

18. COMASTOMA (Wettstein) Toyokuni, Bot. Mag. (Tokyo) 74: 198. 1961.

喉毛花属 hou mao hua shu

*Gentiana* sect. *Comastoma* Wettstein, Oesterr. Bot. Z. 46: 174. 1896.

Herbs annual with fibrous rootlets or perennial with short rhizomes. Stems branched from base (simple in *C. disepalum*). Inflorescences racemelike, sometimes reduced to a solitary terminal flower. Flowers 4- or 5-merous. Calyx lobed nearly to base, without an intracalycular membrane. Corolla tubular, tubular-funnelform, or salverform; lobes each with 1 or 2 basal scales; scales fringed with nonvascularized white fimbriae; plicae absent. Nectaries at base of corolla tube. Stamens inserted on corolla tube; filaments white. Capsules 2-valved, many seeded. Seed coat smooth.

Fifteen species: North America, Asia, Europe; 11 species in China.

- 1a. Calyx 2-lobed, enveloping corolla tube ..... 1. *C. disepalum*
- 1b. Calyx 4- or 5-lobed, not enveloping corolla tube.
  - 2a. Perennials.
    - 3a. Leaves mostly restricted to near base of stem; stem leaves few pairs; corolla 1.4–2.5 cm, lobes each bearing 2 scales ..... 2. *C. cyananthiflorum*
    - 3b. Basal leaves absent or poorly developed; stem leaves 4–7 pairs; corolla 0.6–1.3 cm, lobes each bearing 1 scale ..... 3. *C. stellariifolium*
  - 2b. Annuals or biennials.
    - 4a. Corolla salverform.
      - 5a. Calyx ca. 1/2 as long as corolla, lobes falcate, apex acuminate; stem leaf blades 3–4(–6) mm wide ..... 6. *C. falcatum*
      - 5b. Calyx 1/4–1/3 as long as corolla, lobes erect, apex acute to obtuse; stem leaf blades 5–13 mm wide.
        - 6a. Stem leaf blades oblong to broadly ovate; calyx lobes ovate-lanceolate to ovate; filaments pilose at base ..... 4. *C. traillianum*
        - 6b. Stem leaf blades lanceolate to elliptic; calyx lobes linear-lanceolate; filaments glabrous ..... 5. *C. muliense*
    - 4b. Corolla tubular.
      - 7a. Stem leaf blade bases obtuse to rounded, subamplexicaul; corolla lobes shorter than tube, suberect ..... 7. *C. pulmonarium*
      - 7b. Stem leaf blade bases narrowed or cuneate (rounded and abruptly contracted in *C. henryi*), not amplexicaul; corolla lobes equaling tube, spreading (erect in *C. henryi*).
        - 8a. Stem leaves petiolate; leaf blades widest above middle; calyx lobes oblong-spatulate to narrowly elliptic ..... 8. *C. henryi*
        - 8b. Stem leaves sessile; leaf blades oblong or widest at or below middle; calyx lobes lanceolate to ovate.
          - 9a. Corolla dark blue to blue-purple with dark blue veins and pale yellow base ..... 11. *C. pedunculatum*
          - 9b. Corolla uniformly blue or pale blue.
            - 10a. Calyx lobes acuminate, margin undulate rugose and revolute ..... 9. *C. polycladum*
            - 10b. Calyx lobes apiculate, margin flat and smooth ..... 10. *C. tenellum*

1. *Comastoma disepalum* H. W. Li in T. N. Ho, Acta Biol. Plateau Sin. 1: 37. 1982.

二萼喉毛花 er e hou mao hua

Annuals 2–7 cm tall. Stems erect, subquadrangular. Basal leaves withered at anthesis. Lower stem leaf petioles slender, to 3 cm; leaf blade spatulate to obovate, 3–6 × 2–3.5 mm, base cuneate, margin usually purple, apex rounded, reticulate veins slender. Middle to upper stem leaves sessile, oblong to ovate-orbicular, 3–9 × to 5 mm, base and apex subrounded, reticulate veins slender. Flowers terminal, solitary. Calyx lobes 2, foliose, broadly oblong to ovate-orbicular, 5–10 × 4–6 mm, margin purple, apex rounded, reticulate veins purple. Corolla pale blue, 5-merous, tubular, 7–12 mm; lobes broadly oblong to obovate-oblong, 2–3 mm, scale 1, apex rounded. Nectaries 10, brown. Stamens inserted at middle of corolla tube; filaments ca. 2 mm; anthers blue, ellipsoid, 0.5–0.7 mm. Ovary ellipsoid, 5–6.5 mm. Style

indistinct; stigma lobes suborbicular. Fl. Sep.

