

POLEMONIACEAE

花 沸科 hua ren ke

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Herbs annual or perennial, rarely subshrubs or vines. Leaves alternate or opposite, sessile to petiolate, simple, pinnatifid to palmately lobed, or compound. Inflorescences determinate, corymbose, paniculate, or capitate, or flowers solitary. Flowers (4- or) 5-merous. Calyx gamosepalous, cylindrical to campanulate; tube herbaceous throughout and papery in fruit or with herbaceous midveins separated by translucent membranes distended or ruptured in fruit; lobes often scarious margined. Corolla gamopetalous, actinomorphic or zygomorphic, rotate to funnellform or salverform; lobes overlapping in bud. Stamens inserted at same or different levels on corolla at base, alternate with corolla lobes, exerted to included; filaments equal to unequal, filiform. Ovary superior, (2- or) 3-locular, placentation axile; ovules 1 to many per locule. Style 1; stigma lobes (2 or) 3. Fruit a capsule. Seeds globose, ovoid, or fusiform, sometimes winged, often sticky when wet.

Nineteen genera and 320–350 species: North and South America, a few species native to temperate Asia and Europe; one genus, *Polemonium*, and three species in China. *Cobaea scandens* Cavanilles (a perennial vine with violet campanulate corollas ca. 5 cm) and three species of *Phlox*, *P. drummondii* Hooker, *P. paniculata* Linnaeus, and *P. subulata* Linnaeus (herbs with white to red, salverform corollas and unequally inserted stamens), are cultivated in China.

Fang Rhui-cheng & Huang Shu-hua in Wu Cheng-yih, ed. 1979. Polemoniaceae. Fl. Reipubl. Popularis Sin. 64(1): 155–160.

1. POLEMONIUM Linnaeus, Sp. Pl. 1: 162. 1753.

花 沸属 hua ren shu

Herbs perennial, rarely annual. Stems usually from horizontal rhizomes, erect to decumbent, simple. Leaves cauline, alternate, also often in basal rosettes; leaf blade usually oblong, pinnately lobed, divided, or compound, glabrous to glandular-pubescent, often with a mephitic odor. Inflorescences paniculate, rarely capitate. Calyx campanulate, herbaceous throughout, papery in fruit. Corolla pink, violet, or blue, rarely white or yellow, actinomorphic, campanulate to funnellform. Stamens epipetalous at same level, included or exerted; filaments equal, basally puberulent. Ovary 3-locular. Stigma lobes 3, spreading. Capsule ovoid, rarely globose. Seeds brown to black, usually angular, 1–12 per locule.

Twenty species: temperate Asia, Europe, North America, South America (1 species); three species in China.

The taxa are morphologically very similar and further work is needed to determine their exact relationship.

- 1a. Stamens shorter than corolla (2/3–3/4 as long as corolla); corolla lobes narrowly elliptic, apex acute 3. *P. sumushanense*
- 1b. Stamens ca. as long as or longer than corolla; corolla lobes obovate, apex rounded to ± acute.
 - 2a. Calyx 5–8 mm, lobes oblong to narrowly ovate or lanceolate, ca. as long as tube; corolla 1–2 cm, lobe margin glabrous to sparsely ciliate 1. *P. caeruleum*
 - 2b. Calyx 2–3(–5) mm, lobes deltoid, shorter than tube; corolla 0.8–1.2(–1.7) cm, lobe margin ciliate 2. *P. chinense*

1. *Polemonium caeruleum* Linnaeus, Sp. Pl. 1: 162. 1753.

花沸 hua ren

Stems erect, 30–100 cm, glabrous or sparsely glandular-pubescent above middle. Leaves pinnately compound, 7–14(–25) cm, gradually reduced upward, distal leaves ± sessile; petiole 1.5–8 cm; leaflets 11–27, ovate to lanceolate, 1–4 cm × 2–14 mm, glabrous to sparsely pilose. Pedicel 3–5(–10) mm, puberulent to villous, trichomes often minutely glandular. Calyx 5–8 mm; lobes ca. as long as tube, oblong to lanceolate, apex obtuse to acuminate. Corolla violet to blue-violet, broadly campanulate, 1–2 cm; lobes obovate, margin glabrous to sparsely ciliate, apex rounded to ± acute. Stamens ca. as long as corolla, rarely shorter or longer than corolla. Style longer than stamens, slightly exerted. Capsule

5–7 mm. Seeds brown, 3–3.5 mm. Fl. Jun-Aug, fr. Jun-Sep. 2n = 14, 18 + 0–1B.

Streambanks or moist sites in meadows, open slopes, open sites in forests; (1000–)1700–3700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Xinjiang, NW Yunnan [India, Japan, Kashmir, Korea, Mongolia, Nepal, Pakistan, Russia; Europe, North America].

Relationships of European and Asian infraspecific taxa to endemic North American races [*Polemonium caeruleum* subsp. *occidentale* (E. Greene) Davidson, subsp. *vanbruntiae* (Britton) Davidson, and *P. occidentale* E. Greene subsp. *lacustre* Wherry] need comprehensive study.

Chinese material recognized as *Polemonium caeruleum* var. *himalayanum* Baker is not a good match of that taxon and is in need of further study.

