

4. ACANTHOLIMON Boissier, Diagn. Pl. Orient. 1(7): 69. 1846, nom. cons.

彩花属 cai hua shu

Armeriastrum (Jaubert & Spach) Lindley; Statice subgen. *Armeriastrum* Jaubert & Spach.

Shrublets pulvinate, usually thorny, often subglobose, many branched. Leaves borne on current year's branches, crowded, sessile, persistent on old branches, spring leaves similar or different from summer leaves; leaf blade linear, linear-needlelike, or linear-subulate, usually very shallowly obdeltate to subcomplanate in cross section, apex usually pointed to awned. Inflorescences borne in axil of spring leaves, branched or unbranched; spikes pedunculate, with 2–8 spikelets, arranged in 2 rows, sometimes rachis undeveloped with spike or spikelets axillary; spikelets 1–5-flowered; bracts distinctly shorter than bractlet of first flower, margin membranous; first bractlet similar to bract, margin broadly membranous. Calyx funnelform or rarely subtubular; tube straight or occasionally basally oblique, inconspicuously herbaceous along ribs and scarious between ribs; limb purple, pink, or white, broad, scarious, 5- or 10-lobed. Corolla slightly exerted from calyx; petals basally slightly connate. Stamens adnate to corolla base. Ovary linear-cylindric, apex attenuate. Styles 5, free, glabrous; stigmas depressed capitate. Capsule oblong-filiform.

About 190 species: C and SW Asia, Europe; 11 species in China.

Acantholimon fetisowii Regel has been reported from Xinjiang, but this may be a misidentification.

- 1a. Spikelets forming a sessile spike (but see *A. roborowskii*) or spikelets solitary; current year's branches very short with several crowded leaves.
 - 2a. Calyx limb dark purple; spikelet solitary 11. *A. tianschanicum*
 - 2b. Calyx limb white or pale rose colored with purple-brown veins; spikelets usually 2 or 3, clustered or solitary.
 - 3a. Calyx 7–8.5 mm, veins extending to limb margin; leaf blade apex acute to acuminate and short awned 9. *A. hedinii*
 - 3b. Calyx 5–6.5 mm, veins not extending to limb margin; leaf blade apex obtuse or acute but not awned 10. *A. diapensioides*
- 1b. Spikelets forming a pedunculate spike; current year's branches distinct, 2–15(–25) mm, with dense but never appressed leaves.
 - 4a. Spikelets 1-flowered; bracts and first bractlet glabrous or sparsely puberulent.
 - 5a. Leaf blade velvety puberulent especially so when young 4. *A. kokandense*
 - 5b. Leaf blade glabrous except margin.
 - 6a. Calyx 7–8 mm, glabrous 2. *A. laevigatum*
 - 6b. Calyx (10–)11–12 mm, pubescent between ribs.
 - 7a. Peduncles 3–6 cm, densely pubescent 1. *A. alatavicum*
 - 7b. Peduncles (9–)12–15 cm, subglabrous 3. *A. kaschgaricum*
 - 4b. Spikelets 2- or 3-flowered (or sometimes terminal spikelet 1-flowered); bracts and rib of first bractlet pubescent.
 - 8a. Peduncles 0–2 cm.
 - 9a. Peduncles distinct; cushions to 20–25 cm wide; leaf blade 5–7 mm 5. *A. borodini*
 - 9b. Peduncles practically lacking; cushions to 50–100 cm wide; leaf blade (7–)10–12 mm 6. *A. roborowskii*
 - 8b. Peduncles (3–)4–6 cm.
 - 10a. Leaf blade glaucous; spikes distichous; calyx 6–8 mm 7. *A. lycopodioides*
 - 10b. Leaf blade light green; spikes dense, 1-sided; calyx 10–12 mm 8. *A. popovii*

1. *Acantholimon alatavicum* Bunge, M□. Acad. Sci. Saint P□ersbourg, S□. 7, 18(2): 40. 1872.

