. Tang; *S. repens* var. *vulgaris* Turczaninow; *S. repens* var. *xilingensis* Y. Z. Zhao.

Herbs perennial, 15–50 cm tall, shortly pubescent or glabrous throughout. Rhizome slender, branched. Stems solitary or sparsely caespitose, ascending, basally usually lignified, simple or sometimes branched. Leaves with short, sterile axillary branches, linear-lanceolate, lanceolate, oblanceolate, or orbicular-lanceolate, (1.5–)2–7 cm × (1–)3–10(–12) mm, sparsely pubescent, ciliate at margin, midvein prominent, base cuneate. Flowers in a racemiform thyrse; cymules usually 3–7-flowered, usually opposite, distal cymules often capitate. Pedicel 1–8 mm; bracts lanceolate. Calyx often violet-tinged, tubular to clavate, 1–1.5 cm × 3–4.5 mm, pubescent. Androgynophore 4–6(–8) mm, shortly pubescent. Petal claws oblanceolate, without auricles; limbs not exerted beyond calyx, white, rarely yellowish white, obovate, usually 5–7 mm, bifid to middle or less. Stamens and styles slightly exerted; filaments glabrous. Styles 3. Capsule ovoid, 6–8 mm, shorter than calyx. Seeds black-brown, reniform, ca. 1 mm. Fl. Jun–Aug, fr. Jul–Sep.  $2n = 24, 48$ .

Forests, grasslands, stream edges, stony mountain grasslands, dry steppes, sand dunes, grasslands, mountain summit steppes; 1500–3500 m. NW Gansu, Hebei, Jilin, Nei Mongol, N Shaanxi, Sichuan, Xizang [Japan, Korea, Mongolia, Russia; NW North America]. This taxon is very variable and in urgent need of taxonomic revision on a global scale.

**12. *Silene odoratissima*** Bunge in Ledebour, Fl. Altaic. 2: 148. 1830.

香蝇子草 xiang ying zi cao

*Silene radians* Karelin & Kirilov.

Herbs somewhat suffruticose, greenish white, 30–60 cm tall, glabrous throughout. Stems caespitose, erect, multibranched throughout. Basal leaves withered at anthesis; cauline leaves narrowly oblanceolate, 3–7 cm × 2–5(–9) mm, ciliate at margin, base attenuate, slightly clasping, apex acuminate or acute. Flowers in a racemiform thyrse; cymules with peduncles subequaling or longer than pedicels, opposite, usually 1-flowered. Pedicel 1–2 cm, viscid; bracts lanceolate, herbaceous, margin membranous, ciliate. Calyx tubular, clavate in fruit, 1.2–1.5 cm, glabrous; calyx teeth 1–2 mm. Androgynophore ca. 5 mm, sparsely villous. Petal claws oblanceolate, auricles not obvious; limbs exerted beyond calyx, white, 4-lobed; lobes linear, apex obtuse;

coronal scales minute. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule ovoid, 8–10 mm, shorter than or subequaling calyx. Seeds brown, reniform, ca. 1.5 mm, pitted. Fl. Jun–Jul, fr. Jul–Aug. Sand dunes, grasslands. Xinjiang [Kazakhstan, Russia].

**13. *Silene macrostyla*** Maximowicz, Prim. Fl. Amur. 54. 1859.

长柱蝇子草 chang zhu ying zi cao

*Silene foliosa* Maximowicz var. *macrostyla* (Maximowicz) Rohrbach; *S. tatarica* Persoon var. *macrostyla* (Maximowicz) Regel.

Herbs perennial, 50–90 cm tall. Roots robust, lignified, multicrowned. Stems solitary or clustered, erect, simple or sparsely branched above, basally retrorsely pubescent, apically glabrescent. Basal leaves withered at anthesis; cauline leaves with prominent, sterile axillary branches, narrowly lanceolate, 4–9 cm × 5–13 mm, both surfaces glabrous, margin ciliate, midvein prominent, base cuneate, apex acuminate. Flowers in a thyrse; cymules 1- to several flowered. Pedicel 4–8 mm, slender, glabrous; bracts lanceolate-linear, margin membranous, ciliate. Calyx sometimes pale violet, broadly campanulate, 4–6 mm, glabrous.

Androgynophore 1–1.5 mm, shortly hairy. Petal claws glabrous, auricles not obvious; limbs white, bifid to 1/3 to 1/2 of petals; lobes obtuse; coronal scales minute. Stamens and styles conspicuously exerted; filaments glabrous. Styles 3. Capsule ovoid, 5.5–6.5 mm, shorter than calyx. Seeds dark brown, reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep.

Gravelly grasslands, dry steppes, forests. Heilongjiang, Jilin, Liaoning [Korea, Russia].

**14. *Silene foliosa*** Maximowicz, Prim. Fl. Amur. 53. 1859.

石缝蝇子草 shi feng ying zi cao

?*Silene foliosa* var. *mongolica* Maximowicz; ?*S. maximowicziana* Kozhevnikov (1995), not Rohrbach (1869–1870); *S. tatarica* Persoon var. *foliosa* (Maximowicz) Regel.

Herbs perennial, 25–40 cm tall. Roots robust, lignified, multicrowned. Stems clustered, erect, slender, basally retrorsely hairy. Basal leaves withered at anthesis; cauline leaves with prominent, sterile axillary branches, linear-oblanceolate or lanceolate-linear, 2–4 cm × 3–6 mm, shortly villous at midvein, margin shortly ciliate, base attenuate, apex acuminate. Flowers in a thyrse; cymules 1- to several flowered. Pedicel 4–6 mm, slender, viscid; bracts lanceolate-linear, basal margin membranous, ciliate. Calyx ovoid-campanulate, 6–8 mm. Androgynophore 2–2.5 mm, sparsely hairy. Petal claws oblanceolate, glabrous; limbs white, deeply bifid to middle or more; lobes linear, apex obtuse; coronal scales minute. Stamens and styles conspicuously exerted; filaments glabrous. Styles 3. Capsule globose-

ovoid, 5–7 × 2.5–3 mm. Seeds grayish brown, reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug.

Forests, mountain grasslands, gravelly stone fissures; 1300–2000 m. Gansu, Heilongjiang, S Nei Mongol, Ningxia, Shanxi, N Shaanxi [Japan, Korea, Russia].

The concept of *Silene foliosa* and *S. macrostyla*, sensu Maximowicz, is difficult to understand, and it is possible that the variation between these two taxa is more or less continuous. More detailed studies, including typifications, are needed.

**15. *Silene koreana*** Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 18: 440. 1901.

朝鲜蝇子草 *chao xian ying zi cao*

Herbs annual or biennial, 30–70 cm tall. Principal roots slender. Stems solitary or sparsely clustered, erect, sparsely branched above, basally shortly pubescent, apically viscid. Basal leaves withered at early anthesis; cauline leaves with short, sterile axillary branches, lanceolate or linear-lanceolate, 2–4(–6) cm × 2–8(–15) mm, abaxially pubescent at midvein, ciliate, midvein prominent. Flowers in a racemiform thyrse; cymules 1-flowered, opposite; peduncles very short. Pedicel 5–20 mm, slender, subglabrous, viscid; bracts linear-lanceolate, ciliate. Calyx tubular to narrowly campanulate, 8–9 mm, ca. 2.5 mm in diam., glabrous. Androgynophore 1.5–2 mm, pubescent. Petal claws narrowly oblanceolate, ciliate at base, auricles not obvious; limbs not exerted beyond calyx, white, shallowly bifid; coronal scales minute. Stamens and styles prominently exerted; filaments glabrous. Styles 3. Capsule globose, 7–8.5 mm, shorter than calyx. Seeds dark brown, globose-reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep.

Forests. Heilongjiang, Jilin [Japan, Korea, Russia].

**16. *Silene kungessana*** B. Fedtschenko, Allg. Bot. Z. Syst. 14: 2. 1908.

巩乃斯蝇子草 *gong nai si ying zi cao*

Herbs perennial, 80–100 cm tall, glabrous throughout. Stems sparsely caespitose, erect. Leaves ovate-lanceolate, 7–12 × 1.5–3 cm, base attenuate into long petiole. Flowers in a slender, racemiform thyrse. Pedicel 6–10 mm; bracts lanceolate, small. Calyx tubular, 6–8 × 2–3 mm, glabrous. Androgynophore 1–2 mm. Petal limbs white, margin entire or emarginate at apex. Capsule ovoid, ca. 7 mm. Styles 3. Seeds triangular-reniform, tuberculate.

• Xinjiang.

No specimens have been seen by the present authors.

**17. *Silene komarovii*** Schischkin in Komarov, Fl. URSS 6: 678. 1936.

轮伞蝇子草 *lun san ying zi cao*

*Silene viscidula* Komarov, Trudy Imp. S.-Peterburgsk. Obsch. Estestvoisp., Vyp. 3, Otd. Bot. 26: 129. 1896, not Franchet (1886).

Herbs perennial, 50–70 cm tall. Stems sparsely caespitose, erect, branched, basally shortly pubescent, apically viscid. Basal leaves spatulate or lanceolate, 6–8 cm × 5–10 mm, both surfaces hairy, shortly ciliate, marcescent, base attenuate into long petiole; cauline leaves with short, sterile axillary branches, lanceolate or linear-lanceolate. Flowers in a slender, racemiform thyrse. Pedicel 5–10 mm, sparsely pubescent; bracts lanceolate, submembranous, sparsely villous, apex acute. Calyx tubular-clavate, 8–12 × 2–3 mm, glabrous or sparsely villous, inflated in fruit. Androgynophore 2–3 mm in fruit, glabrous. Petal claws narrowly oblanceolate, glabrous, without obvious auricles; limb pale yellowish white, narrowly obovate, margin entire or slightly emarginate; coronal scales minute. Stamens and styles exerted. Styles 3. Capsule ovoid, 7–9 mm. Seeds reniform, ca. 1 mm. Fl. Jun, fr. Jul–Aug.

Dry steppes; 500–1100 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].

**18. *Silene pseudotenius*** Schischkin, Bot. Mater. Gerb. Glavn. Bot. Sada SSSR 6(3): 6. 1926.

昭苏蝇子草 *zhao su ying zi cao*

Herbs perennial, 20–50 cm tall. Roots robust, lignified, crowned. Stems sparsely caespitose, erect, not or sparsely branched, basally pubescent, rarely subglabrous, apically viscid. Basal leaves spatulate to oblanceolate, (2–)4–9 cm × 4–10 mm, both surfaces glabrous, ciliate, midvein conspicuous, base attenuate into long petiole, apex acute or obtuse; cauline leaves 1–4 pairs, linear-lanceolate, smaller than basal leaves, without short, axillary sterile branches. Flowers in a racemiform thyrse; cymules several flowered, opposite, appearing verticillate. Pedicel 5–13 mm, glabrous; bracts ovate-lanceolate, margin membranous, ciliate. Calyx sometimes violet, clavate, 6–7 mm, glabrous. Androgynophore 2–3 mm, pubescent. Petal claws elliptic-oblanceolate, ciliate basally, without auricles; limbs yellowish white, elliptic, margin entire or emarginate. Coronal scales minute. Stamens and styles prominently exerted; filaments glabrous. Styles 3. Capsule ovoid, ca. 6 mm. Seeds reniform. Fl. Jun–Jul.

Gravelly steppes, sandy steppes; 1900–3200 m. N Xinjiang [Kazakhstan, Kyrgyzstan].

**19. *Silene holopetala*** Bunge in Ledebour, Fl. Altaic. 2: 142. 1830.

全缘蝇子草 *quan yuan ying zi cao*

Herbs perennial, 30–80 cm tall, suffrutescent at base. Roots robust, lignified. Stems caespitose, erect, multibranched; branchlets opposite, sparsely villous. Leaves with short, axillary branches, lanceolate to linear, 1–3 cm × 1.5–3 mm, pubescent, base attenuate, apex acute. Flowers in a racemiform thyrse; cymules opposite, several flowered, appearing verticillate. Pedicel 2–6(–10) mm, viscid; bracts ovate-lanceolate, small,

margin membranous, ciliate. Calyx tubular-clavate, 6–9 × 2.5 mm, glabrous, slightly inflated above in fruit. Androgynophore ca. 2 mm, glabrous. Petal claws oblanceolate, glabrous, auricles absent or obsolete; limbs white, pale red below, narrowly obovate, margin entire; coronal scales minute. Stamens and styles slightly exserted; filaments glabrous. Styles 3. Capsule ovoid, 5–8 mm. Seeds reniform, tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

Stony mountains; ca. 400 m. NW Xinjiang [Kazakhstan].

The above four species all belong to *Silene* sect. *Holopetalae* Chowdhuri, with many taxa described from the region of the former Soviet Union. A revision on a global scale is needed to understand properly the variation of the Chinese plants.

**20. *Silene jennisseensis*** Willdenow, Enum. Pl. 1: 473. 1809.

山蚂蚱草 shan ma zha cao

*Silene dasyphylla* Turczaninow; ?*S. graminifolia* var. *parviflora* Ledebour; ?*S. jennissea* Poiret; ?*S. jennissea* Stephan ex Bunge; ?*S. jennissea* var. *parviflora* Turczaninow; ?*S. jennissea* var. *setifolia* Turczaninow; ?*S. jennisseensis* var. *oliganthella* (Nakai ex Kitagawa) Y. C. Chu; ?*S. jennisseensis* f. *parviflora* (Turczaninow) Schischkin; ?*S. jennisseensis* f. *setifolia* (Turczaninow) Schischkin; ?*S. jennisseensis* var. *vegetior* Popov; ?*S. oliganthella* Nakai ex Kitagawa; ?*S. pauciflora* (F. N. Williams) Nakai; ?*S. tenuis* Willdenow var. *jennissea* Rohrbach; ?*S. tenuis* var. *pauciflora* F. N. Williams.

Herbs perennial, 20–50 cm tall. Roots robust, lignified. Stems caespitose, erect or suberect, simple, glabrous, usually with many axillary sterile shoots at base. Basal leaves numerous, narrowly oblanceolate or lanceolate-linear, 5–13 cm × 2–7 mm, midvein prominent, base attenuate into long petiole, margin ciliate at base; cauline leaves few, small, clasping at base. Flowers in a racemiform thyrse; cymules opposite, proximal ones usually with more than one flower, distal ones with a solitary flower; peduncles very short. Pedicel 4–18 mm, glabrous; bracts ovate or lanceolate, base slightly connate, margin membranous, ciliate, apex acuminate. Calyx narrowly campanulate, slightly inflated in fruit, 8–10(–12) mm, glabrous, longitudinal veins green or violet. Androgynophore ca. 2 mm, shortly hairy. Petal claws narrowly oblanceolate, glabrous, without obvious auricles; limbs white or pale greenish, bifid to middle; lobes linear, apex obtuse; coronal scales small. Stamens and styles exserted; filaments glabrous. Styles 3. Capsule ovoid, 6–7 mm. Seeds grayish brown, reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep.  $2n = 24$ .

Forest margins, forested grasslands, shifting alpine screes, steppes, sandy steppes, mountain grasslands, gravelly grasslands, dune margins; 200–1000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Korea, Mongolia, Russia].

No type material has been seen by the present authors. Such material is necessary for a complete understanding of this very difficult group (*Silene jennisseensis* and the following two species), which has numerous forms and varieties described from the region of the former

Soviet Union. The treatment here is to a large extent in agreement with Fl. URSS and herbarium determinations in BM, K, E, and P (but see note under *S. graminifolia*).

**21. *Silene graminifolia*** Otth in de Candolle, Prodr. 1: 368. 1824.

禾叶蝇子草 he ye ying zi cao

*Silene jennisseensis* Willdenow var. *viscifera* Y. C. Chu; ?*S. pubistyla* L. H. Zhou; *S. stylosa* Bunge; ?*S. tenuis* Willdenow.

Herbs perennial, 15–50 cm. Roots robust, multicrowned. Stems caespitose, erect, slender, simple, glabrous or pubescent at base, apically viscid. Basal leaves numerous, linear-oblanceolate, thin, 2–8(–10) cm × 2–4.5 mm, ciliate, base attenuate into short petiole, apex acute; cauline leaves 2 or 3 pairs, sessile, ciliate, base slightly connate, clasping. Flowers in a racemiform thyrse; cymules opposite, with a solitary flower; peduncles very short. Pedicel shorter than or nearly as long as calyx, slender, glabrous; bracts ovate-lanceolate, margin membranous, ciliate. Calyx narrowly campanulate, 7–10 × 2–3 mm, glabrous. Androgynophore 2–3 mm, glabrous. Petal claws narrowly oblanceolate, long ciliate, limbs exserted beyond calyx, white, deeply bifid to middle; lobes linear, apex obtuse; coronal scales minute. Stamens and styles exserted. Styles 3. Capsule ovoid, 7–8 mm. Seeds dark brown, reniform, ca. 1 mm. Fl. Jun–Jul, fr. Aug.

Mountain grasslands; 1600–4200 m. Nei Mongol, Xinjiang, ?Xizang [Kazakhstan, Mongolia, Russia].

Schischkin (in Komarov, Fl. URSS 6: 626. 1936) stated that the type of *Silene tenuis*, a name very often applied to plants in this group, “does not correspond to the Siberian plant [*S. graminifolia* Otth] and belongs to some other species.” It is imperative that the identity of *S. tenuis* be settled.

**22. *Silene gracilicaulis*** C. L. Tang, Acta Bot. Yunnan. 2: 434. 1980.

细蝇子草 xi ying zi cao

*Silene gracilicaulis* C. L. Tang var. *longipedicellata* C. L. Tang; *S. gracilicaulis* var. *rubescens* (Franchet) C. L. Tang; *S. sericata* C. L. Tang; *S. tenuis* Willdenow f. *rubescens* Franchet; *S. tenuis* Willdenow var. *denudata* Y. W. Tsui & L. H. Zhou; *S. tenuis* Willdenow var. *rubescens* (Franchet) Diels.

Herbs perennial, (15–)20–50 cm. Roots robust, slightly lignified. Stems sparsely, rarely densely, caespitose, erect or ascending, simple, rarely 1- or 2-branched below, glabrous, rarely shortly pubescent. Basal leaves numerous, linear-oblanceolate, 6–18 cm × 2–5 mm, both surfaces glabrous, ciliate basally, base attenuate into petiole, apex acuminate at apex; cauline leaves linear-lanceolate, smaller than basal leaves, ciliate, base half clasping. Flowers in a racemiform thyrse; cymules opposite, 1-flowered (rarely more); peduncles very short. Pedicel nearly as long as calyx, glabrous; bracts ovate-lanceolate, 4–12 mm, ciliate, base connate, apex acuminate. Calyx narrowly campanulate, 8–15(–18) × 4 mm, glabrous, longitudinal veins violet, connate at apex; calyx teeth triangular-ovate, margin



membranous, white, shortly ciliate, apex obtuse. Androgynophore ca. 2 mm, shortly hairy. Petal claws oblanceolate, glabrous, auricles triangular; limbs exerted beyond calyx, white, violet or pink below, bifid to middle or below, lobes narrowly rounded; coronal scales orbicular, small. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule globose-ovoid, 6–8 mm. Seeds orbicular-reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep.

• Gravelly grasslands, mountains; 3000–4000 m. Nei Mongol, Qinghai, Sichuan, Xizang, Yunnan.

*Silene gracilicaulis* var. *rubescens*, from Yunnan, is distinct from the typical variety in having larger flowers with pink petals. Considering the subtle differences between other species recognized in this group, it may well deserve specific status.

*Silene sericata* was distinguished on its ciliate calyx teeth, which in fact is a common character for all taxa in this group (as well as most of the genus *Silene*).

*Silene pterosperma* Maximowicz (Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 67. 1889) was placed in this group in FRPS, but we believe it more likely that this taxon is related to *S. salicifolia* (see note under that species) or *S. hupehensis*.

**23. *Silene dumetosa*** C. L. Tang, Acta Bot. Yunnan. 4: 154. 1982.

灌丛蝇子草 guan cong ying zi cao

Herbs perennial, 10–20 cm. Roots robust, multicrowned. Stems caespitose, suberect, simple, white pubescent; sterile stems numerous. Basal leaves numerous, spatulate to oblanceolate, 3–6 cm × 3–7 mm, both surfaces glabrous, ciliate, midvein obvious, base attenuate into short petiole, apex acute; cauline leaves 2 or 3 pairs, narrowly oblanceolate, pubescent. Flowers in a racemiform thyrse; cymules opposite, 1-flowered, often 3; peduncles very short. Pedicel 1–2.5 cm, slender, villous and sparsely glandular hairy; bracts lanceolate, pubescent. Calyx campanulate or broadly campanulate, 1.5–1.7 cm × 6–8 mm; longitudinal veins usually violet, pubescent. Androgynophore 3–4 mm, shortly hairy. Petal claws oblanceolate, glabrous, auricles orbicular; limbs exerted beyond calyx, violet, bifid to middle; lobes slightly curved, apex obtuse; coronal scales lanceolate. Stamens and styles included, ca. 1 cm; filaments glabrous. Styles 3(or 4). Fl. Aug–Sep.

• Scrub; ca. 4000 m. NW Yunnan.

The type has not been seen by the present authors. Judging from the original description, *Silene dumetosa* is possibly closely related to, or a synonym of, *S. stewartiana*, and does not belong to the *S. gracilicaulis* group.

**24. *Silene quadriloba*** Turczaninow ex Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 167. 1842.

四裂蝇子草 si lie ying zi cao

*Melandrium quadrilobum* (Turczaninow ex Karelin & Kirilov) Schischkin; *M. viscosum* (Linnaeus) Celakovsky f. *quadrilobum* Krylov; *Silene viscosa* (Linnaeus) Persoon var. *quadriloba* Trautvetter.

Herbs biennial, 20–70 cm tall, densely short glandular hairy throughout. Stems sparsely caespitose or solitary, robust, erect, simple. Basal and proximal cauline leaves spatulate or spatulate-oblanceolate, 3–5 × ca. 1 cm, midvein prominent, base attenuate into petiole, apex obtuse or acute; distal leaves sessile, lanceolate, apex acuminate. Flowers in a racemiform thyrse; cymule shortly stalked, 1–3(–7)-flowered. Pedicel 3–5 mm; bracts ovate-lanceolate, herbaceous. Calyx tubular-clavate, 1.7–2 cm × ca. 4 mm, densely glandular hairy; calyx teeth triangular-ovate, 1.5–2 mm.

Androgynophore 2–3 mm, pubescent. Petals ca. 2 cm, claws cuneate, ciliate at base, auriculate at apex; limbs exerted beyond calyx, white, deeply 4-lobed; medial lobes ovate, margin entire; lateral lobes linear-lanceolate, small; coronal scales absent. Stamens and styles prominently exerted; filaments ciliate at base. Styles 3. Capsule globose-ovoid, 1–1.2 cm, lobe teeth excurved. Seeds dark brown, triangular-reniform, ca. 1.2 mm, slightly flat on one side, striate, minutely tuberculate. Fl. May–Jul, fr. Jul–Aug.

Grasslands, cultivated fields; 600–1900 m. Xinjiang [Kazakhstan, Mongolia, Russia].

**25. *Silene suaveolens*** Turczaninow ex Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 168. 1842.

细裂蝇子草 xi lie ying zi cao

*Melandrium griffithii* (Boissier) Rohrbach; *M. suaveolens* (Turczaninow ex Karelin & Kirilov) Schischkin; *M. viscosum* (Linnaeus) Celakovsky f. *suaveolens* Krylov; *Silene griffithii* Boissier; *S. viscosa* (Linnaeus) Persoon f. *multifida* Krylov.

Herbs biennial, rarely perennial, 30–80 cm tall, densely pubescent and viscid throughout. Stems sparsely caespitose, erect, simple. Basal leaves oblanceolate, base attenuate into long petiole, withered at anthesis; cauline leaves sessile, lanceolate, 3–8 cm × 3–30 mm, apex acuminate. Flowers in a racemiform thyrse. Pedicel 3–5 mm; bracts lanceolate, small. Calyx tubular-club-shaped, 1.4–2 cm × ca. 3 mm, densely pubescent, viscid, longitudinal veins not prominent; calyx teeth triangular, short, margin membranous, ciliate, apex obtuse. Androgynophore 2–3 mm, pubescent. Petals exerted beyond calyx, 1.5–2 cm; claws narrowly cuneate, ciliate, auricles not prominent; limbs white, multilobed, lobes linear; coronal scales absent. Stamens prominently exerted, to 2.5 cm; filaments ciliate. Styles exerted. Capsule globose-ovoid, 1–1.2 cm, shorter than calyx. Seeds reniform, ca. 1 mm. Fl. Jun–Jul, fr. Jul–Aug.

Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan].

This species is very closely related to *Silene quadriloba*, differing mainly in the multilobed petals.

**26. *Silene firma*** Siebold & Zuccarini, Abh. Math.-Phys. Cl. Konigl. Bayer. Akad. Wiss. 4(2): 166. 1843.

疏毛女娄菜 shu mao nu lou cai

*Melandrium apricum* (Turczaninow) Rohrbach var. *firmum* (Siebold & Zuccarini) Rohrbach; ?*M. apricum* var. *firmum* f. *pubescens* Makino; *M. firmum* (Siebold & Zuccarini) Rohrbach; ?*M. firmum* f. *pubescens* (Makino) Makino; ?*M. firmum* var. *pubescens* (Makino) Y. Z. Zhao; *Silene aprica* Turczaninow var. *firma* (Siebold & Zuccarini) F. N. Williams; *S. epilosa* W. W. Smith; ?*S. firma* f. *pubescens* (Makino) Ohwi & Ohashi; ?*S. firma* var. *pubescens* (Makino) S. Y. He.

Herbs annual or biennial, 50–100 cm tall, usually glabrous throughout, sometimes only shortly hairy at base. Stems erect, sometimes dark violet basally, robust, simple or sparsely branched. Leaves elliptic-lanceolate to ovate-ob lanceolate or obovate-ob lanceolate, 4–10(–16) × 0.8–2.5(–5) cm, base attenuate, apex acute. Flowers in an irregular thyrse. At least distal cymules without a stalk, proximal cymules rarely stalked. Pedicel erect, 5–18(–30) mm, usually glabrous; bracts narrowly lanceolate. Calyx ovoid-campanulate, 7–9 mm, glabrous, enlarged to 1–1.2 cm in fruit, veins green. Androgynophore very short or obsolete, glabrous. Petals included, white; claws oblanceolate, glabrous, auriculate; limbs ovate, bifid. Coronal scales small. Stamens and styles included. Styles 3. Capsule ovoid, 8–11 mm, shorter or longer than calyx. Seeds gray-brown, globose-reniform, ca. 1 mm, tuberculate. Fl. Jun–Jul, fr. Jul–Aug. *2n* = 48.

Mountain grasslands, scrub; 300–2500 m. Throughout China [Japan, Korea, Russia].

**27. *Silene aprica*** Turczaninow ex Fischer & C. A. Meyer, Ind. Sem. Hort. Petrop. 38. 1835.

女娄菜 nu lou cai

*Hedona ischnopetala* F. N. Williams; *Melandrium apricum* (Turczaninow ex Fischer & C. A. Meyer) Rohrbach; *M. apricum* subsp. *oldhamianum* (Miquel) Kitagawa; *M. apricum* var. *oldhamianum* (Miquel) Y. C. Chu; *M. oldhamianum* (Miquel) Rohrbach; *Silene aprica* var. *oldhamiana* (Miquel) C. Y. Wu; *S. melandriiformis* Maximowicz; *S. morii* Hayata; *S. mu-shaensis* Hayata; *S. oldhamiana* Miquel; *S. taquetii* H. Léveillé.

Herbs annual or biennial, 30–70 cm tall, densely gray pubescent throughout. Principal roots robust, slightly lignified. Stems erect, simple or branched. Basal leaves oblanceolate or narrowly spatulate, 4–7 cm × 4–8 mm, midvein prominent, base attenuate into long petiole, apex acute; cauline leaves oblanceolate to lanceolate or linear-lanceolate, smaller than basal leaves. Cymules stalked. Pedicel erect, 5–20(–40) mm; bracts lanceolate, herbaceous, ciliate, apex acuminate. Calyx ovoid-campanulate, 6–8 mm, to 1.2 cm in fruit, nearly herbaceous, densely pubescent; longitudinal veins green, cohering at apex; calyx teeth triangular-lanceolate, margin membranous, ciliate. Androgynophore very short or obsolete, pubescent. Petal claws ciliate below; limbs white or pink, oblanceolate, 1–5 mm, subequaling

or slightly longer than calyx, bifid; coronal scales ligulate. Stamens and styles included; filaments ciliate at base. Styles 3, shortly hairy at base. Capsule ovoid, 8–9 mm, subequaling or slightly longer than calyx. Seeds gray-brown, globose-reniform, 0.6–0.7 mm, thickened, minutely tuberculate. Fl. May–Jul, fr. Jun–Aug.

Plateaus, downs, mountains. Throughout China [Japan, Korea, Mongolia, Russia].

*Silene oldhamiana*, described from Ningbo, Zhejiang, has pink petal limbs 4–5 mm long, and may deserve status as an independent taxon. Wu Zhengyi (editor's note) regards it as a maritime variety of the widespread *S. aprica*. *Silene morii*, from Taiwan, was segregated on subtle differences in calyx teeth morphology.

**28. *Silene orientalmongolica*** Kozhevnikov, Novosti Sist. Vyssh. Rast. 21: 68. 1984.

内蒙古女娄菜 nei meng gu nu lou cai

*Melandrium orientalmongolicum* (Kozhevnikov) Y. Z. Zhao.

Herbs annual or biennial, 10–40 cm tall, densely pubescent throughout. Principal roots robust, lignified. Stems erect, solitary or multibranched at base. Basal leaves petiolate, distal leaves sessile; leaf blade oblanceolate or lanceolate, 2–5 cm × 2–5 mm, midvein raised abaxially, both surfaces densely pubescent, base attenuate into petiole or sessile, apex acute. Cymes terminal, conical; bracts lanceolate, herbaceous, ciliate, apex acuminate. Pedicels erect, unequal in length, 5–20 mm, pubescent. Calyx elliptic or ovoid-campanulate, 6–8 mm, ovoid in fruit, ca. 1 cm, glandular hairy; longitudinal veins 10, green, cohering at apex; calyx teeth triangular-lanceolate, margin membranous, ciliate. Androgynophore very short. Petals white or pale red; limbs obovate, shallowly bifid at apex; claws narrowly cuneate; coronal scales ligulate. Stamens included; filaments hairy at base. Styles 3, short, shortly hairy at base. Capsule ovoid, ca. 8 mm, shorter than calyx, 6-toothed. Seeds gray-brown, reniform, ca. 0.6 mm, tuberculate. Fl. Jun–Jul, fr. Jul–Aug.

• Steppes, sterile areas. Nei Mongol [?Russia].

**29. *Silene otites*** (Linnaeus) Wibel, Prim. Fl. Werth. 241. 1799.

黄雪轮 huang xue lun

*Cucubalus otites* Linnaeus, Sp. Pl. 1: 415. 1753; *Silene pseudo-otites* Besser ex Reichenbach.

Herbs biennial, 20–40 cm tall, villous throughout. Roots robust. Stem solitary, erect, simple or sparsely branched. Basal leaves spatulate, 4–6 cm × 5–12 mm, base attenuate into long petiole, apex obtuse or mucronulate; cauline leaves linear-ob lanceolate, small, narrow. Flowers unisexual (plants dioecious), in a racemiform thyrse with many-flowered cymules. Pedicel 4–10 mm, slender, glabrous. Calyx campanulate, 4–6 mm, glabrous. Androgynophore obsolete. Petal claws glabrous; limbs greenish, linear-ob lanceolate, small, margin entire; coronal scales absent. Stamens

and styles slightly exerted. Styles 3. Capsule ovoid or subglobose, 3.5–5(–6) mm, slightly longer than calyx. Seeds reniform, small. Fl. Jun–Jul, fr. Aug.  $2n = 24$ .

N Xinjiang [Europe].

**30. *Silene borysthena*** (Gruner) Walters, Repert. Spec. Nov. Regni Veg. 69: 47. 1964.

小花蝇子草 xiao hua ying zi cao

*Silene otites* (Linnaeus) Wibel var. *borysthena* Gruner, Bull. Soc. Imp. Naturalistes Moscou 41(2): 126. 1868; *Otites borysthena* (Gruner) Klokov; *O. parviflora* (Ehrhart) Grossheim; *S. parviflora* (Ehrhart) Persoon.

Herbs biennial, 30–60 cm, pubescent throughout. Roots robust. Stem solitary, erect, simple or sparsely branched. Basal leaves spatulate, 2–6 cm × 2–5(–10) mm, base attenuate into long petiole, apex acute; cauline leaves sessile, small. Flowers unisexual (plants dioecious), in a racemiform thyrse with many-flowered cymules. Pedicel 2–5 mm, pubescent. Calyx campanulate, 1.5–2.5 mm, pubescent, longitudinal veins greenish. Androgynophore obsolete. Petals white, ca. 1.5 × as long as calyx; claws linear-oblongate, ciliate; limbs narrowly orbicular, margin entire; coronal scales absent. Stamens and styles exerted; filaments shortly hairy. Styles 3. Capsule subglobose, ca. 3 mm in diam. Seeds reniform, ca. 0.6 mm. Fl. Jun–Jul, fr. Aug.  $2n = 24$ .

River beaches, grasslands. N Xinjiang [C Asia, Europe].

**31. *Silene wolgensis*** (Hornemann) Oth in de Candolle, Prodr. 1: 370. 1824.

伏尔加蝇子草 fu er jia ying zi cao

*Viscago wolgensis* Hornemann, Suppl. Hort. Bot. Hafn. 48. 1819; *Silene otites* (Linnaeus) Wibel var. *wolgensis* (Hornemann) Rohrbach.

