

VALERIANACEAE

败酱科 bai jiang ke

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Herbs, perennial or biennial, rarely annuals [or shrubs, absent from China], with a characteristic fetid odor caused by monoterpenoid and sesquiterpenoid ethereal oils; vestiture of white, multicellular hairs; taprooted or rhizomatous; roots adventitious. Leaves opposite, basal and cauline, less frequently all basal, simple to pinnatisect or imparipinnate, entire to variously toothed. Inflorescences cymose, simple or compound dichasia or monochasia, bracteate and bracteolate. Flowers perfect or rarely unisexual. Calyx 5-lobed (*Nardostachys*), reduced to inconspicuous teeth (*Patrinia*), or setaceous, plumose, and pappuslike (*Valeriana*). Corolla connate, regular to irregular, sometimes 2-lipped; tube often gibbous (nectariferous) near base; limb (3–)5-lobed; corollas of female flowers 1/3–1/2 size of those of perfect or male flowers. Stamens 1–4, inserted near base of corolla tube, weakly to strongly exerted in bisexual and male flowers, vestigial and included in female flowers; anthers versatile, 4-sporangiate, opening by longitudinal slits. Ovary inferior; carpels 3, 1 fertile, with a solitary, pendulous, apical ovule, 2 sterile; style solitary; stigma entire or 3-lobed. Fruit a cypsela (but commonly referred to as an achene), sometimes winged; sterile locules often reduced; calyx persistent. Seed 1, embryo large, straight, and without endosperm.

Twelve genera and ca. 300 species: nearly cosmopolitan; three genera and 33 species (18 endemic) in China.

Chiu Lien-ching & Wang Han-jin. 1986. Valerianaceae. In: Lu An-ming & Chen Shu-kun, eds., Fl. Reipubl. Popularis Sin. 73(1): 5–44.

- 1a. Stamens 3, rarely 4; calyx segments up to 20, inrolled at anthesis, unrolled in mature fruit, becoming plumose and pappuslike 3. *Valeriana*
- 1b. Stamens 4, rarely reduced to 1–3; calyx 5-dentate, not pappuslike in fruit.
- 2a. Bracteoles not enlarged into wings in fruit; caudices nearly always covered with fibrous remains of old leaves; leaves entire 1. *Nardostachys*
- 2b. Bracteoles enlarged into wings in fruit; caudices without fibrous remains of old leaves; leaves segmented or serrate 2. *Patrinia*

1. NARDOSTACHYS Candolle, Prodr. 4: 624. 1830.

甘松属 gan song shu

Herbs, perennial. Rhizomes short, stout, branching. Caudices robust, densely covered with fibrous or lamellar old leaf sheaths, crowned with rosulate leaves. Flowering stems emerging below rosettes. Rosulate leaves narrowly spatulate or linear-oblongate, veins 3–5, parallel, base attenuate into petiole, margin entire, apex obtuse. Cauline leaves usually 2- or 3-paired, lanceolate, smaller apically. Cymes aggregated into a terminal capitulum; involucre bracts 2- or 3-paired; each flower subtended by a bract; bracteoles 2, small. Calyx 5-dentate, enlarged in fruit. Corolla campanulate; tube gibbous basally; limb 5-lobed. Stamens 4. Sterile locules of fruit not reduced.

Two species: the Himalaya; one species in China.

1. *Nardostachys jatamansi* (D. Don) Candolle, Prodr. 4: 624. 1830.

甘松 gan song

Patrinia jatamansi D. Don, Prodr. Fl. Nepal. 159. 1825; *Nardostachys chinensis* Batalin; *N. grandiflora* Candolle.

Caudices erect or oblique. Flowering stems 5–50 cm tall. Rosulate leaves narrowly spatulate or linear-oblongate; petiole subequal to leaf blade in length; blade 3–25 × 0.5–2.5 cm, glabrous or sparsely puberulent, veins 3, base attenuate, margin entire, apex obtuse. Cauline leaves mostly 2- or 3-paired, lowermost elliptic to obovate, base attenuate into petiole; uppermost sessile, oblanceolate to lanceolate, sometimes sparsely serrate.

Capitula 1.5–2 cm in diam.; primary peduncles sometimes elongated; involucre bracts 4–6, lanceolate; bracts narrowly ovate to ovate, subequal to flowers in length. Calyx 5-lobed; lobes semiorbicular to triangular-lanceolate, enlarged in fruit, usually ciliate. Corolla purple-red, pink, or magenta, campanulate, 4.5–9 mm, 5-lobed; lobes broadly ovate to oblong, 2–3.8 mm, outside ± villous, occasionally glabrous. Stamens subequal to corolla in length; filaments villous. Style subequal to stamens in length; stigma capitate. Achenes obovoid, 3–4 mm, partially or uniformly white hispid or glabrate; calyx lobes deltoid to ovate, 1.5–2.5 mm, prominently and reticulately veined. Fl. late Jun–Aug, fr. Aug–Sep.

Alpine thickets or meadows; 2500–5000 m. SE Gansu, S Qinghai (Maqên, Yushu), W Sichuan, Xizang, N Yunnan [Bhutan, India, Nepal].

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2. *PATRINIA* Jussieu, Ann. Mus. Natl. Hist. Nat. 10: 311. 1807, nom. cons.

败酱属 bai jiang shu

Fedia Adanson; *Fuisa* Rafinesque.

Herbs, perennial, less frequently biennial; taprooted or rhizomatous; roots or rhizomes strongly stinking. Stems sometimes lignified at base. Basal leaves rosulate, simple to pinnatifid or pinnatisect, often wilted or caducous at anthesis. Cauline leaves opposite, simple to pinnatifid or pinnatisect, margin serrate or dentate, rarely entire. Inflorescence of corymbiform or paniculiform compound dichasia. Flowers 3–6 mm; calyx limb 5-lobed; lobes sinuous, obtusely dentate, ovate or ovate-deltoid, persistent, rarely enlarged in fruit. Corolla yellow, pale yellow, or white, campanulate or funnelliform; tube villous within, gibbous basally, nectary sac with dense glands; limb 5-lobed, lobes slightly unequal. Stamens (1–)4, in unequal pairs, inserted at base of corolla tube, usually exerted; longer filaments villous basally, shorter filaments glabrous; anthers oblong, versatile. Style sometimes curved above; stigma capitate or peltate. Achene ovoid or obovoid-oblong; bracteoles reduced or expanded and winglike, detaching as a unit with fruit, 2- or 3-veined, reticulate veins conspicuous. Seeds compressed ellipsoid.

About 20 species: C and E Asia; 11 species (five endemic) in China.

