

7. LIMONIUM Miller, Gard. Dict. Abr. ed. 4, 4. 1754, nom. cons.

补血草属 bu xue cao shu

Statice Linnaeus.

Herbs or shrublets, stems often suppressed and forming caudex. Leaves alternate, often crowded into sessile rosettes, less often spaced along stems. Inflorescences usually much branched, often flat topped, rarely capitate or spikelike; ultimate branches forming spikes with (1 or)2–13 rarely more distichously arranged spikelets; spikelets 1–5-flowered; bracts distinctly shorter than first bractlet, margin membranous; bractlet margin usually broadly membranous. Calyx funnelform, obconic, or tubular, base straight or oblique, indistinctly herbaceous along ribs, scarious between ribs; limb scarious, inflated, or expanded, apically 5- or 10-lobed. Corolla basally connate, apically free and expanded. Stamens adnate to corolla base. Ovary ovoid, apex acute. Styles 5, free, glabrous; stigmas elongated to filiform, terete. Capsule obovoid.

About 300 species: worldwide; 22 species in China.

Limonium macrorhabdos (Boissier) Kuntze var. *thomsonii* C. B. Clarke was described from W Tibet but may have been collected from Ladakh. Although the taxon occurs near the border with China, no definite records are known from China.

- 1a. Shrubs; leaves congested on upper parts of stems.
 - 2a. Stems densely covered with dark brown or black rigid scales; leaves without auriform sheaths; inflorescences corymbose 4. *L. wrightii*
 - 2b. Stems covered with lightly colored scarious scales; leaves with 2 auriform membranous sheaths; inflorescences interrupted spicate 22. *L. suffruticosum*
- 1b. Herbs; leaves only in a basal rosette or basal and along branches.
 - 3a. Calyx not oblique at base, usually 2–3.5 mm but if longer then limb not expanded.
 - 4a. Leaves on main branches of inflorescences clasping, rounded or reniform 18. *L. otolepis*
 - 4b. Leaves on branches not clasping, not rounded nor reniform.
 - 5a. Inflorescences without or only with a few simple sterile branches; first bractlet herbaceous.
 - 6a. Leaf blade 2.5–5 × 1–2 cm; calyx 6.5–7 mm 17. *L. callianthum*
 - 6b. Leaf blade (5–)10–30(–40) × 3–8(–10) cm; calyx to 4 mm 21. *L. gmelinii*
 - 5b. Inflorescences with many branched sterile branches; first bractlet membranous.
 - 7a. Leaves oblong-ovate to oblong-spatulate, 1–3.5 × 0.5–2 cm, early deciduous 19. *L. coralloides*
 - 7b. Leaves spatulate to obovate-spatulate, (5–)10–15(–25) × 2–6(–15) cm, persistent when flowering 20. *L. myrianthum*
 - 3b. Calyx abruptly oblique at base, usually 5–8 mm but even if shorter always funnelform.
 - 8a. Stems 1 (rarely more), erect, apically branched, ultimate branches each with a globose inflorescence; calyx limb without conspicuous lobes 6. *L. flexuosum*
 - 8b. Stems many, erect or prostrate, often branched from base, many branches sterile; calyx limb with well developed lobes.
 - 9a. Calyx limb yellow to orange; corolla golden or orange-yellow.
 - 10a. Sterile branches (2 or)3–5, clustered in axils of membranous scales on node of rachis 16. *L. chrysocomum*
 - 10b. Sterile branches 1 in axils of scales or at forks of inflorescences.
 - 11a. Inflorescences with many dichotomous branches and flexuous rachises.
 - 12a. Peduncle and rachis of inflorescences without clustered hairs 12. *L. aureum*
 - 12b. Peduncle and rachis of inflorescences with dense clustered hairs 13. *L. potaninii*
 - 11b. Inflorescences with straight nonflexuous rachises.
 - 13a. Plants 10–15 cm tall; branches densely verrucose; calyx 5–6 mm 14. *L. dielsianum*
 - 13b. Plants 20–40 cm tall; branches smooth or only young branches verrucose; calyx 8–10 cm.
 - 14a. Sterile branches 2- or 3-branched; spikelets 2 or 3 per spike 11. *L. lacostei*
 - 14b. Sterile branches very long, many branched; spikelets 5–7 per spike 15. *L. rezniczenkoanum*
 - 9b. Calyx limb purple, pink, or white; corolla yellow, rose, pale lilac, or purple-violet.
 - 15a. Stems prostrate; inflorescences with well-developed bracts on basal forks 7. *L. congestum*
 - 15b. Stems erect; inflorescences without bracts.
 - 16a. Caudex with dense white membranous scales; corolla rose-violet or purple-violet.
 - 17a. First bractlet densely hirsute; root bark fissured into brown fibers 9. *L. tenellum*
 - 17b. First bractlet glabrous or slightly hirsute; root bark never fissured 10. *L. kaschgaricum*
 - 16b. Caudex without white membranous scales; corolla yellow, pale lilac, or

- pale purple.
- 18a. Calyx lobes apically distinctly acuminate, with a persistent awn; petiole basally to 2 mm wide 8. *L. leptolobum*
- 18b. Calyx lobes never awned; petiole wider than 2 mm.
- 19a. Limb less than half as long as calyx 1. *L. sinense*
- 19b. Limb half as long as calyx.
- 20a. Corolla pale lilac or pale purple 3. *L. franchetii*
- 20b. Corolla yellow or pale yellow.
- 21a. Spike axis almost complanate 2. *L. bicolor*
- 21b. Spike axis terete 5. *L. dichroanthum*

1. Limonium sinense (Girard) Kuntze, Revis. Gen. Pl. 2: 396. 1891.

补血草 *bu xue cao*

Statice sinensis Girard, Ann. Sci. Nat. Bot., sér. 3, 2: 329. 1844; *S. fortunei* Lindley.