刺叶彩花 ci ye cai hua

Shrublets. Cushions 30–40(–100) cm wide. branches of current year 0.5–1.5(–2.5) cm. Leaf blade glaucous, linear-needlelike to linear-subulate, 2.5–4 cm × 1–2 mm for summer leaves but in spring usually shorter, very shallowly obdeltate in cross section, rigid, glabrous, apex short awned. Inflorescences unbranched; peduncle 3–6 cm, ± densely pubescent; spike ca. 2 cm, with (1–)5–8 spikelets; spikelets 1-flowered; bracts glabrous, usually oblong-ovate, 5–6 mm, apex acuminate; first bractlet 7–8 mm, apex obtuse to acute. Calyx 1–1.2 cm; tube sparsely velvety between ribs; limb white, apically

5- or 10-lobed, veins purple and extending to apex of lobes, basally velvety along veins. Corolla light purple. Fl. Sep–Oct.

Rocky slopes of desert grasslands; 1300–2500 m. W Xinjiang [Kazakstan, Kyrgyzstan, N Tajikistan, Uzbekistan].

2. *Acantholimon laevigatum* (Peng) Kamelin, Novon 3: 261. 1993.

光萼彩花 guang e cai hua

Acantholimon alatavicum var. *laevigatum* Peng, Guihua 3: 291. 1983.

Shrublets. Cushions ca. 30 cm wide. Leaf blade light green, linear, subcomplanate in cross section, 1–2.5 cm, rigid,

glabrous, apex awned. Inflorescences unbranched, 5–9 cm, slightly pubescent; spike with 5–8 spikelets; spikelets 1-flowered; bracts 3–3.5 mm, glabrous; first bractlet 6–6.5 mm. Calyx 7–9 mm, tube glabrous, limb white. Corolla light purple.

* Xinjiang (Tianshan).

3. *Acantholimon kaschgaricum* Linczevski, *Novosti Sist. Vyssh. Rast.* 17: 209. 1980.

喀什彩花 ka shi cai hua

Shrublets loosely pulvinate, cushions 10–15 wide or sometimes more. Leaf blade glaucescent, linear-needlelike, (3–)3.5–4(–4.5) cm × ca. 1 mm, glabrous except margin short ciliate, apex short awned; summer leaf blade ca. 2 cm × 2 mm, needlelike. Inflorescences unbranched or short branched near apex, (9–)12–15 cm; peduncles glabrous; spike 3–5 cm, with 7–12 spikelets, rachis velvety white pubescent; spikelets 1-flowered; bracts 5, 5–6 mm, ovate, glabrous, apex awned; first bractlet 8–9 mm, margin wide membranous, apex long aristate. Calyx 1–1.2 cm, tube apically sparsely pubescent between ribs; limb white, 3.5–4 mm, glabrous, 10-lobed, veins dark purple. Corolla pink.

* Dry slopes. W Xinjiang.

4. *Acantholimon kokandense* Bunge ex Regel, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 3(1): 99. 1875.

浩罕彩花 hao han cai hua

Shrublets. Cushions 20–40 cm wide or sometimes more. Branches of current year 3–7 mm. Leaf blade glaucescent, linear-needlelike, rigid, puberulent or glabrescent when young; summer leaf blade (1–)1.5–2(–2.5) cm × (0.5–)0.8 mm; spring leaf blade 4–7 × ca. 1 mm, very shallowly obdeltate in cross section, apex short awned. Inflorescences unbranched; peduncle 3–6 cm, densely pubescent; spike 1.5–2 cm, with 4–7 spikelets or sometimes with only a single terminal spikelet; spikelets 1-flowered; bracts oblong-ovate, 5–6 mm, glabrous or sparsely puberulent, apex acuminate; first bractlet 7–8 mm, apex acute, short acuminate, subobtuse, or rarely 2-lobed. Calyx 1–1.2 cm, tube apically sparsely pubescent between ribs; limb white, 4–4.5 mm, glabrous, veins dark purple and extending to apex of lobes. Corolla pink. Fl. Jun–Aug, fr. Jul–Sep.

Dry slopes or valleys; 2000–2700 m. Xinjiang [Kyrgyzstan].