- 1a. Cauline leaves in whorls of 3 10. *P. trifoliata*
 1b. Cauline leaves opposite, decussate.
 2a. Bracteoles reduced in fruit; peduncles densely hirsute on upper side only; corolla yellow 6. *P. scabiosifolia*
 2b. Bracteoles enlarged and winged in fruit; peduncles uniformly pubescent or hairs in bilateral rows; corolla yellow, pale yellow, or white.
 3a. Winged bracteoles 2- or occasionally 3-veined.
 4a. Peduncles hispidulous, hairs less than 0.4 mm; cauline leaves usually pinnatifid, rarely entire.
 5a. Leaves rigid, leathery, leaf segments obtuse or acute at apex; corolla 6.5–9 mm; bracteoles in fruit 7–9 × 5–7 mm 7. *P. scabra*
 5b. Leaves thin, papery, leaf segments acute to acuminate at apex; corolla 3–4.5 mm; bracteoles in fruit 5.5–6.2 × 4.5–5.5 mm 2. *P. heterophylla*
 4b. Peduncles hirsute, hairs ca. 1 mm; cauline leaves usually undivided or sometimes with 1–3 pairs of lateral segments.
 6a. Corolla white, limb 3.5–5 mm wide; stamens 4 11. *P. villosa*
 6b. Corolla yellow or pale yellow, very rarely white, limb 2–4 mm wide; stamens 1–4 4. *P. monandra*
 3b. Winged bracteoles usually 3-veined, rarely 2-veined or multiveined.
 7a. Peduncles scaberulose.
 8a. Basal and cauline leaves pinnatisect or bipinnatisect; segments linear 3. *P. intermedia*
 8b. Basal leaves usually shallowly lobed or entire; cauline leaves pinnatifid or pinnatisect, segments various in shape 5. *P. rupestris*
 7b. Peduncles hirsute.
 9a. Plants usually more than 30 cm tall; calyx not obviously enlarged in fruit; leaves glabrous 1. *P. glabrifolia*
 9b. Plants dwarf, less than 25 cm tall; calyx obviously enlarged in fruit; leaves usually pubescent.
 10a. Rhizomes robust; basal leaves oblanceolate, entire or pinnatifid 8. *P. sibirica*
 10b. Rhizomes usually slender; basal leaves oblanceolate-oblong, all pinnatifid 9. *P. speciosa*

1. *Patrinia glabrifolia* Yamamoto & Sasaki, Trans. Nat. Hist. Soc. Formosa 19: 106. 1929.

光叶败酱 guang ye bai jiang

Herbs, perennial, 25–60 cm tall. Rhizomes horizontal, coarse. Stems erect, glabrous, or bilaterally puberulent above. Lower leaves crowded, spatulate or weakly petiolate, glabrous; petiole to 5 cm; blade oblanceolate or oblong, to 25 × 6 cm, base attenuate, margin coarsely serrate, apex acuminate. Cauline leaves petiolate; petiole 1–3.5 cm; blade linear to linear-lanceolate, 4.5–9 × 0.5–1.5 cm, glabrous, base cuneate-decurrent, margin entire or coarsely serrate, apex acuminate. Inflorescence corymbiform-paniculiform; lateral branches in 4–6 pairs, with 2 lines of dense, stiff hairs; pedicels reduced. Calyx lobes inconspicuous. Corolla yellow, ca. 5 mm, regularly 5-lobed; lobes spreading. Stamens 4, exerted. Style ca. 2.5 mm; stigma capitate; fertile ovary locule slightly compressed, ellipsoid,

densely hispidulous or subglabrous below and above margin. Achenes oblong, 2.5–3 mm; bracteoles elliptic or obovate-elliptic, ca. 3 × 1.5 mm, to obovate or orbicular, 3–7 × 2.5–6 mm, 3-veined, apex rounded, sinuate or with 3 rounded lobes. Fl. Jul, fr. Aug.

• Calcareous stony slopes; 1000–2200 m. C and E Taiwan (Hualian, Nantou).

2. *Patrinia heterophylla* Bunge, Enum. Pl. Chin. Bor. 35. 1833.

墓回头 mu hui tou

Patrinia angustifolia Hemsley; *P. graveolens* Hance; *P. heterophylla* subsp. *angustifolia* (Hemsley) H. J. Wang.

Herbs, perennial, 15–100 cm tall. Rhizomes horizontal, longer than 20 cm. Stems erect, densely scaberulose or subglabrous. Basal leaves rosulate, petiolate; blade narrowly elliptic,

3–8 cm, pinnatifid to pinnatisect; segments 1–5 pairs, ovate to linear-lanceolate; terminal segment usually larger, ovate to ovate-lanceolate, margin serrate or crenulate. Cauline leaves subsessile or petiolate; lower leaves pinnatisect, with 2–6 pairs of segments; terminal segment \pm larger, broadly ovate to linear-lanceolate, 7–9 \times 5–6 cm, apex acuminate to long acuminate. Middle and upper leaves often undivided, or with 1 or 2 pairs of segments; terminal segment larger, ovate, ovate-lanceolate, or subrhombic, crenulate. Inflorescence corymbiform; peduncles densely hispidulous; lower involucral bracts with 1 or 2(–4) pairs of linear segments; upper bracts entire, linear, subequal to or longer than inflorescence. Calyx lobes conspicuous or inconspicuous, ovate, ovate-oblong, or ovate-deltoid, 0.1–0.3 mm. Corolla campanulate; tube 1.8–2.4 mm, 1.5–2 mm in diam. distally; lobes ovate or ovate-elliptic, 0.8–1.8 \times ca. 1.6 mm. Stamens 4, exerted; longer filaments 3–3.6 mm; shorter filaments 1.9–3 mm; anthers oblong, ca. 1.2 mm. Ovary ovoid or oblong, 0.7–1.5 mm; style slightly curved, 2.3–2.7 mm; stigma peltate or capitate. Achenes oblong or obovoid, hispidulous, or glabrescent on one or both surfaces, apex truncate; bracteoles obovate, obovate-oblong, or obovate-elliptic, rarely elliptic, 5.5–6.2 \times 4.5–5.5 mm, 2(or 3)-veined, apex rounded, shallowly 3-lobed, or unequally 2-lobed on one lateral side. Fl. Jul–Sep, fr. Aug–Oct. $2n = 22^*$.

• Grassy slopes, open woods, roadsides; 100–2600 m. Anhui, Chongqing, E Gansu (E of Yuzhong), Guizhou (Jiangkou), Hebei, Henan, W Hubei, Hunan, Jiangsu (Tianci Shan), Jiangxi (Lu Shan, Wuning, Xiushui), Jilin (Tongyu), Liaoning (Jianping, Suizhong), S Nei Mongol (Daqing Shan, Xinghe), S Ningxia (Tongxin), E Qinghai (Minhe), Shaanxi, Shandong (Mengshan, Taishan), Shanxi (Jiexiu, Lishi), Sichuan (Emei, Jinchuan, Nanping), Zhejiang (Tianmu Shan).

3. *Patrinia intermedia* (Hornemann) Roemer & Schultes, Syst. Veg. 3: 90. 1818.

中败酱 zhong bai jiang

Fedia intermedia Hornemann, Hort. Bot. Hafn. 1: 48. 1813.