Herbs perennial, 15–60 cm tall. Taproot red-brown; bark never peeling. Caudex often thickened; stems many from 1 crown. Leaves basal, persistent to anthesis; petiole wide; leaf blade obovate-oblong, oblong-lanceolate, or lanceolate, 4–12(–22) × 0.4–2.5(–4) cm including petiole, base attenuate, apex usually obtuse to acute. Inflorescences 3–5(–10) from same leaf rosette, ascending to erect, corymbose or paniculate, main axis 4-angular and 4-sulcate; sterile branches few, simple, on basal part or at forks of rachis; spikes with 2–6(–11) spikelets, axis 2-angular; spikelets 2- or 3(or 4)-flowered; bracts ovate, 2–2.5 mm; first bractlet 5–5.5 mm. Calyx funneliform, 5–6(–7) mm; tube ca. 1 mm in diam.; limb white, 2–2.5 mm wide, 3.5–4.5 mm in diam.; lobes apically obtuse to rarely acute. Corolla yellow. Fl. Jun–Nov (N of Chang Jiang) and Apr–Dec (S of Chang Jiang).

Wet sandy and salty shales adjacent to the ocean. Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Liaoning, Shandong, Taiwan, Zhejiang [Japan (Ryukyu Islands), Vietnam].

2. Limonium bicolor (Bunge) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

二色补血草 *er se bu xue cao*

Statice bicolor Bunge, Enum. Pl. China Bor. 55. 1833; *S. bungeana* Boissier; *S. florida* Kitagawa; *S. sinensium* Gandoger; *S. varia* Hance.

Herbs perennial, 20–50 cm tall. Taproot red-brown to dark brown; bark unbroken. Caudex simple or 2–4-branched, covered with persistent petioles. Leaves basal, rarely 1–3 along axis of inflorescences, usually conspicuous to anthesis; petiole wide; leaf blade spatulate to oblong-spatulate, 3–15 × 0.3–3 cm including petiole, base attenuate, apex ± rounded. Inflorescences solitary or 2–5, each from a different leaf rosette, paniculate; main axis usually 3- or 4-angular, sometimes sulcate, or rarely cylindric at base; sterile branches usually simple, on basal part or at forks of rachis; spikes with 3–5(–9) spikelets, axis 2-angular; spikelets 2- or 3(–5)-flowered; bracts oblong-ovate, 2.5–3.5 mm, herbaceous part ovate to oblong; first bractlet 6–6.5 mm. Calyx funneliform, 6–7 mm; tube ca. 1 mm in diam.; limb pink to pale purple, becoming white, 3–3.5 mm in diam., 6–7 mm in diam. in

apical flowers; lobes short and wide, apex rounded to rarely fugaciously soft awned. Corolla yellow. Fl. May–Jul, fr. Jun–Aug.

Calcareous or sandy soil. Gansu, Hebei, Heilongjiang, N Henan, N Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Mongolia].

3. Limonium franchetii (Debeaux) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

烟台补血草 *yan tai bu xue cao*

Statice franchetii Debeaux, Acta Soc. Linn. Bordeaux 31: 348. 1876; *Limonium subviolaceum* Q. Z. Han & S. D. Zhao; *L. teretiscaposum* S. D. Zhao; *S. tchefouensis* Gandoger.

Herbs perennial, 25–60 cm tall. Taproot often thick, red-brown to black-brown; bark unbroken. Caudex thickened, simple or rarely 2- or 3(–6)-branched, densely covered with persistent petioles. Leaves basal, occasionally 1–6 on basal part of main axis of inflorescences, persistent to anthesis; petiole broad; leaf blade obovate-oblong to oblong-lanceolate including petiole, 3–6(–15) × 1–2(–3) cm, base attenuate, apex rounded to obtuse. Inflorescences corymbose or paniculate; main axis usually simple, rarely 2 or 3(–6), stout, cylindric, without angles and grooves; sterile branches few, usually simple, on basal part and at forks of rachis; spikes with (3–)5–7 spikelets; spikelets 2- or 3-flowered; bracts obovate, 3.5–4.5 mm, usually curved and apically 2- or 3-lobed after anthesis, herbaceous part obovate to obovate-spatulate; first bractlet 7–8 mm. Calyx funneliform, 7–8 mm; tube ca. 1.5 mm in diam.; limb pale purple, becoming white, 3.5–4 mm wide, 7–8 mm in diam.; lobes wide and short, apex rounded and usually fugaciously aristate. Corolla pale lilac to pale purple. Fl. May–Jul, fr. Jun–Aug.

