

### 14. CASSIOPE D. Don, Edinburgh New Philos. J. 17: 157. 1834.

锦缘花属 jin tao hua shu

Fang Ruizheng (方瑞征 Fang Rhui-cheng); Peter F. Stevens

Shrubs evergreen, dwarf. Stems procumbent or ascending. Leaves decussate, sessile, appressed and crowded, imbricate, usually 4-ranked. Leaf blade small, entire or fimbriate-ciliate, veinless, 1-channeled on back, sometimes plane or convex. Flowers solitary, axillary, pendulous. Pedicel slender, base bracteate; bracteoles absent. Flowers usually 5-merous. Calyx lobes imbricate, subfree. Corolla white or pink, campanulate, lobed or cleft; lobes recurved. Stamens included; filaments straight, flattened; anthers ovate, with two long recurved awns. Ovary superior, glabrous, with many ovules per locule. Capsule depressed-globose, each valve 2-cleft at apex. Seeds many, minute, wingless.

About 17 species: circumboreal, extending south into China, the Himalayan region, Japan, Russia, and W North America; 11 species (six endemic) in China.

- 1a. Leaf blade not furrowed abaxially.
  - 2a. Leaf blade plane, margin incrassate, setulose ..... 3. *C. palpebrata*
  - 2b. Leaf blade abaxially convex, margin hyaline membranous.
    - 3a. Leaf blade elliptic, abaxially densely setulose, apex with a membranous acumen much shorter than blade ..... 1. *C. myosuroides*
    - 3b. Leaf blade elliptic to suborbicular, abaxially subglabrous, apex with a membranous acumen ca. as long as or longer than blade ..... 2. *C. membranifolia*
- 1b. Leaf blade ± deeply furrowed abaxially.
  - 4a. Furrow only to 1/3–1/2 blade length ..... 4. *C. abbreviata*
  - 4b. Furrow reaching near apex of leaf blade.
    - 5a. Leaf blade with membranous margin.
      - 6a. Leaf blade abaxially sparsely silvery pubescent, margin rust-brown colored, membranous and brown flattened-setulose; pedicels 5–25 mm ..... 7. *C. argyrotricha*
      - 6b. Leaf blade abaxially glabrous, margin silvery, membranous and ciliolate; pedicels 1–7 mm.
        - 7a. Leaf blade 4–6 mm, 0.5–1 mm apiculate ..... 5. *C. fastigiata*
        - 7b. Leaf blade 2.5–4 mm, apex obtuse, not apiculate ..... 6. *C. fujianensis*
    - 5b. Leaf blade without membranous margin.
      - 8a. Leaves sometimes lax; leaf blade ovate-triangular, 2–3 mm, margin fringed with woolly hairs and glabrescent ..... 8. *C. selaginoides*
      - 8b. Leaves densely imbricate; leaf blade oblong, (2–)4–7 mm, margin barbellate or setulose.
        - 9a. Leaf blade with densely setulose margin, hairs solitary or 2 or 3 together, to 2–3 mm, each with scattered short stiff barbules, adaxially ± plane ..... 9. *C. wardii*
        - 9b. Leaf blade with rigidly pubescent, barbellate margin, adaxially concave.
          - 10a. Leaf blade oblong-elliptic, 2–4 mm, base arching, abaxially with shallow subtriangular glabrous furrow ..... 10. *C. nana*
          - 10b. Leaf blade oblong-linear, 5–7 mm, base 2-lobed, abaxially with deep narrow densely puberulous furrow ..... 11. *C. pectinata*

1. *Cassiope myosuroides* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 19. 1917.

鼠尾锦缘花 shu wei jin tao hua

Shrubs 4–7 cm tall, rarely to 12 cm. Stems suberect, glabrous. Leaves assurgent; leaf blade elliptic, 2–2.5 × ca. 1.2 mm, leathery, abaxially convex, densely setulose, adaxially ?convex, glabrous, base truncate, margin 0.3–0.4 mm wide and membranous, apex acute. Flower nutant. Pedicel 0.7–2 cm, densely crisped-tomentose. Calyx dark purple; lobes oblong to elliptic, 2.5–3 mm, abaxially glabrous, margin membranous and ciliolate. Corolla white, tinged with red, campanulate, 5–8 mm, glabrous; lobes erect, broadly triangular, 1.5–2 mm. Stamens 10, ca. 2 mm; filaments pilose; awns ca. 1 mm. Ovary ca. 1.5 mm in diam. Capsule globose, ca. 3 mm in diam., ± enclosed by persistent corolla. Fl. May–Sep, fr. Jun–Oct.