Herbs, perennial, 10–40(–55) cm tall. Taproot to ca. 20 cm, to ca. 2 cm in diam., fleshy; caudex stout, multiple branched. Stems 10–55 cm tall, scaberulose. Basal leaves rosulate; petiole 1–10 cm; cauline leaves in 2–4 pairs, sessile or shortly petiolate; blade oblong to elliptic, ca. 10 \times 5.5 cm, pinnatisect or bipinnatisect; segments suborbicular or linear to linear-lanceolate, scaberulose or glabrescent, apex obtuse or acute; lower segments crenulate, upper segments entire. Inflorescence corymbiform-paniculiform, ca. 12 cm in diam.; lateral branches in 4–6 pairs, hispidulous; involucral bracts similar to upper cauline leaves, subsessile, to 10 cm; upper bracts smaller, pinnatifid or undivided. Calyx crateriform; lobes inconspicuous. Corolla yellow, campanulate; tube ca. 2 mm, ca. 2.2 mm in diam. above; lobes elliptic, oblong, or ovate, 2–3 \times 1.5–2.5 mm. Stamens 4; longer filaments 3.3–3.6 mm, shorter filaments 2.5–2.7 mm; anthers oblong, ca. 1.2 mm. Ovary oblong, 1.5–2.5 mm; style ca. 2.5 mm; stigma peltate or capitate, 0.5–0.7 mm in diam. Achenes oblong, 3.5–4.5 mm; pedicel 1–1.5 mm; bracteoles ovate, ovate-oblong, or elliptic-oblong, 6–8.5 \times 4.5–5.5 mm, 3-veined. Fl. Jun–Aug, fr. Jul–Sep. $2n = 22$.

Forest margins, meadows, steppes, thickets; 1000–3000 m. Xinjiang (Altay, Pamir, Tian Shan) [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia)].

4. *Patrinia monandra* C. B. Clarke in J. D. Hooker, Fl. Brit. India 3: 210. 1881.

少蕊败酱 shao rui bai jiang

Patrinia formosana Kitamura; *P. monandra* var. *formosana* (Kitamura) H. J. Wang; *P. monandra* var. *sinensis* Batalin; *P. punctiflora* P. S. Hsu & H. J. Wang; *P. punctiflora* var. *robusta* P. S. Hsu & H. J. Wang.

Herbs, perennial or biennial, 1.5–2.2 m tall. Taproots horizontal, oblique, or vertical. Stems slightly lignified at base, robust, uniformly retrorsely hispidulous or with 2 bilateral lines. Basal leaves wilted at anthesis; cauline leaves petiolate; petiole ca. 1 cm, reduced or absent above; blade oblong, 4–14.5 \times 2–9.5 cm, sparsely adpressed hispidulous, margin entire, or lyrate with 1 or 2(or 3) pairs of lateral segments, margin crenate or dentate. Inflorescence corymbiform or paniculiform, 20–25 cm in diam.; lateral branches in 4–6 pairs, densely hirsute; involucral bracts linear-lanceolate to lanceolate, ca. 8.5 cm, entire, or pinnately 3–5-segmented; terminal segment ovate-lanceolate, apex acute to acuminate. Calyx small, 5-dentate. Corolla yellow or pale yellow, rarely white, funnelliform; tube 1.2–1.8 mm, 1.4–1.8 mm in diam.; limb 2–4 mm wide; lobes ovate to ovate-oblong, 0.6–1.8 \times 1–1.2 mm. Stamens 1–4, often one longer and exerted; filaments 1.5–3.3 mm; anthers oblong or ellipsoid, 0.5–0.8 mm. Ovary obovoid, 0.8–1.8 mm; style 1.7–2.8 mm; stigma capitate or peltate. Achenes ovoid-globose; sterile ovary locules thickened, obovoid-oblong, glabrous or sparsely hispidulous; fertile locule compressed ellipsoid, margin hispidulous; bracteoles broadly ovate to suborbicular, 5–7 \times 5–8 mm, 2(or 3)-veined, apex usually shallowly 3-lobed. Fl. Aug–Sep, fr. Sep–Oct. $2n = 88$ (under *P. formosana*).

Grassy slopes, thickets, forests, forest margins, roadsides; 100–3100 m. Anhui, Chongqing, SE Gansu (Tianshui, Wenxian), Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu (Ganyu, Liyang, Yuntai Shan), Jiangxi, Liaoning (Dalian, Huanren), S Shaanxi, Shandong (Zoucheng), Sichuan, Taiwan (Nantou, Taizhong, Taoyuan), Yunnan, Zhejiang (Kaihua, Tiantai Shan, Yinxian) [Bhutan, India (Darjeeling, Sikkim), Nepal].

5. *Patrinia rupestris* (Pallas) Dufresne, Hist. Nat. Valér. 54. 1811.

岩败酱 yan bai jiang

Valeriana rupestris Pallas, Reise Russ. Reich. 3: 266. 1776.

Herbs, perennial, 20–100 cm tall. Taproot clavate, to ca. 1.5 cm in diam.; caudex slender, simple or several branched. Stems woody at base, covered with persistent old leaf remnants, new growth herbaceous, scaberulose. Basal leaves usually wilted at anthesis, subsessile or petiolate; petiole 2–4 cm; blade obovate-oblong, oblong, ovate, or obovate, 2–7 \times 1–2.5 cm, pinnatifid, pinnatifid to pinnatisect, or undivided, margin crenulate; segments linear, oblong-lanceolate, or lanceolate; terminal segment usually crenulate, lobed or segmented. Cauline leaves sessile to shortly petiolate; blade oblong or elliptic, 3–7 cm, pinnatifid to pinnatisect; lateral segments usually in 3–6

pairs, linear or linear-lanceolate to oblong-lanceolate, sparsely crenulate or entire; terminal segment 3-partite, with 3 linear secondary segments. Inflorescence corymbiform, 2.5–20 cm in diam.; lateral branches in 3–7 pairs; lowermost bracts pinnatisect, with 3–5 pairs of linear segments; upper bracts smaller, linear, or with 1 or 2 pairs of filiform-linear segments. Calyx margin truncate, sinuous or shallowly 5-lobed; lobes ovate, 0.1–0.2 mm. Corolla yellow, funnelform-campanulate, 2.5–4 mm; tube 1.8–2 mm, 1.5–2 mm in diam. distally; limb 3–5.5 mm wide; lobes oblong, ovate-elliptic, ovate-oblong, ovate, or ovate-orbicular, 1.2–2 × 1–1.5 mm. Stamens 4; longer filaments 3–4 mm, shorter filaments 2.6–3.5 mm; anthers 0.7–0.8 mm. Ovary columnar, 0.5–1.3 mm, hispidulous, or glabrescent on one or both surfaces; style 2.2–3.3 mm; stigma peltate. Achenes obovoid-columnar, 2.4–2.6 × 1.5–1.8 mm, hispidulous to glabrescent; pedicel 0.5–1 mm; bracteoles oblong, ovate, or obovate, 3.5–5.1 × 3.5–3.6 mm, 3-veined, apex sometimes shallowly 3-lobed. Fl. Jul–Sep, fr. Aug–late Oct. $2n = 22$.

Stony slopes, meadows, margins of *Betula* or *Populus* forests; 200–2500 m. Chongqing (Chengkou, Wanyuan), E Gansu (E of Maxian Shan), Hebei (Weichang, Xiaowutai Shan, Zhangbei), E Heilongjiang, Henan (Huixian), E Jilin (Chunhua, Helong, Jilin), Liaoning (Jianping, Qianshan), NE Nei Mongol, Ningxia (Guyuan), Shaanxi (Wuqi, Zhidan), Shanxi (Luya Shan) [Mongolia, Russia (Far East, Siberia)].