* Sandy slopes around seashores. N Jiangsu, S Liaoning, E Shandong.

4. Limonium wrightii (Hance) Kuntze, Revis. Gen. Pl. 2: 396. 1891.

海芙蓉 *hai fu rong*

Shrublets herblike. Stems and branches thick, usually 10–15 cm tall; old branches densely covered with dark brown to black scales from persistent petiole bases. Leaves clustered on apical parts of young branches; petiole basally enlarged, nearly clasping; leaf blade oblanceolate to spatulate-oblong,

2–4 cm × 4–7 mm including petiole, fleshy, base attenuate, apex rounded. Inflorescences axillary, 7–16 cm, corymbose, rachis 2 or 3 × dichotomously branched; sterile branches often on basal part of rachis; spikes with 5–11 spikelets; spikelets 2–4-flowered; bracts broadly ovate, 2–2.5 mm, apex acute; first bractlet broadly elliptic, ca. 5 mm, apex rounded. Calyx funnelform, 5–6 mm; tube ca. 1 mm in diam.; limb usually plicate and slightly extended, lobes apically triangular. Fl. Aug–Sep, fr. Sep–Oct.

Taiwan [Japan].

- 1a. Calyx limb white; corolla pale purple 4a. var. *wrightii*
1b. Calyx limb pale yellow; corolla yellow 4b. var. *luteum*

4a. *Limonium wrightii* var. *wrightii*

海芙蓉(原变种) hai fu rong (yuan bian zhong)

Statice wrightii Hance, Ann. Sci. Nat. Bot., sér. 5, 5: 236. 1866; *Limonium arbusculum* (Maximowicz) Makino; *L. wrightii* var. *roseum* H. Hara; *S. arbuscula* Maximowicz.

Calyx limb white. Corolla pale purple.

In rock clefts along seashore. Taiwan [Japan].

Medicinal.

4b. *Limonium wrightii* var. *luteum* (H. Hara) H. Hara, Enum. Spermatoph. Jap. 1: 99. 1948.

黃花海芙蓉 huang hua hai fu rong

Limonium arbusculum (Maximowicz) Makino var. *luteum* H. Hara, J. Jap. Bot. 21: 19. 1947.

Calyx limb pale yellow. Corolla yellow.

In rock clefts along seashore. Taiwan [Japan].

5. *Limonium dichroanthum* (Ruprecht) Ikonnikov-Galitzky ex Linczewski in Komarov, Fl. URSS 18: 428. 1952.

淡花补血草 dan hua bu xue cao

Statice dichroantha Ruprecht, Mém. Acad. Imp. Sci. Saint Petersbourg, Sér. 7, 14(4): 69. 1869.

Herbs perennial, 20–70 cm tall, glabrous except for bractlets and calyces. Stems 2–8, straight, subterete, dichotomously branched at base; branches flexuous, terete. Leaves all basal; leaf blade oblong to oblong-spatulate, 2–4 × 0.8–1.0 cm, glaucous. Inflorescences corymbose, with few sterile branches; spikes 2 or 3, dense, on apical part of stem, with 5–11 spikelets; spikelets 4–7(–11)-flowered; bracts obovate, 3–4 mm, glabrous or slightly pubescent, margin scarious; first bractlet membranous, pubescent. Pedicel 1–1.5 mm. Calyx white to pale yellow, funnelform, 5–7 mm, densely pubescent; lobes short triangular, apex awned. Corolla yellow. Fl. Jul, fr. Jul–Aug.

Dry slopes. W Xinjiang [Kyrgyzstan].

6. *Limonium flexuosum* (Linnaeus) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

曲枝补血草 qu zhi bu xue cao

Statice flexuosa Linnaeus, Sp. Pl. 1: 276. 1753.

Herbs perennial, 10–30(–45) cm tall. Taproot red-brown to black-brown; bark unbroken. Caudex slightly thickened. Leaves basal and 1–5 on main axis of inflorescences, persistent at anthesis; petiole broad; leaf blade oblong-ob lanceolate, obovate-oblong, or sometimes lanceolate, (2)–4–7(–12) × 0.5–1.3(–2) cm including petiole, base attenuate, apex acute to obtuse. Inflorescences usually solitary, corymbose or paniculate forming a capitulum; rachis 2–4 × branched, without or with very few simple sterile branches, apical part of main axis obtusely angular; spikes 2 or 3 clustered on apex of branch, each with 7–9(–13) spikelets; spikelets 2- or 3-flowered; bracts broadly ovate, 2.5–3.5 mm, herbaceous part ovate to oblong; first bractlet 4.5–5 mm. Calyx funnelform, 5–6 mm; tube ca. 1 mm in diam.; limb white, usually plicate, 3–4 mm in diam.; lobes indistinct. Corolla pale purple. Fl. Jun–Aug, fr. Jul–Aug.

Grasslands; 600–700 m. NE Nei Mongol [Mongolia, Russia (E Siberia)].