Alpine meadows, open slopes, rocks and boulders; 4000–4500 m. NW Yunnan [Myanmar].

2. *Cassiope membranifolia* R. C. Fang, Novon 9: 162. 1999.

膜叶锦缘花 mo ye jin tao hua

Shrubs. Stems procumbent, ca. 26 cm long, slender, glabrous. Leaves assurgent; leaf blade suborbicular, rarely elliptic, 1.2–1.8 × 1–1.5 mm, leathery, abaxially convex, glabrous or sometimes pilose at base, adaxially concave, glabrous, base arched, margin distinctly membranous, apex an elongated-triangular hyaline acumen ca. as long as or longer than blade. Flower nutant. Pedicel 1–2.5 cm, densely crisped-tomentose. Calyx purple; lobes oblong, ca. 2.5 mm, glabrous, margin membranous and fimbriate. Corolla white, campanulate, 5–7 mm, abaxially glabrous; lobes erect, ovate, ca. 2 mm. Stamens ca. 1.5 mm; filaments pilose or glabrous; awns ca. 1 mm. Ovary ca.

1 mm in diam. Capsule ca. 2.5 mm in diam., enclosed by persistent corolla. Fl. Aug.

• Alpine meadows, moss-covered rocks; ca. 3600 m. NW Yunnan.

A reviewer (Gary D. Wallace) notes that this might be a minor variant of *Cassiope myosuroides*.

**3. *Cassiope palpebrata*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 182. 1914.

朝天锦缘花 chao tian jin tao hua

*Cassiope pulvinalis* T. Z. Hsu.

Shrubs 2–6(–8) cm tall. Stems suberect or decumbent, glabrous. Leaves ± spreading; leaf blade elliptic or oblong, 1.5–3.4 × 0.6–1.2 mm, leathery, both surfaces glabrous and plane, sometimes midvein inconspicuously raised abaxially, base indistinguishable, margin incrassate, scarious, with several brown setula. Flower nutant. Pedicel 1.5–2.5 cm, densely arachnoid-villous. Calyx purple; lobes elliptic or ovate, 2–3 mm, glabrous, margin membranous. Corolla white, campanulate, 5–8 mm, abaxially glabrous; lobes erect or subspreading, 1–3 mm. Stamens 8, ca. 2.5 mm; filaments pilose; awns 0.7–1.5 mm. Ovary ca. 1.5 mm in diam. Capsule ca. 3 mm in diam., enclosed by persistent corolla. Fl. May–Jul, fr. Jun–Oct.

Grassy mountain slopes, alpine moorlands, rocks, rock crevices; 3000–4300 m. NW Yunnan [Myanmar].

**4. *Cassiope abbreviata*** Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 131. 1925.

短梗锦缘花 duan geng jin tao hua

Shrubs 15–20 cm tall. Stems initially decumbent or erect, slender, ultimately many branched, fastigiata, glandular. Leaves assurgent; leaf blade ovate or triangular-ovate, 2.5–3 × 1–1.2 mm, leathery, abaxially nitid, glabrous, deeply furrowed, furrow 1/3–1/2 length, subglabrous within, adaxially concave, glabrous, base lobed, margin membranous and fimbriate, apex acute, distinctly apiculate. Flower nutant. Pedicel 3–8 mm, densely crisped-tomentose. Calyx purple-red; lobes oblong or ovate, ca. 3 mm, margin membranous. Corolla white, campanulate, 5–7 mm; lobes erect, ovate-triangular, ca. 2 mm. Stamens ca. 2.5 mm; filaments pilose; awns ca. 1 mm. Ovary ca. 1 mm in diam. Capsule unknown. Fl. May–Aug.

• *Rhododendron* thicket margins, mossy and rocky places; 3800–4000 m. WC Sichuan (Baoping).

**5. *Cassiope fastigiata*** (Wallich) D. Don, Edinburgh New Philos. J. 17: 158. 1834.

扫帚锦缘花 sao zhou jin tao hua

*Andromeda fastigiata* Wallich, Asiat. Res. 13: 394. 1820.