6. *Patrinia scabiosifolia* Link, Enum. Hort. Berol. Alt. 1: 131. 1821.

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Fedia scabiosifolia Treviranus; *F. serratifolia* Treviranus; *Patrinia hispida* Bunge.

Herbs, perennial, 30–100(–200) cm tall. Rhizomes horizontal or oblique. Stems erect, yellow-green to yellow-brown, sometimes pale purplish, glabrate basally, hispidulous apically, hairs in 2 bilateral rows. Basal leaves rosulate, wilted at anthesis; petiole 3–12 cm; blade pale green abaxially, dark green adaxially, ovate, elliptic, or elliptic-lanceolate, 1.8–10.5 × 1.2–3 cm, simple to pinnatifid or pinnatisect, surfaces glabrate or hispidulous on veins, base cuneate, margin ciliate, entire to coarsely serrate, apex obtuse or acute. Cauline leaves sessile, broadly ovate to lanceolate, 5–15 cm, reduced above, both surfaces hispidulous to glabrescent, usually pinnatifid or pinnatisect, lateral segments in 2–5 pairs, terminal segment ovate, elliptic, or elliptic-lanceolate, margin coarsely serrate, apex acuminate. Inflorescence corymbiform, lateral branches in 5–7 pairs; peduncles densely hirsute abaxially; involucral bracts linear, ca. 1 mm. Calyx lobes inconspicuous. Corolla yellow, campanulate; tube ca. 1.5 × 1.5 mm, weakly gibbous; lobes ovate, ca. 1.5 × 1–1.3 mm. Stamens 4, longer filaments ca. 3.5 mm, shorter filaments 2–2.7 mm; anthers oblong, ca. 1 mm. Ovary ellipsoid-oblong, ca. 1.5 mm; style ca. 2.5 mm; stigma peltate, 0.5–0.6 mm in diam. Achenes oblong, 3–4 mm, 3-angular, compressed, sterile locules reduced; bracteoles inconspicuous. Seeds ellipsoid, compressed. Fl. Jul–Sep, fr. Sep–Oct. $2n = 22$.

Forests, forest margins, thickets, grassy areas, roadsides; (below 100–)400–2600 m. Throughout China except Guangdong, Hainan, Ningxia, Qinghai, Xinjiang, and Xizang [Japan, Korea, Mongolia, Russia (Far East, Siberia)].

7. *Patrinia scabra* Bunge, Pl. Mongholic-Chin. Dec. 1: 20. 1835.

糙叶败酱 cao ye bai jiang

Patrinia rupestris Pallas subsp. *scabra* (Bunge) H. J. Wang.

Herbs, perennial, 30–60 cm tall. Taproot columnar, 0.5–2 cm in diam., fleshy; caudex simple or several branched. Stems densely scaberulose. Basal leaves oblanceolate, pinnatifid, with 2–4 pairs of segments, wilted at anthesis. Cauline leaves petiolate; petiole 1–2 cm; blade ovate-lanceolate, 4–10 × 1–2 cm, leathery, scaberulose, pinnatifid to pinnatisect, with 1–5 pairs of lateral segments; terminal segment larger, oblanceolate; lateral segments falcate-linear, entire, apices obtuse or acute. Inflorescence corymbiform; lateral branches 3 or 4, hispidulous; involucral bracts linear, entire or 2- or 3-segmented. Calyx reduced. Corolla yellow, funnelform, gibbous, 6.5–9 mm; limb 5-lobed, 5–7 mm wide. Stamens 4; longer filaments ca. 4 mm, shorter filaments ca. 3 mm. Ovary ca. 1 mm, scabridulous; style ca. 4 mm. Achenes columnar; bracteoles broadly ovate or oblong-orbicular, 7–9 × 5–7 mm, 2-veined, rarely 3-veined, apex rounded, entire or shallowly 3-lobed. Fl. Jul–Aug, fr. Aug–Sep.

• Sunny grassy slopes, forest margins; 300–1700 m. Hebei, W Henan, W Jilin (Baicheng, Zhenlai), W Liaoning (Jianping), SE Nei Mongol (Bairin Youqi, Chifeng, Ongniud Qi), N Shaanxi (Shenmu), Shanxi.

8. *Patrinia sibirica* (Linnaeus) Jussieu, Ann. Mus. Natl. Hist. Nat. 10: 312. 1807.

西伯利亚败酱 xi bo li ya bai jiang

Valeriana sibirica Linnaeus, Sp. Pl. 1: 34. 1753; *V. ruthenica* Willdenow.

Herbs, perennial, 5–25 cm tall. Taproot clavate, to 1.5 cm in diam. Caudices simple or branching, bark brown or dark brown, usually robust, with fibrous or lamellar remains of old leaf bases. Stems leafless or with a single leaf pair, pubescent, hairs in bilateral rows. Leaves rosulate; petiole 2–5 cm, glabrous or sparsely villous; blade oblong to linear, 2.5–5 × 0.3–2 cm, glabrous, entire or pinnatifid to pinnatisect; segments 2- or 3-paired, linear or linear-lanceolate, apex obtuse-rounded to acuminate; cauline leaves sessile, 1.5–6 cm, pinnatifid. Inflorescence corymbiform, 1.5–4 cm in diam. at anthesis; lateral branches 2–4 pairs; involucral bracts 1–3 cm, pinnatisect; segments sessile, linear; bracts obovate or ovate, ca. 2.4 × 2 mm. Calyx lobes obovate-oblong, oblanceolate, ovate, ovate-deltoid, or oblong, 0.2–1.8 mm. Corolla yellow, funnelform to campanulate; tube 2.5–3.2 mm, 2.5–3.2 mm in diam. distally; lobes ovate or ovate-elliptic, 1.5–2.3 × 1.4–2 mm. Stamens 4; longer filaments ca. 4.5 mm, shorter filaments ca. 4 mm; anthers oblong, ca. 1.5 mm. Ovary ovoid-oblong, 0.5–1.5 mm; style 3.3–3.7 mm; stigma obliquely capitate, ca. 0.6 mm in diam. Achenes narrowly ovoid, 3–4(–6) mm, sterile locules glabrous or hispidulous distally, fertile locule densely hispidulous on margin and proximally; bracteoles obovate, obovate-oblong, ovate, or ovate-oblong, 6–9 × 4.5–6.5 mm, 3- or 4-veined, entire or shallowly 3-lobed. Fl. May–Jun, fr. Jun–Jul. $2n = 22, 44$.

Forests, forest margins, meadows, alpine meadows and stony

slopes, stony riverbanks; below 1700 m. Heilongjiang, Nei Mongol [Japan, Mongolia, Russia (from European part to Far East)].

9. *Patrinia speciosa* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 61: 21. 1924.