7. *Limonium congestum* (Ledebour) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

密花补血草 mi hua bu xue cao

Statice congesta Ledebour, Fl. Altaic. 1: 437. 1829.

Herbs perennial, 5–20 cm tall. Taproot slender. Caudex absent. Basal leaves many; petiole as long as blade; leaf blade oblong-ovate to lanceolate, (0.5)–1–4 cm × (3)–5–10 mm, base attenuate, apex rounded to short acute. Inflorescences 5–25; peduncle prostrate; branches basal, angulate, basal forks with 1 or 2 leaves; spikes dense, distichous, with 10–20 spikelets; spikelets 2–5-flowered; bracts to 2 mm, broadly obovate; first bractlet ca. 4 mm, broadly membranous at apex. Calyx funnelform, 3–4.5 mm; tube pubescent; limb white, rose, or rose-purple, lobes acute. Corolla pale yellow. Fl. Jun–Jul, fr. Jul–Aug.

Gravel slopes and sand dunes; 2300–2700 m. NW Xinjiang (Altay Shan) [Mongolia, Russia].

8. *Limonium leptolobum* (Regel) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

精河补血草 jing he bu xue cao

Statice leptoloba Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 385. 1880; *S. leptoloba* var. *subaphylla* Regel.

Herbs perennial, 20–45 cm tall. Taproot red-brown; bark unbroken. Caudex enlarged with age. Leaves basal, persistent to anthesis; petiole slender, basally 0.5–2 mm wide; leaf blade spatulate to lanceolate-obovate, (1.2)–2–6 × 0.5–1.5 cm including petiole, base attenuate, apex obtuse to rounded. Inflorescences 2–15, corymbose forming a capitulum; rachis dichotomously 4–6 × branched; sterile branches few, simple; spikes short, 2 or 3 clustered on apical part of branch, each spike with 3–7(–9) spikelets; spikelets 2- or 3(or 4)-flowered; bracts ovoid to obovate, 2.5–3 mm; first bractlet 5.5–6 mm. Calyx funnelform, 6.5–8 mm; tube ca. 1 mm in diam.; limb pale purple to pink, becoming white; lobes apically plicate and

acuminate, rarely extended and obtuse, with a persistent arista. Corolla yellow. Fl. May–Jul, fr. Jul–Aug.

Semideserts and hilly areas; 300–1200 m. N Xinjiang [Kazakstan].

Limonium michelsonii Linczevski, which is probably a hybrid between *L. leptolobum* and *L. hoeltzeri* (Regel) Ikonnikov-Galitzky, may also occur in China.

9. Limonium tenellum (Turczaninow) Kuntze, Revis. Gen. Pl. 2: 396. 1891.

细枝补血草 xi zhi bu xue cao

Statice tenella Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 203. 1832.

Herbs perennial, 5–30 cm tall. Taproot dark brown, thick; bark broken and peeling off, exposing inner brown fibers. Caudex woody, thickened, divergent stems many from 1 crown, densely covered with white membranous scales and persistent petiole bases. Leaves small, basal, persistent to anthesis; petiole slender; leaf blade spatulate, oblong-spatulate, or linear-lanceolate, 0.5–1.5 cm × 1–3.5 mm including petiole, base attenuate, apex rounded to obtuse. Inflorescences usually numerous, arising from different leaf rosettes, corymbose, main axis slender; rachis 4–7 × dichotomously branched, flexuous, with most branches sterile; spikes terminal on some branches, with (1 or)2–4 spikelets; spikelets 2- or 3(or 4)-flowered; bracts broadly ovate, 1.5–3 mm; first bractlet 6–7 mm, densely hirsute when young, glabrescent. Calyx funneliform, 8–9 mm; tube 1–1.3 mm in diam.; limb pale purple, becoming white when dry; lobes apically obtuse to acute. Corolla pale purple. Fl. May–Jul, fr. Jul–Aug(–Sep).

Desert grasslands; 800–1200 m. Nei Mongol, Ningxia [Mongolia].

10. Limonium kaschgaricum (Ruprecht) Ikonnikov-Galitsky, Trudy Bot. Inst. Akad. Nauk SSSR. Ser. 1, Fl. Sist. Vyss. Rast. 2: 255. 1936.

喀什补血草 ka shi bu xue cao

Statice kaschgarica Ruprecht, Mem. Acad. Imp. Sci. Saint Petersbourg, Sér. 7, 14(4): 69. 1869.

Herbs perennial, (5–)10–25 cm tall. Taproot stout, dark brown; bark unbroken. Caudex woody, thickened; stems many, compact from 1 crown, densely covered with white membranous scales and persistent petiole bases. Leaves basal, persistent to anthesis; petiole narrow; leaf blade oblong-spatulate, oblong-ob lanceolate, or sometimes linear-lanceolate, 1–2.5 cm × (1–)2–6 mm including petiole, base attenuate, apex rounded to acuminate. Inflorescences usually numerous, arising from different leaf rosettes, corymbose; rachis 4–7 × dichotomously branched, flexuous, with most branches sterile; spikes terminal on branchlets, with 3–5(–7) spikelets; spikelets 2- or 3-flowered; bracts broadly ovate (1–)2–3 mm; first bractlet 5.5–6.5 mm, glabrous or slightly minutely hispid. Calyx funneliform, 6–8.5(–10.5) mm; tube 1–1.3 mm in diam.; limb pale purple, becoming white when dry; lobes apically acute. Corolla pale purple-red. Fl. Jun–Jul, fr. Jul–Aug.