5. *Acantholimon borodinii* Krasnov, *Enum. Pl. Tian Shan Orient.* 128. 1887.

细叶彩花 xi ye cai hua

Shrublets. Cushions 20–25 cm wide. Branches of current year 2–5 mm. Leaf blade pale glaucous, similar in spring and summer, linear-needlelike to linear, 5–7 × 0.5–0.6 mm, subcomplanate in cross section, rigid, glabrous, apex short awned. Inflorescences unbranched; peduncle ca. 2 cm, densely pubescent; spike to 1.5 cm, with 4–7(or 8) spikelets; spikelets 2-flowered; bracts broadly ovate to oblong-ovate, ca. 4 mm, densely pubescent, apex subrounded to truncate and mucronate; first bractlet ca. 6 mm, often densely pubescent, apex

mucronate. Calyx (6–)7–8 mm, tube densely velvety; limb white, ± velvety, apically 10-lobed, veins dark purple and extending to apex of lobes or nearly so. Corolla pink. Fl. Jun–Jul, fr. Jul–Aug.

High slopes with grasslands; 2100–2900 m. W Xinjiang [Kyrgyzstan].

6. *Acantholimon roborowskii* Czerniakowska, *Trudy Bot. Inst. Acad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast.* 3: 2. 1937.

新疆彩花 xin jiang cai hua

Shrublets. Cushions 50–100 cm wide. Leaf blade glaucous, linear, 7–11(–12) × 0.6–0.9 mm, subcomplanate in cross section, rigid, glabrous, apex awned. Inflorescences unbranched, peduncle practically lacking; spike with 2 or 3 spikelets; spikelets 1(or 2)-flowered; bracts ovate, densely pubescent, apex subrounded; first bractlet 6–7 mm, densely pubescent. Calyx 6–7 mm, tube densely velvety; limb white, 10-lobed. Corolla pink. Fl. Jul, fr. Jul–Aug.

* Slopes. SW Xinjiang.

Acantholimon roborowskii is very similar to *A. borodinii*, and the status of these species needs further study.

7. *Acantholimon lycopodioides* (Girard) Boissier in A. de Candolle, *Prodr.* 12: 632. 1848.

石松彩花 shi song cai hua

Statice lycopodioides Girard, *Ann. Sci. Nat. Bot., sér 3,* 2: 330. 1844.

Shrublets densely pulvinate. Cushions 30–100 cm wide. Leaf blade glaucous, linear, (1–)1.5–3 cm × 1–2(–3) mm, rigid, glabrous, apex short awned. Inflorescences unbranched, 3–4(–5) cm, densely pubescent; spikes dense, distichous, with 5–8 spikelets; spikelets 2 or 3 flowered; bracts broadly ovate, 4–5 mm, pubescence very short; first bractlet 6–7 mm, broadly membranous, pubescence very short, apex with a very short awn. Calyx 6–8 mm, funnellform, tube densely velvety between ribs; limb white with red-purple, pubescent or glabrescent veins. Corolla pink to pinkish. Fl. Jul–Aug, fr. Aug–Sep.

Rocks and dry slopes; 2500–3000 m or sometimes higher. NW Xinjiang [Afghanistan, India, Kashmir, Pakistan, Tajikistan].

8. *Acantholimon popovii* Czerniakowska, *Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast.* 3: 264. 1937.

乌恰彩花 wu qia cai hua

Shrublets loosely pulvinate. Branches 3–5 mm. Leaf blade green to pale glaucous, similar in spring and summer, linear, 1–2 cm × 0.8–1(–1.5) mm, subcomplanate in cross section, glabrous, apex short awned. Inflorescences unbranched; peduncle 4.5–6 cm, densely pubescent; spikes usually subcapitate, with 2–4 spikelets; spikelets 2- or 3-flowered; bracts broadly ovate, 4–5 mm, densely pubescent, apex acute and mucronate; first bractlet 8–9 mm, apex obtuse, veins purple. Calyx 1–1.2

cm, tube densely velvety along ribs; limb white, ± velvety along veins, 10-lobed, veins dark purple and slightly projecting beyond apices. Corolla pink. Fl. Jun–Aug, fr. Jul–Sep.