Herbs biennial, 40–80 cm tall. Roots robust, lignified. Stems solitary, sparsely branched, erect, basally hirtellous, apically glabrous, sometimes viscid. Basal and proximal cauline leaves spatulate, 8–10 cm × 5–10 mm, both surfaces pubescent, ciliate at margin, midvein prominent, base attenuate into long petiole, apex acute; distal leaves linear-lanceolate. Flowers unisexual (plants dioecious), in a racemiform thyrse with many-flowered cymules. Pedicel ca. 1.5 × as long as calyx, rarely shorter, slender, glabrous; bracts triangular-lanceolate, membranous. Calyx campanulate, 3–3.5 mm, glabrous, longitudinal veins inconspicuous. Androgynophore very short or absent. Petals white, ± linear, ca. 5 mm, claws glabrous, limbs entire. Coronal scales absent. Stamens slightly exerted; filaments glabrous. Capsule ellipsoid, 4–6 mm, slightly longer than calyx. Seeds dark brown, reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep.  $2n = 24$ .

Dry steppes, stony mountain grasslands; 1100–1400 m. Xinjiang [C Asia, Europe].

Male and female plants of species nos. 29–31 may differ considerably, both in vegetative and floral parts. An understanding of this variation is desirable in order to attain a useful taxonomy of this group.

**32. *Silene vulgaris*** (Moench) Garcke, Fl. Nord-Mittel-Deutschl., ed. 9, 46. 1869.

白玉草 bai yu cao

*Behen vulgaris* Moench, Meth. Pl. 709. 1794; *Cucubalus behen* Linnaeus (1753), not *Silene behen* Linnaeus (1753); *C. latifolius* Miller; *C. venosus* Gilibert; *S. cucubalus* Wibel; *S. inflata* Smith; *S. inflata* var. *vulgaris* Turczaninow; *S. venosa* (Gilibert) Ascherson; ?*S. wallichiana* Klotzsch.

Herbs perennial, grayish green, 40–100 cm tall, glabrous throughout. Roots slightly robust, lignified. Stems sparsely caespitose, erect, usually gray, apically branched. Leaves lanceolate to ovate, 4–10 × 1–3(–4.5) cm, proximal cauline leaves with prominent midvein, base attenuate, apex acuminate or acute; distal leaves cuneate, slightly clasping. Flowers usually in many-flowered dichasia, sometimes in thyrseoid inflorescences; flowers sometimes spreading or slightly nutant. Pedicel shorter than or subequaling calyx; bracts ovate-lanceolate, herbaceous. Calyx usually violet-tinged, broadly ovoid, inflated, 1.3–1.6 cm × 5–7 mm, submembranous, with 20 anastomosing veins; calyx teeth broadly triangular, short, ciliate. Androgynophore ca. 2 mm, glabrous. Petals 1.5–1.8 cm; claws cuneate-oblongate, glabrous, auricles ovoid; limbs exerted beyond calyx, white, obovate, deeply bifid to base of limb, lobes narrowly obovate; coronal scales small. Stamens and styles prominently exerted; filaments glabrous; anthers violet. Styles 3. Capsule subglobose, ca. 8 mm in diam., shorter than calyx. Seeds globose-reniform, ca. 1.5 mm. Fl. Jun–Aug, fr. Aug–Sep.  $2n = 24, 48$ .

Meadows, scrub; 200–2700 m. Heilongjiang, Nei Mongol, Xinjiang, Xizang [India, Mongolia, Nepal; N Africa, SW Asia, Europe].

**33. *Silene baccifera*** (Linnaeus) Roth, Tent. Fl. Germ. 2(1): 491. 1789.

狗筋蔓 gou jin wan

*Cucubalus baccifer* Linnaeus, Sp. Pl. 1: 414. 1753; *C. baccifer* var. *angustifolius* L. H. Zhou; *C. baccifer* var. *cavaleriei* H. Lévillé; *C. baccifer* var. *japonicus* Miquel.

Herbs perennial. Roots white, long fusiform, cross section yellow. Stems and branches spreading, 50–150 cm. Petiole 3–5 mm; leaf blade ovate, ovate-lanceolate, or narrowly elliptic, 1.5–5(–13) × 0.8–2(–4) cm, papery, both surfaces hairy at veins, base attenuate, margin entire, ciliate, apex acuminate. Flower slightly nutant. Pedicel hairy. Calyx broadly campanulate, 9–11 mm; calyx teeth ovate-triangular, nearly as long as tube, ciliolate, revolute in fruit. Androgynophore ca. 1.5 mm.

Petals oblanceolate, ca.  $15 \times 2.5$  mm; claw long, narrow; limb 2-fid. Stamens and styles included. Fruit black, globose, 6–8 mm, fleshy, irregularly dehiscent. Seeds black, ca. 1.5 mm. Fl. Jun–Aug, fr. Jul–Oct.  $2n = 24$ .

Forest margins, scrub, grasslands. Anhui, Fujian, Gansu, Guangxi, Guizhou, Hebei, Henan, Hubei, Jiangsu, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Bhutan, Japan, Kashmir, Kazakhstan, Korea, Nepal, Russia, Sikkim; Europe].

Wu Zhengyi (editor's note) prefers to treat this species as a distinct, monotypic genus (*Cucubalus*), on account of its fleshy, baccate, irregularly dehiscent fruit, which is unique in the Caryophyllaceae.

*Silene baccifera* is used medicinally.

**34. *Silene subcretacea*** F. N. Williams, J. Linn. Soc., Bot. 38: 404. 1909.

藏蝇子草 zang ying zi cao

?*Silene waltonii* F. N. Williams.

Herbs suffruticose, (15–)20–45 cm tall. Stems clustered, erect, basally lignified, dichotomously branched, densely shortly pubescent. Leaves with short, sterile axillary branches, linear, 8–12  $\times$  1–2 mm, both surfaces densely pubescent, apex acute. Flowers bisexual, spreading in bud, erect in flower, usually with two 1-flowered cymules per stem. Pedicel pubescent, 2–5 mm; bracts linear-lanceolate, 2–8 mm, herbaceous, pubescent. Calyx campanulate, clavate in fruit, 1–1.5(–1.8) cm  $\times$  ca. 3.5 mm, densely pubescent, veins dark violet; calyx teeth 2–3 mm. Androgynophore 3–5(–6) mm, pubescent. Petal claws narrow, glabrous, upper part forming triangular, erose auricles; limbs reddish, deeply bifid to 1/2 or more, sometimes erose at apex; coronal scales ca. 2 mm, margin erose. Stamens and styles included or slightly exerted; filaments glabrous. Styles 3. Capsule ovoid, 8–12 mm. Seeds triangular-reniform, ca. 1.2 mm. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine meadows, gravelly mountain grasslands; (3000–)3800–4700 m. Xizang.

**35. *Silene incurvifolia*** Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 14: 391. 1841.

镰叶蝇子草 lian ye ying zi cao

Herbs perennial, 10–25 cm tall, densely and shortly pubescent throughout. Stems densely clustered, basally lignified, erect or ascending, simple, with sterile short branches at base. Basal leaves narrowly oblanceolate, 2–5 cm  $\times$  1–3(–5) mm; cauline leaves 3–8 pairs, linear-lanceolate, 1–2.5 cm  $\times$  1–2 mm, incurved falcately, proximally with sterile axillary shoots. Flowers 1–3, upright. Pedicel 2–4 mm, pubescent; bracts linear, slightly longer than pedicel, herbaceous. Calyx tubular-clavate, 2–2.5 cm  $\times$  ca. 2.5 mm, glandular hairy. Androgynophore pubescent, 8–10 mm. Petal claws broad at apex; limbs obovate, deeply bifid, lobes dentate. Filaments glabrous. Capsule ovoid or ovoid-conical, 1–1.2 cm. Seeds reniform, with small auricular pit, ca. 1.5 mm. Fl. Jun–Jul.

Scrub on river beaches; ca. 2600 m. SE Xinjiang [Kazakhstan, Kyrgyzstan, Russia].

**36. *Silene moorcroftiana*** Wallich ex Bentham in Royle, Ill. Bot. Himal. Mts. 79. 1839.

冈底斯山蝇子草 gang di si shan ying zi cao

*Silene gyirongensis* L. H. Zhou; *S. persica* Boissier subsp. *moorcroftiana* (Wallich ex Bentham) Chowdhuri.

Herbs perennial, 15–25 cm, shortly glandular hairy.

Stems caespitose, basally slightly lignified, erect, simple. Leaves linear, narrowly lanceolate, or oblanceolate, 1.5–2.5 cm  $\times$  2–5 mm, both surfaces glandular hairy, midvein prominent, often curved. Flowers 1–3. Pedicel 1–2.5 cm. Calyx narrowly tubular-clavate, submembranous, 2–2.3 cm  $\times$  ca. 3.5 mm, slightly umbilicate at base, with 10 longitudinal violet veins, densely glandular hairy; calyx teeth ca. 2 mm. Androgynophore ca. 1 cm, glabrous. Petal claws narrowly cuneate, ca. 1 cm, auricles triangular; limbs not exerted, pale red or white. Filaments glabrous. Styles slightly exerted. Capsule ovoid, 7–9 mm, shorter than calyx. Seeds reniform. Fl. Jul, fr. Aug. Gravelly grasslands, fissures in cliffs; 3900–5000 m. W Xizang [Afghanistan, India, Kashmir, Nepal, Pakistan].

**37. *Silene karaczukuri*** B. Fedtschenko, Trudy Imp. S.-Peterburgsk. Bot. Sada 28: 469. 1909.

喀拉蝇子草 ka la ying zi cao

Herbs perennial, 10–20 cm tall. Stems densely clustered, basally slightly lignified, erect, simple, shortly glandular hairy, with rosettelike clusters of sterile shoots basally. Basal leaves linear-oblanceolate or linear, 5–20(–40)  $\times$  0.5–1.5(–3) mm, both surfaces glabrous, margin ciliate, midvein inconspicuous; cauline leaves usually 3(–6) pairs, sessile, linear-lanceolate, smaller than basal leaves, sparsely shortly hairy, base half clasping. Flowers 1 or 2 per stem. Pedicel 5–10 mm, glandular hairy; bracts lanceolate, 3–10 mm, herbaceous. Calyx tubular-clavate, 1.5–2 cm  $\times$  ca. 5 mm, shortly glandular pubescent, longitudinally 10-veined, green or violet; calyx teeth triangular-ovate, ca. 1 mm, glandular hairy, margin membranous, apex obtuse. Androgynophore ca. 8 mm, glabrous. Petals with claws narrowly elliptic-linear, glabrous, auriculate; limbs exerted beyond calyx, pale red, bifid to 1/2; coronal scales band-shaped, short. Filaments glabrous. Capsule not seen. Fl. Jul–Aug.

Alpine meadows, stony valleys; 4000–4300 m. SW Xinjiang [Tajikistan].

**38. *Silene capitata*** Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 18: 440. 1901.

头序蝇子草 tou xu ying zi cao

Herbs perennial, underground organs probably similar to those of *S. qiynshanensis*. Stems diffuse, 20–40 cm, much branched, densely villous with curved hairs. Leaves petiolate, broadly ovate or cordate-ovate, ca. 2  $\times$  1–1.5 cm, both surfaces villous with curved hairs, base rounded or shallowly cordate, apex acute, mucronulate. Inflorescence capitate; bracts herbaceous, lowermost pair forming an involucre, distal ones lanceolate, small. Pedicel 2–4 mm, pubescent. Calyx campanulate,

ca. 8 mm, densely villous, sparsely glandular hairy, inflated after anthesis. Androgynophore ca. 1 mm, ?glabrous. Petals 1–1.2 cm; claws oblanceolate, glabrous, auricles not prominent; limbs pale red or violet, obovate, deeply bifid to middle or more, lobes entire; coronal scales papillose. Stamens and styles prominently exerted. Capsule ovoid, ca. 5 mm, shorter than calyx. Seeds reniform. Fl. Jun–Jul, fr. Aug.

Jilin (Yalu Jiang) [Korea].

Together *Silene capitata*, *S. seoulensis*, and *S. qiyunshanensis* form a very peculiar and distinct assemblage, unique in the genus for their petiole, cordate leaves.

**39. *Silene seoulensis*** Nakai, J. Coll. Sci. Imp. Univ. Tokyo 26(1): 77. 1909.

汉城蝇子草 han cheng ying zi cao

Herbs perennial, pubescent throughout. Stems caespitose, ascending, 40–60 cm tall, slender, sparsely branched. Leaves broadly ovate to narrowly lanceolate, 3–6 × 0.5–3 cm, both surfaces sparsely villous or at veins only, margin ciliate-scabrid, base subsessile or rapidly attenuate into short petiole, apex acute.

Inflorescence a lax, many-flowered dichasium. Bracts lanceolate. Calyx campanulate, ca. 5 mm, glabrous or densely hairy, open at apex in fruit, longitudinal veins dark green; calyx teeth triangular-ovate, ca. 1 mm.

Androgynophore obsolete to 1 mm, glabrous. Petal claws included in calyx, oblanceolate, glabrous, exauriculate; limbs exerted, white, bifid to middle. Stamens slightly exerted; filaments glabrous. Styles exerted. Capsule ovoid, ca. 5 mm, shorter or slightly longer than calyx. Seeds few, large, subglobose. Fl.

Jul–Aug, fr. Sep–Oct.

Heilongjiang, Jilin, Liaoning [Korea].

1a. Calyx glabrous ..... 39a. var. *seoulensis*

1b. Calyx densely hairy ..... 39b. var. *angustata*

**39a. *Silene seoulensis* var. *seoulensis***

汉城蝇子草(原变种) han cheng ying zi cao (yuan bian zhong)

*Melandrium seoulense* (Nakai) Nakai.

Leaves ovate or ovate-lanceolate, 3–6 × 2–3 cm. Calyx glabrous.

Heilongjiang, Jilin, Liaoning [Korea].

**39b. *Silene seoulensis* var. *angustata*** C. L. Tang, Acta Phytotax. Sin. 24: 391. 1986.

狭叶汉城蝇子草 xia ye han cheng ying zi cao

Leaves narrowly lanceolate, 3–4 cm × 5–10 mm. Calyx densely pubescent.

• SE Liaoning.

**40. *Silene qiyunshanensis*** X. H. Guo & X. L. Liu, Acta Bot. Yunnan. 13: 24. 1991.

齐云山蝇子草 qi yun shan ying zi cao

Herbs perennial, pubescent throughout. Stems caespitose, diffuse, slender, arising from a thick irregular rootstock, leafless at very base (probably underground), but forming a leaf rosette and branched at ground level. Leaves subcordate to broadly ovate, proximal ones long petiolate (to 4 cm), petioles of distal leaves gradually shorter; cauline leaves broadly ovate or suborbicular, (0.5–)1.5–2(–3.5) × (0.5–)1–2(–2.5) cm, both surfaces villous, glabrescent, margin ciliate, apex acute or mucronulate. Dichasial cymes lax, rachis, pedicels, and calyx densely pubescent; bracts ovate, small, herbaceous. Pedicel 0.7–2 cm. Calyx campanulate, 4–5 mm, 10-veined; calyx teeth ovate-obtuse, 1.5–2 mm, densely villous. Petals oblanceolate, 7–9 mm, claws slightly exerted beyond calyx; limbs white or pale pink, 4(or 6)-lobed, lobes oblong; coronal scales small, scarious. Androgynophore 0.5–1 mm. Stamens 10, included; filaments inflated at base, glabrous. Styles 3. Capsule ovoid, ca. 2.5 mm, shorter than calyx. Seeds violet-brown, orbicular to reniform, ca. 0.7 mm in diam., minutely tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

• Gravel on mountains; ca. 400 m. Anhui (Xiuning Xian).

**41. *Silene salicifolia*** C. L. Tang, Acta Bot. Yunnan. 2: 439. 1980.

柳叶蝇子草 liu ye ying zi cao

Herbs perennial. Stems caespitose, ascending, 20–30 cm, sparsely branched, glabrous. Leaves lanceolate, 5–7 × 0.6–1.2 cm, both surfaces glabrous, margin ciliate with multicellular hairs, midvein prominent, base cuneate, apex acuminate. Dichasial cymes few flowered. Pedicel 1.5–3 cm, slender, ± viscid; bracts linear-lanceolate, nearly membranous, 5–10 mm, margin ciliate. Calyx campanulate, 1–1.4 cm × ca. 4.5 mm, glabrous; longitudinal veins violet, cohering at apex; calyx teeth triangular, 3–5 mm, apex acute.

Androgynophore ca. 4 mm, pubescent. Petals ca. 2 cm; claws slightly exerted beyond calyx, ca. 1.2 cm, glabrous; auricles orbicular, obscurely laciniate; limbs pale red or lilac, broadly obovate, ca. 7 mm, bifid deeply to middle, sometimes with one small lobe on each lateral side; coronal scales nearly flabellate, ca. 1.5 × 2 mm. Stamens and styles included; filaments glabrous. Styles 3. Capsule ovoid, 8–10 mm, shorter than calyx. Seeds yellow-brown, reniform, ca. 1.2 mm, minutely tuberculate, with prominent, spinose protuberances abaxially. Fl. Aug, fr. Sep–Oct.

• Stony forest substrates; 2100–2300 m. Sichuan.

This species and the following three are clearly closely related. Tang (Acta Bot. Yunnan. 2: 439. 1980) likened *S. salicifolia* to *S. pterosperma* Maximowicz (Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 67. 1889). We have not seen type material of *S. pterosperma*, but it is likely that that name applies to either *S. hupehensis* or *S. salicifolia*.

**42. *Silene morrisonmontana*** (Hayata) Ohwi & H. Ohashi, J. Jap. Bot. 49: 345. 1974.

玉山蝇子草 yu shan ying zi cao

Herbs perennial, 10–15 cm tall. Stems caespitose, nearly prostrate, slender, simple, pubescent or glabrous. Leaves linear, 2–3.5 cm × 1.5–2.5 mm, margin ciliate, midvein prominent, margin obscurely dentate at base, apex acuminate. Flower solitary, terminal, slightly nutant. Pedicel 6–8 mm, densely pubescent; bracts lanceolate, 1–1.4 cm × ca. 2 mm, glandular. Calyx campanulate, ca. 15 × 5–7 mm, hairy at veins; calyx teeth narrowly triangular, 3–4 mm, margin ciliate, apex acute. Androgynophore 2–3 mm, pubescent. Petals 1.5–2 cm; claws saccate-oblancheolate, eciliate; auricles orbicular, sometimes obscurely laciniate; limbs exerted beyond calyx, white, obovate, 4–6 mm, shallowly furcately bifid; lobes narrowly elliptic or ovate, sometimes with one obscure obtuse tooth on each lateral side; coronal scales flabellate, ca. 1 mm, laciniate at apex. Stamens included; filaments glabrous. Styles 3, slightly exerted. Capsule narrowly ovoid, 8–10 mm. Seeds reniform, with a marginal rim of spinose processes. Fl. Jun–Jul, fr. Sep–Oct.

• Stony and gravelly fissures, screes; 3100–3400 m. Taiwan.

1a. Plant hairy ..... 42a. var. *morrisonmontana*  
1b. Plant glabrous ..... 42b. var. *glabella*

**42a. *Silene morrisonmontana* var. *morrisonmontana***

玉山蝇子草(原变种) yu shan ying zi cao (yuan bian zhong)

*Melandrium morrisonmontanum* Hayata, Icon. Pl. Formosan. 3: 36. 1936; *M. transalpinum* Hayata; *M. vesiculiforme* Hayata.

Plants pubescent.

• Stony and gravelly fissures, screes; 3100–3400 m. Taiwan.

**42b. *Silene morrisonmontana* var. *glabella*** (Ohwi) Ohwi & H. Ohashi, J. Jap. Bot. 49: 345. 1974.

秃玉山蝇子草 tu yu shan ying zi cao

*Melandrium glabellum* Ohwi, Repert. Spec. Nov. Regni Veg. 36: 47. 1934; *M. morrisonmontanum* Hayata var. *glabellum* (Ohwi) Ohwi.

Plants glabrous.

• N Taiwan.

**43. *Silene hupehensis*** C. L. Tang, Acta Bot. Yunnan. 2: 438. 1980.

湖北蝇子草 hu bei ying zi cao

Herbs perennial, 10–30 cm tall, glabrous throughout. Stems caespitose, erect or ascending, simple, usually

with clustered sterile shoots at base. Basal leaves few, small. Cymes often 2–5-flowered, rarely numerous or solitary flowered. Pedicel 2–5 cm, slender; bracts linear-lanceolate, ciliate. Flowers erect, 1.5–2 cm in diam. Calyx campanulate, 1.2–1.5 cm × 3.5–7 mm, glabrous, rarely densely pubescent, base rounded; longitudinal veins violet, inconspicuous, cohering at apex; calyx teeth triangular-ovate, 2–4 mm, margin membranous, shortly ciliate, apex rounded or obtuse. Androgynophore 3–4 mm, villous. Petals pale red, 1.5–2 cm; claws inserted or slightly exerted beyond calyx, oblanceolate, 8–10 mm, eciliate, auricles inconspicuous; limbs obovate or broadly ovate, 7–9 mm, shallowly bifid, rarely deeply lobed to middle; lobes nearly orbicular, slightly waved or obscurely laciniate, sometimes with 1 small linear lobe or obtuse tooth on each lateral side; coronal scales subreniform or lanceolate, 1–3 mm, margin often irregularly dentate. Stamens slightly exerted; filaments glabrous. Styles slightly exerted. Capsule ovoid, 6–8 mm. Seeds dark brown, globose-reniform, ca. 1.5 mm, with a marginal rim of spinose processes. Fl. Jul, fr. Aug.

• Rock crevices in forests and mountains, mountain grasslands; 1200–2700 m. Gansu, Henan, Hubei, Shaanxi, Sichuan.

1a. Calyx glabrous ..... 43a. var. *hupehensis*

1b. Calyx densely pubescent ..... 43b. var. *pubescens*

**43a. *Silene hupehensis* var. *hupehensis***

湖北蝇子草(原变种) hu bei ying zi cao (yuan bian zhong)

*Silene linearifolia* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 22: 284. 1915, not Oth (1824).

Calyx glabrous.

• Rock crevices in forests, mountain grasslands; 1200–2700 m. Gansu, Henan, Hubei, Shaanxi, Sichuan.

**43b. *Silene hupehensis* var. *pubescens*** C. L. Tang, Acta Bot. Yunnan. 2: 438. 1980.

毛湖北蝇子草 mao hu bei ying zi cao

Calyx densely pubescent.

• Rock crevices in mountains; 1600–2600 m. Shaanxi.

**44. *Silene tubiformis*** C. L. Tang, Acta Phytotax. Sin. 24: 387. 1986.

剑门蝇子草 jian men ying zi cao

Herbs perennial, 15–20 cm tall. Stems caespitose, sub-erect, slender, simple. Basal leaves linear, 5–7 cm × 1–1.5(–2) mm, ciliate near basal margin, both surfaces glabrous, midvein prominent, apex acuminate; cauline leaves few, linear. Flowers 1–3, erect, ca. 2 cm in diam. Pedicel 1.5–2 cm, slender, glabrous; bracts linear or linear-lanceolate, 1–2 cm. Calyx usually green-violet or violet, narrowly cylindrical, 2–2.5 cm × 2.5–3 mm, glabrous, umbilicate at base, apically slightly inflated at late maturity, longitudinal veins inconspicuous, cohering at apex; calyx teeth triangular-lanceolate, 3–7 mm, apex acuminate. Androgynophore 8–12 mm, glabrous. Petals 2–2.5 cm; claws exerted 2–3 mm beyond calyx, oblanceolate, glabrous, exauriculate;

limbs obovate, 6–8 mm, sometimes shallowly bifid; coronal scales lanceolate, ca. 1 mm, margin entire or obscurely toothed. Stamens and styles slightly exerted; filaments glabrous. Styles 3. Capsule narrowly ellipsoid, ca. 1 cm, shorter than or subequalling calyx. Seeds reddish brown, reniform, ca. 1.2 mm. Seeds with a marginal rim of spinose processes. Fl. Jun, fr. Jul.

• Stony scrub grasslands; 700–1000 m. N Sichuan.

**45. *Silene nana*** Karelina & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 169. 1842.

矮蝇子草 ai ying zi cao

Herbs annual, 3–15 cm, glabrous. Stems erect, simple or much branched at base. Leaves sessile, lanceolate-linear or lanceolate, 2–3.5 cm × 2–6 mm, margin ciliate with curved hairs, base cuneate, apex acute or obtuse. Dichasial cymes (1-to) few flowered. Pedicel subequalling to 3 × as long as calyx, usually curved at late anthesis; bracts lanceolate. Calyx greenish, ovoid-campanulate, ca. 10 × 3.5 mm, umbilicate at base; calyx teeth triangular-lanceolate, ca. 1/4 as long as calyx, margin narrowly membranous, shortly ciliate, apex acute. Androgynophore 1–2 mm, glabrous. Petals slightly exerted beyond calyx, white, ca. 1.1 cm; claws narrowly oblanceolate, glabrous, auricles triangular; limbs subovate, ca. 2.5 mm, margin entire; coronal scales narrowly ovoid, ca. 1/2 as long as limbs, margin entire, rarely lacinate. Stamens and styles slightly exerted; filaments glabrous. Capsule ovoid, ca. 8 mm, shorter than calyx. Seeds orbicular-reniform, flat, ca. 2 mm in diam., abaxially grooved with undulate wings. Fl. Apr–May, fr. Jun.

Sand dunes, sandy steppes. N Xinjiang [Kazakhstan, Pakistan; SW Asia].

**46. *Silene latifolia*** Poiret, Voy. Barbarie 2: 165. 1789.

叉枝蝇子草 cha zhi ying zi cao

Herbs annual or biennial, rarely perennial, dioecious, 40–80 cm tall. Stems erect, branched, basally villous, apically glandular villous. Proximal cauline leaves elliptic, base attenuate into short petiole; distal leaves sessile, orbicular-lanceolate or lanceolate, 6–8 × 1–2.7 cm, densely pubescent, 3-veined, apex acuminate. Flowers unisexual, forming dichasial cymes. Pedicel usually less than 1 cm, glandular villous; bracts ovate-lanceolate, villous. Calyx pubescent, glandular hairy; calyx teeth triangular, margin glandular villous, apex acuminate; male flower calyx tubular-campanulate, 1.3–1.5 cm, longitudinally 10-veined; female flower calyx tubular-ovoid, inflated at middle in fruit, contracted at apex, 1.5–2 cm, longitudinally 20-veined. Androgynophore very short. Petals white, claws exerted beyond calyx, glabrous, cuneate, auricles inconspicuous; limbs obovate, deeply bifid; coronal scales small or inconspicuous. Stamens included. Female flower styles 5. Capsule ovoid, 1.5–1.7 cm, 10-toothed. Seeds gray-brown, reniform, 1–1.3 mm. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 24$ .

Grasslands, scrub grasslands; 1100–1500 m. Liaoning (introduced), Xinjiang (native) [C and SW Asia, Europe].

1a. Fruiting calyx strongly inflated; capsule teeth spreading or recurved ..... 46a. subsp. *latifolia*

1b. Fruiting calyx slightly inflated; capsule teeth erect ..... 46b. subsp. *alba*

**46a. *Silene latifolia*** subsp. *latifolia*

叉枝蝇子草(原亚种) cha zhi ying zi cao (yuan ya zhong)

*Lychnis divaricata* Reichenbach; *Melandrium boissieri* Schischkin; *Silene alba* (Miller) E. H. L. Krause subsp. *divaricata* (Reichenbach) Walters; *S. pratensis* subsp. *divaricata* (Reichenbach) McNeill & C. Prantice.

Fruiting calyx strongly inflated; capsule teeth spreading or recurved. Seeds with flat surfaces.

Grasslands, scrub grasslands; 1100–1500 m. Xinjiang [SW Asia, S Europe].

**46b. *Silene latifolia*** subsp. *alba* (Miller) Greuter & Burdet, Willdenowia 12: 189. 1982.

白花蝇子草 bai hua ying zi cao

*Lychnis alba* Miller, Gard. Dict., ed. 8, *Lychnis* no. 4. 1768; *L. pratensis* Rafinesque; *Melandrium album* (Miller) Garcke; *Silene alba* (Miller) E. H. L. Krause; *S. pratensis* (Rafinesque) Grenier & Godron.

Fruiting calyx slightly inflated, teeth short; capsule teeth erect. Seeds with concave surfaces.

Liaoning (introduced) [native to C Asia and Europe].

**47. *Silene noctiflora*** Linnaeus, Sp. Pl. 1: 419. 1753.

夜花蝇子草 ye hua ying zi cao

*Elisanthe noctiflora* (Linnaeus) Ruprecht; *Melandrium noctiflorum* (Linnaeus) Fries.

Herbs annual, 30–50(–90) cm tall, densely shortly pubescent. Primary root slightly lignified. Stems erect, simple or sparsely branched, apically glandular hairy. Basal leaves long elliptic-obovate, 5–11 × 2–4 cm, both surfaces villous, midvein and lateral veins prominent, base attenuate into short petiole, half clasping, apex acute; distal leaves subsessile, narrowly elliptic or lanceolate. Dichasial cymes few flowered, glandular hairy; flowers bisexual, ca. 1.5 cm in diam. Pedicel erect, shorter than calyx; bracts lanceolate, glandular hairy. Calyx tubular, 2–2.5(–3) cm × ca. 5 mm, glandular hairy, inflated and ellipsoid at late anthesis, slightly constricted at apex; longitudinal veins 10, violet, reticulate; calyx teeth narrowly lanceolate, 8–10 mm. Androgynophore ca. 2 mm. Petals ca. 2.5 cm; claws slightly exerted beyond calyx, narrowly oblanceolate, glabrous, auricles triangular; limbs pale pink, yellowish below, obovate, ca. 6 mm, deeply bifid to 1/2 to 2/3 of limbs; lobes entire or slightly erose, inrolled at daylight; coronal scales ovoid, small, 2–4-toothed. Stamens included; filaments glabrous. Styles 3, slightly exerted. Capsule ovoid, 1.5–1.8 cm, shorter than calyx. Seeds

dark brown, reniform, ca. 1 mm. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 24$ .

Grasslands; 1300–1800 m. Xinjiang (N of Tian Shan) [Kazakhstan, Russia; SW Asia, Europe].

**48. *Silene conoidea*** Linnaeus, Sp. Pl. 1: 418. 1753.

麦瓶草 mai ping cao

Herbs annual, 25–60 cm tall, shortly glandular hairy. Principal roots slightly lignified. Stems solitary, erect, simple. Basal leaves oblong to linear-lanceolate, cauline leaves linear or lanceolate, 5–8 cm  $\times$  5–10 mm, pubescent, margin ciliate. Dichasial cymes few to many flowered; flowers erect, ca. 2 cm in diam. Calyx green, conical, 2–3 cm  $\times$  3–4.5 mm, umbilicate at base, inflated in fruit, to 3.5 cm, lower part broadly ovoid, 6.5–10 mm in diam., upper part attenuate; longitudinal veins 30, shortly glandular hairy; calyx teeth narrowly lanceolate, ca. 1/3 as long as to longer than calyx, margin narrowly membranous below, ciliate.

Androgynophore to 1 mm, subglabrous. Petals 2.5–3.5 cm; claws included in calyx, narrowly lanceolate, 2–2.5 cm, glabrous, auricles triangular; limbs pink, obovate, ca. 8 mm, margin entire or slightly emarginate, sometimes slightly erose; coronal scales white, narrowly lanceolate, 2–2.5 mm. Stamens and styles included or slightly exerted; filaments sparsely shortly hairy. Styles 3. Capsule pyriform, ca. 15  $\times$  6–8 mm. Seeds dark brown, reniform, ca. 1.5 mm. Fl. May–Jun, fr. Jun–Jul.  $2n = 20$ .

Xinjiang, Xizang [Africa, Asia, Europe].

This species is used medicinally.

**49. *Silene tubulosa*** Oxelman & Lidén in Oxelman et al., Novon 11: 323. 2001.

管花蝇子草 guan hua ying zi cao

Herbs perennial. Rootstock short and sturdy, with a few robust roots, crowned by a few small, sterile leaf rosettes. Stems few, caespitose, erect to ascending, 15–25 cm, with a rather dense mixture of long, glandular hairs and some shorter, reflexed, eglandular hairs. Basal leaves long petiolate with leaf blade decurrent on petiole; petiole 1–4 cm; leaf blade suborbicular to narrowly ovate, 2–5  $\times$  1–4 cm, abaxially glaucous and hairy, especially at veins and margin, adaxially subglabrous, apex obtuse to subacute. Distal leaves shortly petiolate; leaf blade lanceolate to elliptic, 1–2 cm  $\times$  5–10 mm, apex acute. Inflorescence a lax, irregular, unequally branched, 1–10-flowered thyrse; cymules long stalked, 2–4 cm, 1 (or 3)-flowered; bracts lanceolate, small, herbaceous. Pedicel 5–15 mm. Calyx pale green with indistinct veins, campanulate at first, soon becoming  $\pm$  inflated and subglobose, sparsely to densely pubescent; teeth obtuse to subacute at apex. Androgynophore ca. 2 mm, densely woolly. Petals greenish white,  $\pm$  straight and erect, together forming a short tube exerted beyond calyx by 1–3 mm, each petal oblong, narrowed toward hairy base, 9–10 mm, ca. 1.5 mm wide at apex, without distinct lamina, claw, or coronal scales; apex truncate,  $\pm$  irregularly notched or sometimes bifid. Stamens and styles long exerted

beyond petal tube by up to 5 mm. Filaments white; anthers dark brown. Styles 3, greenish white. Seeds unknown.

• Granite boulders in deep shade of *Betula* forests, grassy cliff ledges, steep hillsides; 3600–4100 m. Xizang.

*Silene tubulosa* is not similar to any other species of *Silene*. The name alludes to the petals that together form a small tube protruding from the calyx.

**50. *Silene davidii*** (Franchet) Oxelman & Lidén in Oxelman et al., Novon 11: 322. 2001.

垫状蝇子草 dian zhuang ying zi cao

*Lychnis davidii* Franchet, Nouv. Arch. Mus. Paris, sér.

2, 8: 204. 1885; *Hedona davidii* (Franchet) F. N.