Deserts; 1300–3000 m. SW Xinjiang [Kyrgyzstan].

Limonium kaschgaricum may be represented in China by both var. *kaschgaricum* and var. *hoeltzeri* (Regel) R. Kamelin. The latter occurs in E Tian Shan of Kyrgyzstan.

11. Limonium lacostei (Danguy) Kamelin, Novon 3: 261. 1993.

灰杆补血草 hui gan bu xue cao

Statice lacostei Danguy, J. Bot. (Morot), sér. 2, 1(3): 53. 1908; *Limonium roborowskii* Ikonnikow-Galitzky.

Herbs perennial, 20–40 cm tall. Taproot stout, dark brown. Caudex thickened, dichotomously branched; branches thick, suberete to complanate, densely covered with white membranous scales and persistent petiole bases. Leaves in fascicles at branch apex, usually withered by anthesis; petiole narrow; leaf blade spatulate, obovate-spatulate, or oblong-ovate, (0.7–)1–1.5(–2.5) cm × 2–4(–6) mm, base attenuate, apex obtuse to acute. Inflorescences grayish green, 1 per leaf rosette, corymbose, main axis rigid and erect, complanate to 2 edged; rachis 2–4 × branched, with most branches sterile, apical young branches verrucose; spikes terminal, solitary, with (1 or)2 or 3 spikelets; spikelets 2- or 3-flowered; bracts ovate, 2.5–3 mm; first bractlet 7.5–8.5(–9) mm. Calyx funneliform, (8–)8.5–9.5(–10) mm; tube ca. 1 mm in diam.; limb yellow with reddish and pubescent veins; lobes apically acute. Corolla yellow to orange-yellow. Fl. Jun–Jul, fr. Jul–Aug.

Gravel deserts on mountain slopes, alluvial fans on rocky slopes; 1300–1700(–4000) m. SW Xinjiang, NW Xizang [Kashmir, Pakistan].

12. Limonium aureum (Linnaeus) Hill, Veg. Syst. 12: 37. 1767.

黄花补血草 huang hua bu xue cao

Statice aurea Linnaeus, Sp. Pl. 1: 276. 1753; *Limonium erythrorrhizum* Ikonnikov-Galitzky ex Linczevski.

Herbs perennial, 4–25(–30) cm tall, glabrous. Taproot red-brown to dark brown; bark unbroken. Caudex thickened, usually enlarged and woody with age, becoming many headed, usually covered with red-brown scales and persistent petioles. Leaves basal, rarely 1 or 2 along basal part of peduncle, usually withering by anthesis; petiole narrow; leaf blade oblong-lanceolate to oblanceolate, 1.5–3(–5) cm × 2–5(–15) mm including petiole, base attenuate, apex rounded, obtuse, or rarely acute. Inflorescences 2 to several, arising from different rosettes, paniculate; rachis usually 4–7 × dichotomously branched, flexuous, often densely verrucose, with basal branches sterile; spikes terminal on apical branches, with 3–5(–7) spikelets; spikelets 2- or 3-flowered; bracts broadly ovate, 2.5–3.5 mm; first bractlet 5.5–6 mm. Calyx funneliform, 5.5–6 mm; tube ca. 1 mm in diam.; limb golden to orange-yellow; lobes usually with projecting veins, awned to mucronate. Corolla orange. Fl. Jun–Aug, fr. Jul–Aug.

C Gansu, Nei Mongol, Ningxia, N Shaanxi, Shanxi [Mongolia, Russia (E Siberia)].

13. Limonium potaninii Ikonnikov-Galitzky, Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, Fl. Sist. Vyss. Rast. 2: 256. 1936.

星毛补血草 xing mao bu xue cao

Limonium aureum (Linnaeus) Hill var. *potaninii* (Ikonnikov-Galitzky) Peng.

Herbs perennial, 25–40 cm tall, densely pubescent and with clusters of stellate hairs on peduncles and rachises. Stems many, base dichotomously branched and covered with brown scales. Leaves basal; leaf blade oblong-obovate to oblong-spatulate, 2–3 cm × 8–10 mm, apex subrounded with a short awn. Inflorescences several; rachis dichotomously branched, densely verrucose and with stellate hairs, with many sterile branches and triangular scales on base of branchlets. Spikes terminal, with 5–7(–9) spikelets; spikelets 2- or 3-flowered; bracts rounded, to 3 mm, scarious, pubescent; first bractlet 5–6 mm, scarious, glabrous or pubescent, margin broadly membranous. Calyx funneliform, 6.5–7 mm; tube densely pubescent; limb pale yellow to golden; lobes short, apex obtuse, emarginate, and without an awn or mucro. Corolla orange-yellow. Fl. Jul–Aug, fr. Aug.