秀苞败酱 *xiu bao bai jiang*

Herbs, perennial, 8–30 cm tall. Rhizomes slender. Stems solitary, simple or sometimes branched, leafless or with 1 pair of leaves, sparsely villous. Basal leaves rosulate; petiole 1–2 cm, base sheathing; blade oblong-ob lanceolate or ovate-elliptic, 3–10 × 2–3 cm, slightly glaucous abaxially, glabrous or sparsely villous adaxially, pinnatifid; segments 3–5-pairs, ovate or oblong-lanceolate, base decurrent, margin coarsely serrate, apex acute; terminal lobe larger. Cauline leaves ovate or ovate-oblong to oblong, 3–8 × 1.5–2.5 cm, pinnatifid. Inflorescence corymbiform, 3–10 cm in diam. at anthesis; lateral branches in ca. 3 pairs; peduncles sparsely hirsute; involucre bracts elliptic, oblong, or ovate-oblong to lanceolate, 2–6 × ca. 2 cm, serrate, pinnatifid or pinnatifid, reduced apically; bracts ovate-oblong to obovate, 2.5–3 × 1.4–1.7 mm, apex usually unequally 2-lobed. Calyx lobes ovate-lanceolate, ovate, obovate, or oblanceolate, 0.2–1.6 mm, usually 1 or 2 prominently enlarged in fruit. Corolla yellow, campanulate, 5.5–6 mm; tube ca. 3 mm, 2.6–2.8 mm in diam. distally; lobes elliptic or obovate to ovate, ca. 2.5 × 2.5–3 mm. Stamens 4, exerted; longer filaments ca. 7.5 mm, shorter filaments ca. 6.5 mm; anthers oblong, 1.2–1.4 mm. Achenes ellipsoid or oblong, 3–4 × 2–3 mm; bracteoles irregularly obliquely ovate or obliquely obovate, occasionally 10–12 × 8–13 mm, 3(–5)-veined, apex shallowly 3-lobed, sometimes only one lateral side with 2 lobes. Fl. late Jul–Sep, fr. Sep–Oct.

• Stony, grassy, and/or sandy slopes, thickets; 3100–4100 m. SE Xizang (Bomi, Médog, Zayü), NW Yunnan (Gongshan).

10. *Patrinia trifoliata* L. Jin & R. N. Zhao, Acta Bot. Boreal.-Occid. Sin. 22: 667. 2002.

三叶败酱 *san ye bai jiang*

Herbs, perennial, 30–90 cm tall. Rhizomes horizontal, slightly ascending. Stems erect, scaberulose. Basal leaves rosulate, 3–8 cm, long petiolate, pinnatifid to pinnatisect; segments 1–4-paired, ovate-orbicular; terminal segment usually larger, ovate to ovate-lanceolate; cauline leaves in whorls of 3, pinnatisect; segments 1–4-paired; terminal segment larger, ovate or lanceolate, 3–7 × 1–5 cm, sparsely scaberulose, base cuneate, apex acuminate, margin crenulate; upper cauline leaves subsessile. Inflorescence corymbiform, lateral branches in 3–7 pairs, scaberulose; involucre bracts with 1 or 2 pairs of linear segments. Calyx small, 5-lobed; lobes inconspicuous, 0.1–0.3 mm. Corolla campanulate, 3–5 mm, outside scaberulose, inside glabrous; tube 1.8–3 mm; lobes 5, 0.8–1.5 × ca. 1 mm. Stamens 4, longer filaments ca. 3 mm, shorter filaments ca. 2 mm, glabrous or scaberulose. Ovary obovoid, ca. 1 mm; style 2.3–2.7 mm; stigma truncate-capitate. Achenes oblong; bracteoles ovate, 2-veined, rarely 3-veined, shallowly 3-lobed. Fl. and fr. Jul–Aug.

• Grassy slopes, roadsides; 1100–2300 m. SE Gansu.

11. *Patrinia villosa* (Thunberg) Dufresne, Hist. Nat. Valér. 54. 1811.

攀倒甑 *pan dao zeng*

Herbs, perennial or biennial, 50–120 cm tall, rhizomatous or rarely stoloniferous. Stems with 2 bilateral, hispidulous lines, rarely uniformly hispidulous or glabrescent. Basal leaves rosulate, long petiolate; blade ovate, broadly ovate, or oblong-lanceolate to ovate-lanceolate, 4–25 × 2–18 cm, base decurrent, margin serrate or pinnatifid, with 1 or 2(–4) pairs of segments, apex acuminate. Cauline leaves petiolate; petiole 1–3 cm, upper leaves subsessile; blade similar to basal leaves or rhombic-ovate, hispidulous or glabrescent, base decurrent, margin coarsely serrate, apex caudate-acuminate or acuminate. Inflorescence paniculiform or corymbiform, lateral branches in 5 or 6 pairs, densely hirsute; involucre bracts ovate-lanceolate to linear. Calyx small, hispidulous, sometimes sparsely glandular hairy; limb sinuous; lobes 0.3–0.5 mm. Corolla white, campanulate; tube 1.5–2.6 × 1.7–2.3 mm, deeply 5-lobed; lobes dissimilar in shape, ovate, ovate-oblong, or ovate-elliptic, 0.7–2 × 1.1–1.8 mm. Stamens 4, exerted. Style shorter than stamens. Achenes obovoid; bracteoles obovate, ovate, obovate-oblong, or elliptic, sometimes orbicular, 2.8–6.5 × 2.5–8 mm, hispidulous between 2 main veins, 2(or 3)-veined, base cuneate or rounded, apex rounded, entire or slightly 3-lobed. Fl. Aug–Oct, fr. Sep–Nov. *2n* = 44.

Forests, forest margins, thickets, grassy areas, roadsides; below 100–2000 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, SE Liaoning, Taiwan, Zhejiang [Japan].

- 1a. Leaves without glands; lowest involucre bracts entire 11a. subsp. *villosa*
- 1b. Leaves adaxially with minute brown-red glands; lowest involucre bracts usually with 1 or 2 pairs of segments 11b. subsp. *punctifolia*

11a. *Patrinia villosa* subsp. *villosa*

攀倒甑(原亚种) *pan dao zeng (yuan ya zhong)*

Valeriana villosa Thunberg in Murray, Syst. Veg., ed. 14, 81. 1784; *Patrinia dielsii* Graebner; *P. ovata* Bunge; *P. sinensis* (H. Léveillé) Koidzumi; *P. villosa* var. *japonica* H. Léveillé; *P. villosa* var. *sinensis* H. Léveillé.

Leaves without glands. Lowermost involucre bracts entire.

Forests, forest margins, thickets, grassy areas; below 100–2000 m. Anhui, Chongqing, Fujian, Guangdong (Liannan, Ruyuan, Yingde), Guangxi, Guizhou, Henan (Shangcheng), Hubei (Enshi, Hefeng), Hunan, Jiangsu (Liyang, Nanjing), Jiangxi, Taiwan, Zhejiang [Japan].

11b. *Patrinia villosa* subsp. *punctifolia* H. J. Wang, Acta Phytotax. Sin. 23: 380. 1985.

斑叶败酱 *ban ye bai jiang*

Leaves with minute brown-red glands adaxially. Lowermost involucre bracts usually with 1 or 2 pairs of segments.

• Grassy slopes, thickets, forest margins, roadsides; below 800 m. SE Liaoning (Benxi, Huanren, Kuandian).