• Meadows around lakes, alpine slopes; 4200 m. NW Yunnan.

2. *Comastoma cyananthiflorum* (Franchet) Holub, Folia Geobot. Phytotax. 2: 120. 1967.

蓝钟喉毛花 lan zhong hou mao hua

Perennials 5–15 cm tall. Stems ascending, subquadrangular; stem sheathed by blackish remains of old petioles. Basal leaf petiole flattened, to 1.5 cm; leaf blade 1.5–2.8 cm × 3–7 mm. Stem leaves short petiolate; leaf blade 5–10 × 3–6 mm, base obtuse, apex obtuse to rounded. Flowers terminal, solitary. Pedicel ascending, to 4.5 cm, subquadrangular. Calyx lobes slightly unequal, lanceolate to ovate-lanceolate, 6–10 mm, apex acute, midvein distinct. Corolla blue, salverform,

1.4–2.5 cm; lobes oblong to obovate-oblong, 0.8–1.5 cm, scales 2, fimbriae 2.5–3 mm, apex obtuse to rounded. Nectaries 10. Stamens inserted at middle of corolla tube; filaments white, 2–2.5 mm; anthers yellow, ellipsoid, ca. 1.2 mm. Style indistinct; stigma lobes suborbicular. Capsules ovoid-ellipsoid. Seeds brown, globose, 0.5–0.7 mm in diam.; seed coat smooth. Fl. Jun-Oct.

• 3000–4900 m. SE Qinghai, Sichuan, SE Xizang, NW Yunnan.

- 1a. Leaf blade spatulate to obovate, apex rounded ..... 2a. var. *cyananthiflorum*  
1b. Leaf blade ovate-elliptic to ovate, apex acute ..... 2b. var. *acutifolium*

**2a. *Comastoma cyananthiflorum* var. *cyananthiflorum***

蓝钟喉毛花 (原变种) lan zhong hou mao hua (yuan bian zhong)

*Gentiana cyananthiflora* Franchet in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 126. 1890; *Gentianella maclarenii* Harry Smith.

Leaf blade spatulate to obovate, base abruptly contracted to obtuse, apex rounded.

• Meadow slopes, alpine meadows, scrub meadows, forests; 3000–4900 m. SE Qinghai, Sichuan, SE Xizang, NW Yunnan.

**2b. *Comastoma cyananthiflorum* var. *acutifolium* Ma & H. W. Li in T. N. Ho, Acta Biol. Plateau Sin. 1: 37. 1982.**

件叶喉毛花 jian ye hou mao hua

Leaf blade ovate-elliptic to ovate, apex acute.

• Grasslands, slopes; 3500–3700 m. NW Yunnan.

**3. *Comastoma stellariifolium* (Franchet) Holub, Folia Geobot. Phytotax. 3: 217. 1968.**

纤细喉毛花 xian xi hou mao hua

*Gentiana stellariifolia* Franchet in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 135. 1890; *Gentianella stellariifolia* (Franchet) Harry Smith.

Perennials 8–20 cm tall. Stems ascending, subquadrangular. Basal leaves poorly developed, sessile, elliptic to ovate, 2.5–4.5 × 1.2–1.7 mm, base slightly contracted, apex acute. Flowers terminal, solitary. Pedicel ascending, to 6.5 cm, slender, subquadrangular. Calyx 2.5–6 mm; lobes spreading, slightly unequal, lanceolate to narrowly elliptic, apex acuminate to acute, midvein indistinct. Corolla blue, tubular-funnelform to salverform, 6–10(–13) mm; lobes narrowly oblong to obovate-oblong, 3.5–4.5(–6) mm, scale 1, fimbriae ca. 1.5 mm, apex obtuse to rounded. Nectaries 10. Stamens inserted just above middle of corolla tube; filaments 1.2–1.3 mm, base decurrent into pubescent wings of corolla tube; anthers yellow, ellipsoid, ca. 1.2 mm. Style indistinct; stigma lobes suborbicular. Capsules ovoid-ellipsoid, 8–9 mm. Seeds brown, subglobose, ca. 0.5 mm; seed coat smooth. Fl. and fr. Sep-Nov.

River banks, swamp margins, slopes, alpine meadows, scrub, forests; 2800–4100 m. NW Yunnan [Bhutan, Myanmar, Nepal, Sikkim].

**4. *Comastoma traillianum* (Forrest) Holub, Folia Geobot. Phytotax. 2: 120. 1967.**

高杯喉毛花 gao bei hou mao hua

*Gentiana trailliana* Forrest, Notes Roy. Bot. Gard. Edinburgh 4: 69. 1905; *G. beesiana* W. W. Smith; *G. trailliana* var. *minima* C. Marquand.