* Loess slopes and sandy places; 1700–3000 m. C and SW Gansu, E Qinghai, N Sichuan.

14. Limonium dielsianum (Wangerin) Kamelin, Novon 3: 261. 1993.

八龙补血草 ba long bu xue cao

Statice dielsiana Wangerin, Repert. Spec. Nov. Regni Veg. 17: 399. 1921; *Limonium aureum* Linnaeus var. *dielsianum* (Wangerin) Peng.

Herbs perennial, 10–20 cm tall. Stems several, flexuous, base branched and covered with brown scales. Leaves basal; leaf blade spatulate, apex rounded, with a short awn. Inflorescences several; rachis dichotomously branched, thick, mostly straight, glabrous but verrucose near apices; spikes terminal, with several spikelets; spikelets 2-flowered; bracts ovate, to 2.5 mm, scarious, glabrous; first bractlet subrounded, to 5.5 mm, margin broadly membranous. Calyx funneliform, 8–8.5 mm; tube densely pubescent; limb sulfurous; lobes broadly triangular, apex long awned. Corolla yellow. Fl. Jul, fr. Aug.

* Dry gravel flats and slopes. W Gansu, Qinghai.

15. Limonium rezniczenkoanum Linczevski in Komarov, Fl. URSS 18: 434. 1952.

新疆补血草 xin jiang bu xue cao

Herbs perennial, to 40 cm tall. Caudex woody, thick, with many heads, densely covered with persistent petiole bases. Leaves all basal, many; petiole 2 × or more as long as blade; leaf blade oblong-spatulate, 3–6 cm × 4–6 mm, base attenuate, apex rounded, with a short acumen. Inflorescences 10–12, straight, base many branched; sterile branches many, long, with many branchlets; spikes 2 or 3, capitate at apex, with 5–7 spikelets; spikelets 2–4-flowered; bracts broadly ovate, 3–4 mm, glabrous; first bractlet lemon yellow, to 1–2

cm, membranous except at base, glabrous. Calyx funneliform, ca. 1 cm; tube densely pubescent; limb lemon-yellow, lobes acute. Corolla orange-yellow. Fl. Jul.

Rocky slopes. NW Xinjiang [Kazakstan (Saur Mts.)].

16. Limonium chrysocomum (Karelin & Kirilov) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

簇枝补血草 cu zhi bu xue cao

Herbs perennial. Taproot thick, grayish brown to dark brown; bark sometimes broken, with exposed red-brown fibers. Caudex thickened, woody, with short-clumped woody branches; branches densely covered with white membranous scales and persistent petioles, with 1 terminal bud or several buds and many heads. Leaf blade linear-lanceolate to oblong-spatulate, 1–1.5(–2.5) cm × 1–4 mm including petiole, base attenuate, apex acuminate, obtuse, or rounded. Inflorescences capitate to spicate-capitate, unbranched, 1 borne on every leaf rosette; peduncle and rachis simple, flexuous to straight, ± verrucose or not verrucose, nodes with a narrowly triangular to linear-triangular white membranous scale; sterile branches axillary in scales, needlelike, straight or curved, usually simple or rarely short branched, hidden or exposed; spikes (1 or) 2 or 3, crowded, terminal, with (1 or) 2–10 spikelets; spikelets (1 or) 2–5(–10)-flowered; bracts ovate, (2–)4–5 mm; first bractlet 8–10(–12) mm. Calyx funneliform; limb fleshy yellow, lobes apically acuminate to obtuse. Corolla orange. Fl. Jun–Jul, fr. Jul–Aug.

Xinjiang [Kazakstan, Mongolia, Russia].

Limonium chrysocomum is a variable species that has been variously interpreted. Peng (Fl. Reipubl. Popularis Sin. 60(1): 39–40. 1987) recognized four varieties (*chrysocephalum*, *chrysocomum*, *sedoides*, and *semenovii*). Kamelin (Novon 3: 261–262. 1993) recognized two subspecies with subsp. *chrysocomum* having three varieties (*chrysocomum*, *chrysocephalum*, and *sedoides*). Grubov (Novon 4: 31. 1994) treats *L. semenovii* as a separate species with two varieties (*chrysocephalum* and *sedoides*).

1a. First bractlet glabrous or partly covered with hairs ca. 0.5 mm; main axis or sterile branches verrucose 16a. subsp. *chrysocomum*

1b. First bractlet densely covered with hairs to ca. 1 mm; main axis and sterile branches not verrucose 16b. subsp. *semenovii*

16a. Limonium chrysocomum subsp. ***chrysocomum***

簇枝补血草(原变种) cu zhi bu xue cao (yuan bian zhong)

Statice chrysocoma Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 429. 1842; *Limonium chrysocomum* var. *chrysocephalum* (Regel) Peng; *L. chrysocomum* var. *pubescens* Linczevski; *L. chrysocomum* var. *sedoides* (Regel) Peng; *L. sedoides* (Regel) Kuntze; *L. semenovii* (Herder) Kuntze var. *chrysocephalum* (Regel) Grubov; *L. semenovii* var. *sedoides* (Regel) Grubov; *S. chrysocephala* Regel; *S. schrenkiana* Fischer & C. A. Meyer; *S. sedoides* Regel.