Williams; *Melandrium caespitosum* F. N. Williams;

*Silene caespitosa* Bureau & Franchet (1891), not

Salisbury (1796, nom. illeg., included *S. acaulis*

Linnaeus), nor *S. caespitosa* Steven (1812); *S. kant-*

*zeensis* C. L. Tang.

Herbs perennial, 4–8 cm tall. Roots brown, cylindric, slightly robust, multibranching, multicrowned. Stems densely clustered, very short, simple. Basal leaves oblanceolate-linear, 1–2.5 cm  $\times$  2–3 mm, glabrous, coarsely and shortly ciliate, base attenuate, apex acuminate or acute; cauline leaves 1 or 2 pairs or absent, homomorphic with basal leaves. Flower solitary, erect, 1.5–2 cm in diam. Pedicel shorter than leaves, densely pubescent. Calyx dark violet, narrowly campanulate or cylindric-campanulate, 1.3–1.8 cm  $\times$  3–5 mm, base truncate, violet glandular hairy, longitudinal veins violet; calyx teeth triangular-ovate, margin membranous, ciliate, apex obtuse. Androgynophore ca. 1 mm, glabrous. Petals lilac or pale red, ca. 2 cm; claws narrowly cuneate, glabrous, auricles ovoid; limbs exerted beyond calyx, obovate, bifid deeply to middle; lobes narrowly orbicular, margin entire, sometimes laterally obscurely 1-toothed; coronal scales obovoid, margin entire or lacinate. Stamens included; filaments glabrous. Styles included. Capsule cylindric or conical, ca. 15  $\times$  3.5 mm, slightly longer than calyx. Seeds dark brown, globose-reniform, slightly flattened, ca. 1 mm, subsmooth, keeled. Fl. Jul–Aug, fr. Sep–Oct.

• Alpine meadows; (3500–)4100–4700 m. SE Qinghai, W Sichuan, Xizang, NW Yunnan.

**51. *Silene gracilentia*** H. Chuang in C. Y. Wu et al., Fl. Yunnan. 6: 836. 1995.

纤细蝇子草 qian xi ying zi cao

Herbs perennial, 5–10 cm tall, violet septate hairy throughout. Roots multicrowned. Basal leaves caespitose, linear, (2–) 3–5 cm  $\times$  1–1.5 mm, both surfaces white villous; cauline leaves usually 1–3 pairs, smaller, shorter than basal leaves. Flower solitary. Pedicel 1.5–4.5 mm. Calyx campanulate, 1–1.3 cm  $\times$  5–7 mm, violet glandular hairy; calyx teeth broadly triangular, ca. 3 mm, ciliate, apex obtuse or acute. Androgynophore short, glabrous. Petals pale red, claws narrowly obovate-cuneate, glabrous; limbs exerted



beyond calyx, narrowly obovate, bifid deeply to middle, lobes somewhat band-shaped; coronal scales small, laciniate. Stamens not or slightly exerted; filaments glabrous. Styles 3, 1.5–2 mm. Capsule ovoid. Seeds dark brown, reniform, flattened, ca. 1 mm, keeled. Fl. Aug.

- Stone cliffs; 3700–3800 m. NW Yunnan.

Species nos. 52–80 belong to an informal group roughly equivalent to *Silene* sect. *Physolychnis* (Benth) Bocquet. A major difficulty in dealing with the plants in this group is the rather different appearance of the flowers at early anthesis compared with those at the fruiting stage. In some species the calyx swells considerably, and its pigmentation is dependent on exposure and individual variation. The arbitrary division between the “*Physolychnis*” group and the following “*Odontopetalae*” group (species nos. 81–90) is based solely on the number of styles, which poorly reflects natural relationships.

The species of the “*Physolychnis*” group can be described as follows. Herbs perennial. Stems usually simple, erect to ascending. Basal leaves usually caespitose. Inflorescence a thyrse with very unequal branches, or flower solitary. Flowers hermaphroditic, usually nutant. Calyx often inflated, with 10 veins. Androgynophore short. Petals violet, red, or greenish white; claws with auricles; limbs included or exerted beyond calyx, slightly emarginate, 2- or 4-lobed; coronal scales obvious. Styles 5. Capsule (5 or) 10-toothed. Seeds abaxially either tuberculate, or with a broad wing, or (in *Silene bungei*) with long spinose papillae. The group is widespread in Asia, Europe, and North and South America.

**52. *Silene gonosperma*** (Ruprecht) Bocquet, *Candollea* 22(1): 7. 1967.

隱瓣蠅子草 yin ban ying zi cao

*Physolychnis gonosperma* Ruprecht, *Mém. Acad. Sci. Saint-Pétersbourg*, sér. 7, 14(4): 41. 1869; *Lychnis pumila* Royle ex Benth; *Melandrium pumilum* (Benth) Walpers.

Herbs perennial, 6–20 cm. Roots robust, multicrowned. Stems sparsely caespitose or solitary, erect, simple, densely pubescent, apically glandular hairy. Basal leaves linear-oblongate, 3–6 cm × 4–8 mm, both surfaces pubescent, margin ciliate, base attenuate into petiole, apex obtuse or acute; cauline leaves 1–3 pairs, sessile, lanceolate, smaller. Flowers solitary, rarely 2 or 3, nutant. Pedicel 2–5 cm, densely glandular villous; bracts linear-lanceolate, sparsely ciliate. Calyx campanulate-globose, 1.3–1.5 cm × 7–10 mm, base rounded, villous and glandular hairy; longitudinal veins dark violet, not cohering at apex; calyx teeth triangular, margin membranous, apex obtuse. Androgynophore ca. 1 mm. Petals included or rarely slightly exerted beyond calyx, dark violet; claws cuneate, eciliate, with orbicular auricles; limbs emarginate or shallowly bifid; coronal scales inconspicuous. Stamens included; filaments glabrous. Styles included. Capsule ellipsoid-ovoid, 1–1.2 cm, 10-toothed. Seeds brown, orbicular, flat, 1.5–2 mm in diam. including wing. Fl. Jun–Jul, fr. Aug.

Alpine meadows; (1600–)3000–4400 m. Gansu, Hebei, Qinghai, Shanxi, Xinjiang, Xizang [C Asia].

**53. *Silene himalayensis*** (Rohrbach) Majumdar, *J. Indian Bot. Soc.* 42: 648. 1964.

須彌蠅子草 xu mi ying zi cao

*Melandrium apetalum* (Linnaeus) Fenzl var. *himalayense* Rohrbach, *Linnaea* 36: 220. 1869; *Lychnis apetalum* Linnaeus var. *pallidum* Edgeworth & J. D. Hooker; *L. himalayensis* (Rohrbach) Edgeworth; *L. macrorrhiza* Royle ex Benth; *M. apertum* Pax & K. Hoffmann; *M. himalayense* (Rohrbach) Y. Z. Zhao; *M. macrorrhizum* (Royle ex Benth) Walpers; *M. qomolangmaense* Y. W. Tsui & P. Ke ex L. H. Zhou; *M. souliei* F. N. Williams; *Silene gonosperma* (Ruprecht) Bocquet subsp. *himalayensis* (Rohrbach) Bocquet; *S. madens* Majumdar.

Herbs perennial, 20–80 cm tall. Roots robust. Stems sparsely clustered or solitary, erect, slender, simple, pubescent, apically sparsely glandular hairy. Basal leaves narrowly oblanceolate, 4–10 cm × 4–10 mm, both surfaces pubescent to subglabrous, margin ciliate, base attenuate into petiole, apex acuminate, rarely acute; cauline leaves 3–6 pairs, oblanceolate or linear-lanceolate, base cuneate or attenuate. Flowers 3–7, slightly nutant. Pedicel 1–5 cm, slender, densely pubescent, sparsely glandular hairy; bracts linear-lanceolate, herbaceous, hairy. Calyx ovoid-campanulate, 1–1.2 cm, closed in fruit, densely pubescent, glandular hairy, veins violet, anastomosing and broadly confluent above; calyx teeth triangular, margin membranous, ciliate, apex obtuse. Androgynophore ca. 1 mm. Petals not or slightly exerted beyond calyx, dark red, ca. 1 cm; claws cuneate, glabrous, auricles not obvious; limbs shallowly bifid at apex; coronal scales small. Stamens included; filaments glabrous. Styles included. Capsule ovoid, 8–10 mm, shorter than calyx, 10-toothed. Seeds brown, orbicular, flat, ca. 1.5 mm in diam. including wing. Fl. Jun–Jul, fr. Jun–Aug.

Scrub, alpine meadows; 2000–5000 m. Hebei, Hubei, Shaanxi, Sichuan, Xizang, Yunnan [Afghanistan, Bhutan, Nepal, Pakistan, Sikkim].

This species is distinct from *Silene gonosperma* by its more floriferous inflorescence and smaller, more inflated calyx with peculiar venation.

**54. *Silene zhongbaensis*** (L. H. Zhou) C. Y. Wu & C. L. Tang, *Flora Reipubl. Popularis Sin.* 26: 314. 1996.

仲巴蠅子草 zhong ba ying zi cao

*Melandrium zhongbaense* L. H. Zhou in C. Y. Wu, *Fl. Xizang*. 1: 722. 1983.

Herbs perennial, 10–20 cm tall, densely pubescent or sparsely glandular hairy. Roots conical, slender. Stems clustered, simple. Basal leaves caespitose, oblanceolate, 3–5 cm × 3–6 mm, both surfaces shortly pubescent, base attenuate into long petiole, apex obtuse; cauline leaves 2 or 3 pairs, lanceolate, smaller than basal leaves,

broadly cuneate at base, sessile. Flowers (1–)3–8. Bracts lanceolate, densely glandular hairy. Pedicel 2–8 mm, densely villous with pallid hairs. Calyx narrowly campanulate, 7–13 mm, densely glandular hairy; calyx teeth triangular, margin membranous, ciliate, apex obtuse; veins dark violet, robust, reticulate.

Androgynophore ca. 1 mm. Petals violet, subequaling or slightly longer than calyx; claws cuneate, ciliate, auricles minute, limbs bifid; lobes truncate at apex, each with a lateral tooth; coronal scales ligulate. Stamens included. Capsule not seen. Fl. Jul–Aug.

• 4700–5200 m. SW Xizang (Zhongba Xian).

**55. *Silene Zhoui*** C. Y. Wu in C. L. Tang, Fl. Reipubl. Popularis Sin. 26: 315. 1996.

耐国蝇子草 nai guo ying zi cao

*Melandrium integripetalum* L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 715. 1983, not *Silene integripetala* Bory & Chaubard (1832).

Herbs perennial, 8–15 cm tall. Root crowns slender, multibranching. Stems clustered, densely glandular villous. Cauline leaves 4 or 5 pairs, oblanceolate, 1.5–4 cm × 5–8 mm, both surfaces densely glandular hairy, base cuneate, attenuate into petiole, apex obtuse or mucronulate. Flowers 1–4. Pedicel 1.5–10 mm, densely glandular hairy; bracts lanceolate, glandular hairy. Calyx campanulate, 1.3–1.5 cm, glandular hairy; longitudinal veins 10, violet, cohering at apex, densely glandular hairy; calyx teeth triangular, margin membranous, ciliate. Androgynophore short. Petals slightly exerted beyond calyx, ca. 1.5 cm; claws narrowly cuneate, glabrous; limbs pale violet, flat-orbicular, margin nearly entire; coronal scales square. Stamens included; filaments glabrous. Styles linear, ca. 5 mm. Capsule not seen. Fl. Aug.

• Grasslands; ca. 5000 m. S Xizang (Lhasa Shi).

This species differs from *Silene nigrescens* in its less divided petals and different habitat requirements.

**56. *Silene nigrescens*** (Edgeworth) Majumdar, J. Indian Bot. Soc. 42: 647. 1964.

变黑蝇子草 bian hei ying zi cao

Herbs perennial, 10–15 cm tall. Stems few to several from a creeping branched base, ascending, simple, glandular hairy. Basal leaves caespitose, pale green or dark green, linear or narrowly oblanceolate, 3–6 cm × 2–4(–10) mm, both surfaces sparsely hairy, ciliate at base, base attenuate into petiole, apex acute; cauline leaves usually 2–4, linear or narrowly oblanceolate. Flowers solitary, rarely 2 or 3, slightly nutant. Pedicel 8–20 mm, densely glandular villous; bracts lanceolate, herbaceous. Calyx globose, saccate, 1.8–2 × 1.2–1.6 cm, membranous, slightly contracted at mouth, with prominent dark violet veins, densely glandular villous, loose in fruit; calyx teeth broadly triangular, ca. 5 × 6

mm, margin membranous, glandular ciliate.

Androgynophore 1.5–2 mm, woolly. Petals exerted 3–5 mm beyond calyx, blackish violet; claw obovate, ca. 10 × 5 mm, auriculate, ciliate at base; limbs broadly obovate, ca. 5 × 4–5 mm, shallowly bifid; lobes dentate with small round teeth; coronal scales truncate at apex, dentate with round teeth. Filaments ± hairy at base; anthers dark violet. Styles slightly exerted. Capsule subglobose, ca. 2 cm in diam., shorter than calyx, 5–10-toothed at apex. Seeds brown, triangular-reniform, flat, ca. 1.8 mm including wing. Fl. and fr. Jul–Sep.

Alpine meadows, gravelly grasslands, shifting screes; 3000–4500 m. SW Sichuan, S Xizang, NW Yunnan [Bhutan, Myanmar, Nepal, Sikkim].

1a. Leaves 2–4 mm wide, linear 56a. subsp. *nigrescens*

1b. Leaves 5–10 mm wide, narrowly lanceolate ..... 56b. subsp. *latifolia*

**56a. *Silene nigrescens*** subsp. *nigrescens*

变黑蝇子草(原亚种) bian hei ying zi cao (yuan ya zhong)

*Lychnis nigrescens* Edgeworth in J. D. Hooker, Fl. Brit. India 1: 223. 1874; *Melandrium nigrescens* (Edgeworth) F. N. Williams.

Leaves linear, 2–4 mm wide.

Alpine meadows; 3800–4200 m. S Xizang (Yadong Xian) [Bhutan, Myanmar, Nepal, Sikkim].

**56b. *Silene nigrescens*** subsp. *latifolia* Bocquet, Candollea 22(1): 16. 1967.

宽叶变黑蝇子草 kuan ye bian hei ying zi cao

Leaves narrowly lanceolate, 5–10 mm wide. Fl. Jul–Aug, fr. Aug–Sep.

• Gravelly grasslands, shifting screes; 3000–4500 m. SW Sichuan, NW Yunnan.

**57. *Silene chodatii*** Bocquet, Candollea 22(1): 18. 1967.

球萼蝇子草 qiu e ying zi cao

Herbs perennial, 4–25 cm tall. Roots robust, multicrowned. Stems clustered, robust, ascending, simple, glandular villous, with leaf remnants at base. Basal leaves caespitose, narrowly linear or linear, 5–10 cm × 2–5 mm, both surfaces glabrous or glandular villous, base slightly clasping, apex acute; cauline leaves 2–6 pairs, homomorphic with but smaller than basal leaves. Flowers 1–3, slightly nutant, suberect in late anthesis. Pedicel 3–4 cm, glandular hairy. Calyx globose, inflated, 1.5–2.5 × 1.2–1.8 cm, umbilicate at base, open at apex; veins cohering at apex, dark brown- or dark violet glandular hairy; calyx teeth broadly triangular, margin glandular ciliate. Androgynophore 2–4 mm, violet woolly-hairy. Petals exerted 6–7 mm beyond calyx, dark violet; limbs 7–9 × 8–11 mm, deeply bifid; lobes with lobules unequal in size or dentate with weak round teeth, basal part 1-toothed on both sides; coronal scales nearly cuneate, ca. 2 mm, margin weakly dentate, apex truncate or obtuse. Stamens slightly exerted; filaments long woolly-hairy at base. Styles slightly exerted. Capsule ovoid, 1.8–2 × ca. 1.3 cm, usually 5-toothed. Seeds dark brown, flat, 1.5–2 mm in diam. including wing. Fl. Aug–Sep.

- Cliffs, stone fissures; 2700–4300 m. SW Sichuan, NW Yunnan.

- 1a. Leaves 2–6 mm wide; calyx 1.8–2.5 cm  
 ..... 57a. var. *chodatii*  
 1b. Leaves 1–2 mm wide; calyx 1.5–1.8 cm  
 ..... 57b. var. *pygmaea*

**57a. *Silene chodatii* var. *chodatii***

球萼蝇子草(原变种) qiu e ying zi cao (yuan bian zhong)

Stems 10–25 cm tall. Leaves 5–10 cm × 2–6 mm, glabrous. Calyx 1.8–2.5 cm. Androgynophore ca. 2 mm.

- Stone fissures; 2700–3300 m. NW Yunnan (Lijiang Naxi Zu Zizhixian).

This variety is similar to *Silene stewartiana*, but has fewer flowers, a more rounded calyx, and 5 styles.

**57b. *Silene chodatii* var. *pygmaea* Bocquet, Candollea 22: 19. 1967.**

矮球萼蝇子草 ai qiu e ying zi cao

*Silene graminoides* C. Y. Wu & C. L. Tang.

Stems 4–10 cm tall. Leaves 3–5 cm × 0.8–2 mm, glandular villous. Calyx 1.5–1.8 cm. Androgynophore to 4 mm.

- Cliffs; 3700–4300 m. SW Sichuan (Muli Zang Zu Zizhixian), NW Yunnan (Dêqên Xian, Zhongdian Xian).

**58. *Silene namlaensis* (Marquand) Bocquet, Candollea 22: 19. 1967.**

墨脱蝇子草 mo tuo ying zi cao

*Lychnis namlaensis* Marquand, J. Linn. Soc., Bot. 48: 164. 1929; *Melandrium namlaense* (Marquand) Pax & K. Hoffmann.

Plants perennial, 15–40 cm tall, with violet multicellular glandular hairs throughout. Rootstock robust, lignified, brown, without stolons. Stems clustered, erect, simple, basally usually violet. Cauline leaves 2–6 pairs, narrowly orbicular or lanceolate, 3–7 cm × 5–12 mm, glandular villous, midvein prominent, base cuneate, apex acute. Flowers 1–3, slightly nutant, erect in late anthesis. Pedicel 3–5 cm, densely glandular villous; bracts lanceolate. Calyx cylindrical-campanulate, slightly inflated-saccate, 2.3–2.7 × 1–1.5 cm, densely violet glandular hairy, open at apex; longitudinal veins dark violet, hairy; calyx teeth broadly triangular, 4–6 mm, margin ciliate, apex acute. Androgynophore ca. 5 mm, villous. Petals exserted 3–6 mm beyond calyx, violet; claws cuneate, ca. 15 × 6 mm, with auricles, subglabrous at base; limbs square, shallowly 4–6-lobed, lobes rounded or lacinate; coronal scales broad, rounded to slightly erose. Stamens slightly exserted beyond corolla throat; filaments glabrous. Styles included. Capsule ovoid. Seeds probably winged. Fl. Aug–Sep.

- Alpine grasslands; 3600–4500 m. C and SE Xizang.

**59. *Silene atsaensis* (Marquand) Bocquet, Candollea 22: 20. 1967.**

阿扎蝇子草 a zha ying zi cao

*Lychnis atsaensis* Marquand, J. Linn. Soc., Bot. 48: 163. 1929; *Melandrium atsaense* (Marquand) Pax & K. Hoffmann.

Herbs creeping and branched at base, ascending with 10–20 cm tall flowering stems, densely glandular hairy throughout. Leaves oblanceolate, 3–5 × 1–1.5 cm, both surfaces and margin densely glandular villous, base attenuate, apex acute or obtuse. Flowers 1–3. Pedicel 1–4 cm. Calyx cylindrical-campanulate, membranous, saccate, 2–2.5 × 1–1.5 cm, densely violet glandular hairy; longitudinal veins violet or dark violet, cohering at apex, with violet glandular hairs; calyx teeth ovate-triangular, 3–4 mm, ciliate, apex obtuse.

Androgynophore 2–5 mm, hairy. Petals exserted 6–9 mm beyond calyx, white or lilac; claws usually violet, narrowly cuneate, ca. 1.8 cm, ca. 6 mm wide at apex, auriculate, ± hairy at base; limbs suborbicular, 6–8 mm, deeply 4-lobed to middle; median lobes broad, shallowly 2-lobed; lateral lobes linear; coronal scales nearly cupuliform with small round teeth at apex.

Stamens slightly exserted; filaments glabrous, sometimes sparsely villous at base. Styles included. Capsule ovoid, 1.3–1.7 cm, 10-toothed. Seeds flat, with broad wings, yellowish brown, orbicular-reniform, ca. 1.8 × 1.5 mm. Fl. Aug, fr. Aug–Sep.

- Alpine grassland, shifting screes; 4200–4500 m. C and E Xizang.

**60. *Silene wardii* (Marquand) Bocquet, Candollea 22: 20. 1967.**

林芝蝇子草 lin zhi ying zi cao

*Lychnis wardii* Marquand, J. Linn. Soc., Bot. 48: 165. 1929; *Melandrium wardii* (Marquand) Pax & K. Hoffmann.

Stems violet, ascending from ± procumbent base, 10–15(–22) cm tall, sparsely clustered, usually simple, densely glandular hairy. Basal leaves withered at anthesis; cauline leaves usually 4 or 5 pairs, sessile, elliptic, 2–3(–4.5) × 1–1.5(–2) cm, both surfaces and margin glandular hairy, apex acute. Flowers solitary, rarely 2 or 3. Pedicel 1.5–2 cm, densely glandular hairy. Calyx ovoid-campanulate, 2–2.5 × 1–1.4 cm, umbilicate below, open at apex, densely violet glandular hairy at veins; calyx teeth violet, elliptic, 5–7 mm, margin glandular ciliate, apex obtuse.

Androgynophore 3–4 mm, long lanate-villous. Petals exserted 8–10 mm beyond calyx, pale violet; claws 1.7–1.8 cm; limbs glandular hairy, deeply bifid; lobes dentate or with small round teeth; coronal scales cuneate, truncate at apex, erose. Stamens ca. 1 cm; filaments woolly-hairy basally. Styles short. Capsule ovoid, 1.2–1.5 cm, 5-toothed. Seeds pale brown, orbicular-reniform, flat, ca. 2 mm, winged.

- Shifting screes, sandy gravelly deltas of glacier streams; ca. 4200 m. SE Xizang.

This species is unique in its group in its hairy petal limbs. The type sheet bears the field note “limb dark slaty blue, pink at margin, coronal scales crimson.”

**61. *Silene karekirii* Bocquet, Candollea 22: 10. 1967.**

污色蝇子草 wu se ying zi cao

*Lychnis sordida* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 170. 1842, not *Silene sordida* Huber-Morath & Reese (1943); *Melandrium sordidum* (Karelin & Kirilov) Rohrbach; ?*M. verrucosolatum* Y. Z. Zhao & P. Ma.

Herbs 30–45 cm tall. Rootstock conical, multicrowned. Stems several, rarely solitary, erect, basally nearly glabrous, apically densely glandular pubescent. Basal leaves and proximal cauline leaves oblanceolate, 5–12 cm × 5–11 mm, both surfaces sparsely hairy, margin glandular ciliate, midvein prominent, base attenuate into petiole, apex acuminate; cauline leaves 2–5 pairs, narrowly lanceolate, base attenuate into short petiole or sessile, apex acute. Flowers (1–)2–7, slightly nutant or erect. Pedicel 5–15 mm, slender, shortly glandular. Calyx narrowly campanulate, 1.7–2.3 cm × 8–10 mm, open at apex; longitudinal veins dark violet, robust, shortly glandular hairy. Androgynophore ca. 4 mm, shortly hairy. Petals dark violet; claws exerted beyond calyx by ca. 2 mm, cuneate, with obtuse auricles, glabrous (or nearly so) at base, limbs deeply bifid; lobes orbicular, with irregular round teeth at apex, narrowly 1-toothed on two sides; coronal scales small, margin crenulate. Styles 5, exerted. Capsule globose-ovoid, ca. 1.5 cm. Seeds flat. Fl. Jul.

Mountain grasslands; ca. 3000 m. W Xinjiang [Kazakhstan].

**62. *Silene puranensis*** (L. H. Zhou) C. Y. Wu & H. Chuang in C. L. Tang, Fl. Reipubl. Popularis Sin. 26: 321. 1996.

普兰蝇子草 pu lan ying zi cao

*Melandrium puranense* L. H. Zhou in C. Y. Wu, Fl. Xizang. 1: 718. 1983.

Herbs perennial, 10–30 cm tall. Roots multicrowned. Stems sparsely clustered, ascending from ± weak and creeping base, glandular hairy. Non-flowering leafy shoots present at base. Leaves oblanceolate, 4–7 cm × 6–15(–20) mm, both surfaces with short glandular hairs, margin glandular hairy, base attenuate into petiole, apex acute; cauline leaves usually 2 or 3 pairs, smaller than basal leaves, lanceolate, 2–3 cm, densely glandular hairy, base nearly sessile, slightly clasping. Flowers 1–3. Pedicels unequal, 1.5–7 cm, densely glandular hairy; bracts ovate-lanceolate, 5–10(–15) mm, herbaceous, glandular villous. Calyx greenish, campanulate, 1–1.5 cm × ca. 8 mm, membranous; veins dark violet glandular hairy, cohering at calyx teeth; calyx teeth broadly ovate-triangular, margin membranous, apex obtuse. Androgynophore ca. 1 mm, white woolly-hairy. Petals ca. 1.5 cm; claws narrowly oblanceolate, woolly-hairy at base, auricles not obvious; limbs exerted beyond calyx, orbicular, shallowly bifid; lobes obtuse, each with a narrow lateral tooth; coronal scales small. Stamens shorter than or nearly as long as petals. Styles 4 or 5. Capsule ellipsoid, ca. 1 cm, shorter than or subequaling calyx, 10-toothed. Seeds suborbicular or irregularly shaped, flat, 1–1.2 mm wide, smooth, winged. Fl. Jul, fr. Aug.

• Shifting screes; ca. 5000 m. SW Xizang (Burang Xian).

**63. *Silene bungei*** Bocquet, Candollea 22: 15. 1967.

暗色蝇子草 an se ying zi cao

*Lychnis tristis* Bunge in Ledebour, Fl. Altaic. 2: 184. 1830, not *Silene tristis* Salisbury (1796, nom. illeg., included *S. undulata* Aiton); *Melandrium triste* Fenzl ex Ledebour.

Herbs perennial, (15–)25–40(–50) cm tall. Roots vertical, gray-brown, robust, lignified; root crowns multibranching, slightly lignified, with procumbent stems. Stems sparsely caespitose, erect, pale yellowish green, ± black at apex, simple, basally glabrous, apically hirtellous with intermixed black glandular hairs. Basal leaves oblanceolate or linear-oblanceolate, 4–10 cm × 6–10 mm, base attenuate into petiole, apex obtuse or acute; cauline leaves 1–4 pairs, narrowly elliptic, smaller than basal leaves, nearly sessile, slightly sheathed, both surfaces glabrous, ciliate, hairy at veins abaxially, midvein prominent; distal leaves narrowly lanceolate, sometimes withered, coarsely glandular hairy. Flowers solitary, sometimes 2 or 3, nutant, erect in late anthesis. Pedicel subequaling calyx, elongating in late anthesis, viscid, villous. Calyx globose-campanulate, saccate, 1.8–2.2 × 1.2–1.5 cm, membranous, sparsely robust glandular hairy, contracted at apex, opened in late anthesis; veins dark violet, with brown-violet glandular hairs, coherent at calyx teeth; calyx teeth triangular, margin ciliate, apex acute. Androgynophore 2–3 mm, villous. Petals exerted 1–3 mm beyond calyx, dark violet; claws 1.4–1.6 cm, cuneate, with narrow auricles, limbs emarginate or shallowly bifid; lobes entire or shallowly toothed, rarely 1-toothed obscurely at base of two sides; coronal scales small, cuneate, with minute teeth at apex. Stamens included. Styles 5. Capsule orbicular, 1.2–1.5 × 1–1.4 cm, 5-toothed. Seeds dark brown, reniform, ca. 1.4 mm, thick, flat, with prominent papillae abaxially. Fl. Jun–Jul.

Alpine grasslands, shifting screes; 4000–5300 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia].

**64. *Silene rubricalyx*** (Marquand) Bocquet, Candollea 22: 15. 1967.

红萼蝇子草 hong e ying zi cao

*Lychnis rubricalyx* Marquand, J. Linn. Soc., Bot. 48: 164. 1929; *Melandrium rubricalyx* (Marquand) Pax & K. Hoffmann.

Herbs perennial, 5–15(–20) cm, with procumbent stems, rooting at nodes. Stems sparsely caespitose, erect, simple, densely violet glandular hairy. Basal leaves ovate or narrowly oblanceolate, 2.5–5 cm × 7–13 mm, subglabrous to sparsely villous with long hairs, especially toward margin, apex acute or nearly so; cauline leaves 1 or 2 pairs, elliptic, smaller, 1–3 cm × 4–6 mm. Flowers 1–3, slightly nutant, erect after anthesis. Pedicel 2.5–3 cm, glandular villous; bracts lanceolate, glandular hairy. Calyx campanulate or cylindric-campanulate, membranous, saccate, 1.3–1.7 cm × 8–10 mm, densely glandular villous, umbilicate at

base, open at apex, inflated in fruit, longitudinal veins brown or dark violet; calyx teeth broadly triangular, ca. 4 mm, weakly hairy, margin ciliate. Androgynophore ca. 3 mm, woolly-hairy. Petals exerted ca. 7 mm beyond calyx; claws pale red, exerted 2–3 mm beyond calyx, 1.3–1.4 cm × 5–6 mm, cuneate, with triangular-ovate auricles above, villous at base; limbs spreading, violet or dark violet, broadly ovate, ca. 5 mm, 4-lobed or deeply so, medial lobes with minute laciniae or round teeth; lateral lobes dentate or linear, smaller; coronal scales broadly cuneate, 1–1.5 mm, lacinate or dentate. Stamens slightly exerted beyond corolla throat; filaments villous at base. Styles not exerted. Capsule globose or ellipsoid, 7–10 × 6–8 mm, shorter than calyx, 5-toothed. Seeds brown, slightly flattened, ca. 1.5 mm, lustrous, abaxially faintly tuberculate. Fl. Aug–Sep, fr. Aug–Sep.

• Alpine meadows; 3400–3600 m. SW Sichuan, E Xizang.

**65. *Silene songarica*** (Fischer, C. A. Meyer & Avé-Lallemant) Bocquet, *Candollea* 22: 3. 1967.

准噶尔蝇子草 *zhun ga er ying zi cao*

*Melandrium songaricum* Fischer, C. A. Meyer & Avé-Lallemant, *Index Sem. Hort. Petrop. Suppl.* 9: 14. 1844; *Lychnis brachypetala* Fischer ex Hornemann; *L. mongolica* Maximowicz; ?*Melandrium auritipetalum* Y. Z. Zhao & P. Ma; *M. baicalense* Sukaczew ex Tolmatchew; *M. brachypetalum* (Fischer ex Hornemann) Fenzl; *M. irikutense* Kitagawa; *M. mongolicum* (Maximowicz) Grubov; *Silene duthiei* Majumdar.

Herbs perennial, 15–60 cm tall, densely pubescent throughout. Principal root slender, slightly lignified. Stems caespitose, erect, simple. Basal leaves narrowly lanceolate, 3–9 cm × 3–10 mm, ciliate, base attenuate into petiole, apex acuminate; cauline leaves 3–5 pairs, sessile, linear-lanceolate. Inflorescence 2–6-flowered, rarely more; flowers nutant in early anthesis, soon becoming erect. Pedicel (2–)5–15 mm; bracts linear-lanceolate, herbaceous. Calyx narrowly campanulate, 1.2–1.5 cm × 5–7 mm, densely pubescent, sparsely glandular hairy; longitudinal veins dark green, not cohering at apex; calyx teeth triangular, margin membranous, white, ciliate, apex acute.

Androgynophore ca. 1 mm, shortly pubescent. Petals white or pale red, subequaling or longer than calyx, 1.1–1.3 cm; claws oblanceolate, auricles orbicular; limbs obovate, shallowly bifid, with or without a couple of lateral teeth; coronal scales small. Stamens included; filaments glabrous. Styles included. Capsule ellipsoid-ovoid, 1–1.2 cm, shorter than calyx. Seeds dark brown, reniform, 0.8–1 mm, tuberculate. Fl. Jun–Jul, fr. Jul–Aug.

Gravelly scrub grasslands, alpine meadows; 2000–4700 m. Jilin, Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia].

**66. *Silene nangqenensis*** C. L. Tang, *Acta Bot. Yunnan.* 2: 433. 1980.

囊谦蝇子草 *nang qian ying zi cao*

*Melandrium glandulosum* (Maximowicz) F. N. Williams var. *hexapetalum* Y. W. Tsui & L. H.

Zhou; ?*M. glandulosum* var. *longistylum* Y. W. Tsui & L. H. Zhou.

Herbs perennial, 15–30 cm tall, densely glandular hairy throughout. Roots spiniform or conical, slightly fleshy. Stems sparsely clustered or solitary, erect, simple. Basal leaves elliptic-oblanceolate, rarely saccate, 4–8 × 1–1.5 cm, midvein prominent, base cuneate or attenuate, apex acute, rarely rounded; cauline leaves often 1–3 pairs, smaller than basal leaves. Flowers few, slightly nutant, erect in late anthesis. Pedicel 1–5 cm, densely glandular hairy; bracts lanceolate, 5–10 mm, glandular hairy. Calyx broadly campanulate, slightly saccate, ca. 1.5 × 1 cm, rounded at base, open at apex; longitudinal veins slightly robust, dark violet, glandular hairy; calyx teeth broadly triangular-ovate, ca. 3 mm, margin membranous, white, shortly ciliate, apex acute.