3. VALERIANA Linnaeus, Sp. Pl. 1: 31. 1753.

缬草属 xie cao shu

Herbs, perennial. Plants hermaphroditic, gynodioecious, polygamo-dioecious, or dioecious, glabrous or variously pubescent, villous or hirsute, hairs 1- to several celled, white or translucent. Rhizomes elongate, with fibrous roots, or rhizomes reduced, with fascicled, often clavate, roots. Taproots absent (Chinese spp.). Stolons present or absent. Basal leaves rosulate, petiolate or spatulate, undivided, pinnate or pinnatifid, persistent or caducous. Cauline leaves opposite, petiolate to sessile; petiole length typically diminishing upward along stem; blade pinnate, pinnatifid, pinnatisect, or undivided. Inflorescence paniculiform or corymbiform, at anthesis: flowers in remote terminal clusters or in a densely capitate head, branches elongating in fruit; lowermost bracts often lobed, bracts otherwise simple and entire; bracteoles simple, similar to bracts; flowers bisexual, male (not in China?) or female. Calyx a ring at anthesis, unfurling into 5–15 white, plumose segments, 4–8 mm, in mature fruit. Corolla funnelform, rotate or salverform; tube usually gibbous near base; limb 5-lobed. Stamens 3 (4 in *Valeriana kawakamii*), inserted on corolla tube. Achene compressed dorsally, 3-veined on abaxial side, 1-veined on adaxial side, sterile locules reduced; crowned by persistent, plumose calyx, segments 2–7 mm.

About 300 species: Asia, Europe, North and South America; 21 species (13 endemic) in China.

A difficulty in the key is the rhizomes as unfortunately many collections do not have the rhizomes attached.

- 1a. Leaves undivided, or at least lower 2 or 3 pairs of cauline leaves undivided.
 - 2a. Rhizomes relatively stout, 0.5–1.5 cm in diam.; leaves cordate at base, 2–14 × 3–10 cm 13. *V. jatamansi*
 - 2b. Rhizomes relatively slender, less than 0.5 cm in diam.; leaves not cordate at base.
 - 3a. Leaves all undivided.
 - 4a. Leaves entire or sparsely crenulate; plants less than 12 cm tall; achenes hairy 21. *V. trichostoma*
 - 4b. Leaves serrate; plants more than 12 cm tall; achenes glabrous.
 - 5a. Inflorescences laxly paniculiform at anthesis, flowers clustered at branch tips; stem glabrous 15. *V. lancifolia*
 - 5b. Inflorescences compact and capitate at anthesis; stem hirsute 11. *V. hiemalis*
 - 3b. Upper cauline leaves divided.
 - 6a. Undivided leaves entire.
 - 7a. Plants 10–35 cm tall; leaf segments sparsely serrate 5. *V. fedtschenkoi*
 - 7b. Plants 5–15 cm tall; leaf segments entire 20. *V. tangutica*
 - 6b. Undivided leaves serrate.
 - 8a. Corolla less than 3 mm; upper cauline leaves usually pinnatisect, segments 5–7 16. *V. minutiflora*
 - 8b. Corolla 3.5–4 mm; upper cauline leaves 3-segmented, rarely 5-segmented, lateral segments much smaller than terminal segment 2. *V. barbulate*
- 1b. Leaves all divided, or rarely lowest 1 or 2 pairs of cauline leaves undivided.
 - 9a. Rhizomes 2–8 cm, with marked internodes; roots fibrous, not fascicled; inflorescences lax, with several separate corymbs even at anthesis 7. *V. flaccidissima*
 - 9b. Rhizomes reduced, without marked internodes; roots fascicled; inflorescences compact or lax at anthesis.
 - 10a. Leaf segments entire, rarely incised; plants 5–20(–50) cm tall; leaves all pinnatisect or at least middle and upper cauline leaves pinnatisect, with 4–11 pairs of segments; inflorescences compact at least at anthesis.
 - 11a. Plants 5–20(–30) cm tall; leaf segments rounded or obtuse; terminal segment ± larger than lateral ones.
 - 12a. Achenes hirsute on both sides; petiole of lowermost cauline leaves 3–6 cm 12. *V. hirticalyx*
 - 12b. Achenes glabrous; petiole of lowermost cauline leaves 0.5–2 cm 8. *V. flagellifera*
 - 11b. Plants 10–50 cm tall; leaf segments acute to acuminate at apex; terminal segments similar to or larger than lateral ones.
 - 13a. Corolla 1.5–3 mm; stems sparsely retrorsely puberulent; all leaf segments similar in shape and size, sparsely puberulent 19. *V. stenoptera*
 - 13b. Corolla ca. 6 mm; stems glabrous; terminal leaf segment larger than lateral ones, glabrous or sometimes ciliate 6. *V. ficariifolia*
 - 10b. Leaf segments always serrate (except *V. stenoptera*); plants more than (20–)30 cm tall; leaves pinnatisect or not, with 1–11 pairs of segments; inflorescences lax or compact.
 - 14a. Inflorescences lax, with several separate heads even at anthesis.
 - 15a. Leaves lyrate, terminal segment markedly larger, over 2 times wider than lateral ones; corolla rose or red, 3–4 mm 10. *V. hengduanensis*
 - 15b. Leaves pinnatisect, terminal segments slightly wider than lateral ones; corolla white, 1.5–3.5 mm, or rose, 4–4.5 mm.
 - 16a. Corolla rose, 4–4.5 mm; inflorescence corymbiform; achenes ca. 4 mm 18. *V. sichuanica*

- 16b. Corolla white, 1.5–3.5 mm; inflorescence paniculiform; achenes 2–2.5(–3) mm.
 17a. Plants over 50 cm tall; leaf segments large, terminal ones over 3 cm 9. *V. hardwickii*
 17b. Plants usually less than 20 cm, rarely up to 30 cm tall; leaf segments smaller, terminal ones less than 2 cm 3. *V. briquetiana*
- 14b. Inflorescences compact and capitate, at least at anthesis.
 18a. Leaves usually lyrate, with 1–4 pairs of segments; terminal segment markedly larger than lateral segments.
 19a. Corolla narrowly tubular, tube 4–6 × as long as lobes; achenes 1.5–2 mm 4. *V. daphniflora*
 19b. Corolla funnelform, tube nearly as long as lobes; achenes 2.5–3 mm.
 20a. Roots fibrous, less than 1 mm in diam.; lateral leaf segments 1- or 2-paired; corolla lobes elliptic 2. *V. barbulate*
 20b. Roots ± carrot-shaped, 1.5–2 mm in diam.; lateral leaf segments 1–4-paired; corolla lobes ovate 16. *V. minutiflora*
- 18b. Leaves pinnatisect, with 4–11 pairs of segments; terminal segment equal to or slightly larger than lateral segments.
 21a. Leaf segments usually entire, rarely incised, acute to acuminate at apex 19. *V. stenoptera*
 21b. Leaf segments always serrate, obtuse or acute at apex.
 22a. Plants 10–20 cm tall; corolla white, tubular, ca. 2.7 mm 14. *V. kawakamii*
 22b. Plants over 50 cm tall; corolla rose or white, funnelform, 3–6 cm.
 23a. Plants glandular-hairy at upper part of stems and inflorescence rachises; inflorescence capitate 1. *V. amurensis*
 23b. Plants without glandular hairs; inflorescence corymbiform 17. *V. officinalis*

1. *Valeriana amurensis* P. Smirnov ex Komarov, *Izv. Bot. Sada Akad. Nauk S.S.S.R.* 30: 214. 1932.