Main axis of inflorescences 2–20(–25) cm tall, ± verrucose, internodes 0.5–2 cm; sterile branches 0.1–1.5(–3) cm,

shorter than scales to $6 \times$ length of scales, patent, slender, straight, simple or short branched, often verrucose; bracts and first bractlet glabrous or partly minutely hispid with hairs ca. 0.5 mm. Calyx 5–12 mm; tube ca. 1.5 mm in diam.

Rocky slopes. N and NW Xinjiang [Kazakstan, Mongolia, Russia].

16b. *Limonium chrysocomum* subsp. *semenovii* (Herder) Kamelin, Novon 3: 261. 1963.

大簇补血草 da cu bu xue cao

Statice semenovii Herder in Herder & Regel, Bull. Soc. Imp. Naturalistes Moscou 41(1): 398. 1868; *Limonium chrysocomum* var. *semenovii* (Heder) Peng; *L. semenovii* (Herder) Kuntze.

Main axis of inflorescences 20–40 cm tall, not verrucose, internodes 2–4 cm; sterile branches (1–)2–3.5(–5.5) cm, usually 4–7 × scale length or more, patent, straight or curved, simple or short branched; bracts and first bractlet densely minutely hispid, hairs ca. 1 mm, rarely glabrous. Calyx 8.5–11 mm; tube ca. 1.3 mm in diam.

Rocky hills and slopes. Xinjiang [Kazakstan, Mongolia].

17. *Limonium callianthum* (Peng) Kamelin, Novon 3: 262. 1993.

美花补血草 mei hua bu xue cao

Limonium drepanostachyum Ikonnikov-Galitzky subsp. *callianthum* Peng, Guihaia 3: 292. 1983.

Herbs perennial, 30–40 cm tall. Taproot red-brown. Caudex thickened, densely covered with persistent petiole bases. Leaves basal; leaf blade obovate-spatulate to spatulate, 2.5–5 × 1–2 cm including petiole, base attenuate, apex rounded to obtuse. Inflorescences usually solitary, paniculate; rachis terete, generally 3–5 × branched, without or with few sterile branches; spike 1, terminal, with (2–)5–8(–10) spikelets; spikelets 2–4-flowered; bracts broadly ovate, 1.5–2.5 mm, glabrous; first bractlet oblong ovate, 4.5–5.5 mm, glabrescent to partly pubescent. Calyx tubular-campanulate, 6.5–7 mm, densely pilose; tube ca. 1.3 mm in diam.; limb pale grayish purple to nearly white, lobes minute, veins dark purple. Corolla blue-purple. Fl. Jul–Sep, fr. Aug–Sep.

* Base of mountains at low altitude. SW Xinjiang.

18. *Limonium otolepis* (Schrenk) Kuntze, Revis. Gen. Pl. 2: 396. 1891.

耳叶补血草 er ye bu xue cao

Statice otolepis Schrenk, Bull. Cl. Phys.-Math. Acad. Sci. Saint-Pétersbourg 1: 362. 1843.

Herbs perennial, 30–90(–120) cm tall. Rhizomes dark red-brown, apical part usually erect and becoming a thickened caudex. Leaves basal and on inflorescence, withered by anthesis, basal ones with a narrow petiole; leaf blade obovate-spatulate, 3–6(–8) × 1–2(–3) cm including petiole, base attenuate, apex obtuse to rounded; other leaves sessile, broadly ovate to reniform, base clasping, leaving ringlike scars after abscission. Inflorescences 1 or several from different leaf

rosettes; rachis 4–7 × branched; branchlets slender, numerous, basal ones sterile; spikes arranged along apical part and terminal on slender branches, with 2–5(–7) spikelets; spikelets 1(or 2)-flowered; bracts broadly ovate, ca. 1 mm, membranous except base; first bractlet ca. 2 mm. Calyx obconical, 2.2–2.5 mm; tube glabrous or slightly pubescent along 1 side; limb white. Corolla pale blue-purple. Fl. Jun–Jul, fr. Jul–Aug.

Saline soil; 300–1400 m. Gansu, N Xinjiang [N Afghanistan, Kazakstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].

19. *Limonium coralloides* (Tausch) Linczevski in Komarov, Fl. URSS 18: 451. 1952.

珊瑚补血草 shan hu bu xue cao

Statice coralloides Tausch, Syll. Pl. Nov. 2: 255. 1828; *Limonium decipiens* (Ledebour) Kuntze; *S. aphylla* Poiret; *S. decipiens* Ledebour.

Herbs perennial, 25–50 cm tall. Caudex woody, many headed. Leaves basal, usually withered by anthesis; petiole wide; leaf blade oblong-ovate to oblong-spatulate, 1–3.5 × 0.5–2 cm including petiole, base attenuate, apex usually rounded. Inflorescences often numerous, arising from different leaf rosettes, large, paniculate; rachis 5–7 × branched, with sterile basal branches; branchlets slender, short, numerous, densely verrucose; verrucae with apically clustered hairs when young, later glabrescent and foveolate; spikes arranged on apical or terminal part of branchlets, with 3–5(–7) spikelets loosely arranged; spikelets 1(or 2)-flowered; bracts broadly ovate to subrounded, ca. 1 mm, membranous at least on apical half; first bractlet ca. 2 mm. Calyx obconical to almost narrowly funnelform, 2.5–3 mm; tube densely pubescent; limb white. Corolla pale blue-purple. Fl. Jul–Aug, fr. Aug–Sep.