Androgynophore ca. 2 mm, glabrous. Petals slightly exerted beyond calyx; claws nearly cuneate, ciliate at base, auricles obtuse; limbs broadly obovate, deeply bifid; lobes narrowly elliptic, apex obtuse, emarginate or shallowly bifid, shortly 1-lobed or weakly toothed on two sides; coronal scales flabellate, lacinate. Stamens slightly exerted; filaments hairy. Styles included. Capsule ovoid, ca. 1.2 cm, 10-toothed. Seeds brown, globose-reniform, ca. 1 mm. Fl. Jul, fr. Aug.

• Alpine meadows; 4200–4600 m. S Qinghai, E Xizang.

**67. *Silene nepalensis*** Majumdar, *J. Indian Bot. Soc.* 42: 649. 1964.

尼泊尔蝇子草 *ni po er ying zi cao*

*Lychnis multicaulis* Wallich ex Benth; *Melandrium brachypetalum* (Hornemann) Fenzl var. *tibetanum* Rohrbach; *M. multicaule* (Wallich ex Benth) Walpers.

Herbs perennial, 10–50 cm tall. Roots robust, multicrowned. Stems caespitose, erect, simple, densely pubescent. Basal leaves linear-lanceolate, 3–14 cm × 3–7 mm, midvein prominent, glabrous or subglabrous, base attenuate into petiole, ± connate, apex acuminate; distal leaves sessile, homomorphic with basal leaves, ± connate at base, both surfaces and margin pubescent. Inflorescence an irregular elongate thyrsoid with (short-and) long stalked densely 3–7-flowered cymules; flowers nutant, erect in late anthesis. Pedicel 5–10 mm in fruit, densely pubescent; bracts linear, pubescent. Calyx cylindrical-campanulate in early anthesis, 7–9 × 3–4 mm, soon becoming broader as capsule swells, densely pubescent, round at base, open at apex; longitudinal veins dark violet or deep greenish brown, not raised, usually cohering at calyx teeth.

Androgynophore to 1 mm, pubescent. Petals exerted 2–3 mm beyond calyx, violet; claws broadly cuneate, 6–8 mm, subglabrous at base, very broadly auriculate; limb 1.5–2 mm long and slightly broader, emarginate or bifid, lobes entire or usually with obscure lateral teeth; coronal scales small, nearly round, obtuse or emarginate at apex. Stamens included; filaments subglabrous. Styles included. Capsule ovoid-ellipsoid,

8–10 mm. Seeds grayish brown, reniform, ca. 0.8 mm, tuberculate. Fl. Jul–Aug, fr. Aug.

Mountain grasslands; 2700–5100 m. Qinghai, Sichuan, Xizang, Yunnan [Bhutan, ?Kashmir, Nepal, ?Pakistan, Sikkim].

**68. *Silene kialensis*** (F. N. Williams) Lidén & Oxelman in Oxelman et al., *Novon* 11: 322. 2001.

甲拉蝇子草 *ji la ying zi cao*

*Melandrium kialense* F. N. Williams, *J. Linn. Soc., Bot.* 34: 432. 1899; *Lychnis kialensis* (F. N. Williams) H. Léveillé; *Silene nepalensis* Majumdar var. *kialensis* (F. N. Williams) C. L. Tang ex C. Y. Wu.

Herbs perennial, 30–60 cm tall. Stems few or solitary, erect, with sparse to dense, strict erect branches, pubescent, very rarely glabrous. Basal leaves (ob)lanceolate, 6–10 × 1–2 cm, base attenuate into short petiole, apex acute; cauline leaves lanceolate or narrowly oblanceolate. Inflorescence an irregular thyrsoid with long stalked, usually 3-flowered cymules; flowers slightly nutant. Pedicel usually shorter than calyx, rarely longer, densely pubescent, sometimes with a few glandular hairs. Calyx narrowly campanulate to ovoid, narrowed at base, 1–1.2 cm × 3–3.5 mm, soon becoming broader as capsule swells; veins slightly raised, pubescent. Androgynophore 1.5–2 mm, pubescent. Petals dark red, rarely white; claws usually conspicuously exerted beyond calyx (but cleistogamous forms occur), oblanceolate, 8–10 mm, hairy at base; auricles prominent, orbicular; limb 3–4 mm, deeply bifid to middle, sometimes with short lateral lobes. Stamens included or slightly exerted. Styles 5, included. Capsule ellipsoid, ca. 1 cm. Seeds gray, globose-reniform, ca. 1.2 mm, minutely tuberculate.

• Forest margins, grasslands; 1800–4000 m. Gansu, Qinghai, Sichuan, SE Xizang.

This species is very similar to, and possibly sometimes confused with, *Silene chungtienensis*, but has prominent petal claw auricles and very few or no glandular hairs.

*Melandrium kialense* was not treated by Bocquet (1969) in his revision of *Silene* sect. *Physolychnis*. The taxon is close to *S. songarica*, but differs in calyx size (10–12 mm, vs. 12–15 mm in *S. songarica*), 4-fid petal limbs with subequal lobes (vs. 2-fid, or 2-fid with small, lateral teeth), poorly developed petal claw auricles, and longer androgynophore (1.5–2 mm, vs. only to 1 mm). We also find a difference in calyx pubescence: *S. kialensis* has spreading, stiff hairs, whereas *S. gonosperma* has retrorse, shorter hairs.

**69. *Silene chungtienensis*** W. W. Smith, *Notes Roy. Bot. Gard. Edinburgh* 11: 221. 1920.

中甸蝇子草 *zhong dian ying zi cao*

*Melandrium chungtienense* (W. W. Smith) Pax & Hoffmann; *Silene flavovirens* C. Y. Wu.

Herbs perennial, (15–)30–60 cm tall. Stems sparsely clustered or solitary, erect, simple or sparsely branched at base, pubescent. Basal leaves elliptic-lanceolate or narrowly oblanceolate, 6–10 × 0.8–3 cm, both surfaces glabrous or pubescent, base attenuate into short petiole, apex acute; cauline leaves numerous, lanceolate or narrowly oblanceolate. Inflorescence a racemiform-

conical irregular thyrsoid; cymules with short to long rachis, usually 3-flowered; flowers slightly nutant. Pedicel usually shorter than calyx, rarely longer, densely villous or sparsely glandular hairy; bracts linear-lanceolate, sparsely hairy. Calyx narrowly campanulate, narrowed at base, 1–1.2 cm × 3–3.5 mm, soon becoming broader as capsule swells; veins violet or green, slightly raised, pubescent; calyx teeth triangular, ca. 3 mm, margin membranous, ciliate, apex acute or obtuse. Androgynophore 1.5–2 mm, pubescent. Petals dark red, rarely white; claws oblanceolate, 8–10 mm, hairy at base; auricles not prominent (claw at apex not or only slightly broader than limb), with erose margin; limb 3–4 mm, shallowly to deeply (to middle) bifid, with lateral triangular small teeth or small lobes; coronal scales subflabellate, ca. 1 mm. Stamens included or slightly exerted. Styles 5, included. Capsule ellipsoid, ca. 1 cm. Seeds gray, globose-reniform, ca. 1.2 mm, minutely tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

• Moist rocks; 2800–3600 m. NW Yunnan.

In the original description, Smith incorrectly indicated 3 (rather than 5) styles.

Photographs of the type material of *Silene flavovirens* (described from Luquan Xian, NC Yunnan) agree well with *S. chungtienensis*, except for their shorter stems. The petal color is variable in natural populations of *S. chungtienensis*, as well as among the types of *S. flavovirens*, and so that character cannot be used to distinguish them. *Silene flavovirens* was, however, described as having a glabrous androgynophore.

**70. *Silene yetii*** Bocquet, *Candollea* 22: 5. 1967.

腺毛蝇子草 *xian mao ying zi cao*

*Lychnis glandulosa* Maximowicz, *Fl. Tangut.* 83. 1889, not *Silene glandulosa* Hampe ex Walpers (1842), nor Bertoloni (1884); *Melandrium glandulosum* (Maximowicz) F. N. Williams.

Herbs perennial, 20–60 cm tall, densely glandular hairy throughout. Principal root vertical, robust, slightly lignified. Stems sparsely caespitose, rarely solitary, erect, robust, simple. Basal leaves oblanceolate or elliptic-lanceolate, 5–10(–13) × 1–2(–2.5) cm, both surfaces glandular hairy, midvein prominent, base attenuate into long petiole; cauline leaves oblanceolate or lanceolate, 3–5 cm × 5–15 mm, half clasping at base. Inflorescence racemiform, usually 3–5-flowered, rarely more; flowers slightly nutant, erect in late anthesis. Pedicel 5–50 mm; bracteoles linear-lanceolate, 5–7 mm, herbaceous. Calyx campanulate, 1.1–1.5 cm × 6–9 mm, densely glandular hairy, rounded at base, open at apex, slightly inflated in fruit; longitudinal veins dark brown or brown, coherent at calyx teeth, glandular hairy; calyx teeth ovate-triangular, margin membranous, white, ciliate, apex obtuse. Androgynophore 1–1.5 mm. Petals exerted 5–6 mm beyond sepals, violet or pale red; claws nearly cuneate, auricles orbicular, glabrous or sparsely hairy; limbs nearly elliptic, ca. 3 mm, shallowly bifid; lobes narrowly elliptic; coronal scales round, small. Stamens included; filaments hairy. Styles

included. Capsule ovoid, 1.2–1.4 cm × 9 mm, shorter than calyx. Seeds gray-brown, reniform, ca. 1 mm, tuberculate. Fl. Jul, fr. Aug.

• Gravelly grasslands, alpine grasslands; 2700–4800(–5000) m. Gansu, Qinghai, Sichuan, Xizang.

**71. *Silene herbilegorum*** (Bocquet) Lidén & Oxelman in Oxelman et al., *Novon* 11: 322. 2001.

多裂腺毛蝇子草 *duo lie xian mao ying zi cao*

*Silene yetii* Bocquet var. *herbilegorum* Bocquet, *Candollea* 22: 5. 1967.

Herbs perennial, densely glandular hairy throughout, with sterile basal rosettes and a few flowering stems. Stems sparsely caespitose, rarely solitary, erect, robust, 30–60 cm tall, simple, with very long internodes above. Rosette leaves obovate, 2–4 × 0.5–1.5 cm, both surfaces glandular hairy, base attenuate into distinct petiole; cauline leaves oblanceolate to lanceolate, 3–7 × 0.5–1 cm, becoming smaller upward, base half clasping. Inflorescence 5–10-flowered, racemiform with unequal branches that become very strict and erect and elongated in fruit; cymules 1–3-flowered; flowers nutant at first, becoming erect in late anthesis. Pedicel 4–10 mm, elongating in fruit to 1–3 cm; bracteoles linear-lanceolate, herbaceous, 5–7 mm. Calyx narrowly campanulate, 9–11 × 5–7 mm, densely glandular hairy, longitudinal veins dark brown or brown, glandular hairy. Androgynophore ca. 1 mm, pubescent. Petal claws slightly exerted, cuneate, auricles prominent; limbs dark red, 2–3 mm, shallowly 4-fid. Stamens included; filaments hairy at base. Styles included. Capsule ovoid, ca. 9 × 5 mm, equaling calyx. Seeds gray, ca. 1 mm, tuberculate.

• Alpine grasslands; 2700–4100 m. Sichuan, NW Yunnan.

This species is close to *Silene yetii*, but the inflorescence has 5–10 flowers (vs. 1–5 in *S. yetii*), the calyx is markedly smaller (9–10 mm, vs. 12–13 mm in *S. yetii*), and the petal limb is clearly 4-fid (vs. 2-fid in *S. yetii*).

**72. *Silene alaschanica*** (Maximowicz) Bocquet, *Candollea* 22: 15. 1967.

贺兰山蝇子草 *he lan shan ying zi cao*

*Lychnis alaschanica* Maximowicz, *Bull. Acad. Imp. Sci. Saint-Petersbourg*, sér. 3, 26: 427. 1880; *Melandrium alaschanicum* (Maximowicz) Y. Z. Zhao.

Herbs perennial, 20–30 cm tall, densely glandular villous throughout. Principal root conical, robust, slightly lignified, multicrowned. Stems sparsely caespitose, erect, simple. Basal leaves oblanceolate, 3–7(–10) cm × 7–16 mm, both surfaces and margin glandular hairy, midvein prominent, base attenuate into petiole, apex obtuse or acute; distal leaves lanceolate, smaller than basal leaves. Flowers 1–4. Pedicel 1.3–1.5 cm, slender, densely glandular hairy; bracts linear-lanceolate, 3–8 mm, herbaceous. Calyx narrowly campanulate, 7–11 × 3–3.5 mm, open at apex, glandular hairy; longitudinal veins deep green or violet, shortly glandular villous, cohering at calyx teeth; calyx

teeth triangular-ovate, ca. 4 mm, margin membranous, sparsely ciliate, apex obtuse or acute. Androgynophore ca. 1 mm. Petals exerted ca. 5 mm beyond calyx, lilac; claws prominently exerted, narrowly cuneate, with triangular auricles, long ciliate at base; limbs broadly obovate, ca. 4 mm, deeply bifid; lobes entire, linearly 1-lobed on two sides; coronal scales elliptic, lacinate. Stamens slightly exerted beyond corolla throat; filaments hairy at base. Styles exerted. Capsule ovoid, 8–9 mm, shorter than calyx, 10-toothed. Seeds dark brown, orbicular-reniform, ca. 1.5 mm, thick, minutely tuberculate. Fl. Jun–Jul, fr. Jul–Aug.

• Mountain scrub or grasslands; 2000–2700 m. Nei Mongol, Ningxia.

**73. *Silene muliensis*** C. Y. Wu, *Acta Bot. Yunnan.* 4: 147. 1982.

木里蝇子草 *mu li ying zi cao*

Herbs perennial, 20–50 cm, densely pubescent throughout, erect, simple, apically glandular hairy. Basal leaves obovate-lanceolate, 5–7 × 1.3–1.8 cm, both surfaces villous, margin ciliate, 3-veined basally, midvein conspicuous, pubescent at veins, base attenuate into petiole, apex acute; distal leaves ovate-lanceolate, smaller, base nearly rounded, apex acuminate. Flowers in an irregular thyrsoid, most cymules shortly stalked, usually 3-flowered, densely glandular villous. Pedicel 5–10(–20) mm, slender, glandular hairy; bracts ovate-lanceolate, herbaceous. Calyx campanulate, ca. 15 × 6 mm; longitudinal veins violet, glandular hairy; calyx teeth ovate, 3–5 mm, margin membranous, ciliate, apex obtuse. Androgynophore 2–3 mm, shortly hairy. Petals lilac, 2–2.5 cm; claws slightly exerted beyond calyx, narrowly cuneate, ciliate at base, auricles broad; limbs nearly orbicular, 4–6 mm, deeply 4-lobed; medial lobes narrowly band-shaped, with 2 or 3 obscure teeth; lateral lobes nearly linear, small; coronal scales nearly square. Stamens included; filaments glabrous. Styles included. Capsule not seen. Fl. Aug.

• Grasslands at forest margins; 2800–4200 m. Sichuan (Muli Zang Zu Zizhixian).

**74. *Silene caespitella*** F. N. Williams, *J. Linn. Soc., Bot.* 38: 403. 1909.

丛生蝇子草 *cong sheng ying zi cao*

*Melandrium neo-caespitosum* Y. W. Tsui ex L. H. Zhou; *M. xainzaense* L. H. Zhou; *Silene maheshwarii* Bocquet. Plants 13–40(–60) cm tall. Roots robust, vertical, lignified. Stems caespitose, erect, green, shortly retrorse pubescent throughout. Basal and proximal cauline leaves green on both surfaces, linear, 4–7(–10) cm × 2–5 mm, margin ciliate, midvein prominent, hairy only at veins or glabrous, base narrow, apex acute; distal leaves 3 or 4 pairs, sessile, linear, gradually reduced upward. Flowers up to 20, in an irregular thyrsoid with long- and shortly stalked, (1–)3–5-flowered cymules, sharply nutant, becoming erect in late anthesis. Pedicel short. Calyx narrowly cylindrical-campanulate, soon becoming broader as capsule swells,

5–7 × 2.5–3 mm, rounded at base, open at apex, weakly hairy, veins dark green to blackish red; teeth triangular, ca. 2.5 mm, margin membranous, ciliate, apex acute. Androgynophore ca. 1 mm, sparsely villous. Petals exerted 1–2 mm beyond calyx, dark red, rarely greenish white; claws cuneate, ca. 6 mm, glabrous at base, conspicuously auriculate (2.5–3 mm wide at apex); auricles ciliate; limb 1–2 mm, shallowly bifid, usually with small lateral lobes; coronal scales small. Stamens included. Styles included. Capsule globose, ca. 8 mm, slightly longer than calyx. Seeds gray, globose-reniform, ca. 0.8 mm, minutely tuberculate. Fl. Jun–Jul, fr. Aug–Sep.

Alpine forests, alpine meadows; 2500–5100 m. SE Qinghai, SW and W Sichuan, S and SE Xizang [Bhutan, Kashmir].

This species is closely related to *Silene nepalensis*, from which it differs in its linear leaves and smaller flowers. *Silene caespitella* is a very homogeneous species throughout its range.

**75. *Silene sveae*** Lidén & Oxelman in Oxelman et al., *Novon* 11: 323. 2001.

德钦蝇子草 *de qin ying zi cao*

Herbs perennial, 20–25 cm. Stems caespitose, few, erect, simple, grayish pubescent with short retrorse hairs throughout. Basal leaves in a persistent rosette, ovate, ca. 3 × 1–1.5 cm, fleshy; cauline leaves 2–4 pairs, lanceolate, 1–2 cm. Cymules 1–3-flowered in a lax, few-flowered thyrsoid. Pedicel sharply deflexed and very short in early anthesis, becoming strict, erect, and 1–3 cm in fruit. Fruiting calyx grayish green, ca. 7 × 4 mm, cylindrical, base rounded; veins not anastomosing, dark green to dark violet; teeth triangular, shortly ciliate, apex acute. Petals slightly exerted; claw ca. 2 mm wide at apex with narrow, prominent forward-projecting auricles; limb narrow, deeply bifid with entire lobes. Androgynophore very short, sparsely hairy. Stamens and styles included. Capsule shortly cylindrical, subequaling fruiting calyx. Seeds gray, round, ca. 0.8 mm, minutely tuberculate. Fl. and fr. Sep.

• Gravelly river banks, ca. 3000 m. NW Yunnan (Dêqên Xian). *Silene sveae* is easily distinguished from *S. caespitella* by its few broad basal leaves, from *S. nepalensis* by being smaller in all its parts, and from both species by its grayish, slightly fleshy habit, overwintering leaf rosette, few-flowered inflorescence, prominent, forward-projecting petal auricles, and narrow, deeply bifid petal limbs.

**76. *Silene huguettiae*** Bocquet, *Candollea* 22: 5. 1967.

狭果蝇子草 *xia guo ying zi cao*

Herbs perennial, 30–60(–90) cm tall. Root conical, slightly lignified. Stems solitary, sparsely clustered, erect, simple, sometimes basally branched, densely pubescent, intermixed with sparse glandular hairs. Basal leaves elliptic-lanceolate or oblanceolate, 5–10 cm × (5–)8–15(–20) mm, both surfaces sparsely glandular villous, margin glandular ciliate, base attenuate into long petiole, apex acute; distal leaves 1–3 pairs, lanceolate, smaller than basal leaves. Flowers many, nutant, soon becoming erect. Cymules 1–3-flowered with strict erect peduncles of varying length. Pedicel 1–3 cm, slender, pubescent, intermixed with

sparse glandular hairs; bracts lanceolate, villous. Calyx narrowly oblong, 8–12 × ca. 3 mm, slightly inflated in fruit, densely pubescent; longitudinal veins dark green or dark violet, glandular hairy, cohering at calyx teeth; calyx teeth triangular-lanceolate, 3–4 mm, margin membranous, ciliate, apex obtuse. Androgynophore very short, sparsely hairy. Petals exerted 4–6 mm beyond calyx, pale yellowish green or dark red; claw exerted, with narrow auricles, glabrous; limb 2–4 mm, shallowly bifid; lobes narrow, usually with small lateral teeth; coronal scales ligulate, entire or emarginate. Stamens included; filaments glabrous. Styles 5, included, very short. Capsule globose, 1–1.4 cm, often longer than calyx. Seeds gray-brown, globose-reniform, ca. 0.8 mm, thickened, tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

• Forest margins, grasslands; 2300–4600 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.

- 1a. Glandular hairs present, at least on calyx, leaves adaxially, and stem apically 76a. var. *huguettiae*  
1b. Glandular hairs absent ..... 76b. var. *pilosa*

**76a. *Silene huguettiae* var. *huguettiae***

狭果蝇子草(原变种) *xia guo ying zi cao* (yuan bian zhong)

Glandular hairs present.

• Forest margins, grasslands; 2400–4600 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.

**76b. *Silene huguettiae* var. *pilosa*** C. Y. Wu & H. Chuang in C. Y. Wu et al., *Fl. Yunnan*. 6: 836. 1995.

无腺狭果蝇子草 *wu xian xia guo ying zi cao*

Stems, leaves, and calyx sparsely villous, eglandular.

• Forest margins, grasslands; 2300–3600 m. Qinghai, Sichuan, Xizang, Yunnan.

**77. *Silene indica*** Roxburgh ex Otth in de Candolle, *Prodr.* 1: 368. 1824.

印度蝇子草 *yin du ying zi cao*

Herbs perennial, 25–50 cm tall. Roots robust, root crown lignified, producing stoloniform stems. Stems caespitose, erect or ascending, gray-green, simple or branched, hairy, apically glandular hairy. Basal leaves withered early; cauline leaves 4–8 pairs, ovate or ovate-lanceolate, 2–4(–4.5) × 1–2 cm, hirtellous, glandular hairy, margin ciliate, base cuneate, half clasping, apex acute. Flowers 7–20(–30). Pedicel elongated. Flowers slightly nutant, erect in late anthesis. Calyx campanulate, slightly inflated, 1.1–1.8 cm × 6–12 mm, umbilicate at base, open at apex, glandular hairy; longitudinal veins dark violet or green, densely hirtellous-glandular hairy; calyx teeth broadly triangular, 3–4 mm, margin membranous, glandular ciliate, apex obtuse. Androgynophore 2–3 mm, weakly hairy. Petals exerted 3–4 mm beyond calyx, green or violet-brown; claws cuneate, 9–11 mm, narrowly auriculate, glabrous or sparsely villous in early anthesis; limbs nearly orbicular, ca. 4 mm, bifid or deeply so, lobes entire or with obtuse lacinae; coronal scales



round, scarious, with small round teeth at apex, 0.5–1 mm. Stamens exerted; filaments villous at base. Styles 4 or 5. Capsule ovoid, 1.1–1.2 cm × 7–8 mm, 8–10-toothed. Seeds triangular-reniform, ca. 1 mm, with auriculate pit on two sides, abaxially with prominent tubercles. Fl. Jul, fr. Aug.

Mountains, mountain scrub; 2300–3900 m. S Xizang [Bhutan, India, Kashmir, Nepal].

1a. Calyx 11–14 × 6–9 mm; androgynophore  
ca. 2 mm ..... 77a. var. *indica*

1b. Calyx 14–18 × 10–12 mm; androgynophore  
ca. 3 mm ..... 77b. var. *bhutanica*

#### 77a. *Silene indica* var. *indica*

印度蝇子草(原变种) yin du ying zi cao (yuan bian zhong)

*Lychnis indica* (Roxburgh ex Otth) Benth; *L. nutans* Royle ex Benth; *Melandrium indicum* (Roxburgh ex Otth) Walpers.

Plants relatively smaller. Calyx 1.1–1.4 cm × 6–9 mm. Androgynophore ca. 2 mm

Mountain scrub; 2300–2900 m. S Xizang [Bhutan, India, Kashmir, Nepal].

77b. *Silene indica* var. *bhutanica* (W. W. Smith) Bocquet, *Candollea* 22: 13. 1967.

不丹蝇子草 bu dan ying zi cao

*Lychnis bhutanica* W. W. Smith, *Notes Roy. Bot. Gard. Edinburgh* 10: 51. 1917; *Silene bhutanica* (W. W. Smith) Majumdar.

Plants tall, robust. Calyx 1.4–1.8 × 1–1.2 cm. Androgynophore ca. 3 mm.

Mountains; 2600–3900 m. S Xizang [Bhutan, India, Kashmir, Nepal].

78. *Silene tibetica* Lidén & Oxelman in Oxelman et al., *Novon* 11: 324. 2001.

西藏蝇子草 xi zang ying zi cao

Herbs perennial, probably with a densely branched rootstock crowned by dense remnants of dead leaves and cataphylls. Sterile rosette leaves with petiole 5–6 cm; leaf blade obovate, gradually narrowed into petiole, 3(–4) × 1.5–2 cm, apex subobtusate to acuminate. Stems erect or ascending, 10–15 cm. Cauline leaves in 2 pairs, sessile, broadly ovate, ca. 3.5 × 2.5 cm, apex acute.

Inflorescence a dense thyrse consisting of a terminal dichasium and stalked (stalk ca. 2 cm) lateral dichasia, each dichasium 3–5-flowered; bracts gradually narrowed toward apex, 6–12 × 2–3 mm, herbaceous. Pedicel 3–4 mm, that of basal (first) flower to 1 cm. Lateral (later) flowers in dichasium apparently functionally male (an extremely rare condition in *Silene*). Calyx 1–1.2 cm × ca. 5 mm, expanding to 1–1.3 cm wide at late anthesis, divided to ca. 1/3 into triangular teeth acute at apex. Androgynophore ca. 3 mm, densely woolly. Petal claws exerted beyond calyx by 1–2 mm, with orbicular auricles; limb oblong, ca. 3

mm, deeply bifid, usually with 2 pairs of lateral teeth; coronal scales short, dentate. Stamens exerted. Styles 5, included or exerted. Seeds (immature) with long, spiny papillae abaxially.

• About 3000 m. SW Xizang (Zanda Xian).

This species is not similar to any other Chinese species of *Silene*. A peculiar feature of the type specimen is that only the alar (apical or first) flower is bisexual, whereas the other (later) flowers appear to be functionally male. Although gynomonoeocy is a widespread phenomenon in *Silene*, andromonoeocy is not. *Silene tibetica* is possibly related to the *S. indica* group, which is in urgent need of revision. The regular nature of the inflorescence is deviating.

79. *Silene cashmeriana* (Royle ex Benth) Majumdar, *J. Indian Bot. Soc.* 42: 649. 1964.

克什米尔蝇子草 ke shi mi er ying zi cao

*Lychnis cashmeriana* Royle ex Benth in Royle, *Ill. Bot. Himal. Mts.* 80. 1834; *Melandrium cashmerianum* (Royle ex Benth) Walpers; *M. dingriense* Y. W. Tsui & P. Ke ex L. H. Zhou; *M. nyalamense* L. H. Zhou. Herbs perennial, 50–70 cm tall. Stems erect, densely shortly whitish hairy. Basal leaves withering early; cauline leaves sessile, ovate or ovate-lanceolate, 5–7.5 cm × 6–15(–20) mm, both surfaces sparsely villous, ciliate at margin, base cuneate or nearly rounded, apex acute or acuminate. Cymes sparse, few flowered. Pedicel slender, glandular hairy; bracts lanceolate, herbaceous, glandular hairy. Calyx pale green, campanulate, 1–1.7 cm × 7–9 mm; longitudinal veins violet-blue or brown, prominent, cohering at calyx teeth; calyx teeth triangular-ovate, 3–5 mm, abaxially glandular hairy, margin membranous, ciliate, apex acute or acuminate. Androgynophore 2–3 mm, densely villous. Petals exerted 6–8 mm beyond calyx, yellowish green or ?pale green, 1.2–1.5 cm; claws saccate-oblongate, villous at base, auricles ovate; limbs broadly ovate, 5–8 mm, bifid; lobes entire or lacinate, with teeth or small lobes on each lateral side; coronal scales round, ca. 1.5 mm, slightly undulate at apex. Stamens included, ca. 1 cm; filaments glabrous. Styles (4 or)5, ca. 3 mm. Capsule not seen. Fl. Jul–Aug.

Grasslands, scrub; 3400–4100 m. S Xizang [Kashmir].

The type has not been seen by the present authors.

80. *Silene multifurcata* C. L. Tang, *Acta Phytotax. Sin.* 24: 391. 1986.

花脉蝇子草 hua mai ying zi cao

*Melandrium multifurcatum* (C. L. Tang) Kozhevnikov.

Herbs perennial, 30–40 cm tall, rhizomatous. Stems sparsely clustered, ascending, simple, sparsely villous. Leaves elliptic-lanceolate or oblanceolate, 5–8 cm × 8–12 mm, both surfaces glabrous, margin sparsely ciliate, 3-veined at base, midvein prominent, base cuneate, apex acuminate. Cymes racemiform. Pedicel 2–3 cm, slender, densely pubescent; bracts lanceolate or linear-lanceolate, densely pubescent, margin ciliate. Calyx

campanulate, 1.5–1.8 cm × 6–8 mm, densely villous, sparsely glandular hairy; longitudinal veins violet, veins usually reticulate. Calyx teeth triangular-ovate, 3–4 mm, margin membranous, ciliate. Androgynophore ca. 3 mm, villous. Petals violet, ca. 2 cm; claws pale yellowish green, cuneate, ca. 1.2 cm, glabrous at base, auricles orbicular; limbs exerted beyond calyx, deeply 4-lobed; medial lobes round, shallowly 2-lobed or lacinate; lateral lobes linear, small; coronal scales broad, nearly flabellate, ca. 2 mm, with small irregular teeth. Stamens slightly exerted, 1–1.3 cm; filaments glabrous. Styles (4 or)5, included or slightly exerted. Capsule ellipsoid, 1–1.2 cm, shorter than calyx, usually 5-toothed. Seeds brown, reniform, ca. 1 mm, with prominent tubercles. Fl. Aug, fr. Aug–Sep.

• Mountains; 2600–3200 m. S Xizang (Cona Xian).

Species nos. 81–90 belong to an informal group that approximates to *Silene* sect. *Odontopetalae* Schischkin ex Chowdhuri. The Chinese species fall neatly into two distinct subgroups corresponding to the first lead in the key: those with broad, inflated corollas, similar to the winged-seeded species of the “*Physolychnis*” group above, and those of the *S. delavayi* group.

*Silene dentipetala* H. Chuang (in C. Y. Wu et al., Fl. Yunnan. 6: 836. 1995) probably also belongs to the “*Odontopetalae*” group. It was described as differing from *S. gracilentia* in having more flowers, shorter and irregularly toothed petal limbs, and fimbriate seeds.

**81. *Silene lamarum*** C. Y. Wu, Acta Bot. Yunnan. 4: 153. 1982.

喇嘛蝇子草 *la ma ying zi cao*

Herbs perennial, 15–30 cm tall. Stems sparsely caespitose, ascending, simple, apically sparsely glandular hairy. Cauline leaves narrowly oblanceolate, 4–10 cm × 5–10 mm, both surfaces glabrous, shortly ciliate, base attenuate into long petiole, apex acuminate; cauline leaves usually 2–4 pairs, narrowly oblanceolate to lanceolate, slightly clasping at base. Cymes 2–4-flowered. Pedicel 1–4 cm, densely glandular hairy; bracts lanceolate, densely white villous. Calyx campanulate, 1.1–1.4 cm × 5–7 mm, base rounded, margin membranous, ciliate. Androgynophore 1–2 mm, glabrous. Petals lilac, 1.7–2 cm; claws oblanceolate, glabrous, auricles orbicular; limbs exerted beyond calyx, orbicular, deeply bifid to middle, lobes entire or weakly lacinate; coronal scales broad, toothed. Stamens included; filaments glabrous. Styles included. Capsule ellipsoid-ovoid, 1–1.2 cm, shorter than calyx. Seeds 2–2.5 mm, minutely striate, grooved abaxially. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine grasslands, scrub; (2900–)3400–4000 m. Sichuan, NW Yunnan (Dêqên Xian, Zhongdian Xian).

This species is like a miniature *Silene stewartiana*, but its seeds are wingless.

**82. *Silene pubicalycina*** C. Y. Wu, Acta Bot. Yunnan. 4: 151. 1982.

毛萼蝇子草 *mao e ying zi cao*

Herbs perennial, 15–30 cm tall. Roots robust, with root crown. Stems sparsely clustered, ascending, simple, white villous, apically glandular hairy. Basal leaves saccate-oblanceolate, 5–10 cm × 5–12 mm, both surfaces and margin white villous, midvein prominent, base attenuate into long petiole, apex acute, rarely rounded, mucronulate; cauline leaves oblanceolate or lanceolate, small, 3–5 cm × 4–7 mm. Cymes few flowered. Pedicel 1–3 cm, villous, glandular hairy; bracts ovate-lanceolate, small, herbaceous, densely white villous. Calyx campanulate, 1.2–1.5 cm × 4–6 mm, densely villous; longitudinal veins obscure, lilac, cohering at apex; calyx teeth triangular-ovate, 3–4 mm, margin membranous, ciliate, apex rounded or obtuse. Androgynophore 2–3 mm, glabrous. Petals red, ca. 1.8 cm; claws oblanceolate, ca. 1.2 cm, glabrous, with auricles; limbs exerted beyond calyx, ovate, ca. 6 mm, deeply bifid to middle; lobes narrowly ovate, margin entire, slightly emarginate; coronal scales broad, ca. 1.5 mm, with few indented teeth. Stamens included; filaments glabrous. Styles included. Capsule ovoid, shorter than calyx. Seeds dark brown, reniform, minutely tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

• Forests; ca. 3200 m. SW Sichuan, SE Xizang (Zayü Xian), NW Yunnan (Zhongdian Xian).

This species is very similar to *Silene lamarum*, but has a longer androgynophore and different seed morphology.

**83. *Silene atrocastanea*** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 181. 1912.

栗色蝇子草 *li se ying zi cao*

*Melandrium atrocastaneum* (Diels) Handel-Mazzetti; *Silene cupiformis* C. L. Tang.