黑水缬草 *hei shui xie cao*

Valeriana amurensis f. *leiocarpa* H. Hara; *V. officinalis* Linnaeus var. *incisa* Nakai ex Mori.

Plants 80–150 cm tall. Rhizomes reduced; roots fascicled, 1–2 mm in diam. Stems solitary, erect, simple, hispidulous, glandular pubescent above. Leaves cauline, in 5–11 pairs; petiole of lowermost leaves to 4 cm; blade 9–12 × 4–10 cm, pinnatisect; segments 7–10, ovate to ovate-lanceolate, puberulent, margin coarsely serrate; upper leaves similar but smaller. Inflorescence capitate at anthesis, expanding in fruit; peduncles and pedicels glandular pubescent; bracts lanceolate or linear, glandular pubescent, apex acute or acuminate. Corolla rose, funnelform, 3–5 mm. Achenes triangular-ovoid, ca. 3 mm, hispid. Fl. Jun–Jul, fr. Jul–Aug.

Meadows, *Larix* or *Betula* forests. Heilongjiang, Jilin [Korea, Russia (Far East)].

Valeriana amurensis differs from *V. officinalis* only in having glandular hairs at the upper part of the stems, inflorescence rachises, and bracts. A population study is needed to clarify if *V. amurensis* is just a variant of the latter or a distinct species.

2. *Valeriana barbulate* Diels, *Notes Roy. Bot. Gard. Edinburgh* 5: 295. 1912.

髯毛缬草 *ran mao xie cao*

Plants 5–25 cm tall. Rhizomes reduced; roots fascicled, fibrous, less than 1 mm in diam. Stems solitary, erect, simple. Cauline leaves 5–8 pairs; lowermost often undivided; petiole 1–3.5 cm; blade broadly ovate to elliptic, 0.5–1.6 × 0.5–1 cm, sparsely serrate; upper leaves with petiole 1–1.2 cm, 3(–5)-segmented; terminal segment ovate-orbicular or broadly elliptic, 0.8–2 × 0.5–1.2 cm, petiole and abaxial surface sparsely pubescent, margin ciliate; lateral segments reduced. Inflorescence capitate at anthesis, 1–1.5 cm in diam.; bracts and bracteoles

linear-lanceolate to lanceolate. Corolla rose, reddish purple, or pink, 2.5–4 mm; lobes broadly elliptic, 0.7–1.5 mm, glabrous or villous at throat. Stamens and style exserted. Achenes narrowly ovoid or ellipsoid, 2.5–3 mm, pubescent or glabrous. Fl. Jul–Sep, fr. Aug–Sep.

Alpine meadows or stony sites; 3000–4600 m. SW Sichuan, SE Xizang, NW Yunnan [Bhutan, Myanmar, Nepal].

3. *Valeriana briquetiana* H. Léveillé, *Cat. Pl. Yun-Nan*, 277. 1917.

滇北缬草 *dian bei xie cao*

Plants up to 30 cm tall. Rhizomes reduced; roots fascicled, ± thickened, clavate, ca. 1.5 mm in diam. Stems erect or ascending, simple or rarely branched, densely villous below, sparsely villous to glabrate above. Basal and lower cauline leaves usually wilted at anthesis; occasionally lower 1 or 2 cauline pairs persistent; petiole to 2.5 cm; blade obovate-orbicular, ca. 2 × 1.5 cm; middle cauline leaves: petiole 1–3 cm, sparsely villous; blade pinnatisect, sparsely hispidulous adaxially, hirsute abaxially; terminal segment elliptic to linear-elliptic, 10–20 × 3–11 mm, margin usually serrate; lateral lobes 2 or 4, similar but smaller; uppermost 1 or 2 pairs of cauline leaves smaller, subsessile or sessile, otherwise similar. Inflorescence paniculiform, flowers and fruit in remote, terminal, dichasial clusters; peduncles to 15 cm, lax in fruit; bracts leaflike to linear-subulate; bracteoles linear, entire. Corolla funnelform, 2.5–3.5 mm; tube ca. 2 mm; lobes oblong-ovate. Stamens and style prominently exserted. Achenes ovoid-lanceolate, 2.5–3 mm, puberulent on anterior side, glabrous on posterior side. Fl. and fr. Jul.

• 2600–2800 m. NE Yunnan.

4. *Valeriana daphniflora* Handel-Mazzetti, *Acta Horti Gothob.* 9: 179. 1934.

瑞香缬草 *rui xiang xie cao*

Plants 15–40 cm tall. Rhizomes reduced; roots 3–6, fascicled, 1.5–2 mm in diam. Stolons rarely present. Stems soli-

tary, erect, simple, sparsely puberulent. Lowermost cauline leaves long petiolate; blade orbicular to broadly elliptic, 1–2 × 1–1.5 cm, undivided, entire or sparsely and irregularly serrate apically. Middle and upper cauline leaves petiolate to subsessile; blade ovate, 1.5–2 × 0.8–1 cm, pinnatifid; segments 3–7, glabrous or hispidulous on veins abaxially, margin irregularly serrate; terminal segment rhombic or elliptic, 1–1.2 × 0.4–0.6 cm; lateral segments smaller, linear-elliptic to linear. Inflorescence capitate at anthesis, 1.5–2.5 cm in diam., becoming lax and ca. 5 cm in diam. in fruit; bracts linear; bracteoles linear, subequal to achenes in length. Corolla rose or pink, tubular, 4.5–6 × ca. 1 mm; lobes ca. 1 mm. Stamens and style exerted. Achenes ovoid-ellipsoid, 1.5–2 × ca. 1 mm, glabrous or sparsely villous. Fl. (late Jul–)Aug, fr. Sep.

• Grassy slopes; 2600–3000(–4500) m. SW Sichuan, Xizang, NW Yunnan (Binchuan, Lijiang).

5. *Valeriana fedtschenkoi* Coincy, Ecl. Pl. Hisp. 2: 15. 1895.

新疆缬草 xin jiang xie cao

Valeriana longiflora Regel & Schmalhausen, Trudy Imp. S.-Peterburgsk. Bot. Sada 7: 384. 1880, not Willkomm (1851).

Plants 10–35 cm tall, subglabrous throughout. Rhizomes horizontal or ascending, 1–2 cm, apex covered with fibrous remains of old leaves; roots fibrous. Stems erect. Basal leaves in 1–3 pairs; petiole 3–6 cm; blade ovate-orbicular, 1–2.5 × 1–2 cm, simple, subtentire to crenulate; cauline leaves 2- or 3-paired; petiole 0.5–2.5 cm; blade obovate-oblong, ca. 4 × 2–4 cm, lyrate; lobes 3–5, terminal lobe ovate or suborbicular, 2–3.5 cm; lateral lobes smaller, lanceolate to linear. Inflorescence capitate at anthesis, ca. 1.5 cm in diam., becoming lax and broader in fruit; bracts and bracteoles linear-lanceolate. Corolla rose, funnelform, 5–6 mm; lobes oblong, 2–2.5 mm. Stamens and style exerted. Achenes ovoid-ellipsoid, glabrous. Fl. Jun–Jul, fr. Jul–Aug, $2n = 16$.