Shrubs 8–20 cm tall. Stems initially decumbent, ultimately much branched, fastigiata, stiff white pubescent. Leaves densely imbricate; leaf blade ovate-triangular, 4–6 × 1.5–2 mm, leathery, abaxially deeply furrowed, furrow reaching near apex and diverging near base, furrow rim densely pubescent, adaxially concave, subglabrous, base divergent, 2-lobed, margin silvery, membranous, densely ciliolate, apex with apicule 0.5–1 mm. Flower nutant. Pedicel 3–7 mm, densely crisped-tomen-

tose. Calyx purple; lobes oblong-ovate, 4–5 mm, margin broadly membranous. Corolla white, broadly campanulate, 6–9 mm; lobes spreading, oblong, 2–4 mm. Stamens ca. 2.5 mm; filaments glabrous; awns ca. 1 mm. Capsule 2–3 mm in diam. Fl. May–Jul, fr. Jun–Sep.

Alpine thickets, rocky places; 3000–4500 m. S Xizang [Bhutan, ?Kashmir, Nepal, Pakistan, Sikkim].

One of us (Stevens) suggests that there exists a possible hybrid in Xizang (see *H. Smith 3823*).

**6. *Cassiope fujianensis*** L. K. Ling & G. S. Hoo, Fl. Fujian. 4: 633. 1990.

福建锦缘花 fu jian jin tao hua

Subshrubs dwarf, 8–25 cm. Stems ascending or spreading. Leaves decussate, imbricate; leaf blade ovate or ovate-lanceolate, 2.5–4 × 1.5–2 mm, leathery, abaxially carinate, deeply furrowed, furrow reaching 3/4 leaf length, glabrous, adaxially concave, sparsely puberulous or subglabrous, base lobed, margin membranous, hyaline, 0.5–0.7 mm wide, ciliolate, apex obtuse. Flower nutant. Pedicel ca. 1 mm, densely white villous. Calyx lobes oblong, ca. 2 mm, glabrous, margin membranous. Corolla campanulate, ca. 1.5 mm; lobes oblong or obovate-oblong, ca. 1 mm. Stamens ca. 1 mm; filaments glabrous; awns ca. 0.3 mm. Ovary ca. 1 mm in diam. Capsule unknown. Fl. Sep.

• Rocky fissures; 1000–1100 m. Fujian.

This is a post-glacial relict species.

**7. *Cassiope argyrotricha*** T. Z. Hsu, Acta Bot. Yunnan. 4: 263. 1982.

银毛锦缘花 yin mao jin tao hua

Shrubs 12–15 cm tall, much branched. Stems erect or decumbent. Leaves densely imbricate; leaf blade oblong, 4–5 × ca. 1.5 mm, leathery, abaxially convex, sparsely silvery pubescent, deeply furrowed, furrow nearly reaching apex and divergent towards base, adaxially concave, glabrous, base arching, margin rust-colored-brown, membranous, brown flattened-setulose, apex obtuse. Flower erect. Pedicel 5–25 cm, densely arachnoid-tomentose. Calyx glabrous; lobes elliptic, ca. 4.5 mm. Corolla white, campanulate, ca. 9 mm; lobes spreading, broadly triangular. Stamens ca. 3 mm; filaments pilose; awns ca. 1 mm. Ovary ca. 1 mm in diam. Capsule unknown. Fl. Sep.

• Rocks in forests, *Rhododendron* thickets; 3000–4400 m. NW Yunnan (Fugong).

**8. *Cassiope selaginoides*** J. D. Hooker & Thomson, Hooker's J. Bot. Kew Gard. Misc. 7: 126. 1855.

锦缘花 jin tao hua

*Cassiope mairei* H. Léveillé.

Shrubs 10–20 cm tall. Stems initially decumbent, ultimately erect, glabrous or pubescent. Leaves assurgent; leaf blade ovate-triangular, 2–3 × 1–1.5 mm, cymbiform, leathery, abaxially deeply furrowed, furrow nearly reaching apex and divergent near base, furrow rim densely pubescent, adaxially concave, glabrous, margin not membranous, fringed with woolly hairs, glabrescent. Flower nutant. Pedicel 0.5–1.6 cm, densely

crisped-tomentose. Calyx crimson or reddish brown; lobes oblong to elliptic, ca. 3.8 mm, glabrous or puberulous, margin membranous, inconspicuously ciliolate. Corolla pure white, reddish within at base, broadly campanulate, 6–8 mm; lobes erect, oblong, 2.5–3 mm. Stamens ca. 2.5 mm; filaments pilose; awns ca. 0.9 mm. Capsule 2–3 mm in diam. Fl. May–Jul, fr. Jun–Sep.