Herbs perennial, 15–30 cm. Roots brown, robust, conical, with root crowns. Stems solitary or sparsely clustered, erect or ascending, simple, densely villous. Basal leaves saccate-obovoid or elliptic-oblanceolate, 5–10(–15) × 2.5–4 cm, sparsely villous, margin ciliate, 3-veined, base attenuate into petiole, apex acute or acuminate; distal leaves sessile, ovate-lanceolate to lanceolate, small. Cymes 3–8-flowered; flowers subopposite, slightly nutant. Pedicel 1–1.5 cm, slender, densely villous; bracts lanceolate, herbaceous, villous. Calyx broadly campanulate, 1.8–2 cm, margin membranous, ciliate, apex acute or obtuse. Androgynophore ca. 5 mm, glabrous or early villous. Petals dark violet, ca. 1.8 cm; claws obovate-lanceolate, ca. 1 cm, ciliate at base, auricles orbicular; limbs exerted beyond calyx, broadly obovate, ca. 8 mm, deeply 4-lobed; lobes linear-lanceolate, subequal, apex acute; coronal scales nearly suborbicular, 1.5–2 mm, with few round teeth. Stamens included; filaments sparsely villous. Styles included. Seeds 2–2.5 mm, winged. Fl. Aug–Sep.

• Stony alpine grasslands; (3000–)3200–4000 m. NW Yunnan (Lijiang Naxi Zu Zizhixian).

**84. *Silene stewartiana*** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 180. 1912.

大子蝇子草 da zi ying zi cao

Herbs perennial, 25–35 cm. Roots slightly spiniform, often multicrowned. Stems sparsely caespitose, ascending, apically slightly villous. Basal leaves narrowly oblanceolate, 7–12 × 0.7–1.5 cm, both surfaces and margin glabrous, midvein prominent, base attenuate into long petiole, apex acute; cauline leaves narrowly lanceolate, 6–8 cm × 5–10 mm, glabrous, base slightly clasping, apex acuminate. Cymes 2–5-flowered; flowers slightly nutant. Pedicel 1–3 cm, densely glandular hairy; bracts linear-lanceolate, 1–1.5 cm, glandular villous. Calyx campanulate, 2–2.5 cm × 7–10 mm, loose in fruit; longitudinal veins dark green, violet glandular hairy; calyx teeth triangular-ovate, 5–8 mm, margin membranous, apex obtuse. Androgynophore 3–4 mm, glabrous. Petals lilac, 2.3–2.5 cm; claws nearly cuneate, glabrous, auricles orbicular; limbs exerted beyond calyx, elliptic, ca. 10 × 4–5 mm, deeply 4-lobed; medial lobes narrowly elliptic, margin entire; lateral lobes spreading, linear, small; coronal scales oblong, 2- or 3-toothed. Stamens included; filaments glabrous. Styles included. Capsule ovoid, 1–1.4 cm, shorter than calyx. Seeds 2–2.5 mm, winged. Fl. Aug–Sep, fr. Oct.

• Alpine grasslands; 2800–3900 m. NW Yunnan (Lijiang Naxi Zu Zizhixian).

**85. *Silene scopulorum*** Franchet, Bull. Soc. Bot. France 33: 423. 1886.

岩生蝇子草 yan sheng ying zi cao

*Lychnis scopulorum* (Franchet) Diels; *Melandrium scopulorum* (Franchet) Handel-Mazzetti.

Herbs perennial, 20–25 cm tall. Roots cylindric, multicrowned. Stems sparsely caespitose, ascending, simple, shortly villous. Basal leaves oblanceolate, 4–7 cm × 5–10 mm, glabrous, margin ciliate, midvein prominent, base attenuate into long petiole, apex acute; cauline leaves lanceolate or ovate-lanceolate, small. Cymes few flowered; flowers slightly nutant. Pedicel 2–4 mm, villous with curved hairs; bracts ovate-elliptic, herbaceous, shortly villous. Calyx reddish, campanulate, 1.2–1.5 cm × ca. 6 mm, base rounded; longitudinal veins violet, cohering at apex, multicellular glandular hairy; calyx teeth nearly semicircular, margin membranous, ciliate, apex acute. Androgynophore ca. 1.5 mm, glabrous. Petals dark violet, 1.5–2 cm; claws oblanceolate, glabrous, with auricles; limbs exerted beyond calyx, broadly obovate, deeply 4-lobed; medial lobes narrowly elliptic, sometimes toothed or shallowly bifid; lateral lobes spreading, linear; coronal scales subsquarrose, lacinate. Stamens included; filaments glabrous. Styles included. Capsule ovoid, 8–10 mm, shorter than calyx. Seeds ca. 2.5 mm, winged. Fl. Aug–Sep, fr. Sep–Oct.

• Alpine grasslands; 3000–4000 m. NW Yunnan.

**86. *Silene melanantha*** Franchet, Bull. Soc. Bot. France 33: 423. 1886.

黑花蝇子草 hei hua ying zi cao

*Melandrium longipes* Handel-Mazzetti; *M. melananthum* (Franchet) Handel-Mazzetti; *Silene longipes* (Handel-Mazzetti) C. Y. Wu.

Herbs perennial, ca. 30 cm tall. Roots long conical. Stems sparsely caespitose, ascending, simple, apically pubescent. Basal leaves narrowly oblanceolate, 8–12 cm × 5–7 mm, glabrous, margin ciliate, midvein prominent, base attenuate into long petiole, apex acute; distal leaves lanceolate, small. Cymes few flowered; flowers slightly nutant. Pedicel 1–3 cm, glandular hairy; bracts small, herbaceous. Calyx violet, campanulate, 1.2–1.4 cm × 3.5–5 mm; longitudinal veins violet, cohering at apex, glandular hairy; calyx teeth triangular-ovate, mucronulate at apex. Androgynophore ca. 2 mm. Petals dark violet, 1.5–1.8 cm, exerted beyond ca. 1/3 × length of calyx, claws obovoid, glabrous, with orbicular auricles, margin erose; limbs broadly obovate, deeply 4-lobed; medial lobes broadly band-shaped, truncate at apex, sometimes toothed; lateral lobes spreading, linear; coronal scales subsquarrose, indented-toothed. Stamens included; filaments glabrous. Styles included. Capsule ovoid, 8–10 mm. Fl. Aug.

• Grasslands; 2800–3800(–4200) m. NW Yunnan.

This species is probably best regarded as conspecific with *Silene scopulorum*, because it is impossible to find sharp discontinuities in any of the characters used for separating them.

**87. *Silene delavayi*** Franchet, Bull. Soc. Bot. France 33: 424. 1886.

西南蝇子草 xi nan ying zi cao

*Lychnis delavayi* (Franchet) Diels; *Melandrium delavayi* (Franchet) Handel-Mazzetti.

Herbs perennial, 20–40(–60) cm tall. Roots conical. Stems sparsely caespitose, ascending, simple, apically densely glandular hairy. Basal leaves elliptic-lanceolate, 3–8(–12) × 1–1.7 (–2.5) cm, minutely pubescent, ciliate, midvein obvious, densely pubescent, base attenuate into long petiole, sometimes nearly cuneate, apex acute or obtuse; cauline leaves usually 2–4 pairs, violet, lanceolate, 1.5–3 cm. Cymes many flowered; flowers slightly nutant. Pedicel shorter than calyx, densely violet glandular hairy; bracts lanceolate, herbaceous. Calyx narrowly campanulate or cylindric-campanulate, 1–1.5(–2) cm × 4–5 mm, densely violet glandular hairy, longitudinal veins violet; calyx teeth triangular-lanceolate, 4–6 mm. Androgynophore ca. 2 mm, glabrous. Petals red or dark violet, (1.5–)2–2.5(–3) cm; claws narrowly cuneate, glabrous, auricles triangular; limbs exerted beyond calyx, nearly orbicular, shallowly bifid or emarginate; lobes nearly ovate, erose at apex, sometimes lateral part of limb 1-toothed at base; coronal scales narrowly elliptic, apex erose. Stamens slightly exerted; filaments glabrous. Capsule globose-ovoid, ca. 1.5 cm, shorter than calyx. Seeds dark brown, reniform, 1.2–1.5 mm, minutely tuberculate, with long,

sharp tubercles toward abaxial side. Fl. Jul–Aug, fr. Sep–Oct.

• Mountain grasslands; below 3800 m. NW Yunnan.

This species is used medicinally.

**88. *Silene longicornuta*** C. Y. Wu & C. L. Tang, Acta Bot. Yunnan. 4: 149. 1982.

长角蝇子草 chang jiao ying zi cao

Herbs perennial, 7–15 cm tall. Roots robust. Stems solitary or sparsely clustered, erect, simple, rarely branched at base, densely villous and glandular hairy. Basal leaves oblanceolate, 5–12 × 1–2 cm, glabrous, margin long ciliate, midvein conspicuous, base attenuate into long petiole, apex acute or acuminate; cauline leaves 1 or 2 pairs, sessile, ovate-lanceolate, smaller than basal leaves. Cymes many flowered, rarely 2- or 3-flowered. Pedicel 1–2.5 cm, dense hairy with multicellular, violet glandular hairs; bracts ovate or ovate-lanceolate, 8–15 mm, herbaceous, densely glandular villous. Calyx narrowly campanulate, 1.2–1.7 cm × ca. 5 mm, densely violet glandular hairy, longitudinal veins violet; calyx teeth triangular-lanceolate, 3–4 mm, margin membranous, ciliate, apex acute. Androgynophore 1–2 mm, glabrous. Petals violet, to 2.5 cm; claws slightly exerted beyond calyx, white, cuneate-oblanceolate, 1–1.3 cm, glabrous, auricles orbicular, margin erose; limbs obovate, deeply 4-lobed to 2/3 of petals; medial lobes broadly band-shaped, sometimes emarginate at apex; lateral lobes linear, small; coronal scales lanceolate. Stamens included; filaments glabrous. Styles included. Capsule globose. Seeds reniform, ca. 1 mm. Fl. Sep–Oct.

• Stony fissures in mountains; ca. 2500 m. SW Sichuan, W Yunnan.

**89. *Silene oblanceolata*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 227. 1920.

倒披针叶蝇子草 dao pi zhen ye ying zi cao

*Melandrium oblanceolatum* (W. W. Smith) Handel-Mazzetti.

Herbs perennial, 15–30 cm tall. Roots slightly robust. Stems solitary or sparsely clustered, erect or ascending, simple, densely hairy with violet, nodiferous glandular hairs, apically viscid. Basal leaves usually violet, oblanceolate, 5–15 × 1–2 cm, both surfaces slightly coarse, sometimes sparsely hairy, margin ciliate, midvein prominent, base attenuate into long petiole, apex acute or rarely obtuse; cauline leaves 2 or 3 pairs, sessile, ovate or ovate-lanceolate, margin ciliate, apex acuminate. Cymes many flowered; flowers slightly nutant. Pedicel 5–15 mm, densely violet glandular hairy; bracts ovate-lanceolate or lanceolate, glandular hairy. Calyx narrowly campanulate, 1–1.2 cm × 3–3.5 mm, densely violet glandular hairy, closed in fruit, longitudinal veins cohering at apex; calyx teeth triangular-lanceolate, ca. 4 mm, glandular hairy. Androgynophore very short, villous. Petals included, lilac or red, ca. 1 cm; claws saccate or oblanceolate, glabrous, auricle erose at margin; limbs nearly orbicular, deeply 4-lobed; median lobes orbicular, shallowly bifid

to middle of petals; lateral lobes linear-orbicular, small; coronal scales suborbicular to orbicular. Stamens included; filaments glabrous. Styles included. Capsule ellipsoid, ca. 1 cm, slightly longer than calyx. Seeds reniform, minutely tuberculate. Fl. Aug–Sep, fr. Oct.

• Stony substrate of forests; 2400–3600 m. SW Sichuan, N Yunnan.

**90. *Silene lineariloba*** C. Y. Wu, Acta Bot. Yunnan. 4: 148. 1982.

线瓣蝇子草 xian ban ying zi cao

Herbs perennial, 6–15 cm tall. Roots robust. Stems sparsely caespitose, erect, simple, densely glandular hairy. Basal leaves saccate-oblanceolate, 3–6 × 0.8–1.2 cm, both surfaces subglabrous, margin ciliate, midvein prominent, base attenuate into petiole, apex obtuse, rarely rounded; cauline leaves 1 or 2 pairs oblanceolate to lanceolate, small. Cymes multiflowered. Pedicel 5–15 mm, glandular villous; bracts ovate-lanceolate, ca. 1 cm, herbaceous, glandular villous. Calyx narrowly campanulate, 9–11 × 3–3.5 mm, densely glandular villous, longitudinal veins not prominent; calyx teeth triangular, ca. 2 mm, ciliate, apex obtuse.

Androgynophore 1–1.5 mm, pubescent. Petals pale red, 1.2–1.4 cm; claws oblanceolate, glabrous, exauriculate; limbs exerted beyond calyx, subsaccate, 3–5 mm, deeply 4-lobed to below middle of petal; lobes linear, nearly equal in size; lateral lobes spreading; coronal scales nearly flabellate, ca. 0.6 mm, margin entire or slightly emarginate. Stamens included; filaments glabrous. Styles exerted after anthesis. Capsule ovoid, ca. 8 mm, shorter than calyx. Fl. Sep–Oct.

• About 2900 m. NW Yunnan.

Species nos. 91–110 belong to an informal group that approximates to *Silene* sect. *Cucubaloideae* Edgeworth & J. D. Hooker. As circumscribed here, this is a distinct, probably monophyletic group characterized by more or less creeping habit and fleshy, fasciculate root tubers.

The species of the “*Cucubaloideae*” group can be described as follows. Herbs perennial, with clustered, tuberous roots. Stems diffuse, supine or ascending, branched. Inflorescence a dichasial cyme. Flowers bisexual, erect. Calyx tubular-clavate or campanulate, appressed to capsule in fruit, 10-veined, veins usually violet, usually coherent at calyx teeth. Androgynophore short. Petals red, rarely white, bifid, sometimes 1-toothed on each side; coronal scales present. Styles 3. The group is distributed in China, the Himalayas, and Indo-China.

**91. *Silene tatarinowii*** Regel, Bull. Soc. Imp. Naturalistes Moscou 34(2): 562. 1861.

石生蝇子草 shi sheng ying zi cao

*Melandrium tatarinowii* (Regel) Y. W. Tsui; *Silene potaninii* Maximowicz; *S. tatarinowii* f. *albiflora* (Franchet) Kitagawa; *S. tatarinowii* var. *albiflora* Franchet.

Herbs perennial, finely retrorse pubescent throughout. Roots yellowish, cylindrical or spiniform. Stems ascending or supine, branched, sometimes with adventitious roots at nodes. Leaves lanceolate or ovate-lanceolate, rarely ovate, 2–5 × 0.5–1.5(–2) cm, both

surfaces sparsely villous, margin shortly ciliate, 1- or usually 3-veined, base broadly cuneate or attenuate into petiole, apex acuminate. Dichasial cymes lax, broad. Pedicel 8–30(–50) mm, slender, pubescent; bracts lanceolate, herbaceous. Calyx tubular-clavate, 1.2–1.5 cm × 3–5 mm; longitudinal veins green, rarely violet, glabrous or sparsely pubescent; calyx teeth triangular, margin membranous, shortly ciliate, apex acute, rarely obtuse. Androgynophore ca. 4 mm, glabrous. Petals white, oblanceolate, claws not or slightly exerted beyond calyx, glabrous, exauriculate; limbs obovate, ca. 7 mm, shallowly bifid to 1/4 of limbs, each with 1 small linear lobe or slender tooth on two lateral lobes; coronal scales elliptic, margin entire. Stamens prominently exerted; filaments glabrous. Styles prominently exerted. Capsule ovoid or narrowly ovoid, 6–8 mm, shorter than calyx. Seeds gray-brown, reniform, ca. 1 mm. Fl. Jul–Aug, fr. Aug–Oct.

• Scrub, forested stony mountains, rock fissures; 800–2900 m. Gansu, Guizhou, Hebei, Henan, Hunan, Nei Mongol, Ningxia, Shanxi, Shaanxi, Sichuan.

**92. *Silene platyphylla*** Franchet, Bull. Soc. Bot. France 33: 419. 1886.

宽叶蝇子草 kuan ye ying zi cao

*Melandrium platyphyllum* (Franchet) Handel-Mazzetti; *M. praticola* (W. W. Smith) Pax & K. Hoffmann; *Silene platyphylla* f. *congesta* Franchet; *S. platyphylla* f. *involutrata* Franchet; *S. platyphylla* f. *paniculifera* Franchet; *S. platyphylla* var. *praticola* (W. W. Smith) C. Y. Wu; *S. praticola* W. W. Smith.

Herbs perennial. Roots cylindrical. Stems diffuse, 60–100 cm tall, much branched, pubescent. Leaves ovate, 6–8 × 3–5 cm, abaxially pubescent, margin ciliate, conspicuously 3- or 5-veined, base nearly rounded or shallowly ovate, apex acute. Lower internodes in dichasium long, subsequent short. Pedicel 6–30 mm, hirtellous. Bracts ovate, herbaceous, densely pubescent. Calyx tubular-clavate, ca. 1.5 cm, densely spinose hairy at veins; teeth triangular-lanceolate, margin membranous, ciliate, apex acute or acuminate. Androgynophore 1–2 mm. Petals white or pale red, ca. 2 cm; claws slightly exerted beyond calyx, oblanceolate, glabrous; limbs obovate, bifid to middle; lobes elliptic, with a linear lobe or narrow tooth on each side (shallowly 4-lobed in var. *praticola*). Stamens slightly exerted; filaments glabrous. Styles prominently exerted. Capsule ovoid, 8–10 mm, shorter than calyx. Seeds dark brown, reniform, ca. 1 mm, with lateral auricular pits. Fl. Jun–Aug, fr. Aug–Sep.

• Forest margins, scrub; 2400–2700(–3200) m. SW Sichuan, W Yunnan.

The primary dichasial branch is very long and subsequent ones short, especially so in f. *involutrata*. The species is not divided here, but Wu Zhengyi (editor's note) prefers to maintain var. *praticola*.

**93. *Silene yunnanensis*** Franchet, Bull. Soc. Bot. France 33: 425. 1886.

云南蝇子草 yun nan ying zi cao

Herbs perennial. Roots clustered, long cylindrical. Stems diffuse, 20–80 cm, much branched, pubescent. Leaves sessile, gray-green abaxially, green or gray-green adaxially, lanceolate, 3–7 × 0.6–1.5 cm, base rounded to broadly cuneate, apex acuminate, pubescent with small tubercle-based hairs. Cymes few flowered, dense to rather lax; flowers erect, ca. 2 cm in diam. Pedicel 5–20 mm, densely pubescent; bracts lanceolate, herbaceous, villous. Calyx tubular-clavate, ca. 1.5 × 3.5 mm; longitudinal veins green or violet, densely spinose hairy, or ± evenly pubescent; calyx teeth triangular-lanceolate, margin membranous, ciliate, apex acuminate. Androgynophore 2–3 mm, glabrous. Petals pale red to white, 2–2.5 cm; claws slightly exerted, oblanceolate, glabrous; limbs broadly obovate, deeply bifid to middle; lobes obovate, with 1 small linear lobe on lateral side at base; coronal scales elliptic, margin entire. Stamens exerted; filaments glabrous. Styles exerted. Capsule narrowly ovoid, 1–1.2 cm, shorter than calyx. Seeds dark brown, reniform, ca. 1 mm, with long papillae abaxially. Fl. Jun–Jul, fr. Jul–Sep.  $2n = 24^*$ .

• Forests, fields; (2400–)2700–3400(–3900) m. NW Yunnan.

**94. *Silene adenocalyx*** F. N. Williams, J. Linn. Soc., Bot. 38: 403. 1909.

腺萼蝇子草 xian e ying zi cao

Herbs perennial. Stems supine, 25–40 cm, multibranched, densely short glandular hairy, sometimes glandular hairy apically. Leaves ovate-lanceolate to lanceolate, 1.5–3 cm × 5–12 mm, both surfaces densely pubescent, margin glandular hairy, 1- or 3-veined, base rounded, apex acuminate. Dichasial cymes 3–10-flowered, lax. Pedicel 1–2.5 cm, slender, glandular villous; bracts lanceolate, 8–10 mm, pubescent. Calyx tubular, 1.4–1.5 cm × 4–5 mm, truncate at base, slightly constricted above, glandular villous, longitudinal veins dark green; calyx teeth narrowly lanceolate, ca. 5 mm, shortly glandular hairy, margin shortly ciliate, apex acuminate.

Androgynophore ca. 3 mm, glabrous. Petals white or pale red; claws cuneate-oblanceolate, ca. 1 cm, glabrous; auricles triangular, margin entire or slightly erose; limb narrow, ca. 5 mm, bifid to 1/2, lobes entire or lacinate. Stamens and styles prominently exerted. Capsule ca. 8 mm. Seeds not seen. Fl. Jul–Aug.

• Alpine scrub grasslands, shifting screens; 3200–4300 m. C and SE Xizang.

**95. *Silene trachyphylla*** Franchet, Bull. Soc. Bot. France 33: 417. 1886.

糙叶蝇子草 cao ye ying zi cao

Herbs perennial. Roots cylindrical, with robust root crowns. Stems supine or ascending, branched, densely glandular villous. Leaves narrowly lanceolate or lanceolate, 3–5 cm × 6–8(–12) mm, both surfaces

hirtellous, margin coarsely ciliate, midvein prominent, base attenuate, apex acuminate. Dichasial cymes large, many flowered. Pedicel nearly as long as to longer than calyx, densely glandular hairy; bracts lanceolate. Calyx tubular, 1.5–2 cm × ca. 3.5 mm, glandular hairy, umbilicate at base, longitudinal veins violet; calyx teeth triangular-ovate, ca. 2 mm, villous, margin membranous, ciliate, apex obtuse. Androgynophore ca. 3 mm, glabrous. Petals pale red, ca. 2.5 cm; claws slightly exerted beyond calyx, oblanceolate, glabrous, auricles not prominent; limbs obovate, 8–10 mm, shallowly bifid; lobes ovate, with 1 small dentate lobe on lateral side of limbs; coronal scales ovoid, sometimes lacinate. Stamens slightly exerted; filaments glabrous. Styles slightly exerted. Capsule ovoid-globose, 1–1.2 cm. Seeds reniform. Fl. Jul–Aug, fr. Aug–Oct.

• Scrub; 3100–3900 m. Qinghai, Sichuan, Xizang, Yunnan. The type could not be found by the present authors. The taxon described above is similar to *Silene adenocalyx*, but has much larger and broader petals and fits reasonably well with the type description of *S. trachyphylla*.

**96. *Silene asclepiadea*** Franchet, Bull. Soc. Bot. France 33: 422. 1886.

掌脉蝇子草 zhang mai ying zi cao

*Lychnis adenantha* (Franchet) Diels; *Melandrium adenanthum* (Franchet) Handel-Mazzetti; *M. asclepiadeum* (Franchet) Handel-Mazzetti ex Pax & K. Hoffmann; *M. kermesinum* (W. W. Smith) Handel-Mazzetti; *M. viscidulum* (Franchet) F. N. Williams var. *szchuanensis* (F. N. Williams) Handel-Mazzetti; *Silene adenantha* Franchet; *S. asclepiadea* var. *glutinosa* Franchet; *S. kermesina* W. W. Smith; *S. lutea* Franchet; *S. szchuanensis* F. N. Williams.

Herbs perennial, basally crispate-puberulent to sub-glabrous, apically glandular hairy. Roots clustered, cylindric, fleshy. Stems diffuse, to 1 m, much branched. Leaves sessile, broadly ovate or ovate-lanceolate, 4–7 × 2–4 cm, glabrous or sparsely hairy abaxially and at veins adaxially, conspicuously 3- or 5-veined. Dichasial cymes lax and broad; proximal pedicels to 5 cm, subsequent ones much shorter, densely glandular hairy; bracts ovate-lanceolate, herbaceous, glandular pubescent. Calyx campanulate, 8–12(–13) × ca. 4 mm, base rounded, slightly inflated in late maturity, densely violet glandular villous at veins; calyx teeth triangular-ovate, subobtuse and shortly ciliate. Androgynophore 1–2 mm, glabrous. Petals ca. 1.5 cm; claws cuneate, glabrous, erose above; limbs violet or pale pink, 4-lobed; medial lobes narrowly orbicular; lateral lobes linear, small; coronal scales subsquarrose, margin dentate or entire. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule ovoid, ca. 1 cm, shorter than calyx. Seeds reniform, with auricular pit. Fl. Jul–Aug, fr. Aug–Oct.

• Scrub grasslands, forest edges; 1300–3900 m. Guizhou, Sichuan, Yunnan.

The type material of *Silene kermesina* is slightly heterogeneous; the specimen at BM has slightly larger and less hairy calyces, whereas the specimen at E fits well with our concept of *S. asclepiadea*.

**97. *Silene khasiana*** Rohrbach, Linnaea 36: 258. 1869.

卡西亚蝇子草 ka xi ya ying zi cao

Herbs perennial, glandular villous throughout. Stems sparsely caespitose, ascending, 50–80 cm, branched. Leaves ovate-lanceolate, 2.5–5 × 1–2.5 cm, conspicuously 3- or 5-veined, both surfaces glabrous or sparsely hairy, margin ciliate, base rounded, apex acuminate. Cymes few flowered, lax (smaller lateral inflorescences often 1-flowered). Pedicel 1–3 cm; bracts lanceolate, herbaceous. First branch in dichasium sometimes very long (to 15 cm). Calyx campanulate, 8–10 mm, glandular hairy; longitudinal veins dark green, cohering at apex; calyx teeth lanceolate, apex acute. Androgynophore ca. 2 mm, glabrous. Petals pale red, claws narrow, subequaling calyx, glabrous, limbs deeply bifid, lobes obtuse; coronal scales small. Filaments glabrous. Capsule ovoid, ca. 8 mm. Seeds reniform.

Xizang [India, ?Nepal].

**98. *Silene lhassana*** (F. N. Williams) Majumdar, Bull. Bot. Surv. India 15(1–2): 42. 1976.

拉萨蝇子草 la sa ying zi cao

*Melandrium lhassanum* F. N. Williams; *Silene nyingchiensis* L. H. Zhou.

Herbs perennial. Stems ascending to upright, usually violet, 30–60 cm, branched, pubescent, apically glandular hairy, with sterile leafy branches. Leaves ovate-lanceolate, 1.5–3.5 cm × 5–15 mm, both surfaces densely hairy, margin ciliate, 1- or 3-veined basally, margin undulate. Dichasial cymes densely glandular pubescent. Flowers erect, 1–1.3 cm in diam. Pedicel 5–15 mm; bracts lanceolate, 2–10 mm, herbaceous. Calyx campanulate, 1–1.2 cm × 3.5–5 mm, densely glandular hairy, truncate at base, slightly inflated in late maturity, longitudinal veins violet; calyx teeth triangular, ca. 2.5 mm. Androgynophore ca. 3.5 mm, glabrous. Petals violet, 1–1.5 cm; claws exerted beyond calyx, oblanceolate, glabrous, with broad auricles; limbs ca. 4.5 mm, bifid nearly to 1/2; lobes elliptic, margin entire. Stamens exerted; filaments glabrous. Styles ca. 8 mm, prominently exerted. Capsule ovoid, 6–8 mm, shorter than calyx. Seeds dark brown, triangular-reniform, ca. 1.2 mm. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine scrub grasslands; 2900–4600 m. C and S Xizang.

**99. *Silene grandiflora*** Franchet, Bull. Soc. Bot. France 33: 427. 1886.

大花蝇子草 da hua ying zi cao

*Melandrium grandiflorum* (Franchet) Y. W. Tsui.

Herbs perennial. Stems diffuse, 40–50 cm, branched, pubescent. Leaves lanceolate or narrowly lanceolate, 3–6 cm × 4–15 mm, both surfaces slightly coarse, sparsely villous at veins, margin ciliate, midvein prominent, base

suborbicular or broadly cuneate, apex acuminate. Dichasial cymes lax and broad; flowers erect, to 2.5 cm in diam. Pedicel 4–7 cm, slender, pubescent; bracts lanceolate, herbaceous, villous. Calyx pale green or red, tubular-clavate, ca. 20 × 4 mm, umbilicate at base, sparsely pubescent, veins not prominent; calyx teeth ovate-lanceolate, ca. 2.5 mm, margin membranous, apex obtuse. Androgynophore 5–8 mm, glabrous. Petals red, 2–2.5 cm; claws narrowly oblanceolate, glabrous, auriculate; limbs obcordate, shallowly bifid, lobes suborbicular; coronal scales orbicular. Stamens exerted; filaments glabrous. Styles exerted. Capsule ovoid-globose, shorter than calyx. Seeds reniform. Fl. Jul–Aug.

- Scrub grasslands; ca. 2000 m. Yunnan.

This species is similar to *Silene cardiopetala*, but has narrower leaves and stiffer hairs on the calyx.

*Silene grandiflora* var. *xerobatica* W. W. Smith (Notes Roy. Bot. Gard. Edinburgh 11: 224. 1920) has a creeping habit, more crowded, linear leaves, shorter internodes in the inflorescence, fewer flowers, and shorter pedicels. It is perhaps best regarded as a separate species.

*Silene grandiflora* is cultivated as an ornamental.

**100. *Silene cardiopetala*** Franchet, Bull. Soc. Bot. France 33: 419. 1886.

心瓣蝇子草 xin ban ying zi cao

*Melandrium cardiopetalum* (Franchet) Handel-Mazzetti.

Herbs perennial. Roots clustered, cylindrical or spiniform. Stems diffuse, supine, slender, 40–100 cm, branched, pubescent. Leaves elliptic, 2–3(–4) × 0.7–1.5(–1.7) cm, both surfaces subglabrous, abaxially sparsely villous at midvein, ciliate, midvein prominent, base attenuate, apex acute. Dichasial cymes lax and broad, with flowers ca. 2 cm in diam. Pedicel longer, rarely shorter, than calyx, densely villous; bracts linear-lanceolate, sparsely villous. Calyx tubular-clavate, 1.5–1.8 cm × ca. 3 mm, longitudinal veins obscure, villous or subglabrous; calyx teeth ovate-lanceolate, margin membranous, apex obtuse. Androgynophore 5–8 mm, glabrous. Petals pale red, 2–2.5 cm; claws cuneate, glabrous, with auricles; limbs obcordate, 6–7 mm in diam., slightly emarginate or shallowly bifid at apex; lobes broadly ovate, margin entire; coronal scales orbicular, margin entire. Stamens slightly exerted; filaments glabrous; anthers dark violet. Styles exerted. Capsule ovoid-globose, ca. 1 cm, shorter than calyx. Seeds reniform. Fl. Jul–Sep, fr. Aug–Oct.

- Scrub, forest margins; 700–3200 m. SW Sichuan, SE Xizang (Zayü Xian), NW Yunnan.

**101. *Silene lichiangensis*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 225. 1920.

丽江蝇子草 li jiang ying zi cao

*Melandrium lichiangense* (W. W. Smith) Handel-Mazzetti.

Herbs perennial. Roots clustered, spiniform. Stems diffuse, supine, 20–40 cm, multibranched, basally eglandular pubescent, apically glandular hairy. Leaves elliptic or elliptic-oblanceolate, 3–6 × 1–2(–2.5) cm, subglabrous, midvein prominent, cuneate or gradually narrowed to base, apex acute. Dichasia 1–5(–7)-flowered. Pedicel 1.5–5 cm, densely violet glandular pubescent; bracts ovate or lanceolate, 3–15 mm, herbaceous, abaxially and margin violet glandular hairy. Calyx campanulate, 1.3–1.5 cm × ca. 5 mm, glandular hairy, veins violet, base truncate; calyx teeth triangular, ca. 3.5 mm. Androgynophore 1–2 mm, glabrous. Petals ca. 2 cm; claws oblanceolate, glabrous, with auricles; limbs pale red, obovate, deeply bifid to middle; lobes rounded, sometimes with 2 or 3 teeth. Stamens and styles included; filaments glabrous. Styles 3. Fl. Jul–Aug.

- Grasslands near forest margins; 2900–3600 m. NW Yunnan (Lijiang Naxi Zu Zizhixian).

**102. *Silene monbeigii*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 226. 1920.

沧江蝇子草 cang jiang ying zi cao

*Silene cardiopetala* Franchet var. *deqenensis* C. Y. Wu; *S. zangdongensis* L. H. Zhou.

Herbs perennial. Roots clustered, cylindrical. Stems supine, 15–50 cm, slender, multibranched, retrorsely pubescent. Leaves narrowly elliptic or oblanceolate-elliptic, 5–15(–30) × 4–7 mm, thin, both surfaces pubescent, ciliate, midvein prominent, base attenuate into short petiole, sometimes with short, sterile axillary branches. Dichasial cymes several flowered; ca. 1.5 cm in diam. Pedicel 7–17 mm, with glandular and eglandular hairs; bracts lanceolate, herbaceous. Calyx narrowly cylindrical, ca. 15 × 2 mm, glandular hairy, clavate in fruit, longitudinal veins violet; calyx teeth lanceolate, apex acute. Androgynophore ca. 5 mm, glabrous. Petals ca. 1.5 cm; claws subequaling calyx, glabrous, narrowly cuneate; limbs pale red, obovate, ca. 6 mm, shallowly bifid, sometimes with 1 obscure thin tooth on lower part of lateral lobes; coronal scales ovoid or suborbicular, margin entire. Stamens slightly exerted; filaments glabrous. Styles exerted. Capsule ovoid-globose, 8–10 mm, shorter than calyx. Seeds dark brown, reniform, with lateral auricular pits. Fl. Jul–Aug, fr. Aug–Sep.

- Forest margins; 1900–3400 m. Sichuan, SE Xizang, Yunnan. This species is very similar to *Silene rosiflora*, but has a markedly longer calyx and androgynophore.

**103. *Silene rosiflora*** Kingdon-Ward ex W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 111. 1913.

粉花蝇子草 fen hua ying zi cao

*Silene salweenensis* W. W. Smith; ?*S. sinowatsonii* W. W. Smith.