Annuals 5–30 cm tall. Stems erect, terete, striate. Basal leaves withered at anthesis. Stem leaves sessile, oblong to broadly ovate, 0.6–3.8 × 0.5–1(–1.3) cm, base obtuse to rounded and subamplexicaul, apex acute to obtuse; veins 1–3, abaxially distinct. Inflorescences racemelike, rarely 1-flowered. Pedicel erect, to 5 cm, striate. Calyx 5–7 mm; lobes slightly unequal, ovate-lanceolate to ovate, to 5 mm wide, margin sometimes ciliate, apex obtuse, veins 1–3 and sometimes ciliate. Corolla blue, salverform, 1.5–2.6 cm × to 6 mm; lobes oblong to elliptic, 8–11 × to 6 mm, scales 2, fimbriae ca. 4 mm, apex obtuse to rounded. Nectaries 10. Stamens inserted just below middle of corolla tube; filaments 4.5–5.5 mm, base decurrent into pubescent wings of corolla tube; anthers yellow, ellipsoid, ca. 2 mm. Ovary ovoid-ellipsoid, 1.2–1.5 cm. Style indistinct; stigma lobes suborbicular. Fl. Aug-Oct.

• Grassland slopes, alpine meadows, forests; 3000–4200 m. S Sichuan, NW Yunnan.

**5. *Comastoma muliense* (C. Marquand) T. N. Ho, Acta Biol. Plateau Sin. 1: 38. 1982.**

木里喉毛花 mu li hou mao hua

*Gentiana muliensis* C. Marquand, Bull. Misc. Inform. Kew 1928: 53. 1928.

Annuals 5–10 cm tall. Stems ascending to erect, subquadrangular. Leaves sessile, lanceolate to elliptic, 1–2.5 cm × to 6 mm, base obtuse, apex acute to obtuse, midvein distinct. Flowers terminal, solitary. Pedicel tinged purple, erect, 4–8 cm, subquadrangular. Calyx 5–6 mm; lobes slightly unequal, linear-lanceolate, apex acute to obtuse, midvein distinct. Corolla blue-purple, salverform, 1.8–2.8 cm; lobes oblong to obovate-oblong, 8–10 mm, scales 2, apex rounded. Nectaries 10. Stamens inserted just above middle of corolla tube; filaments 1.2–1.3 mm, base decurrent into wings of corolla tube; anthers yellow, ellipsoid, ca. 1.2 mm. Style indistinct; stigma lobes suborbicular. Capsules narrowly ellipsoid. Seeds brown, subglobose, 0.5–0.6 mm; seed coat smooth. Fl. and fr. Sep.

• *Pinus* forests; ca. 3100 m. Sichuan (Muli Zangzu Zhixian).

**6. *Comastoma falcatum* (Turczaninow ex Karelin & Kirilov) Toyokuni, Bot. Mag. (Tokyo) 74: 198. 1961.**

镰萼喉毛花 lian e hou mao hua

*Gentiana falcata* Turczaninow ex Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 404. 1842; *G. cordisepala* Murbeck; *G. hedinii* Murbeck.

Annuals 4–25 cm tall. Stems ascending to erect, subquadrangular, branched from base. Leaves mostly basal; petiole to 2 cm; leaf blade oblong to oblong-spatulate, 0.5–1.5 cm × 3–6 mm, base cuneate, apex obtuse to rounded, midvein distinct. Stem leaves sessile, oblong, rarely ovate-oblong to ovate, 0.8–1.5 cm × 3–4(–6) mm, apex obtuse. Flowers terminal, solitary. Pedicel tinged purple, erect, 4–6(–12) cm, subquadrangular. Calyx 6–12 mm, tube saccate at base; lobes falcate-curved, unequal, usually ovate-lanceolate, rarely oblong, lanceolate, or broadly ovate, margin slightly undulate, apex acuminate, midvein distinct. Corolla blue, dark blue, or blue-purple, with blackish veins, salverform, (0.9–)1.2–2.5 cm × ca. 9 mm; lobes spatulate-oblong to oblong, 5–13 × to 7 mm, scales 2, fimbriae to 4 mm, apex rounded. Nectaries 10. Stamens inserted at middle of corolla tube; filaments 5–6 mm, base decurrent into wings of corolla tube; anthers yellow, ellipsoid, 1.5–2 mm. Style indistinct; stigma lobes suborbicular. Capsules narrowly ellipsoid to ovoid-ellipsoid, 8–11 mm. Seeds brown, subglobose, ca. 0.7 mm in diam.; seed coat smooth. Fl. and fr. Jul-Sep.