*Rhododendron* thickets, alpine grasslands, rocky slopes, cliffs; 3000–4200(–4500) m. W Sichuan, SE Xizang, NE Yunnan [Bhutan, Myanmar, Nepal, Sikkim].

**9. *Cassiope wardii*** C. Marquand, J. Linn. Soc., Bot. 48: 199. 1929.

长毛锦绦花 chang mao jin tao hua

Shrubs 10–20 cm tall. Stems initially decumbent; twigs erect, glandular and setose. Leaves assurgent; leaf blade linear-oblong, 5–7 × ca. 2 mm, cymbiform, leathery, abaxially deeply furrowed, furrow reaching near apex and divergent near base, furrow rim densely pubescent, adaxially concave, glabrous, with densely setulose margin, hairs solitary or 2 or 3 together,

to 3 mm. Flower nutant. Pedicel 0.5–1.6 cm, densely crisped-tomentose. Calyx crimson or reddish brown; lobes oblong to elliptic, ca. 3.8 mm, glabrous or puberulous, margin membranous, ciliolate. Corolla pure white, reddish within at base, broadly campanulate, 6–8 mm; lobes ± recurved, ovate, 2.5–3 mm. Stamens (8 or)10, ca. 2.5 mm; filaments pilose; awns ca. 0.9 mm. Capsule 2–3 mm in diam. Fl. May–Jul, fr. Jun–Sep.

• Open *Rhododendron* moorlands, rocky places; 3900–4200 m. SE Xizang.

**10. *Cassiope nana*** T. Z. Hsu, Acta Bot. Yunnan. 4: 265. 1982.

矮小锦绦花 ai xiao jin tao hua

Shrubs 3–10 cm tall. Stems decumbent or erect. Leaves assurgent; leaf blade oblong-elliptic, 2–4 × 0.8–1.2 mm, leathery, abaxially shallowly furrowed, furrow subtriangular, nearly reaching apex, glabrous, adaxially concave, glabrous, base arched, margin not membranous, inconspicuously denticulate, rigidly pubescent-barbellate, apex obtuse. Flower usually erect. Pedicel 1–2 cm, crisped-tomentose, base with 3 fringed bracts. Calyx lobes 5, ovate or oblong, 2–3 mm, glabrous, margin ciliolate. Corolla white, campanulate, ca. 6 mm; lobes erect, oblong, ca. 1.5 mm. Stamens 8 or 9, ca. 2 mm; filaments pilose; awns ca. 1 mm. Ovary ca. 2.5 mm in diam. Capsule ca. 3 mm in diam. Fl. Jun, fr. Aug.

• Margins of woods, mountain slopes, meadows; 2000–3800 m. NW Yunnan (Dêqên, Gongshan).

**11. *Cassiope pectinata*** Stapf, Bot. Mag. 149: t. 9003(B). 1924.

篦叶锦绦花 bi ye jin tao hua

*Cassiope dendrotricha* Handel-Mazzetti; *C. macrantha* Handel-Mazzetti.

Shrubs 6–18(–46) cm tall. Stems initially decumbent, ultimately much branched, fastigiate, glandular and shortly pubescent. Leaves assurgent; leaf blade linear-oblong, 5–7 × 1–1.2 mm, boat-shaped, leathery, abaxially nitid or dull, deeply furrowed, furrow nearly reaching apex and divergent near base, densely puberulous within, adaxially strongly concave, glabrous, base 2-lobed, margin not membranous, inconspicuously denticulate, rigidly pubescent-barbellate, apex obtuse, apiculate. Flower nutant. Pedicel 0.9–1.8(–2.5) cm, densely crisped-tomentose, base with 4 fringed bracts. Calyx purple-red; lobes oblong or ovate, 2–3 mm, glabrous, margin membranous. Corolla white, campanulate, 6–7 mm, glabrous; lobes erect, oblong, 2–3 mm. Stamens 2–2.5 mm; filaments pilose; awns ca. 1.2 mm. Capsule ca. 2.5 mm in diam. Fl. Jun–Aug, fr. Jul–Aug.

*Rhododendron* scrub, alpine moorlands, meadows, rocks, rock crevices; 3600–4100 m. SW Sichuan, E Xizang, NW Yunnan [Myanmar].