Herbs perennial. Stems sparsely clustered, diffuse, ascending, 40–60 cm, multibranched, pubescent, apically glandular hairy. Leaves elliptic, sometimes nearly obovate, 2–4 × 1–2 cm, abaxially villous,

adaxially papillose or sparsely hairy, margin coarsely ciliate, midvein prominent, base cuneate, apex rounded or obtuse, mucronulate; distal leaves smaller. Dichasia 7–15-flowered, rachis densely glandular hairy. Pedicel 2–4 cm, glandular hairy; bracts lanceolate or linear. Calyx campanulate, 1.1–1.3 cm × ca. 3.5 mm, umbilicate at base; longitudinal veins violet, densely glandular hairy; calyx teeth suborbicular or obtusely triangular, ca. 1.5 mm, sparsely villous.

Androgynophore ca. 2 mm, glabrous. Petals pale red, ca. 2 cm; claws exerted ca. 5 mm beyond calyx, oblanceolate, glabrous, auricles inconspicuous; limbs nearly orbicular, ca. 5 mm, shallowly 4-lobed; medial lobes square or elliptic, entire, lateral lobes dentate; coronal scales narrowly elliptic, small, margin entire. Stamens included, ca. 1/2 as long as calyx; filaments glabrous. Styles prominently exerted. Capsule ovoid-ellipsoid, ca. 8 mm. Fl. Sep, fr. Oct.

• Grasslands of forest margins; 2800–3000 m. Sichuan, Yunnan. This species is similar to *Silene monbeigii*, but has a shorter calyx and androgynophore. *Silene sinowatsonii* has been reported to have the chromosome number  $2n = 24$ .

**104. *Silene batangensis*** Limpricht in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 363. 1922.

巴塘蝇子草 *ba tang ying zi cao*

*Melandrium batangense* (Limpricht) Pax & K. Hoffmann.

Herbs perennial. Roots clustered, spiniform. Stems supine or ascending, 20–35 cm, multibranched, 25–35 cm, densely shortly glandular hairy, apically viscid. Leaves lanceolate-linear, 2–3 cm × 1.5 × 3.5(–5) mm, both surfaces pubescent, margin ciliate, midvein prominent, base cuneate, apex obtuse or acute. Dichasial cymes 3–7-flowered, densely glandular hairy; flowers erect, 1.6–2 cm in diam. Pedicel 1–1.8 cm, slender, glandular hairy; bracts lanceolate, herbaceous. Calyx tubular-clavate, 1.2–1.5 cm, densely pubescent, viscid, longitudinal veins violet; calyx teeth triangular-lanceolate, villous, margin membranous, apex obtuse. Androgynophore 2–3 mm, glabrous. Petals included in calyx, pale red; claws oblanceolate, glabrous, auricles inconspicuous; limbs obovate, 5–6 mm, shallowly bifid; coronal scales orbicular. Stamens slightly exerted; filaments glabrous. Styles slightly exerted. Capsule ovoid, 6–8 mm, shorter than calyx. Seeds reniform, abaxially smooth. Fl. Jul–Aug, fr. Aug–Oct.

• Forest margins, coastal scrub grasslands; 2500–3500 m. W Sichuan, E Xizang.

The type has not been seen by the present authors.

**105. *Silene napuligera*** Franchet, Pl. Delavay. 82. 1889.

纺锤蝇子草 *fang chui ying zi cao*

*Melandrium napuligerum* (Franchet) Handel-Mazzetti; *M. rubicundum* Handel-Mazzetti; *Silene rubicunda* Franchet (1886), not A. Dietrich (1835); *S. rubicunda* var. *revoluta* Franchet.

Herbs perennial. Roots clustered, spiniform. Stems ascending, 20–50 cm, multibranched, pubescent, basally retrorsely pubescent, apically glandular hairy. Leaves often with short, sterile axillary branches; leaf blade lanceolate-linear, 1.5–6 cm × 1.5–4(–9) mm, both surfaces densely pubescent, margin ciliate, sometimes revolute, midvein prominent, base cuneate, apex acute. Dichasial cymes lax, densely glandular hairy, lateral dichasia sometimes present. Pedicel 5–20 mm, densely glandular hairy; bracts lanceolate-linear, glandular hairy. Calyx tubular, ca. 15 × 2.5 mm, densely to sparsely glandular hairy, veins violet; calyx teeth triangular, margin membranous, ciliate, apex acute.

Androgynophore 3–5 mm, glabrous. Petals pale red, ca. 2 cm; claws slightly exerted beyond calyx, oblanceolate, glabrous, auricles obscure; limbs obovate, bifid, 1-toothed on each lateral side, lobes ovate; coronal scales orbicular, apex obtuse. Stamens exerted; filaments glabrous. Styles exerted. Capsule ovoid, ca. 1 cm, shorter than calyx. Seeds reniform, grossly tuberculate and slightly grooved abaxially. Fl. May–Jun, fr. Jun–Jul.

• Scrub grasslands; 1500–3600 m. Sichuan, Xizang, Yunnan. Three forms of *Silene napuligera* have been distinguished based on differences in leaf morphology. These correspond to *Silene rubicunda* Franchet (not A. Dietrich), with lanceolate leaves to 6 cm long; the type of *S. napuligera*, with linear-lanceolate leaves to 3 cm long; and *S. rubicunda* var. *revoluta*, with revolute, linear leaves. However, we do not find any characters consistently correlated with these entities, and we therefore treat them as conspecific.

*Silene habaensis* H. Chuang (in C. Y. Wu et al., Fl. Yunnan. 6: 837. 1995) is said to be similar to *S. bilingua*, but differs in having a tubular-clavate calyx and 2-lobed petals. We have seen only a scanty paratype (at KUN), which agrees with these characters. This specimen also differs in having 1- or 2-flowered inflorescences and very long pedicels; moreover, the leaves are reminiscent of plants that have been called *S. rubicunda* var. *revoluta*, but the calyx is about 20 mm.

**106. *Silene principis*** Oxelman & Lidén in Oxelman et al., Novon 11: 323. 2001.

宽瓣蝇子草 *kuan ban ying zi cao*

*Silene platypetala* Bureau & Franchet, J. Bot. (Morot) 5: 22. 1891, not Otth (1824); *Melandrium platypetalum* F. N. Williams.

Herbs perennial. Roots clustered, cylindrical. Stems diffuse, supine, slender, 40–60 cm, multibranched, shortly retrorsely pubescent. Leaves linear or ligulate, 1–3(–4) cm × 1.5–3(–4) mm, abaxially pubescent at veins, adaxially coarse, margin ciliate, midvein prominent, base cuneate, apex acuminate. Dichasial cymes diffuse, few flowered; flowers erect, ca. 2 cm in diam. Pedicel 1–3 cm, pubescent; bracts lanceolate, herbaceous, densely pubescent. Calyx campanulate, 1–1.3 cm × ca. 3.5 mm, densely pubescent; calyx teeth triangular-ovate. Androgynophore 3–4 mm. Petals white, rarely pale pink; claws included or slightly exerted beyond calyx, oblanceolate, glabrous, broadly



triangular above; limbs obcordate, 6–8 × 5–6 mm; coronal scales narrowly elliptic, apex obtuse. Stamens slightly exerted; filaments glabrous; anthers dark violet. Styles slightly exerted beyond calyx. Capsule ovoid, ca. 8 mm, shorter than calyx. Seeds dark brown, reniform, ca. 1 mm. Fl. Jun–Aug, fr. Aug–Sep.

• Scrub grasslands; 1600–4000 m. W Sichuan.

*Wilson 3751a* (K) has smaller petal limbs and fasciculate leaves.

**107. *Silene bilingua*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 220. 1920.

双舌蝇子草 *shuang she ying zi cao*

*Melandrium bilinguum* (W. W. Smith) Pax & K. Hoffmann.

Herbs perennial. Roots clustered, spiniform. Stems diffuse, supine, ca. 8 cm, slender, multibranched, basally sparsely pubescent, apically glandular hairy. Leaves linear, 2–3(–6) cm × 1–2(–3) mm, both surfaces subglabrous, margin ciliate, midvein prominent, apex acute. Dichasial cymes multiflowered. Pedicel 1–2.5 cm, glandular hairy; bracts narrowly lanceolate, 5–10 mm, glandular hairy. Calyx campanulate, (8–)10–12 × ca. 3 mm, densely glandular hairy, base rounded, longitudinal veins violet; calyx teeth triangular, apex obtuse. Androgynophore ca. 2 mm, glabrous. Petals pale red, ca. 1.5 cm; claws included in calyx, oblanceolate, glabrous, auricles spreading to flabellate, margin erose; limbs obovate, bifid; lobes ligulate, ca. 3.5 mm, 1-toothed on each lateral side; coronal scales subsquarrose, small, margin entire or emarginate. Stamens exerted beyond calyx; filaments glabrous. Styles exerted. Capsule ovoid, ca. 8(–10) mm, shorter than calyx. Seeds dark brown, reniform, ca. 1 mm. Fl. Jun–Aug, fr. Jul–Sep.

• Forests, alpine meadows; (2200–)3100–4100 m. Sichuan, Xizang, NW Yunnan.

**108. *Silene viscidula*** Franchet, Bull. Soc. Bot. France 33: 421. 1886.

粘萼蝇子草 *nian e ying zi cao*

*Melandrium lankongense* (Franchet) Handel-Mazzetti;

*M. viscidulum* (Franchet) F. N. Williams; *Silene asclepiadea* Franchet var. *dumicola* (W. W. Smith) C. L. Tang; *S. bodinieri* H. Léveillé; *S. dumicola* W. W. Smith; *S. lankongensis* Franchet; *S. mairei* H. Léveillé.

Herbs perennial, pubescent throughout. Roots clustered, dark brown, cylindrical. Stems diffusely branched, to 80 cm, apically glandular hairy. Leaves elliptic, 3–6 cm, 1.5–2 × as long as broad, both surfaces slightly tuberculate-scrabrid or shortly pubescent, margin shortly ciliate, midvein prominent, base cuneate or attenuate into short petiole, apex acute. Dichasia large, the first internodes very long (often 5–10 cm), distally dense, densely glandular villous; flowers erect, 1–1.2 cm in diam. Pedicel of first flower subequaling or longer than calyx, pedicels of other flowers usually shorter than calyx; bracts ovate-lanceolate, herbaceous. Calyx campanulate, (6–)8–10 mm, densely glandular villous, base rounded, longitudinal veins violet; calyx teeth

ovate-lanceolate, apex acute. Androgynophore 1–2 mm, glabrous, furrowed. Petals pale red, 1–2 cm, claws exerted 2–5 mm beyond calyx, oblanceolate, glabrous, auricles not prominent, limb bifid to ca. 1/2; lobes narrow, sometimes with 1 slender lateral tooth.

Stamens and styles prominently exerted (2–3 mm); filaments glabrous. Capsule ovoid, 5–8 mm, shorter than calyx. Seeds dark brown to black, globose-reniform, ca. 1 mm. Fl. Jul–Aug, fr. Sep–Oct.

• Scrub grasslands; (1200–)1500–3200 m. Guizhou, Sichuan, SE Xizang, Yunnan.

*Silene viscidula* is a complex that could be split into about three species differing, for example, in indumentum, inflorescence structure, size of calyx and petals, and degree of exertion of petals. One form has a thyrse (including the types of *Silene bodinieri*, *S. dumicola*, and *S. mairei*) and multicellular, often glandular hairs together with recurved, short, unicellular, eglandular hairs; another form has terminal dichasia and multicellular, often glandular hairs only. The latter form also has smaller flowers (calyx 7–8 mm) and less exerted petal claws (by 2–3 mm). This applies also to the type of *S. viscidula* at P. Another species in the vicinity of this complex is *S. phoenicodonta*, which is distinguished by its small flowers and fringed petal auricles.

The roots are used medicinally.

The roots are used medicinally.

**109. *Silene phoenicodonta*** Franchet, Bull. Soc. Bot. France 33: 422. 1886.

红齿蝇子草 *hong chi ying zi cao*

Herbs perennial. Roots clustered, cylindrical, dark brown. Stems sparsely caespitose, ascending, 25–50 cm, branched, basally sparsely villous, apically sparsely hairy. Proximal cauline leaves greenish, ovate-elliptic or obovate-elliptic, 5–10 (–12) × 2–3 cm, glabrous or sparsely villous at veins, margin shortly pubescent, 3-veined, base attenuate into petiole, apex acute at apex; distal leaves sessile, often ovate, small. Dichasia diffuse, few flowered; flowers erect. Pedicel and rachis villous, sparsely glandular hairy; bracts ovate-lanceolate, villous. Calyx ovoid-campanulate, 6–8 mm, base rounded; longitudinal veins green or violet, sparsely hirtellous and glandular hairy, inflated after anthesis; calyx teeth violet, ovate, apex acute. Androgynophore ca. 1 mm, glabrous. Petals dark violet, 1–1.2 cm; claws included in calyx, subsaccate, glabrous, flabellately inflated above, lacinate; limbs obovate, deeply bifid to middle, lobes ovate or nearly band-shaped; coronal scales orbicular-linear, small. Stamens included or slightly exerted; filaments glabrous. Styles exerted. Capsule broadly ovoid, 7–10 mm, shorter than calyx. Seeds dark brown, reniform, ca. 1 mm, thickened. Fl. Jun–Jul, fr. Jul–Aug.

• Scrub, stream edges; 1600–2600 m. E and S Sichuan, NW Yunnan.

**110. *Silene otodonta*** Franchet, Bull. Soc. Bot. France 33: 426. 1886.

耳齿蝇子草 *er chi ying zi cao*

Herbs perennial, eglandular pubescent. Roots clustered, cylindric. Stems diffuse, 30–70 cm, multibranching, shortly pubescent. Leaves with short, sterile axillary branches; leaf blade elliptic, 2–3 cm × 6–15 mm, both surfaces pubescent, ciliate, midvein prominent, base cuneate or attenuate into short petiole, apex acute. Inflorescence a thyrses, sometimes composed of two orders, cymules usually 5–7-flowered, dense. Pedicel 1–10(–20) mm, pubescent; bracts linear-lanceolate, herbaceous, blackish pointed, pubescent. Flowers ca. 1.5 cm in diam. Calyx tubular or narrowly campanulate, 1.2–1.5 cm × ca. 3.5 mm, pubescent, base umbilicate; calyx teeth blackish violet, ovate-lanceolate, ca. 3.5 mm, apex acuminate. Androgynophore ca. 2.5 mm, glabrous.

Petals ca. 1.8 cm; claws included in calyx, oblanceolate, glabrous, with broad auricles; limbs pale red or white, ca. 7 mm, bifid to middle; lobes linear, with 1 narrow lateral tooth; coronal scales lanceolate, 1.5–2 mm, apex acute. Stamens and styles exerted; filaments glabrous. Styles 3. Capsule subovoid, 8–10 mm. Seeds reniform. Fl. Aug–Sep.

- Forests; 2100–2500 m. Sichuan, Yunnan.

*Silene otodonta* is easily distinguished from all other species by numerous lateral dichasia, forming a complex paniculate thyrses, and its acuminate flower buds, appearing pointed because of the protruding, blackish violet calyx teeth.

## 22. AGROSTEMMA Linnaeus, Sp. Pl. 1: 435. 1753.

麦仙翁属 mai xian weng shu

Lu Dequan (鲁德全); Magnus Lidén, Bengt Oxelman

Herbs annual. Stems erect. Leaves narrowly lanceolate to linear. Flowers in few flowered, lax dichasia. Calyx tube ovate or elliptic-ovate, with 10 longitudinal, raised veins; teeth 5, leaflike, linear, usually longer than tube. Androgynophore absent. Petals 5; limb usually shorter than calyx teeth, emarginate, gradually turning to claw; coronal scales absent. Stamens 10. Ovary 1-locular; styles 5, hairy, alternating with calyx lobes. Capsule ovoid, septicidally dehiscent by 5 teeth. Seeds numerous.

About three species: native to the Mediterranean region, native or naturalized in N Asia and Europe, naturalized in North America; one species in China.

### 1. *Agrostemma githago* Linnaeus, Sp. Pl. 1: 435. 1753.

麦仙翁 mai xian weng

Plants 60–90 cm tall, with long appressed grayish hairs. Stems unbranched, often with axillary dichasia above. Leaves linear or linear-lanceolate, 4–13 cm × (2–)5–10 mm, midvein prominent, base slightly connate, apex acute. Pedicel very long. Calyx tube 1.2–1.5 cm, abaxially villous; teeth 2–3 cm. Petal limbs pink, 1.4–1.8 cm, shorter than calyx teeth; claw white, narrowly cuneate; limb dark red, obovate, emarginate. Stamens

and styles exerted. Capsule ovoid, 1.2–1.8 cm, slightly longer than calyx. Seeds black, ovoid or reniform, 2.5–3 mm, with prominent acute tubercles. Fl. Jun–Aug, fr. Jul–Sep. *2n* = 24, 48.

Weed of fields, wheat farmlands, roadside grasslands. Heilongjiang, Jilin, Nei Mongol, Xinjiang [native to the Mediterranean region, native or naturalized in N Asia and Europe; naturalized elsewhere].

This species is used medicinally. The stem, leaves, and seeds are poisonous.

## 23. LYCHNIS Linnaeus, Sp. Pl. 1: 436. 1753.

剪秋罗属 jian qiu luo shu

Lu Dequan (鲁德全); Magnus Lidén, Bengt Oxelman

*Coronaria* Guettard; *Hedona* Loureiro.

Herbs biennial or perennial. Stems erect. Leaves lanceolate to ovate-lanceolate, apex acute. Inflorescence a dichasium or flower solitary. Calyx tubular to narrowly funnel-shaped or narrowly campanulate, usually not inflated, 10-veined, with 5 teeth. Petals 5, long clawed, limb white, pink, or red, entire, bifid, 4-fid, or lacinate; coronal scales present. Androgynophore ± conspicuous, glabrous. Stamens 10. Ovary 1-loculed; ovules numerous; styles 5, opposite calyx teeth, their bases persistent in fruit. Capsule septicidally dehiscent with 5 teeth. Seeds numerous, reniform, minute, ± tuberculate.

About 25 species: temperate Africa, Asia, and Europe; six species in China.

*Lychnis coronaria* (Linnaeus) Desrousseaux is cultivated in China for its attractive flowers.

Recently, Greuter (in Taxon 44: 543–581. 1995) placed *Lychnis* into the synonymy of *Silene*. However, Oxelman et al. (in Nordic J. Bot. 20: 513–518. 2001) showed that it is possible to retain *Lychnis* and several other genera (e.g., *Atocion*) as separate from *Silene* in a taxonomy that is consistent with both the ability to diagnose taxa and solid, molecular-phylogenetic hypotheses. Some species, traditionally included in *Lychnis*, belong in *Silene*.

- 1a. Inflorescence a dense, corymblike dichasium ..... 1. *L. chalconica*  
1b. Inflorescence not corymblike.

- 2a. Petal limb unlobed, apex dentate ..... 5. *L. coronata*  
 2b. Petal limb lobed, apex dentate or entire.  
 3a. Petal limb 2-lobed with lateral, subulate teeth, apex obtuse.  
 4a. Petal limb crimson-red, not overlapping, bracts and calyx densely villous ..... 4. *L. fulgens*  
 4b. Petal limb orange-red or reddish, obovate, overlapping, bracts and calyx laxly villous .... 3. *L. cognata*  
 3b. Petal limb with several acute, ± irregular lobes.  
 5a. Androgynophore ca. 10 mm or more ..... 6. *L. senno*  
 5b. Androgynophore ca. 5 mm or less ..... 2. *L. wilfordii*

**1. *Lychnis chalconica*** Linnaeus, Sp. Pl. 1: 436. 1753.

皱叶剪秋罗 *zhou ye jian qiu luo*

*Silene chalconica* (Linnaeus) E. H. L. Krause.

Herbs perennial, 50–100 cm tall, hispid with multicellular eglandular hairs. Stems simple or rarely branched; sterile, dwarf, axillary shoots from short rhizomes present. Leaves ovate or ovate-lanceolate, 5–12 × 2–5 cm, both surfaces sparsely pilose. Inflorescence a terminal, dense, corymblike, 10–50-flowered dichasium. Pedicel much shorter than calyx, slender; bracts lanceolate, small, herbaceous. Flowers 1.5–2 cm in diam. Calyx tubular or tubular-clavate, 1.2–1.5(–1.7) × ca. 3 mm, pilose at veins; teeth triangular-lanceolate, ca. 3 mm. Petal limb orange-red, broadly obovate, 7–9 mm, bifid to 1/3; lobes obovate, each with a subulate lateral tooth; claw oblanceolate, base ciliate; coronal scales linear, apex acute. Stamens slightly exerted. Androgynophore 4–6 mm. Capsule ovoid, 8–10 mm. Seeds dark red-brown, triangular-reniform, ca. 1 mm, sharply pointed tuberculate. Fl. summer–autumn, fr. autumn.  $2n = 24, 48$ .

Gansu, Xinjiang [Mongolia, Russia].

This species is also cultivated in Chinese gardens.

**2. *Lychnis wilfordii*** (Regel) Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 17: 178. 1872.

丝瓣剪秋罗 *si ban jian qiu luo*

*Lychnis fulgens* Fischer var. *wilfordii* Regel, Bull. Soc. Imp. Naturalistes Moscou 34(4): 576. 1861; *Silene wilfordii* (Regel) H. Ohashi & H. Nakai.

Herbs perennial, 45–100 cm tall, glabrous or pilose with intermixed sparse multicellular eglandular hairs. Roots unknown. Stems simple or branched above. Leaves sessile, ovate-lanceolate or narrowly lanceolate, 3–12 × 1–2.5 cm, glabrous, margin thickly ciliate. Dichasium rather dense, many flowered. Pedicel 3–20 mm; bracts linear-lanceolate. Flowers 2.5–3 cm in diam. Calyx narrowly funnel-shaped, 1.5–2 cm × 4–5 mm, veins prominent, teeth ca. 3 mm. Petal limb bright red, 4-lobed; lobes subulate to broadly filiform, apex acute; claw narrowly cuneate; coronal scales dark red, oblong. Stamens and styles exerted. Androgynophore ca. 5 mm. Capsule cylindrical-ovoid, ca. 1 cm, equaling or slightly included in calyx. Seeds black-brown, reniform, ca. 1 mm, sharply pointed tuberculate. Fl. Jun–Jul, fr. Aug–Sep.  $2n = 24$ .

Wet meadows, low river banks, woodland edges, forest margins; 200–1200 m. Jilin [Japan, N Korea, Russia (Far East)].

Mabberley (in Telopea 8: 249–256) considered species nos. 2–6 to be conspecific, hypothesizing that the type specimens pertaining to them are of garden origin and that they could all be of hybrid origin. The morphological diversity should thus be a reflection of segregation of offspring in  $F^2$  or later generations.

**3. *Lychnis cognata*** Maximowicz, Prim. Fl. Amur. 55. 1859.

浅裂剪秋罗 *qian lie jian qiu luo*

*Lychnis fulgens* Fischer var. *cognata* (Maximowicz) Regel; *Silene cognata* (Maximowicz) H. Ohashi & H. Nakai.

Herbs perennial, 30–90 cm tall, pilose with intermixed sparse multicellular eglandular hairs. Roots caespitose, fusiform, slightly fleshy. Stems simple or branched above. Leaves ovate-lanceolate, 5–11 × 1–4 cm, more densely pilose at veins, base broadly cuneate, apex acute. Dichasium several flowered, or sometimes flowers solitary in leaf axils. Pedicel 3–12 mm; bracts laxly villous. Flowers 3.5–5 cm in diam. Calyx narrowly campanulate, 2–2.5 cm × 3.5–5 mm, laxly villous at veins, slightly inflated in fruit; teeth triangular, ca. 3 mm. Petal limb orange-red or reddish, bifid, apically obtuse, each with a subulate lateral tooth, main lobes obovate, margin entire or obscurely denticulate; claw slightly protruding from calyx, glabrous, base narrowly cuneate; coronal scales dark red, apex dentate. Stamens and styles slightly exerted. Androgynophore 8–10 mm. Capsule narrowly ellipsoid-ovoid, ca. 1.5 cm. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 24$ .

Mountain slopes, gullies, forests, scrub, grasslands; 500–2000 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Zhejiang [Korea, Russia (Far East)].

**4. *Lychnis fulgens*** Fischer ex Sprengel, Nov. Prevent. 26. 1818.

剪秋罗 *jian qiu luo*

*Silene fulgens* (Sprengel) E. H. L. Krause.

Herbs perennial, 50–85 cm tall, pilose with sparse multicellular eglandular hairs. Roots caespitose, fusiform, slightly fleshy. Stems simple or branched above. Leaves ovate or ovate-lanceolate, 3.5–10 × 2–4 cm, both surfaces and margin pilose, base rounded, rarely broadly cuneate, slightly clasping, apex acute. Dichasium several flowered, dense, rarely corymblike. Pedicel 3–12 mm; bracts lanceolate, herbaceous, densely villous, ciliate at margin. Flowers 3.5–5 cm in diam. Calyx narrowly campanulate, 1.5–2.8 cm × 4–8

mm, villous, densely so at veins, slightly inflated in fruit; teeth triangular. Petal limb crimson-red, 2-lobed to 1/2; lobes linear, apex obtuse, sometimes obscurely denticulate, each lobe with a subulate, lateral tooth; claw narrowly lanceolate, not exceeding calyx; coronal scales dark red, narrowly elliptic. Stamens and styles slightly exerted. Androgynophore ca. 5 mm. Capsule narrowly ellipsoid-ovoid, 1.2–1.4 cm. Fl. Jun–Jul, fr. Aug–Sep.  $2n = 24$ .

Woodlands on low hills, wet shady scrub meadows. Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shanxi, Sichuan, Yunnan [Japan, Korea, Russia (Siberia, Far East)].

**5. *Lychnis coronata*** Thunberg in Murray, Syst. Veg., ed. 14, 435. 1784.

剪春罗 jian chun luo

*Agrostemma banksia* Meerburgh; *Hedona sinensis* Loureiro; *Lychnis grandiflora* Jacquin; *Silene banksia* (Meerburgh) Mabblerley; *S. grandiflora* (Jacquin) H. Ohashi & H. Nakai.

Herbs perennial, 50–90 cm tall, subglabrous. Roots caespitose, pale yellow, narrowly fusiform, slightly fleshy. Stem solitary, rarely sparsely caespitose. Leaves ovate-lanceolate, (5–)8–15 × (1–)2.5 cm, both surfaces subglabrous, ciliate at margin, base cuneate, apex acuminate. Dichasium several flowered. Pedicel very short, sparsely pubescent; bracts lanceolate, herbaceous, ciliate at margin. Flowers 4–5 cm in diam. Calyx tubular, (2.5–)3–3.5 cm × 3.5–5 mm, veins prominent, glabrous, teeth 8–10 mm. Petal limb salmon-pink, obovate, (1.5–)2–2.5 cm, unlobed, apex irregularly incised-dentate; claw not exceeding calyx. Stamens

included. Androgynophore 1–1.5 cm. Capsule narrowly ellipsoid, ca. 2 cm. Fl. Jun–Jul, fr. Aug–Sep.

Sparse forests, scrub grasslands, also cultivated. Anhui, Fujian, Hunan, Jiangsu, Jiangxi, Sichuan (Emei Shan), Zhejiang [Japan].

This species is used medicinally.

**6. *Lychnis senno*** Siebold & Zuccarini, Fl. Jap. 1: 98. 1839.

剪红纱花 jian hong sha hua

*Agrostemma bungeana* D. Don; *Lychnis bungeana* (D. Don) Fischer ex Lindley; *Silene bungeana* (D. Don) H. Ohashi & H. Nakai.

Herbs perennial, 50–100 cm tall, pilose with sparse multicellular eglandular hairs. Roots caespitose, pale yellow, narrowly cylindrical, slightly fleshy. Stem solitary, simple or branched above. Leaves elliptic-lanceolate, (4–)8–12 × 2–3 cm, both surfaces pubescent, ciliate at margin, base cuneate, apex acuminate.

Dichasium many flowered. Pedicel 2–5(–15) mm; bracts lanceolate, pubescent. Flowers 3.5–5 cm in diam. Calyx tubular to narrowly funnel-shaped, (2–)2.5–3 cm × 2.5–3.5 mm, slightly inflated in fruit, pilose at veins; teeth triangular, 2–4 mm. Petal limb deep red, triangular-obovate, irregularly parted into numerous incised-dentate lobes; claw often exceeding calyx, narrowly cuneate, glabrous. Stamens and styles included; anthers dark purple. Androgynophore 1–1.5 cm. Capsule ellipsoid-ovoid, 1–1.5 cm, protruding from calyx tube. Seeds red-brown, reniform, ca. 1 mm, tuberculate. Fl. Jul–Aug, fr. Aug–Sep.  $2n = 24^*$ .

Sparse forests, scrub grasslands, also extensively cultivated; 100–2000 m. Anhui, Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan].

## 24. VACCARIA Wolf, Gen. Pl. iii. 1776.

麦蓝菜属 mai lan cai shu

Lu Dequan (鲁德全); Magnus Lidén, Bengt Oxelman

Herbs annual. Stems erect, dichotomously branched. Leaves ovate-lanceolate or lanceolate, base slightly clasping. Inflorescence a corymbose dichasium. Calyx narrowly ovate, 5-toothed, 5-winged at angles, inflated below after anthesis. Petals 5, long clawed. Stamens 10. Ovary 1-loculed; ovules numerous. Styles 2. Capsule ovoid, dehiscing with 4 teeth. Seeds numerous, globose, tuberculate.

One species: temperate Asia and Europe; one species in China.

**1. *Vaccaria hispanica*** (Miller) Rauschert, Wiss. Z. Martin-Luther-Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 14: 496. 1965.

麦蓝菜 mai lan cai

*Saponaria hispanica* Miller, Gard. Dict., ed. 8, *Saponaria* no. 4 [in errat.]. 1768; *S. segetalis* Necker; *S. vaccaria* Linnaeus; *Vaccaria pyramidata* Medicus; *V. segetalis* (Necker) Garcke.

Plants 30–70 cm tall. Stems gray-green, apically branched, glabrous. Leaves 3–9 × 1.5–4 cm, apex acute. Bracts lanceolate, midvein green. Calyx green, 1–1.5

cm × 5–10 mm, 5-angled, submembranous between angles; calyx teeth triangular, margin scarious; globose in fruit. Petals 1.4–1.7 cm × 2–3 mm; claw greenish, narrowly cuneate; limb pink, emarginate, sometimes erose. Stamens included. Styles slightly exerted. Capsule 8–10 mm. Seeds red-brown to black, ca. 2 mm, granulate. Fl. Apr–Jul, fr. May–Aug.  $2n = 30^*$ .

Wheat fields. Anhui, Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang, Xizang, Yunnan [native to Asia and Europe].

The seeds are used medicinally.

## 25. DIANTHUS Linnaeus, Sp. Pl. 1: 409. 1753.

石竹属 shi zhu shu

Lu Dequan (鲁德全); Nicholas J. Turland

Herbs perennial, rarely annual. Roots sometimes woody. Stems mostly caespitose, terete or angular, articulated, dilated at nodes. Leaves opposite, usually glaucous, linear or lanceolate, veins parallel, base slightly connate, margin scabrid. Flowers solitary, several in a loose cyme, or numerous and clustered into capitula, subtended by 1–4 pairs of appressed bracts. Calyx cylindrical, apically 5-toothed, veins 7, 9, or 11, without scarious commissures. Petals 5, purple, red, pink, or white; claw long; limb dentate or lacerate, rarely entire. Stamens 10. Ovary 1-loculed; ovules numerous. Gynophore long. Styles 2. Capsule cylindrical, suboblong, or rarely ovoid, dehiscing by 4 teeth or valves. Seeds dorsiventrally compressed, orbicular or discoid, flat or concave; embryo erect; albumen eccentric.

About 600 species: widespread in N temperate regions, mostly in Asia and Europe and especially in the Mediterranean region, a few species in Africa and America; 16 species (two endemic) in China.

*Dianthus harrissii* K. H. Rechinger (Pl. Syst. Evol. 142: 240. 1983), described from N Pakistan (Chitral), was recorded by Rechinger (Fl. Iran. 163: 143. 1988) from W Xizang and Kashmir. The specimens cited by Rechinger have not been seen by the present authors, and the species is therefore not described here.

The following species have not yet been recorded for China but might be expected to occur in SW Xinjiang and/or W Xizang: *Dianthus angulatus* Royle (Ill. Bot. Himal. Mts. 1: 79. 1835), from Afghanistan, India, and Pakistan, including the W Himalayas; *D. cachemiricus* Edgeworth (in J. D. Hooker, Fl. Brit. India 1: 214. 1874), from E Afghanistan, Kashmir, and N Pakistan; and *D. crinitus* Smith (Trans. Linn. Soc. London, Bot. 2: 300. 1794), from C and SW Asia, as far E as Afghanistan, Tajikistan, and Pakistan.

*Dianthus foliosus* Turczaninow (Bull. Soc. Imp. Naturalistes Moscou 5: 184. 1832) was described from territory probably now within China ("Habitat in saxosis Mongoliae chinensis"), and *D. seisuimontanus* Masamune (Trans. Nat. Hist. Soc. Taiwan 31: 343. 1941) was described from Taiwan ("Mt. Seisui," ca. 2000 m). However, the types have not been seen by the present authors and their identities could not be ascertained.

Several species are cultivated in China for their attractive flowers, including *Dianthus barbatus*, *D. caryophyllus* Linnaeus (including *D. arbuscula* Lindley), *D. chinensis*, and *D. japonicus* Thunberg.