* Grassy tablelands; ca. 2200 m. Xinjiang (Kashi Diqu, Wuqia Diqu).

9. *Acantholimon hedinii* Ostenfeld in Hedin, S. Tibet 6(3): 48. 1922.

彩花 cai hua

Acantholimon diapensioides Boissier var. *longifolia* O. Fedtschenko.

Shrublets densely pulvinate. Cushions 20–70 cm wide. Branchlets very slow growing; branches of current year very short, with only a few densely appressed leaves. Leaf blade pale glaucous, lanceolate to linear, 4–8 × 0.6–0.8 mm, very shallowly obdeltate to subcomplanate in cross section, glabrous, apex acute to acuminate and short awned. Inflorescences without a rachis; spikelets (1 or) 2 or 3, clustered in leaf axils at base of current year's branches, 1- or 2-flowered; bracts broadly ovate, ca. 3 mm, densely pubescent or glabrous, apex acuminate and usually mucronate; first bractlet ca. 6 mm, densely pubescent, apex acuminate. Calyx ca. 7–8.5 mm, tube densely velvety; limb white with dark purple veins, veins extending to apices or slightly projecting. Corolla pink. Fl. Jun–Aug, fr. Jul–Sep.

High grasslands; 3000–4700 m. SW Xinjiang [Kyrgyzstan, Tajikistan].

10. *Acantholimon diapensioides* Boissier in A. de Candolle, Prodr. 12: 624. 1848.

小叶彩花 xiao ye cai hua

Shrublets densely pulvinate. Cushions 30–70(–120) cm wide. Branchlets very slow growing; branches of current year very short, inconspicuous, with only a few densely appressed leaves. Leaf blade usually pale glaucous, lanceolate to linear, 1.5–4(–5) × 0.6–0.9 mm, subcomplanate in cross section, glabrous, apex acute to obtuse. Inflorescences without a rachis; spikelets (1 or) 2 or 3, clustered in leaf axils or at base of current year's branches, 1- or 2-flowered; bracts broadly ovate, ca. 3 mm, glabrous, apex acute; first bractlet 4.5–5 mm, glabrous, apex acute. Calyx 5–6.5 mm, tube sparsely velvety between ribs or glabrescent; limb white or pale rose, glabrous, apically 10-lobed or almost truncate, veins dark purple and not reaching lobe apices. Corolla light red.

Grassy slopes; 2700–4800 m. SW Xinjiang [Afghanistan, Pakistan, Tajikistan].

Acantholimon diapensioides is similar to *A. hedinii* and *A. tianschanicum* but differs by smaller leaves that lack a mucro and smaller calyx with veins not extending to lobe apices.

11. *Acantholimon tianschanicum* Czerniakowska, Trudy Bot. Inst. Acad. Nauk SSSR, Ser. 1, Fl. Sist. Vyss. Rast. 3: 262. 1937.

天山彩花 tian shan cai hua

Shrublets densely pulvinate. Cushions 20–30 cm wide. Branchlets very slow growing; branches of current year very short, inconspicuous, with few densely appressed leaves. Leaf blade usually pale glaucous, lanceolate to linear, 3–7 × 0.8–1.2 mm, very shallowly obdeltate to subcomplanate in cross section, apex acuminate and conspicuously awned. Inflorescences without a rachis; spikelet 1–3-flowered, borne in leaf axil or at base of current year's branch; bracts broadly ovate, ca. 3 mm, glabrous, apex acute; first bractlet 5–6 mm, glabrous, apex acute. Calyx 7–8 mm, tube sparsely velvety along ribs or glabrescent; limb dark purple, glabrous, obscurely 10-lobed to subtruncate, veins extending to apex. Corolla light purple to light red. Fl. Jun–Sep, fr. Jul–Oct.

Slopes of alpine grasslands; 2000–4000 m. SW Xinjiang [Kyrgyzstan, Tajikistan].

Acantholimon tianschanicum is similar to *A. hedinii*, and its status as a distinct species needs further study.