River banks, grassland slopes, scrub, alpine meadows, forests; 2100–5300 m. Gansu, Hebei, Nei Mongol, Qinghai, Shanxi, NW Sichuan, Xinjiang, Xizang [India, Kashmir, Kyrgyzstan, Mongolia, Nepal, Russia (Siberia), Tajikistan].

**7. *Comastoma pulmonarium*** (Turczaninow) Toyokuni, Bot. Mag. (Tokyo) 74: 198. 1961.

喉毛花 hou mao hua

*Gentiana pulmonaria* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 22(4): 317. 1849; *G. arrecta* Franchet; *G. holdereriana* Diels & Gilg.

Annuals 5–30 cm tall. Stems erect, subquadrangular, branched from base. Basal leaves few; leaf blade oblong to oblong-spatulate, 1.5–2.2 × 0.5–0.7 cm, base cuneate, apex rounded, midvein distinct. Stem leaves sessile, ovate-lanceolate, 0.6–2.8 cm × 3–10 mm, base obtuse to rounded and subamplexicaul, apex acute to obtuse, veins 1–3. Flowers in terminal and axillary cymes or solitary. Pedicel erect, to 4 cm, subquadrangular. Calyx spreading, slightly unequal, 6–8 mm; lobes narrowly elliptic, lanceolate, or ovate-triangular, margin scabrous to ciliolate, apex acute, veins 1–3. Corolla pale blue, with dark blue veins, tubular to broadly tubular, (0.9–)1.5–2(–2.3) cm; lobes erect, ovate-elliptic, elliptic-triangular, or ovate-triangular, 5–6 mm, scale 1, apex acute. Nectaries 10. Stamens inserted just above middle of corolla tube; filaments ca. 3 mm, base decurrent into wings of corolla tube; anthers yellow, ellipsoid, ca. 1 mm. Style indistinct; stigma lobes suborbicular. Capsules ovoid-ellipsoid, 2–2.7 cm. Seeds light brown, subglobose, 0.8–1 mm in diam.; seed coat smooth. Fl. and fr. Jul-Nov.

River banks, meadow slopes, scrub, alpine meadows, forests; 3000–4800 m. Gansu, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan [Japan, Russia (E Siberia)].

**8. *Comastoma henryi*** (Hemsley) Holub, Folia Geobot. Phytotax. 2: 120. 1967.

鄂西喉毛花 e xi hou mao hua

*Gentiana henryi* Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 128. 1890.

Annuals 4–6 cm tall. Stems prostrate to ascending, slender, terete, striate, branched from base. Basal leaves withered at anthesis. Stem leaf petiole slender, to 5 mm; leaf blade spatulate to obovate, ca. 11 × to 4 mm including petiole, base rounded and abruptly contracted into a petiole, apex rounded, veins 1–3. Flowers terminal, solitary. Pedicel erect, to 3 cm, terete, striate. Calyx spreading, 3–3.5 mm; lobes slightly unequal, oblong-spatulate to narrowly elliptic, base narrowed, apex acute, veins 1–3 and indistinct. Corolla blue, narrowly tubular, 5.5–6.5 mm, to 10 mm in fruit; lobes erect, lanceolate, 2–3 mm, scale 1, apex acute to obtuse. Nectaries 10. Stamens inserted at middle of corolla tube; filaments 1.5–2 mm; anthers yellow, ellipsoid, ca. 1.5 mm. Style indistinct; stigma lobes suborbicular. Capsules narrowly ellipsoid, 6.5–7.5 mm. Seeds light brown, subglobose, 0.4–0.5 mm in diam.; seed coat smooth. Fl. and fr. Aug-Sep.

• Grassland slopes. W Hubei, E Sichuan.

**9. *Comastoma polycladum*** (Diels & Gilg) T. N. Ho, Acta Biol. Plateau Sin. 1: 39. 1982.

皱边喉毛花 zhou bian hou mao hua

*Gentiana polyclada* Diels & Gilg in Fütterer, Durch Asien, Bot. Repr. 3: 16. 1903; *G. limprichtii* Grüning.