- 1a. Flowers numerous, clustered into capitula, very shortly pedicellate or subsessile ..... 1. *D. barbatus*
- 1b. Flowers solitary or several in a loose cyme, long pedicellate.
  - 2a. Petal limb margin distally lobed to irregularly toothed.
    - 3a. Leaves linear-lanceolate, 2–4 mm wide; bracts more than 1/2 as long as calyx.
      - 4a. Stems densely caespitose; bracts 2(or 4); calyx 1.2–1.4 cm ..... 2. *D. repens*
      - 4b. Stems loosely caespitose; bracts 4; calyx 1.5–2.5 cm ..... 3. *D. chinensis*
    - 3b. Leaves linear or subulate, 1–2(–3) mm wide; bracts 1/3–1/2 as long as calyx.
      - 5a. Petals white; calyx tube ca. 3 mm in diam.; bracts elliptic, ca. 1/3 as long as calyx 7. *D. ramosissimus*
      - 5b. Petals purple, light purple-red, pink, or rose; calyx tube 4–7 mm in diam.; bracts ovate or obovate, ca. 1/2 as long as calyx.
        - 6a. Plants 5–15 cm tall ..... 4. *D. semenovii*
        - 6b. Plants 20–50 cm tall.
          - 7a. Calyx not inflated near middle, ca. 4 mm in diam.; bracts obovate, apex subulate with short, sharp tip; leaves 1–2 mm wide ..... 5. *D. turkestanicus*
          - 7b. Calyx slightly inflated near middle, 5–7 mm in diam.; bracts ovate, apex long acuminate with caudate tip; leaves 2–3 mm wide ..... 6. *D. elatus*
    - 2b. Petal limb margin distally fimbriate to deeply fimbriate.
      - 8a. Plants more than 30 cm tall; leaves linear-lanceolate or lanceolate.
        - 9a. Bracts broadly ovate, 1/4–1/3 as long as calyx; calyx 2.3–2.5 cm; capsule longer than calyx 16. *D. hoeltzeri*
        - 9b. Bracts ovate or obovate, 1/5–1/4 as long as calyx; calyx 2.5–4 cm; capsule shorter to slightly longer than calyx.
          - 10a. Bracts in 2 or 3 pairs, obovate, ca. 1/4 as long as calyx, apex subulate or long acuminate; calyx usually reddish purple, 2.5–3 cm; capsule equaling or slightly longer than calyx 14. *D. superbus*
          - 10b. Bracts in 3 or 4 pairs, ovate, ca. 1/5 as long as calyx, apex mucronate; calyx green, 3–4 cm; capsule shorter than calyx ..... 15. *D. longicalyx*
      - 8b. Plants less than 30 cm tall; leaves linear or acicular.
        - 11a. Plants to 15 cm tall; calyx ca. 1.8 cm (Taiwan) ..... 13. *D. pygmaeus*
        - 11b. Plants (10–)15–30(–40) cm tall; calyx (1.5–)2–3.5 cm.
          - 12a. Petals dark red, yellow-brown, or pink.
            - 13a. Petals dark red or yellow-brown; bracts in 2 pairs, oblong-elliptic, 1/5–1/4 as long as calyx ..... 10. *D. soongoricus*

- 13b. Petals pink; bracts in 3 or 4 pairs, ovate, 1/4–1/3 as long as calyx ..... 11. *D. orientalis*  
 12b. Petals white, rarely pale rose or claw pink.  
 14a. Petal limb fimbriate for less than 1/4 its length (Taiwan) ..... 12. *D. palinensis*  
 14b. Petal limb fimbriate for at least 1/3 its length (Xinjiang).  
 15a. Petal limb adaxially hairy, fimbriate for ca. 1/3 its length; bracts 1/4–1/3 as long  
 long  
 as calyx; leaves acicular, basal ones densely fascicled ..... 8. *D. acicularis*  
 15b. Petal limb glabrous, fimbriate for ca. 1/2 its length; bracts 1/3–1/2 as long as  
 calyx; leaves linear, basal ones not densely fascicled ..... 9. *D. kuschakewiczii*

**1. *Dianthus barbatus*** Linnaeus var. **asiaticus** Nakai, Tyosen-Syokubutsu 143. 1914.

头石竹 *tou shi zhu*

Herbs perennial, 30–60 cm tall, glabrous. Stems erect, angular. Leaves lanceolate, 4–8 × ca. 1 cm, midvein prominent, base attenuate into a sheath, apex acute. Flowers numerous, clustered into capitula; pedicel very short or obscure; bracts 4, ovate, equaling or slightly longer than calyx, margin membranous, denticulate, apex caudate. Calyx tubular, ca. 1.5 cm; teeth sharply pointed. Petals purple-red, spotted with white; claw long; limb ovate, throat bearded, apex toothed. Stamens slightly exerted. Ovary suboblong. Styles linear. Capsule ovoid-suboblong, ca. 1.8 cm, 4-valved for ca. 1/2 its length. Seeds brown, compressed ovoid, smooth. Fl. and fr. May–Oct.

Broad-leaved forests, forest margins. E and S Jilin [N Korea, Russia (Far East)].

*Dianthus barbatus* var. *barbatus*, which is restricted to Europe as a native plant, is cultivated for ornament in China. It differs from var. *asiaticus* in being stouter, with broader, thicker leaves, and larger, more numerous flowers.

**2. *Dianthus repens*** Willdenow, Sp. Pl. 2: 681. 1799.

簇茎石竹 *cu jing shi zhu*

*Dianthus chinensis* Linnaeus subsp. *repens* (Willdenow) Voroschilov.

Herbs perennial, to 30 cm tall, glabrous, rarely stems pilose and scabrid. Stems numerous, densely caespitose. Leaves pendent, linear-lanceolate, 3–5 cm × 2–3 mm, soft, midvein prominent, base attenuate, apex acuminate. Flowers 1 or 2, terminal, 2–2.5 cm in diam.; bracts 2(or 4), ovate, slightly shorter than or subequaling calyx, apex subulate. Calyx sometimes purplish, cylindrical, 1.2–1.4 cm × ca. 4 mm; teeth lanceolate, margin membranous, ciliate, apex sharply pointed. Petal claw 1.4–1.5 cm; limb purple-red, obovate-cuneate, 1.2–1.3 cm × 8–9 mm, adaxially shortly hairy, base dark purple ringed, caespitose long pilose, apex toothed. Gynophore ca. 1 mm. Capsule not seen. Fl. Jul–Aug.

Meadows at forest margins, mountain slopes, river banks, steppes. Nei Mongol [Russia (Far East, Siberia); North America].

*Dianthus repens* var. *scabripilosus* Y. Z. Zhao (Acta Sci. Nat. Univ. Intramong. 20(1): 110. 1989) was described from Nei Mongol. It differs only in having pilose, scabrid stems.

**3. *Dianthus chinensis*** Linnaeus, Sp. Pl. 1: 411. 1753.

石竹 *shi zhu*

*Dianthus amurensis* Jacques; *D. chinensis* var. *amurensis* (Jacques) Kitagawa; *D. chinensis* var. *dentosus* (Fischer ex Reichenbach) Debeaux; *D. chinensis* f. *ignescens* (Nakai) Kitagawa; *D. chinensis* var. *ignescens* Nakai; *D. chinensis* var. *jingpoensis* G. Y. Zhang & X. Y. Yuan; *D. chinensis* var. *liaotungensis* Y. C. Chu; *D. chinensis* var. *longisquama* Nakai & Kitagawa; *D. chinensis* var. *macrosepalus* Franchet ex L. H. Bailey; *D. chinensis* var. *morii* (Nakai) Y. C. Chu; *D. chinensis* var. *subulifolius* (Kitagawa) Y. C. Ma; *D. chinensis* var. *sylvaticus* W. D. J. Koch; *D. chinensis* var. *trinervis* D. Q. Lu; *D. chinensis* subsp. *versicolor* (Fisher ex Link) Voroschilov; *D. chinensis* var. *versicolor* (Fisher ex Link) Y. C. Ma; *D. dentosus* Fischer ex Reichenbach; *D. fischeri* Sprengel; *D. morii* Nakai; *D. sequieri* Chaix; *D. sequieri* var. *dentosus* (Fischer ex Reichenbach) Franchet; *D. subulifolius* Kitagawa; *D. subulifolius* f. *leucopetalus* Kitagawa; *D. versicolor* Fisher ex Link; *D. versicolor* f. *leucopetalus* (Kitagawa) Y. C. Chu; *D. versicolor* var. *subulifolius* (Kitagawa) Y. C. Chu.

Herbs perennial, 30–50 cm tall, glabrous. Stems laxly caespitose, erect, distally branched. Leaves linear-lanceolate, 3–5 cm × 2–4 mm, midvein prominent, base slightly narrowed, margin entire or denticulate, apex acuminate. Flowers solitary or several in cymes; pedicel 1–3 cm; bracts 4, ovate, ca. 1/2 as long as calyx, margin membranous, ciliate, apex long acuminate. Calyx cylindrical, 1.5–2.5 cm × 0.4–5 mm, striate; teeth lanceolate, ca. 5 mm, margin ciliate, apex sharply pointed. Petals 1.6–1.8 cm; limb bright red, purple-red, pink, or white, obovate-triangular, 1.3–1.5 cm, throat spotted and laxly bearded, apex irregularly toothed. Stamens exerted; anthers blue. Ovary suboblong. Styles linear. Capsule cylindrical, surrounded by calyx, apex 4-toothed. Seeds black, compressed globose. Fl. May–Jun, fr. Jul–Sep.  $2n = 30^*$ .

Sandy forest margins, forest grasslands, scrub on mountain slopes, hillside grasslands, dry hillsides, sandy hill summits, valleys, rocky ravines, meadows, streamsides, mountain stream wetlands, mountain waterfalls, rocks, steppes, steppe sands, fixed dunes, seashores, also widely cultivated. Native in Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, and Xinjiang; naturalized in S China [Kazakhstan, Korea, Mongolia, Russia (Siberia, Far East); Europe].

*Dianthus chinensis* is a very variable species represented in China by both cultivated and wild plants. In FRPS, the species was divided into eight varieties (treated in synonymy here), all of them occurring as wild plants and var. *chinensis* also including the cultivated material. No key to the varieties was provided, and the features given in the diagnoses were not always parallel, making it almost impossible to identify any given plant to variety. Moreover, the plants cultivated as ornamentals comprise numerous cultivars. Further research is needed on the species in China and surrounding countries before a satisfactory infraspecific classification can be presented. In the present account, therefore, *Dianthus chinensis* is treated in the broadest sense.

The species is used medicinally.

**4. *Dianthus semenovii*** (Regel & Herder) Vierhapper, Sitzungsber. Kaiserl. Acad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 107: 1147. 1898.

狭叶石竹 xia ye shi zhu

*Dianthus alpinus* Linnaeus var. *semenovii* Regel & Herder, Bull. Soc. Imp. Naturalistes Moscou 39: 531. 1866.

Herbs perennial, 5–15 cm tall. Stems numerous, densely caespitose, ascending. Leaves linear, 1.5–3 cm × 1–2 mm, 3–5-veined, base connate into a 1–2 mm sheath, apex acuminate. Flowers 1–4; bracts 4 or 6, leaflike, ovate, ca. 1/2 as long as calyx, apex sharply pointed. Calyx greenish or lilac, cylindrical, 1.5–1.9 cm × 4–5.5 mm; teeth lanceolate, apex acuminate. Petals purple-red, 1.1–1.2 cm × 7.5–8 mm, adaxially hairy, apex cristate toothed. Capsule not seen.

Grassy mountain slopes; 1300–1800 m. Xinjiang [Kazakhstan, Kyrgyzstan].

**5. *Dianthus turkestanicus*** Preobraschensky, Izv. Imp. Bot. Sada Petra Velikago 15: 366. 1915.

细茎石竹 xi jing shi zhu

*Dianthus versicolor* Fischer ex Link subsp. *turkestanicus* (Preobraschensky) Kozhevnikov.

Herbs perennial, 20–40 cm tall. Rhizome woody. Stems caespitose, branched, scabridulous. Leaves linear, 3–5 cm × 1–2 mm, base connate into a 2–4 mm sheath, apex sharply pointed; basal leaves early withered; apical leaves usually subulate. Flowers solitary, sometimes 2 or 3, terminal; bracts 4 or 6, obovate, ca. 8 × 6 mm, leathery, apex subulate with a short, sharp tip. Calyx cylindrical, 1.5–1.8 cm × ca. 4 mm, striate, glabrous or pubescent; teeth ciliate at margin, apex acute. Petal limb rose or purple, ca. 1 cm × 5 mm, adaxially shortly hairy, apex shallowly dentate. Ovary suboblong. Capsule cylindrical, subequaling calyx, apex 4-valved. Seeds black, compressed globose, ca. 2 mm in diam. Fl. Jul–Aug, fr. Sep.

Mountain slope grasslands; 1000–2000 m. N Xinjiang [Kazakhstan].

**6. *Dianthus elatus*** Ledebour, Fl. Altaic. 2: 136. 1830.

高石竹 gao shi zhu

Herbs perennial, 25–50 cm tall. Stems distally branched, scabrous or subglabrous. Leaves linear, 2.5–4 cm × 2–3 mm, base connate into a 1–2 mm sheath, margin

scabrous, apex acute. Flowers 1 or 2, terminal; bracts (4 or 6) (or 8), ovate, ca. 1/2 as long as calyx, apex long acuminate-caudate. Calyx cylindrical, slightly inflated at middle, 1.6–2 cm × 5–7 mm; teeth ovate, margin membranous, ciliate, apex mucronate. Petals adaxially light purple-red or pink, abaxially yellowish green; limb 0.8–1.2 cm × 5–8 mm, adaxially hairy, apex irregularly toothed. Ovary oblong. Styles linear. Capsule shorter than calyx, apex 4-toothed. Fl. and fr. Jul–Aug.

Mountain slopes; 1200–1800 m. N Xinjiang [Kazakhstan, Russia (W Siberia)].

**7. *Dianthus ramosissimus*** Pallas ex Poiret in Lamarck, Encycl. Suppl. 4: 130. 1816.

多分枝石竹 duo fen zhi shi zhu

Herbs perennial, 20–50 cm tall. Stems caespitose, erect, much-branched, slender, subglabrous or pilose. Leaves linear, 1–4 cm × 1–1.5 mm, base connate into a 1–2 mm sheath, margin slightly revolute, apex sharply pointed. Flower solitary, terminal; pedicel 1–2 cm; bracts 4 (or 6), elliptic, ca. 1/3 as long as calyx, leathery, margin membranous, apex mucronate. Calyx cylindrical, 1.2–1.4 cm × ca. 3 mm; teeth triangular, margin membranous. Petals white; limb obovate, 5–6 × 3–3.5 mm, throat pilose, apex irregularly toothed. Ovary suboblong. Styles linear. Capsule cylindrical, ca. 1.5 cm × 3.5 mm, apex 4-valved. Fl. and fr. Sep.

Dry grassy slopes; 1100–1900 m. N Xinjiang [Kazakhstan, W Mongolia, Russia (W Siberia)].

**8. *Dianthus acicularis*** Fischer ex Ledebour, Fl. Ross. 1: 284. 1842.

针叶石竹 zhen ye shi zhu

Herbs perennial, 15–30 cm tall. Stems numerous, erect, simple or branched above, glabrous. Leaves acicular, 2–4 (–6) cm × 0.3–1 mm, base connate into a sheath; basal leaves clustered. Flowers 1–3, terminal, fragrant; pedicel 1–3 cm; bracts 4, ovate or elliptic (outer pair) or obovate (inner pair), 1/4–1/3 as long as calyx, leathery, apex sharply pointed. Calyx cylindrical, 2–2.5 cm × 3–5 mm; teeth lanceolate, apex sharply pointed. Petals white; limb elliptic or obovate, 1.2–1.5 cm, adaxially hairy, fimbriate for ca. 1/3 its length, fimbriae linear. Capsule cylindrical, subequaling calyx. Seeds ca. 2 mm. Fl. and fr. Jun–Aug.

Rocky mountain slopes, floodlands, deserts; 500–1300 m. N Xinjiang [Kazakhstan, Russia (W Siberia); E Europe].

**9. *Dianthus kuschakewiczii*** Regel & Schmalhausen, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 244. 1877.

长萼石竹 chang e shi zhu

Herbs perennial, 20–35 cm tall. Stems usually numerous, branched, glabrous. Leaves spreading, linear, 2–8 cm × 0.5–2 mm, flaccid, glabrous, midvein prominent, base connate into a ca. 1.5 mm sheath, apex acute. Flower solitary, terminal and lateral; bracts 4, oblong to elliptic (outer pair) or ovate-elliptic (inner

pair), 1/3–1/2 as long as calyx, leathery, margin membranous, apex mucronate. Calyx cylindrical, 2.5–3.5 cm × 3–4 mm; teeth lanceolate, margin narrowly membranous, apex acuminate. Petals white, rarely pale rose; limb oblong, glabrous, fimbriate for ca. 1/2 its length, fimbriae linear. Capsule not seen. Fl. Jun–Aug.

Forests, forest margin grasslands, mountain slopes, mire drainage margins, steppes; 600–2800 m. N Xinjiang [Kazakhstan].

**10. *Dianthus soongoricus*** Schischkin in Komarov, Fl. URSS 6: 899. 1936.

准噶尔石竹 zhun ga er shi zhu

*Dianthus crinitus* Smith subsp. *soongoricus* (Schischkin) Kozhevnikov.

Herbs perennial, (10–)15–30 cm tall, subglabrous. Roots thick, woody. Stems caespitose, simple. Leaves linear, 1–3 cm × 0.5–1 mm, glabrous, apex sharply pointed. Flower solitary, terminal; bracts 4, oblong-elliptic, 1/5–1/4 as long as calyx, margin membranous, apex acuminate, rarely mucronate. Calyx cylindrical, 2–3 cm × 3–4 mm; teeth lanceolate, apex sharply pointed. Petals dark red or yellow-brown; limb ca. 1 cm, fimbriate. Stamens shorter than petals. Ovary cylindrical. Styles linear. Capsule cylindrical, subequaling calyx. Seeds compressed ellipsoid, ca. 3 × 1.5 mm, apex slightly emarginate. Fl. and fr. Jul–Aug.

Rocky mountain valley slopes, deserts, semideserts; 900–3200 m. N Xinjiang [Kazakhstan, W Mongolia].

**11. *Dianthus orientalis*** Adams in F. Weber & D. Mohr, Beitr. Naturk. 1: 54. 1805–1806.

瘰裂石竹 sui lie shi zhu

*Dianthus fimbriatus* Marschall von Bieberstein (1808), not Lamarck (1779), nor Brotero (1805), nor Hohenacker (1833).

Herbs perennial, (10–)15–30(–40) cm tall. Roots thick, ca. 1 cm in diam., woody. Stems caespitose, erect, basally woody, distally branched, glabrous. Basal leaves caespitose, linear-subulate, 1–4 cm × 1–1.5 mm, stiff, midvein convex abaxially, base broadened, shortly membranous sheathed, margin revolute, apex sharply pointed; cauline leaves somewhat shorter than basal ones. Flowers solitary, rarely in cymes, terminal; pedicel ca. 1.5 cm; bracts 6 or 8, ovate, 1/4–1/3 as long as calyx, margin membranous, apex mucronate or long acuminate. Calyx slightly glaucous, cylindrical, (1.5–)2–2.5 cm × 4–5 mm, striate, glabrous; teeth lanceolate, margin membranous. Petals pink; claw long; limb narrowly oblong, fimbriate for ca. 1/2 its length. Stamens shorter than petals; anthers suboblong. Ovary suboblong. Styles linear. Capsule cylindrical, slightly shorter than or equaling calyx, apex 4-toothed. Seeds black-brown, compressed suboblong, 3–4 × ca. 1.5 mm, broadly winged. Fl. May–Aug, fr. Aug–Sep.

Mountain slope grasslands, rocky areas, river banks, dry rocky deserts; 900–2200 m (Xinjiang), 3100–4100 m (Xizang). N Xinjiang, W Xizang [SW Asia].

The Chinese populations of *Dianthus orientalis* appear to be disjunct from the main range of the species and therefore deserve further study. Rechinger (Fl. Iran. 163: 155–166. 1988) recorded nine subspecies from SW Asia, ranging from Turkey to Iran, but no further east, even though the coverage of that flora extends to the western border of China.

**12. *Dianthus palinensis*** S. S. Ying, Coloured Illustr. Fl. Taiwan 2: 693. 1987.

八里石竹 ba li shi zhu

Herbs perennial, 10–20 cm tall. Rhizomes slender. Stems few branched; branches erect. Basal leaves crowded, sessile, lanceolate, 5–8 cm × 5–7 mm, both surfaces glabrous, midvein prominently elevated abaxially, inconspicuous adaxially, base long attenuate, somewhat dilated and semiamplexicaul, margin entire, apex acuminate; cauline leaves linear to linear-lanceolate, 4–7 cm × 3–3.5 mm, usually smaller distally on stem, apex acuminate. Flowers 1–4, terminal, erect; pedicel 1.5–2 cm, glabrous; bracts ca. 10, proximal ones linear, 5–6 × ca. 1 mm, apex acute, distal ones ovate, 1–1.2 cm × 3–4 mm, apex shortly cuspidate. Calyx green, tinged purple, cylindrical, 2.8–3.2 cm × ca. 4 mm, many veined; teeth lanceolate, 6–8 × 1.2–1.5 mm, glabrous except margin ciliate, apex acute or acuminate. Petals 5–5.5 cm, glabrous; claw white, elongate linear, 3–3.5 cm × 0.3–2.5 mm; limb pink, ovate or orbicular-ovate, 1.8–2.2 × 1.2–1.5 cm, usually fimbriate for less than 1/4 its length. Stamens 4 or 5 (or 6); filaments white, tinged pink distally, 3.5–4 cm; anthers oblong, 1–1.5 × ca. 0.5 mm, glabrous. Styles 2, distinct, linear, 3–3.5 cm, white pubescent. Seeds black, oblong, ca. 1.5 mm, apex apiculate. Fl. Nov.

• About 600 m. N Taiwan (Taoyuan Xian: Bali).

**13. *Dianthus pygmaeus*** Hayata, Icon. Pl. Formos. 3: 34. 1913.

玉山石竹 yu shan shi zhu

*Dianthus pygmaeus* f. *albiflorus* (S. S. Ying) S. S. Ying; *D. pygmaeus* var. *albiflorus* S. S. Ying.

Herbs perennial, to 15 cm tall. Stem solitary, erect. Leaves linear, 2–3 cm × 1–4 mm, base attenuate, connate into a short sheath, margin minutely denticulate, apex acuminate. Flowers solitary or in cymes; pedicel 1.5–1.8 cm; bracts 4, outer pair oblong, 8–10 × 2–4 mm, apex sharply pointed, inner pair ovate, 1–1.2 cm × 4–6 mm, base cuneate, apex acute. Calyx cylindrical, ca. 1.8 cm × 3.5 mm, with numerous fine veins; teeth lanceolate, margin glabrous. Petals pink, rarely white, 3–3.5 cm × 2–3 mm; claw long; limb fimbriate for ca. 1/2 its length, fimbriae linear. Filaments 1.5–2 cm; anthers narrowly suboblong, 1–1.5 mm. Ovary cylindrical, 7–8 mm. Styles linear, ca. 1 cm. Capsule cylindrical, ca. 1 cm × 3 mm. Seeds minute.



• Meadows, grasslands, rocky places and ledges, roadsides; 1400–3900 m. Taiwan.

**14. *Dianthus superbus*** Linnaeus, Fl. Suec., ed. 2, 146. 1755.

瞿麦 qu mai

Herbs perennial, green to glaucous, to 60 cm tall or more. Stems caespitose, erect, distally branched, glabrous, large jointed. Leaves linear-lanceolate, 5–10 cm × 3–5 mm, sometimes glabrescent, midvein prominent, base connate into a sheath, apex sharply pointed. Flowers 1 or 2, terminal, sometimes axillary; bracts 4 or 6, elliptic to broadly ovate or obovate, 6–10 × 4–5 mm, ca. 1/4 as long as calyx, apex subulate or long acuminate. Calyx usually reddish purple, cylindric, 2.5–3 cm × 3–7 mm; teeth lanceolate, 4–5 mm. Petals 4–5 cm; claw 1.5–3 cm, surrounded by calyx tube; limb broadly obovate, 2–3 cm, fimbriate for at least 1/2 its length, throat bearded. Stamens and styles slightly exerted. Capsule cylindric, equaling or slightly longer than calyx, 4-toothed. Seeds black, glossy, compressed ovoid, ca. 2 mm. Fl. Jun–Sep, fr. Aug–Oct.

Wooded hills, forest openings and margins, grassy hillsides, meadows, mountain valley streams, river banks; 400–3700 m. Anhui, Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Zhejiang [Japan, Kazakhstan, Korea, N and W Mongolia, Russia (Far East, Siberia); Europe].

1a. Plants glaucous; petal limb ca. 3 cm

..... 14b. subsp. *alpestris*

1b. Plants green or only slightly glaucous;

petal limb ca. 2 cm ..... 14a. subsp. *superbus*

**14a. *Dianthus superbus*** subsp. *superbus*

瞿麦(原亚种) qu mai (yuan ya zhong)

*Dianthus szechuensis* F. N. Williams.

Plants green or only slightly glaucous; petal limb ca. 2 cm.

Wooded hills, forest margins, meadows, mountain valley streams; 400–3700 m. Anhui, Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Zhejiang [Japan, Kazakhstan, Korea, N and W Mongolia, Russia (Far East, Siberia); Europe].

The species is used medicinally.

**14b. *Dianthus superbus*** subsp. *alpestris* Kablikova ex Celakovsky, Prodr. Fl. Böhmen 3: 508. 1875.

高山瞿麦 gao shan qu mai

*Dianthus superbus* var. *monticola* Makino; *D. superbus* subsp. *speciosus* (Reichenbach) Hayek; *Dianthus superbus* var. *speciosus* Reichenbach; *D. speciosus* (Reichenbach) Reichenbach.

Plants glaucous; petal limb ca. 3 cm.

Forest openings, high mountain forest margins, grassy hillsides, river banks; 2100–3200 m. Hebei, S Jilin (Changbai Shan), S Nei Mongol (Helan Shan), S Shaanxi (Taibai Shan), Shanxi [alpine regions of Asia and Europe].

**15. *Dianthus longicalyx*** Miquel, J. Bot. Néerl. 1: 127. 1861.

长萼瞿麦 chang e qu mai

*Dianthus oreadum* Hance; *D. superbus* Linnaeus f.

*longicalycinus* Maximowicz; *D. superbus* var.

*longicalycinus* (Maximowicz) F. N. Williams; *D.*

*superbus* var. *oreadum* (Hance) Pampanini; *D.*

*superbus* var. *taiwanensis* (Masamune) T. S. Liu & S. S.

Ying; *D. taiwanensis* Masamune.

Herbs perennial, 40–80 cm tall. Stems erect, basally branched, glabrous, large jointed. Basal leaves several, withered at anthesis; cauline leaves linear-lanceolate or lanceolate, 4–10 cm × 2–5(–10) mm, base connate into a short sheath, margin serrulate, apex acuminate. Flowers 2 to several in lax cymes; bracts 6 or 8, appressed, leaflike, ovate, ca. 1/5 as long as calyx, margin broadly membranous, scabridulous, apex mucronate. Calyx green, long tubular, 3–4 cm, striate, glabrous; teeth lanceolate, 5–6 mm, apex sharply pointed. Petals pink, obovate or cuneate-oblong; limb fimbriate for ca. 1/2 its length. Stamens level with corolla throat. Styles linear, ca. 2 cm. Capsule narrowly cylindric, slightly shorter than calyx, 4-toothed. Fl. Jun–Aug, fr. Aug–Sep.

Forests, grassy mountain slopes, grasslands, exposed rocky places, river beds, fixed dunes; 800–2100 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang [Japan, Korea].

**16. *Dianthus hoeltzeri*** C. Winkler, Gartenflora 30: 1. 1881.

大苞石竹 da bao shi zhu

Herbs perennial, 30–60 cm tall. Rhizomes ropelike, bearing flowering stems and sterile dwarf shoots. Stems solitary or caespitose, erect, simple. Leaves linear-lanceolate, 4–6 cm × 2–4 mm, base connate into a 2–4 mm sheath, margin slightly uneven, apex sharply pointed. Flowers 1–4; bracts 4, broadly ovate, 1/4–1/3 as long as calyx, margin narrowly membranous, apex mucronate, sometimes subtruncate. Calyx reddish purple, cylindric, 2.3–2.5 cm × 4–5 mm; teeth triangular, margin ciliate. Petals deep rose, 2.5–3 × as long as calyx; claw usually longer than (rarely equaling) calyx; limb obovate or broadly ovate, rarely oblong, bearded, fimbriate for ca. 2/5 its length. Capsule cylindric, longer than calyx, 4-toothed. Fl. Jun–Jul, fr. Aug.

Grassy mountain slopes; 1500–3300 m. N Xinjiang [Kazakhstan, W Mongolia].

## 26. ACANTHOPHYLLUM C. A. Meyer, Verz. Pfl. Casp. Meer. 210. 1831.

刺叶属 ci ye shu

Lu Dequan (鲁德全); Nicholas J. Turland

Herbs suffruticose. Stems caespitose, erect, many branched. Leaves subulate or linear-lanceolate, spinose. Flowers in panicles, corymbs, or capitula; bracts leaflike, ovate, lanceolate, or needlelike, margin sometimes spinose. Calyx tubular or campanulate, membranous between veins, 5(–15)-veined, apex 5-toothed. Petals 5, red, rarely white; claw long, narrow; limb apically entire, rarely retuse. Gynophore short, rarely long. Stamens 10, in 2 series, those inserted opposite petals shorter. Ovary 1-loculed; ovules 4–10. Styles 2. Capsule suboblong or subglobose, membranous proximally, irregularly transversely dehiscent or toothed. Seeds 1 or 2, subreniform, slightly compressed; embryo annular.

About 50 species: C and W Asia; one species in China.

**1. *Acanthophyllum pungens*** (Ledebour) Boissier, Fl. Orient. 1: 561. 1867.

刺叶 ci ye

*Saponaria pungens* Ledebour, Icon. Pl. 1: [3]. 1829.

Plants 15–35 cm tall. Main root stout. Stems globose caespitose, basally branched, tomentulose. Leaves horizontal or reflexed, subulate-needlelike, 2–4 cm × 1–1.5 mm, sparsely tomentulose; leaf axils with dwarf, spinose, sterile shoots. Corymb or capitulum terminal, 2–5 cm in diam. Pedicel very short; bracts leaflike, usually reflexed distally, hairy. Calyx sometimes red, tubular, 6–7 × 1–1.5 mm, white hirsute, 5-veined; calyx teeth broadly triangular, ca. 1 mm, margin membranous

proximally, ciliate, apex subulate-spinose. Petals red or reddish, elliptic-ob lanceolate, ca. 1.2 cm × 1.5 mm; claw glabrous; limb apex obtuse-rounded. Stamens exerted, ca. 1.4 cm. Ovules 4. Style exerted. Capsule not seen. Fl. Jun–Aug.

Rocky mountain slopes, sandy places; 400–1300 m. N Xinjiang [Kazakhstan, Mongolia].

In FRPS, *Acanthophyllum spinosum* (Desfontaines) C. A. Meyer was treated as a synonym of *A. pungens*. However, the present account follows Schiman-Czeika (in Rechinger, Fl. Iran. 163: 285–286. 1988) in treating *A. spinosum* (including *A. fontanesii* Boissier) as a separate species restricted to Afghanistan and Iran.

## 27. SAPONARIA Linnaeus, Sp. Pl. 1: 408. 1753.

肥皂草属 fei zao cao shu

Lu Dequan (鲁德全); Magnus Lidén, Bengt Oxelman

Herbs annual or perennial. Stem solitary, erect. Leaves lanceolate, elliptic or spatulate, 3- or 5-veined. Inflorescence a cyme, panicle, or capitulum. Calyx cylindrical, 15- to 25-veined, not membranous between veins, 5-toothed. Petals 5, red or white, margin entire, emarginate, or 2-lobed; claw long, narrow; coronal scales usually present. Stamens 10. Ovary 1-loculed; styles 2. Androgynophore short. Capsule cylindrical or ovoid, crustaceous, dehiscing with 4 teeth. Seeds reniform, tuberculate or striate; embryo annular.

About 30 species: temperate Asia and Europe, mainly in the Mediterranean region; one species in China.

**1. *Saponaria officinalis*** Linnaeus, Sp. Pl. 1: 408. 1753.

肥皂草 fei zao cao

*Lychnis officinalis* (Linnaeus) Scopoli; *Silene saponaria* Fries ex Willkomm & Lange.

Herbs perennial, 30–70 cm tall. Axial root stout, fleshy, rhizome thin, many branched. Stem simple or branched above, usually glabrous. Leaves ovate or ovate-lanceolate, 5–10 × 2–4 cm, 3- or 5-veined, base attenuate, slightly connate, semiclasping, apex acute. Inflorescence a thyrs, cymules 3–7-flowered; bracts lanceolate, margin and midvein sparsely hirtellous, apex long acuminate. Pedicel 3–8 mm, sparsely and shortly pubescent. Flowers large. Calyx green,

sometimes dark purple, tubular, 1.8–2 cm × 2.5–3.5 mm, obscurely 20-veined; calyx teeth broadly ovate, apex acute. Petal limb white or pink, cuneate-obovate, 1–1.5 cm, apex emarginate; coronal scales linear. Gynophore ca. 1 mm. Stamens and styles exerted. Capsule cylindrical-ovoid, ca. 1.5 cm. Seeds black-brown, globose-reniform, slightly compressed, 1.8–2 mm, tuberculate. Fl. Jun–Sep.  $2n = 30$ .

Cultivated as an ornamental in parks, usually escaping. NE China [native to W Asia and Europe].

This species is used medicinally and as a soap.

## 28. PSAMMOSILENE W. C. Wu & C. Y. Wu in L. P. King et al., Icon. Pl. Medic. Libro Tien-Nan-Pen-Tsao Lanmaoano 1: t. 1. 1945.