- 1a. Corolla lobes rounded, usually glabrous; calyx lobes oblong to narrowly ovate,

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apex obtuse 1a. var. *caeruleum*
1b. Corolla lobes ± acute, usually ciliate; calyx lobes lanceolate, apex acuminate ... 1b. var. *acutiflorum*

1a. *Polemonium caeruleum* var. *caeruleum*

花沸 (原变种) hua ren (yuan bian zhong)

Polemonium laxiflorum (Regel) Kitamura.

Calyx lobes oblong to narrowly ovate, apex obtuse. Corolla lobes rounded, usually glabrous. Fl. Jun-Jul, fr. Jul-Sep. $2n = 18$.

Streambanks, open slopes, open sites in forests; (1000–)1700–3700 m. Xinjiang, NW Yunnan [India, Japan, Mongolia, Pakistan, Russia; Europe].

1b. *Polemonium caeruleum* var. *acutiflorum* (Willdenow ex Roemer & Schultes) Ledebour, Fl. Ross. 3: 84. 1847.

尖裂花沸 jian lie hua ren

Polemonium acutiflorum Willdenow ex Roemer & Schultes, Syst. Veg. 4: 792. 1819; *P. caeruleum* Linnaeus subsp. *villosum* (Rudolph ex Georgi) Brand; *P. racemosum* Kitamura; *P. villosum* Rudolph ex Georgi; *P. villosum* var. *glabrum* S. D. Zhao.

Calyx lobes lanceolate, apex acuminate. Corolla lobes usually ciliate, apex ± acute. Fl. Jun-Jul, fr. Jul-Sep. $2n = 14$.

Meadows; 1700–3700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, E Russia; NW North America].

2. *Polemonium chinense* (Brand) Brand, Repert. Spec. Nov. Regni Veg. Beih. 17: 316. 1921.

中华花沸 zhong hua hua ren

Stems erect, 30–90 cm, glabrous, rarely densely pubescent and glandular below middle, glandular pubescent above middle. Leaves pinnately compound, 6–18 cm, gradually reduced upward, uppermost ones usually ± sessile; petiole 6–14 cm; leaflets 15–25, narrowly lanceolate to ovate-lanceolate, 0.5–4 cm × 2–14 mm, glabrous. Pedicel 2–3 mm, puberulent, glandular or not. Calyx 2–3(–5) mm; lobes deltoid, shorter than tube, apex acute. Corolla violet, rarely white, rotate to broadly campanulate, 0.8–1.2(–1.7) cm; lobes obovate, margin ciliate, rounded at apex. Stamens ca. as long as or longer than corolla. Style longer than stamens, exerted. Capsule 3–6 mm. Seeds brown, fusiform to oblong-lanceolate,

2–2.5 mm. Fl. Jun-Aug, fr. Jun-Sep.

Meadows, moist open sites in or at forest edges; 1000–2100 m. Gansu, Heilongjiang, Hubei, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, NE Sichuan [Korea, Mongolia, E Russia].

1a. Stems glabrous below middle 2a. var. *chinense*

1b. Stems densely pubescent and glandular below middle 2b. var. *hirticaulum*

2a. *Polemonium chinense* var. *chinense*

中华花沸 (原变种) zhong hua hua ren (yuan bian zhong)

Polemonium caeruleum Linnaeus var. *chinense* Brand, Ann. Conserv. Jard. Bot. Genève 15/16: 324. 1913; *Polemonium liniflorum* V. Vassiljev.

Stems glabrous below middle. Fl. Jun-Jul, fr. Jul-Aug.

Meadows, open sites in forests; 1000–2100 m. Gansu, Heilongjiang, Hubei, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, NE Sichuan [Korea, Mongolia, E Russia].

2b. *Polemonium chinense* var. *hirticaulum* G. H. Liu & Y. C. Ma, Acta Sci. Nat. Univ. Intramongol. 20: 392. 1989.

毛茎花沸 mao jing hua ren

Stems densely pubescent and glandular below middle. Fl. Jun-Jul, fr. Jul-Aug.

- Moist sites in or at forest edges; 1000 m. Nei Mongol.

3. *Polemonium sumushanense* G. H. Liu & Y. C. Ma, Acta Sci. Nat. Univ. Intramongol. 20: 392. 1989.

苏木山花沸 su mu shan hua ren

Stems erect, 70–80 cm, sparsely pubescent, also glandular above middle. Leaves pinnately compound, 3–17 cm, gradually reduced upward, uppermost leaves ± sessile; petiole 0.5–8 cm; leaflets 7–21, narrowly lanceolate to lanceolate, 1.2–3.5 cm × 2–5 mm, glabrous, young leaves sparsely glandular-puberulent. Pedicel 3–8 mm, densely glandular-pubescent, with some nonglandular trichomes. Calyx 5–7 mm; lobes lanceolate, ca. as long as or longer than tube, apex acuminate. Corolla violet, rotate, 1.3–1.5 cm; lobes narrowly elliptic, margin sparsely ciliate, apex acute. Stamens 2/3–3/4 as long as corolla. Style longer than stamens, exerted or slightly so. Fruit unknown. Fl. Jun-Jul.

- Moist open sites, forests; 1700–1800 m. Nei Mongol.