Saline sandy soil, river banks; 500–1200 m. Xinjiang (Altay Shan) [Kazakstan, Mongolia, Russia (Siberia)].

20. *Limonium myrianthum* (Schrenk) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

繁枝补血草 fan zhi bu xue cao

Statice myriantha Schrenk in Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 14. 1841; *S. latissima* Karelin & Kirilov.

Herbs perennial, 40–100 cm tall. Caudex woody, with many rosettes. Leaves thickened, hard, persistent to anthesis; petiole long, both sides sometimes involute; leaf blade spatulate to obovate-spatulate, (5–)10–15(–25) × 2–6(–15) cm including petiole, base abruptly constricted, cuneate, apex usually truncate to rounded. Inflorescences paniculate, main axis terete, rachis 3–5 × branched, basal branches sterile; spikes arranged on apical part of branchlets, with 3–7(–9) spikelets; spikelets 1(or 2)-flowered; bracts broadly ovate to subrounded, ca. 1 mm, apical half or more membranous; bractlets slender, numerous, polished or verrucose, verrucae sometimes apically with white clustered hairs, first bractlet ca. 2 mm. Calyx narrowly funnelform, pubescent along outer ribs or sometimes glabrous; limb white. Corolla pale blue-purple. Fl. Jun–Aug, fr. Jul–Aug.

Saline wastelands, lake shores; 400–1100 m. N Xinjiang [Kazakstan, Kyrgyzstan, Mongolia].

21. *Limonium gmelinii* (Willdenow) Kuntze, Revis. Gen. Pl. 2: 395. 1891.

大叶补血草 da ye bu xue cao

Statice gmelinii Willdenow, Sp. Pl. 1: 1524. 1798;
Limonium pycnanthum (K. Koch) Kuntze; *S. glauca* Willdenow ex Schultes; *S. gmelinii* var. *scoparia* (Pallas ex Willdenow) Schmalhausen; *S. pycnantha* K. Koch; *S. scoparia* Pallas ex Willdenow.

Herbs perennial, 30–70(–100) cm tall. Taproot stout, dark purplish brown. Caudex thickened, with 1–3 heads, densely covered with persistent petiole bases. Leaves basal, hard, persistent to anthesis; petiole distinct; leaf blade oblong-obovate, elliptic, or ovate, (5–)10–30(–40) × 3–8(–10) cm including petiole, base attenuate, apex usually obtuse to rounded. Inflorescences usually solitary, large, corymbiform or paniculate; main axis cylindric, polished; rachis 3 or 4 × branched; branchlets slender, erect; sterile branches usually absent or simple and solitary on forks; spikes with 2–7 spikelets, densely clustered on upper part of branchlets; spikelets 1- or 2(or 3)-flowered; bracts broadly ovate, 1–1.5 mm, margin narrowly membranous; first bractlet 2–2.5 mm, margin membranous. Calyx obconical; tube basally and adaxially pubescent along ribs; limb pale purple or white. Corolla blue-purple. Fl. Jul–Sep, fr. Aug–Sep. $2n = 18$.

Saline wastelands. N Xinjiang [Kazakstan, Kyrgyzstan, Mongolia, Russia; Europe].

22. *Limonium suffruticosum* (Linnaeus) Kuntze, Revis. Gen. Pl. 2: 396. 1891.

木本补血草 mu ben bu xue cao

Statice suffruticosa Linnaeus, Sp. Pl. 1: 276. 1753.

Shrublets dwarf, cespitose. Branches growing 1–3.5(–8) cm per year, old ones covered with persistent membranous sheaths. Leaves fleshy; petiole slender, base expanded, nearly clasping, becoming marginally membranous sheath with 2 erect and 1 auriculate scale; leaf blade oblong-spatulate to lanceolate-spatulate, 1–4.5(–7) cm × 2–7(–10) mm including petiole, base attenuate, apex rounded. Inflorescences axillary on young branches, 5–35 cm; peduncle and rachis cylindric; rachis 1 or 2 × branched, without sterile branches; spikes (1 or)2 or 3, clustered or capitate, arranged on nodes or terminal on rachis branches, with 2–5(–7) spikelets; spikelets 2- or 3 (-5)-flowered; bracts broadly ovate, 1–1.5 mm, glabrous; first bractlet broadly ovate to subrounded, 2–3 mm, glabrous. Calyx obconical, 3–4 mm; tube ± pubescent or glabrous; limb white. Corolla pale purple to blue-purple. Fl. Aug–Oct, fr. Sep–Oct. $2n = 18$.

Saline soils; 400–1300 m. N Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, SW Mongolia, Russia, Uzbekistan; SW Asia, Europe].