金铁锁属 jin tie suo shu

Lu Dequan (鲁德全); Magnus Lidén, Bengt Oxelman

Herbs perennial. Roots long conical, fleshy. Stems several, diffuse, branched. Leaves ovate, subcarinate, midvein prominent. Flowers bisexual, subsessile, small. Inflorescence a thyrs, densely glandular pubescent; bracts herbaceous. Calyx tubular-campanulate, herbaceous, 15-veined, slightly convex, veins free at apex, 5-toothed. Petals

5, purple-red, narrowly spatulate, margin entire, claw attenuate. Stamens 5, opposite calyx teeth. Ovary 1-loculed; ovules 2, anatropous; styles 2. Capsule clavate, thin, nearly unsplit. Seed 1, narrowly obovoid, plano-convex.

• One species.

**1. Psammosilene tunicoides** W. C. Wu & C. Y. Wu in L. P. King et al., *Icon. Pl. Medic. Libro Tien-Nan-Pen-Tsao Lan-maoano* 1: t. 1. 1945.

金铁锁 jin tie suo

*Silene cryptantha* Diels, *Notes Roy. Bot. Gard. Edinburgh* 5: 180. 1912, not Viviani (1824).

Roots brown-yellow. Stems prostrate, purple-green, 20–35 cm, dichotomously branched, pubescent. Leaves subsessile, 1.5–2.5 × 1–1.5 cm, adaxially pilose, base rounded, rarely broadly cuneate, apex entire, acute.

Inflorescence a thyrse with a terminal, lax dichasium and 2 opposite, similarly lax and many-flowered

dichasia proximally. Flowers 3–5 mm in diam. Pedicel short or flowers sessile. Calyx tubular-campanulate, 4–6 mm, densely glandular pubescent, veins green; calyx teeth triangular-ovate, margin membranous, apex obtuse or acute. Petals 7–8 mm. Stamens exerted beyond calyx, 7–9 mm; anthers yellow. Ovary narrowly obovoid, ca. 7 mm; styles ca. 3 mm. Capsule ca. 7 mm. Seed brown, ca. 3 mm. Fl. Jun–Sep, fr. Jul–Oct.

• Warm and dry valleys along Jinsha Jiang and Yarlung Zangbo Jiang, rocky mountain slopes, dry pastures, calcareous rock crevices, forests; 900–3800 m. W Guizhou, SW Sichuan, SE Xizang, Yunnan. This species is used medicinally.

## 29. GYPSOPHILA Linnaeus, *Sp. Pl.* 1: 406. 1753.

石头花属 shi tou hua shu

Lu Dequan (鲁德全); Nicholas J. Turland

*Heterochroa* Bunge; *Psammophila* Fourreau; *Psammophiliella* Ikonnikov; *Timaeosia* Klotzsch.

Herbs annual or perennial. Stems usually caespitose, erect or diffuse, glabrous or glandular pubescent, sometimes glabrescent or base woody. Leaves opposite, linear, lanceolate, ovate, oblong, spatulate, or sometimes subulate or subfleshy. Flowers numerous, bisexual, small, borne in dichasial cymes, corymbs, or panicles, sometimes aggregated into capitula; bracts usually scariosus, rarely leaflike. Calyx green or purple veined, white membranous between veins, campanulate or funnelform, rarely cylindrical, glabrous or puberulous, veins broad, apex 5-toothed. Petals 5, white or pink, sometimes purple veined, oblong or obovate, longer than calyx, base usually cuneate, apex entire, truncate, or retuse. Stamens 10. Ovary globose or ovoid, 1-loculed; ovules numerous. Styles 2(or 3).

Gynophore absent. Capsule globose, ovoid, or oblong, 4-valved. Seeds subreniform, compressed, tuberculate; hilum lateral; embryo annular; radicle prominent.

About 150 species: mainly in temperate Asia and Europe, fewer species in NE Africa (Egypt), Australia, and North America; 17 species (four endemic) in China.

*Gypsophila elegans* Marschall von Bieberstein, native to SW Asia and SE Europe, is cultivated in China as an ornamental.

1a. Herbs annual ..... 17. *G. muralis*

1b. Herbs perennial.

2a. Stems densely caespitose, ascending; bracts leaflike; calyx not white membranous between veins.

3a. Plants white pubescent; leaves obovate-spatulate ..... 14. *G. cerastioides*

3b. Plants brown glandular pubescent or sericeous; leaves linear-subulate or lanceolate.

4a. Plants brown glandular pubescent; leaves linear-subulate; pedicels 0.3–1.2 cm ..... 15. *G. desertorum*

4b. Plants sericeous; leaves lanceolate; pedicels 1.4–2 cm ..... 16. *G. sericea*

2b. Stems simple or laxly caespitose, erect; bracts scariosus; calyx white membranous between veins.

5a. Inflorescence paniculate, spreading, many branched, pedicels slender; calyx broadly campanulate.

6a. Leaves lanceolate or linear-lanceolate, 0.25–0.7 cm wide, glabrous; calyx 1.5–2 mm, veins purple ..... 12. *G. paniculata*

6b. Leaves obovate- or ovate-oblong, 1–3 cm wide, glandular pubescent; calyx 2–4 mm, veins green ..... 13. *G. perfoliata*

5b. Inflorescence usually corymbose, sometimes subcapitate, pedicels usually stout, rigid; calyx campanulate

or narrowly so.

7a. Leaves linear.

8a. Inflorescence few branched or subcapitate, few flowered.

9a. Inflorescence lax, pedicels 5–20 mm; calyx 2–3 mm ..... 8. *G. patrinii*

9b. Inflorescence subcapitate, pedicels ca. 1 mm; calyx 3.5–5 mm ..... 9. *G. capituliflora*

8b. Inflorescence many branched, numerous flowered.

10a. Inflorescence lax, divergent spinose ..... 11. *G. spinosa*

10b. Inflorescence congested, not spinose ..... 10. *G. licentiana*

- 7b. Leaves not linear.
- 11a. Leaves linear-lanceolate.
- 12a. Plants more than 50 cm tall; inflorescence many branched; calyx veins green 6. *G. davurica*
- 12b. Plants less than 50 cm tall; inflorescence few branched; calyx veins purple-brown.
- 13a. Inflorescence lax, few flowered, pedicels 5–15 mm; calyx 3–5 mm, lobes acuminate; stamens and styles included; seeds obtusely tuberculate ... 4. *G. tschiliensis*
- 13b. Inflorescence subcapitate, numerous flowered, pedicels 2–3 mm; calyx 2–3 mm, lobes obtuse; stamens and styles exserted; seeds acutely tuberculate 5. *G. huashanensis*
- 11b. Leaves linear-oblong, oblong, or ovate.
- 14a. Leaves linear-oblong.
- 15a. Plants 50–80 cm tall; inflorescences scattered, pedicels 2–5 mm; bracts and calyx lobes ciliate at margin; seeds acutely tuberculate ..... 1. *G. altissima*
- 15b. Plants 20–50 cm tall; inflorescences concentrated into capitula, pedicels 0.5–2.5 mm; bracts and calyx lobes undulate at margin, not ciliate; seeds truncately tuberculate ..... 2. *G. cephalotes*
- 14b. Leaves oblong or ovate.
- 16a. Leaves oblong; inflorescence dense, pedicels 2–5 mm; petal apex truncate or retuse; stamens and styles longer than petals ..... 3. *G. oldhamiana*
- 16b. Leaves ovate; inflorescence spreading, pedicels 5–10 mm; petal apex rounded; stamens and styles shorter than petals ..... 7. *G. pacifica*

**1. *Gypsophila altissima*** Linnaeus, Sp. Pl. 1: 407. 1753.

高石头花 gao shi tou hua

Herbs perennial, 50–80 cm tall. Roots thick, 0.5–1.5 cm in diam. Stems usually solitary, sometimes 2 or 3 together, erect, distally branched, glandular pubescent. Leaves sessile, glaucous, linear-oblong, 1.5–8 cm × 3–12 mm, midvein prominent, base attenuate, apex subobtusely or acute; proximal leaves longer than distal ones. Corymbose cymes scattered; bracts ovate, base attenuate, margin membranous, ciliate, apex acute. Pedicel 2–5 mm, glabrous. Calyx campanulate, 2–3 × ca. 1.5 mm; lobes ovate, margin ciliate, apex rounded. Petals white or pink, obovate-oblong, apex retuse. Stamens shorter than or equaling petals. Capsule globose, slightly longer than calyx, 2–2.5 mm in diam. Seeds ca. 1 mm, acutely tuberculate. Fl. Jun–Jul, fr. Jul–Aug.

Mountain slopes, valley grasslands, floodlands, ditches; 1300–2400 m. NW Xinjiang [Kazakhstan, Russia (Siberia); Europe].

**2. *Gypsophila cephalotes*** (Schrenk) F. N. Williams, J. Bot. 27: 323. 1889.

膜苞石头花 mo bao shi tou hua

*Gypsophila fastigiata* Linnaeus var. *cephalotes* Schrenk in Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 92. 1841.

Herbs perennial, 20–50 cm tall. Roots thick, 3–15 mm in diam. Stems several, caespitose, rarely solitary, erect, branched, distally glandular pubescent. Leaves linear-oblong, 3–6 cm × 3–8 mm, apex obtuse. Corymbose cymes concentrated into subcapitate clusters; peduncle 1–4 cm; bracts lanceolate, margin undulate, membranous, apex acuminate. Pedicel 0.5–

2.5 mm, glabrous. Calyx purple, campanulate, 2.5–3 mm, divided for ca. 1/2 its length; lobes slightly undulate and membranous at margin, apex obtuse. Petals white, obovate-oblong, ca. 6 × 1 mm, apex truncate or retuse. Stamens longer than petals. Ovary obovoid, ca. 2 mm. Styles ca. 4 mm, shorter than stamens. Capsule globose, 3–4 mm. Seeds brown, compressed globose, ca. 1.5 mm, truncately tuberculate. Fl. Jun–Aug, fr. Jul–Sep.

Mountain slope grasslands; 1000–3900 m. N Xinjiang [NE Afghanistan, Kazakhstan, W Mongolia, N Pakistan, Russia (W Siberia)].

**3. *Gypsophila oldhamiana*** Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 187. 1867.

长蕊石头花 chang rui shi tou hua

Herbs perennial, 60–100 cm tall. Roots brownish or brown-gray, thick, woody. Stems several, arising from root crown, dichotomously or trichotomously spreading branched, usually purple-red when mature. Leaves oblong, 4–8 × 0.5–1.5 cm, thick, subfleshy, 3–5-veined, midvein prominent, base connate into a short sheath, apex apiculate. Corymbose cymes terminal or axillary, dense, glabrous; bracts ovate-lanceolate, membranous, margin ciliate, apex caudate-acuminate. Pedicel 2–5 mm, glabrous or pubescent. Calyx campanulate or funnellform, 2–3 mm; lobes ovate-triangular, veins green, margin white, membranous, ciliate, apex acute. Petals pink, obovate-oblong, ca. 2 × as long as calyx, apex truncate or retuse. Stamens longer than petals. Ovary obovoid. Styles exserted, long linear. Capsule ovoid, slightly longer than calyx. Seeds brown-gray, compressed subreniform, 1.2–1.5 mm, with striate

protuberances; raphe mucronate tuberculate. Fl. Jun–Sep, fr. Aug–Oct.

Scrub, mountain slope grasslands, rocks, maritime sands; sea level to 2000 m. Anhui, Hebei, Henan, Hubei, Jiangsu, Liaoning, Shaanxi, Shandong, Shanxi [Korea].

The roots are used medicinally and the species is cultivated as an ornamental.

**4. *Gypsophila tschiliensis*** J. Krause in Pax, Repert. Spec. Nov. Regni Veg. Beih. 12: 364. 1922.

河北石头花 he bei shi tou hua

*Gypsophila acutifolia* Fischer ex Sprengel var. *chinensis* Regel; *G. ellipticifolia* Barkoudah.

Herbs perennial, (10–)20–30 cm tall. Roots thick. Stems erect or ascending, distally branched, slender, ca. 2 mm in diam. Leaves linear-lanceolate, 2–3 cm × 2–4 mm, midvein prominent, base attenuate, apex acute, mucronulate. Cymes laxly few flowered, glabrous; bracts white, lanceolate, scarious, veins brownish at apex. Pedicel brownish, 0.5–1.5 cm. Calyx brown-purple, campanulate, 3–5 × ca. 4 mm, 5-veined; lobes ovate, margin scarious, apex acuminate. Petals rose, obovate-cuneate, 6–7 × ca. 2 mm, apex truncate or slightly undulate. Stamens ca. 5 mm. Ovary ovoid, ca. 2 mm. Styles equaling stamens. Capsule ovoid. Seeds brown, globose, obtusely tuberculate. Fl. Jul–Aug, fr. Sep.

• Forest margins, scrub, mountain slopes, grasslands; 2000–3000 m. Hebei.

**5. *Gypsophila huashanensis*** Y. W. Tsui & D. Q. Lu in D. Q. Lu, Acta Phytotax. Sin. 31: 565. 1993.

华山石头花 hua shan shi tou hua

Herbs perennial, 20–50 cm tall. Roots woody, sometimes thick. Stems sparsely caespitose, erect, distally branched, glabrous. Leaves linear-lanceolate, 2–4 cm × 2–5 mm, midvein abaxially prominent, base attenuate, connate into a short sheath, apex acute. Corymbose cymes terminal or borne in distal leaf axils, in subcapitate clusters; bracts ovate, 1–3 mm, scarious, glabrous, apex acute. Pedicel slender, 2–3 mm. Calyx white membranous between 5 brown-purple veins, campanulate, 2–3 mm; lobes membranous at margin, apex obtuse. Petals pinkish white, oblong-oblancheolate, ca. 5 mm, apex retuse. Filaments exerted, linear, flat, unequal, shorter than to longer than petals, base broad. Ovary ovoid, ca. 1 mm. Styles longer than filaments. Capsule ovoid, slightly longer than calyx. Seeds brown, reniform-globose, both surfaces elevated striate; raphe acutely tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

• Mountain slopes, valleys, roadside grasslands, rock crevices; 600–2600 m. S Shaanxi (Hua Shan, Qin Ling).

**6. *Gypsophila davurica*** Turczaninow ex Fenzl in Ledebour, Fl. Ross. 1: 294. 1842.

草原石头花 cao yuan shi tou hua

Herbs perennial, 50–80 cm tall, glabrous. Roots brownish to brown-gray, thick, ca. 1 cm in diam., woody. Stems several, caespitose, distally branched.

Leaves sessile, linear-lanceolate, 3–6 cm × 1–7 mm, midvein abaxially prominent, base narrowed, apex long acuminate. Cymes lax; bracts lanceolate, margin slightly membranous, ciliate, apex acuminate to caudate. Pedicel 4–10 mm. Calyx campanulate, 3–4 mm, 5-lobed for 1/3–1/2 its length; lobes ovate-triangular, veins 5, extending to apex, green, margin white, broadly membranous, apex acute. Petals pinkish or pinkish white, obovate-oblong, ca. 3 × as long as calyx, base narrowed, apex retuse or truncate. Stamens shorter than petals. Ovary ovoid. Styles long exerted. Capsule ovoid, longer than calyx. Seeds brown-black, compressed reniform-globose, 1.2–1.5 mm, elevated striate; raphe acutely tuberculate. Fl. Jun–Sep, fr. Jul–Oct.

Hills, dry rocky slopes, steppes, fixed dunes. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [E and N Mongolia, Russia (Far East, Siberia)].

1a. Leaves 3–7 mm wide ..... 6a. var. *davurica*

1b. Leaves 1–2 mm wide ..... 6b. var. *angustifolia*

**6a. *Gypsophila davurica* var. *davurica***

草原石头花(原变种) cao yuan shi tou hua (yuan bian zhong)

*Gypsophila patrinii* Seringe subsp. *davurica*

(Turczaninow ex Fenzl) Kozhevnikov.

Leaves 3–7 mm wide.

Hills, dry rocky slopes, steppes, fixed dunes. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [E and N Mongolia, Russia (Far East, Siberia)].

The species is used medicinally.

**6b. *Gypsophila davurica* var. *angustifolia*** Fenzl in Ledebour, Fl. Ross. 1: 294. 1842.

狭叶石头花 xia ye shi tou hua

Leaves 1–2 mm wide.

Hilltops, dry rocky slopes, steppes. E Nei Mongol [Russia (Siberia)].

**7. *Gypsophila pacifica*** Komarov, Izv. Glavn. Bot. Sada RSFSR 16: 167. 1916.

大叶石头花 da ye shi tou hua

Herbs perennial, 60–90 cm tall. Roots brown-gray, thick, woody. Stems erect, reddish or glaucous, glabrous. Leaves ovate, 2.5–6 × 1–3.5 cm, 3- or 5-veined, base amplexicaul, apex obtuse to acute. Cymes terminal, lax; bracts triangular, margin membranous, ciliate, apex acuminate. Pedicel 5–10 mm. Calyx campanulate, 2–3 mm; lobes ovate-triangular, margin membranous, ciliate, apex obtuse. Petals pale purple or pink, oblong, ca. 6 mm, base narrowed, apex rounded. Stamens shorter than petals. Ovary ovoid. Styles shorter than petals. Capsule ovoid, longer than calyx. Seeds brown-black, compressed reniform-globose, 1.2–1.5 mm, obtusely tuberculate. Fl. Jul–Oct, fr. Aug–Oct.

*Quercus*-forested hills, forest margin grasslands, rocky slopes; 200–300 m. Heilongjiang, Jilin, Liaoning [Korea, Russia (Far East)].

The roots are used medicinally.

**8. *Gypsophila patrinii*** Seringe in de Candolle, Prodr. 1: 353. 1824.

紫萼石头花 *zi e shi tou hua*

*Gypsophila acutifolia* Fischer ex Sprengel var. *gmelinii* (Bunge) Regel; *G. gmelinii* Bunge.

Herbs perennial, 25–60 cm tall, glabrous. Roots thick, 5–10 mm in diam., woody. Stems ascending or erect. Leaves linear, 1.5–4 cm × 1–3 mm, base connate into a short sheath, apex acute; basal leaves fascicled; cauline leaves few. Cymes terminal, laxly few flowered; bracts lanceolate or triangular, 2–3 × ca. 1 mm, margin membranous, ciliate, apex acuminate. Pedicel slender, 0.5–2 cm. Calyx lilac membranous between green or purplish, broad veins, campanulate, 2–3 mm; lobes ovate, margin membranous, sparsely ciliate, apex acute. Petals purple-red, obovate, base cuneate, apex retuse. Stamens shorter than petals; filaments linear, flat; anthers yellow, subglobose. Ovary ovoid, ca. 1.5 mm. Styles ca. 3.5 mm. Capsule ovoid, longer than calyx. Seeds brown-red, compressed reniform-globose, 0.8–1.2 mm, both surfaces smooth; raphe tuberculate. Fl. Jun–Sep, fr. Jul–Oct.

Grassy mountain slopes, rocky slopes, Gobi Desert rock crevices, sands; 600–3400 m. Gansu, Ningxia, Qinghai, Xinjiang [Kazakhstan, N Mongolia, Russia (Siberia)].

**9. *Gypsophila capituliflora*** Ruprecht in Osten-Saken & Ruprecht, Sert. Tianschan. 40. 1869.

头状石头花 *tou zhuang shi tou hua*

*Gypsophila dshungarica* Czerniakowska.

Herbs perennial, to 25 cm tall. Roots thick, woody. Stems several, caespitose, usually simple, glabrous. Leaves linear, subtrigonous, 1–3 cm × ca. 1 mm, subfleshy, glabrous, apex acute; basal leaves caespitose. Cymes terminal, in subcapitate clusters 1–2 cm in diam.; bracts lanceolate, margin membranous, ciliate, apex acuminate. Pedicel ca. 1 mm. Calyx purple 5-veined, campanulate, 3.5–5 mm, lobed for 1/3–1/2 its length; lobes triangular, margin membranous, ciliate, apex acute. Petals light red-purple or white, narrowly obovate, 6–7 × ca. 1.5 mm, base cuneate, apex retuse. Stamens equaling petals. Ovary ca. 2 mm. Styles short. Capsule suboblong, subequaling calyx. Seeds purple-black, globose, 1.5–2 mm, minutely flat tuberculate. Fl. Jul–Sep, fr. Aug–Sep.

Dry mountain slopes; 800–2600 m. Gansu, Nei Mongol, Ningxia, Xinjiang [Kazakhstan, Kyrgyzstan, W Mongolia].

**10. *Gypsophila licentiana*** Handel-Mazzetti, Oesterr. Bot. Z. 82: 245. 1933.

细叶石头花 *xi ye shi tou hua*

Herbs perennial, 30–50 cm tall, glabrous. Stems caespitose, distally branched, straight, slender. Leaves linear, 1–3 cm × ca. 1 mm, subfleshy, base connate into a short sheath, apex usually acutely conduplicate carinate, cartilaginous. Cymes terminal, dense; bracts triangular, ca. 1.5 mm, margin white scarious, ciliolate, apex acuminate. Pedicel purplish, 2–3(–10) mm. Calyx white membranous between 5 green or deep purple veins, narrowly campanulate, 2–3 mm, lobed for ca. 1/3 its

length; lobes ovate, apex acuminate. Petals white, triangular-cuneate, 2.5–3 × as long as calyx, apex retuse. Stamens unequal, shorter than petals; anthers yellowish brown, globose. Ovary ovoid. Styles equaling petals. Capsule slightly longer than calyx. Seeds reniform-globose, ca. 1 mm, tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

• Mountain slopes, sands, field margins; 500–2000 m. Gansu, Nei Mongol, Ningxia, Qinghai, N Shaanxi, Shanxi, Xinjiang [?C Asia].

Chinese records of *Gypsophila acutifolia* Fischer ex Sprengel are referable to *G. licentiana*. True *G. acutifolia* is native to the Caucasus region and has distal stems and inflorescences glandular pubescent, leaves broader, and the calyx incised for ca. 1/2 its length.

Czerepanov (Vasc. Pl. Russia Adjacent States, 167. 1995) recorded *G. licentiana* from C Asia, but without further data.

**11. *Gypsophila spinosa*** D. Q. Lu, Acta Phytotax. Sin. 31: 568. 1993.

刺序石头花 *ci xu shi tou hua*

Herbs perennial, 30–50 cm tall, glabrous. Roots thick. Stems erect. Leaves linear, 1–4.5 cm × ca. 1 mm, fleshy, base connate into a short sheath, apex acute. Corymbose cymes lax, bearing spines in forks of axis; spines 2–10 mm; bracts triangular, scarious. Flowers 3–4 mm in diam.; pedicel 1–5 mm. Calyx campanulate, 2–3 mm, 5-toothed; lobes triangular or ovate, margin scarious, apex obtuse. Petals light purple-red, pink, or white, cuneate, ca. 4 × 1 mm, apex retuse. Stamens subequaling petals; anthers globose. Ovary ovoid. Styles long linear. Capsule ovoid. Seeds brown, ovoid, ca. 1 mm, striate tuberculate. Fl. and fr. Jul–Sep.

• Desert grasslands, river bank sands; 500–900 m. N Xinjiang (Altay Shan).

**12. *Gypsophila paniculata*** Linnaeus, Sp. Pl. 1: 407. 1753.

圆锥石头花 *yuan zhui shi tou hua*

Herbs perennial, 30–80 cm tall. Roots stout. Stems solitary, rarely sparingly caespitose, erect, diffusely many branched, glabrous or proximally glandular pubescent. Leaves lanceolate or linear-lanceolate, 2–5 cm × 2.5–7 mm, glabrous, midvein prominent, apex acuminate. Thyrses profusely forked, numerous flowered; bracts triangular, apex acute. Flowers small; pedicel slender, 2–6 mm, glabrous. Calyx prominently purple veined, broadly campanulate, 1.5–2 mm; lobes ovate, margin scarious, apex obtuse. Petals pale reddish or white, spatulate, ca. 3 × 1 mm, apex truncate or obtuse. Filaments linear, flat, subequaling petals; anthers globose. Ovary ovoid, ca. 1 mm. Styles slender. Capsule globose, slightly longer than calyx. Seeds brown-red, globose, ca. 1 mm, obtusely tuberculate. Fl. Jun–Aug, fr. Aug–Sep.

Grasslands, rocky slopes, fixed dunes, floodlands, fields; 1100–1500 m. N and W Xinjiang [Kazakhstan, W Mongolia, Russia (Siberia)].

The species is used medicinally and cultivated as an ornamental.

**13. *Gypsophila perfoliata*** Linnaeus, Sp. Pl. 1: 408. 1753.

钝叶石头花 *dun ye shi tou hua*

*Gypsophila trichotoma* Wenderoth.

Herbs perennial, yellow-green, to 70 cm tall. Stems erect, distally many branched, proximally glandular pubescent. Leaves obovate- or ovate-oblong, 3–7 × 1–3 cm, glandular pubescent, 3–5-veined, base amplexicaul and slightly connate. Thyrses diffuse; bracts triangular, glabrous, apex acuminate. Pedicel slender, 4–15 mm, glabrous. Calyx green veined, broadly campanulate, 2–4 mm, lobed for ca. 1/2 its length; lobes ovate, margin membranous, apex obtuse. Petals red, pink, or white, oblong, ca. 5 × 2 mm, apex retuse or obtuse. Stamens slightly shorter than petals. Ovary ovoid. Styles exerted. Capsule globose, longer than calyx. Seeds reniform, ca. 1 mm, minutely flat tuberculate. Fl. Jul–Aug, fr. Aug–Sep.

Forest grasslands, wet riversides, saline-alkaline soils, steppe sands; 500–1000 m. N Xinjiang (Altay Shan) [Kazakhstan, W Mongolia, Russia, Turkmenistan; SW Asia, SE Europe].

**14. *Gypsophila cerastioides*** D. Don, Prodr. Fl. Nepal. 213. 1825.

卷耳状石头花 juan er zhuang shi tou hua

*Timaeosia cerastioides* (D. Don) Klotzsch.

Herbs perennial, 10–27(–40) cm tall, tomentose. Roots conical, thick, 9–18 cm, fleshy. Stems densely caespitose, ascending. Leaves obovate-spatulate, 0.5–1.5 × 0.3–1.2 cm, both surfaces pubescent, margin ciliate; basal leaves long petiolate; cauline leaves sessile. Cymes terminal, 5–20-flowered; bracts leaflike, ovate, 2–5 mm, margin ciliate. Flowers 4–13 mm in diam.; pedicel 2–9 mm. Calyx green, broadly campanulate, 3–6 mm, lobed for ca. 1/2 its length; lobes ovate or lanceolate, margin ciliate, apex obtuse. Petals lilac or white, pale purple-red 3-veined, obovate-cuneate, 5–8 mm, base narrowed, apex retuse. Stamens shorter than petals. Ovary ovoid. Styles 2(or 3). Capsule ovoid, usually indehiscent. Seeds black, compressed globose, ca. 0.7 mm in diam., minutely tuberculate. Fl. and fr. May–Aug.

Mixed forests on mountain slopes, forest grasslands, water courses, rubble, roadside fields; 2800–4000 m. S Xizang [Bangladesh, Bhutan, N India, Nepal, N Pakistan, Sikkim].

*Gypsophila sedifolia* Kurz (Flora 55: 285. 1872), from Afghanistan, Kashmir, and Pakistan, is similar to *G. cerastioides*. It has not yet been recorded for China but might be expected to occur in SW Xinjiang and/or W Xizang.

**15. *Gypsophila desertorum*** (Bunge) Fenzl in Ledebour, Fl. Ross. 1: 292. 1842.

荒漠石头花 huang mo shi tou hua

*Heterochroa desertorum* Bunge, Verz. Altai Pfl. 29. 1836.

Herbs perennial, 5–15 cm tall, brown glandular pubescent. Roots brown, 0.5–1.5 cm in diam., woody. Stems densely caespitose, ascending, simple or distally sparsely branched, usually with dwarf, sterile, axillary shoots. Leaves pseudovercillate, linear-subulate, 4–15

× 0.5–1 mm, rigid, midvein abaxially prominent, base connate, margin involute, apex apiculate. Inflorescence a dichasium; bracts lanceolate or ovate-lanceolate, 2–4 × 2–3 mm, apex apiculate. Pedicel 3–12 mm. Calyx campanulate, ca. 4 × 2–3 mm, lobed for ca. 1/2 its length; lobes ovate, ca. 1.5 mm, margin membranous, apex obtuse or acute. Petals white, lilac veined, obovate-cuneate, ca. 6 × 3 mm, base narrowed, apex retuse. Stamens slightly shorter than petals. Ovary ovoid, ca. 3 mm. Styles 2, ca. 2.5 mm. Capsule ovoid, ca. 4 mm. Seeds deep brown, reniform, ca. 1 mm, obtusely curved rugulose. Fl. May–Jul, fr. Aug.

Dry river valleys, sandy and desert steppes, gravelly places; 1400–1500 m. Nei Mongol, N Xinjiang [N Mongolia, Russia (Altai)].

**16. *Gypsophila sericea*** (Seringe) Krylov, Fl. Sibir. Occid. 5: 1087. 1931.

绢毛石头花 juan mao shi tou hua

*Arenaria sericea* Seringe in de Candolle, Prodr. 1: 414. 1824.

Herbs perennial, diffuse, small, sericeous, with stolons 10–35 cm, rooting at nodes. Stems numerous, ascending, branched, slender, 5–10 cm. Leaves sessile, lanceolate, ca. 1.5 cm × 1.5–3.5 mm, lower leaves obtuse at apex, upper leaves acute. Flowers solitary, terminal or borne in distal leaf axils; bracts leaflike. Pedicel 1.4–2 cm, hairlike. Calyx broadly campanulate, 4–5 × 3.5–4 mm, glandular pubescent, lobed for ca. 1/2 its length; lobes ovate, margin membranous, apex obtuse. Petals abaxially lilac, adaxially white, oblanceolate to obovate, 2.5–3 × as long as calyx. Stamens shorter than petals. Ovary ovoid, 4–5 mm. Styles incurved, long. Capsule equaling calyx. Seeds black, reniform, ca. 1.3 mm, flat tuberculate. Fl. Jun–Aug, fr. Jul–Aug.

Coniferous forests, forest margins, hill ridge grasslands; 1600–2400 m. N Xinjiang (Altay Shan) [Kazakhstan, N Mongolia, Russia (Siberia)].

**17. *Gypsophila muralis*** Linnaeus, Sp. Pl. 1: 408. 1753.

细小石头花 xi xiao shi tou hua

*Psammophila muralis* (Linnaeus) Fourreau;

*Psammophiliella muralis* (Linnaeus) Ikonnikov.

Herbs annual, 5–20 cm tall. Stems branched, proximally puberulous, distally glabrous. Leaves glaucous, linear, 0.5–2.5 cm × 1–2.5 mm, base attenuate, apex obtuse or acute. Dichasium lax; bracts leaflike. Pedicel strict, thin, many times longer than calyx. Calyx obconic-cylindric, 3–4 × 0.5–2.5 mm, lobed for 1/4–1/3 its length; lobes orbicular, apex erose. Petals pink, darker veined, obovate-cuneate, 1.5–2 × as long as calyx, apex erose. Stamens equaling or longer than calyx. Ovary ovoid. Styles short. Capsule suboblong, longer than calyx. Seeds numerous, black, asymmetrically ovoid, 0.3–0.5 mm, striate tuberculate. Fl. May–Oct.

Roadside grasslands, fields, walls. SE Heilongjiang (Xingkai Hu) [Kazakhstan, Russia (Siberia); SW Asia (Caucasus); Europe].

**30. PETRORHAGIA** (Seringe) Link, Handbuch 2: 235. 1831.

膜萼花属 mo e hua shu

Lu Dequan (鲁德全); Richard K. Rabeler

*Gypsophila* Linnaeus sect. *Petrorhagia* Seringe in de Candolle, Prodr. 1: 354. 1824.

Herbs annual (or perennial). Stems erect or ascending. Leaves linear or linear-subulate; stipules absent. Inflorescence a cymose panicle, (rarely capitate); bracts subtending calyx in 1–4 pairs or rarely absent. Flowers small. Calyx campanulate, 5(or 15)-veined, scarious between veins, 5-toothed. Petals 5, white (or reddish), (with or without claw; limb entire (or emarginate). Stamens 10. Ovary 1-loculed; ovules numerous; styles 2. Capsule oblong or ovoid, dehiscent by 4 teeth or valves. Seeds numerous, dorsiventrally compressed, ridged-winged, tuberculate or smooth; embryo straight.

About 30 species: Mediterranean region to C Asia; one species in China.

*Petrorhagia saxifraga* (Linnaeus) Link var. *saxifraga* is cultivated in China. It is a perennial, with four bracts immediately subtending the calyx, and reddish or white petals.

**1. *Petrorhagia alpina*** (Hablitz) P. W. Ball & Heywood, Bull. Brit. Mus. (Nat. Hist.) Bot. 3: 145. 1964.

直立膜萼花 zhi li mo e hua

*Gypsophila alpina* Hablitz, Neue Nord. Beitr. Phys. Geogr. Erd-Völkerbeschreib. 4: 57. 1783; *Fiedleria alpina* (Hablitz) Ovczinnikov; *G. stricta* Bunge; *Tunica stricta* (Bunge) Fischer & C. A. Meyer.

Herbs annual, glabrous. Stem solitary, erect, 10–40 cm tall, branched from base; branchlets alternate, strict. Basal leaves in a rosette, linear-oblongate, 2.5–3.5 cm × 3–15 mm, midvein conspicuous, margin rough, apex acute; cauline leaves erect, broadly linear,

smaller than basal leaves. Cymose panicle lax. Pedicel 1–1.5 cm. Calyx green, 3–4(–5.5) × ca. 1.5 mm, 5-veined, ribbed, teeth shortly triangular, apex acute. Petals white, oblong-obovate, 3–6 mm, slightly longer than calyx, not clawed, margin entire. Stamens included. Styles included. Capsule cylindrical-obovoid, ca. 5 mm. Seeds ovoid, 0.7–1.2 mm, tuberculate. Fl. May–Jun, fr. Jul–Aug.  $2n = 30$ .

Rocky, dry grassy slopes; 1000–1800 m. N Xinjiang [Kashmir, Kazakhstan, Pakistan, Russia, Tajikistan; SW Asia, Europe]. Chinese plants belong to var. *alpina*.