Annuals 8–20 cm tall. Stems erect, much branched from base, subquadrangular, scabrous along striae. Basal leaves withered at anthesis, short petiolate; leaf blade spatulate, 6–11 × 2.5–5 mm including petiole, base cuneate, apex rounded, midvein distinct. Stem leaves sessile, elliptic-lanceolate to elliptic, to 2 × 0.5 cm, margin usually undulate and revolute, apex obtuse, midvein indistinct. Flowers in terminal and axillary cymes or solitary. Pedicel to 11 cm, spreading to erect, subquadrangular. Calyx 6.5–9 mm; lobes slightly unequal, lanceolate to ovate-lanceolate, margin revolute and dark purple, apex acuminate, midvein distinct. Corolla blue, tubular, 1–1.5 cm × 3–4 mm; lobes erect, narrowly elliptic, 5–7 mm, scales 2, fimbriae ca. 2.5 mm, apex obtuse. Nectaries 10. Stamens inserted at middle of corolla tube; filaments ca. 3.5 mm, base decurrent into wings of corolla tube; anthers yellow, ellipsoid, ca. 1 mm. Style indistinct; stigma lobes suborbicular. Capsules narrowly ellipsoid to ellipsoid, 1.2–1.5 cm. Seeds light brown, ellipsoid, 0.5–0.7 mm; seed coat smooth. Fl. and fr. Aug-Sep.

• River banks, meadow slopes, wet places; 2100–4500 m. Gansu, Qinghai, Nei Mongol, Shanxi.

**10. *Comastoma tenellum*** (Rottbøll) Toyokuni, Bot. Mag. (Tokyo) 74: 198. 1961.

长梗喉毛花 chang geng hou mao hua

*Gentiana tenella* Rottbøll, Skr. Naturhist.-Selsk. 10: 436. 1770.

Annuals 5–12 cm tall. Stems ascending to erect, subquadrangular, branched from base. Basal leaves few, short petiolate; leaf blade spatulate to oblong-spatulate, 5–8 × 2–3 mm including petiole, base cuneate, apex rounded, midvein distinct. Stem leaves sessile, oblong to ovate-oblong, 4–11 × 2–4 mm, apex acute, with reticulate veins. Flowers terminal, solitary, often 4-merous. Pedicel spreading to erect, to 8 cm. Calyx lobes slightly unequal, lanceolate to ovate, 6–7 × 2.5–3 mm, apex acute. Corolla pale blue to blue, tubular, 7–11 × to 3 mm; lobes spreading, oblong, 2–3 mm, scales 2, fimbriae ca. 1.5 mm, apex obtuse. Nectaries 8. Stamens inserted just below middle of corolla tube; filaments subulate, ca. 2 mm, base decurrent into wings of corolla tube; anthers yellow, ovate. 0.5–0.7 mm. Ovary ovoid-ellipsoid, ca. 7 mm. Style indistinct; stigma lobes oblong. Capsules exserted from persistent corolla. Seeds (immature) ovoid; seed coat smooth. Fl. and fr. Jun.

Hillsides, wet places; ca. 2600 m. Xinjiang [Mongolia].

**11. *Comastoma pedunculatum*** (Royle ex D. Don) Holub, Folia Geobot. Phytotax. 3: 218. 1968.

柔弱喉毛花 rou ruo hou mao hua

*Eurythalia pedunculata* Royle ex D. Don, London Edinburgh Philos. Mag. & J. Sci. 8: 76. 1836; *Gentianella pedunculata* (Royle ex D. Don) Harry Smith.

Annuals 5–15 cm tall. Stems ascending, subquadrangular, branched from base. Basal leaves few, short petiolate; leaf blade oblong-spatulate, 0.5–1.6 cm × to 3 mm including petiole, base narrowed, apex obtuse to rounded, midvein distinct. Stem leaves sessile, elliptic to ovate-oblong, 2–12 × 2–5 mm, base obtuse, apex acute, midvein indistinct. Flowers terminal, solitary, often 5-merous on main stem but 4-merous on lateral branches. Pedicel spreading, to 20 cm, subquadrangular. Calyx 1.5–4 mm, tube shallowly saccate at base; lobes slightly unequal, lanceolate to ovate-lanceolate, margin sometimes blackish, apex acuminate to acute. Corolla dark blue to blue-purple, with pale yellow base and dark blue veins, tubular, 6–10 × ca. 4 mm, to 1.8 cm in fruit; lobes suberect, ovate-oblong, 3–11 mm, scale 1, fimbriae 2–2.5 mm, apex obtuse. Nectaries 10. Stamens inserted at middle of corolla tube; filaments ca. 3 mm, base decurrent into wings of corolla tube; anthers yellow, ellipsoid, ca. 1 mm. Style indistinct; stigma lobes oblong. Capsules exserted from persistent corolla. Seeds dark brown, subglobose; seed coat smooth. Fl. and fr. Jul–Oct.

River banks, alpine meadows; 3200–4800 m. Gansu, Qinghai, W Sichuan, Xizang, NW Yunnan [Bhutan, India, Kashmir, Nepal, Sikkim].