Forests, alpine meadows; 2300–3900 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, N Pakistan].

The Chinese record of *Valeriana turczaninovi* Grubov (in FRPS 73(1): 41. 1986) is referable to *V. fedtschenkoi*.

6. *Valeriana ficariifolia* Boissier, Fl. Orient. 3: 89. 1875.

芥叶缬草 jie ye xie cao

Plants 30–40 cm tall. Rhizomes reduced; roots fascicled, more than 1 mm in diam. Stems solitary, erect or ascending, glabrous. Basal leaves long petiolate; petiole 3–9 cm; blade broadly ovate or cordate, 1.5–4 × 1.5–4.5 cm, glabrous or hispidulous, subtentire. Lower cauline leaves in 2 or 3 pairs; petiole 2–4 cm, clasping and sheathing; blade lyrate; terminal lobe orbicular to broadly elliptic, 2–3 × 1.5–2 cm, margin entire or irregularly sinuous; lateral lobes 2- or 3-paired, remote, broadly ovate, 1.2–1.4 × ca. 0.8 cm, smaller toward base. Upper leaves similar but smaller. Inflorescence capitate at anthesis, 1–2 cm in diam., expanding and lax in fruit; peduncles glabrous or puberulent; bracts and bracteoles linear-lanceolate, margin ciliate basally. Corolla reddish, ca. 6 mm. Stamens and style exerted. Achenes narrowly ovoid, 5–6 mm, glabrous. Fl. Jul, fr. Jul–Aug, $2n = 16, 18$.

Mountain slopes; 2800–3000 m. Xinjiang (Yecheng) [Afghanistan, Kazakhstan, Tajikistan; SW Asia (Iran)].

The Chinese record of *Valeriana sisymbriifolia* Vahl (in FRPS 73(1): 43. 1986) is referable to *V. ficariifolia*.

7. *Valeriana flaccidissima* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 12: 228. 1867.

柔垂缬草 rou chui xie cao

Valeriana faberi Graebner; *V. nokozanensis* Yamamoto; *V. tripteroides* Handel-Mazzetti (1934), not (Neuman) Kreyer (1930).

Plants 20–80 cm tall, stoloniferous. Rhizomes 2–8 cm; roots fibrous, less than 0.5 mm in diam.; stolons terminating in leafy rosettes. Stems erect, simple, glabrous. Basal leaves simple or 3-lobed, margin crenulate or entire, apex obtuse. Cauline leaves ovate, pinnatisect, glabrous, or puberulent along veins abaxially; segments 3–7, remote; terminal segment ovate or lanceolate, 2–4 × 1–2 cm, glabrous or pubescent abaxially, margin coarsely serrate, apex obtuse or acuminate; lateral segments similar but smaller. Inflorescence paniculiform; involucre bracts and bracteoles linear to linear-lanceolate; bracteoles equal to or slightly shorter than achenes. Corolla reddish, purple, or white, funnelform, 2.5–3.5 mm; lobes oblong to ovate-oblong, shorter than corolla tube. Stamens and style usually exerted. Achenes narrowly ovoid, ca. 3 mm, glabrous or hispidulous. Fl. (Mar–)Apr–Jun, fr. May–Aug.

Forest margins, grassy areas, by streams; 400–3600 m. Anhui (Shucheng), Chongqing, SE Gansu, Guizhou, SE Henan (Shangcheng), W Hubei, Hunan (Xinning), Sichuan, Taiwan (Gaioxiong, Nantou, Xinzhu), Yunnan [Japan].

8. *Valeriana flagellifera* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 374. 1894.

秀丽缬草 xiu li xie cao

Valeriana pseudodioica Pax & K. Hoffmann; *V. venusta* L. C. Chiu; *V. xiaheensis* L. C. Chiu.

Plants 5–20(–30) cm tall. Rhizomes reduced; roots fascicled, fibrous, 0.5–1 mm in diam. Stolons present or absent. Stems solitary, erect, sparsely puberulent. Basal leaves caducous; cauline leaves in 6–9 pairs, glabrous adaxially, hispidulous along veins abaxially; petiole of lowermost 1 or 2 pairs 0.5–2 cm; blade undivided, obovate, ca. 1.5 × 1–1.2 cm, margin entire, ciliate, apex rounded; middle leaves 3-lobed, lateral lobes reduced; upper leaves pinnatisect, 1–3 × 0.5–1.5 cm; lateral segment in 4–10 pairs, margin entire or rarely coarsely serrate, sparsely ciliate, apex rounded or obtuse, terminal lobe similar but slightly larger. Inflorescence capitate at anthesis; bracts and bracteoles linear-lanceolate, bracteoles shorter than achenes. Flowers polygamous; corolla rose, red, purplish red, pink, or white, funnelform, ca. 3.5 mm (bisexual) or 2.5–3 mm (female); lobes oblong, 1–1.5 mm. Stamens exerted in bisexual flowers, vestigial in female flowers; style exerted. Achenes not seen. Fl. Jun–Jul, fr. Aug.

• Moist slopes; 3300–4300 m. S Gansu (Xiahe), Qinghai (Tongde), W Sichuan (Dawu, Sertar), NW Yunnan (Dèqèn).

9. *Valeriana hardwickii* Wallich in Roxburgh, Fl. Ind. 1: 166. 1820.

长序缬草 chang xu xie cao

Valeriana barbulate Diels var. *gymnostoma* Handel-Mazzetti; *V. hardwickii* var. *hoffmeisteri* Klotzsch; *V. hardwickii* var. *leiocarpa* Miquel; *V. helictes* Graebner; *V. rhodoleuca* H. B. Chen & C. Y. Cheng; *V. rosthornii* Graebner; *V. udicola* Briquet.

Plants to 150 cm tall. Rhizomes short; roots slender, ca. 1 mm in diam. Stolons 1 to several, or absent. Stems erect, often hispidulous below, glabrous above except at nodes. Basal leaves long petiolate; petiole to 9 cm; blade pinnatisect or pinnatifid, rarely simple and cordate; terminal segment ovate to ovate-lanceolate, 3.5–7 × 1.5–3 cm, hispidulous to glabrate, base subrounded, margin entire or serrate, apex acuminate; lateral segments 4 or 6, remote, reduced toward petiole. Cauline leaves similar, gradually reduced apically. Inflorescence paniculiform, flowers and fruit in remote dichasial clusters, primary peduncles to 70 cm; bracts linear-subulate; bracteoles deltoid-ovate, ca. 1/2 as long as achenes, margin entire or crenulate. Corolla white, pinkish white, or purplish, campanulate to funnelform, 1.5–2.5(–3.5) mm, tube and lobes of equal length. Stamens and style subequal to corolla in length or slightly exerted. Achenes broadly ovoid to ovoid, 2–3 × 1–1.2 mm, hispidulous or less frequently glabrous. Fl. Jun–Aug, fr. Jul–Oct. $2n = 14, 16, 28, 32$.

Grassy slopes, forest margins, by streams; 900–3800 m. Chongqing (Nanchuan), Fujian (Chong'an), Guangxi (Damiao Shan), Guizhou, SW Hubei, W Hunan (Qianyang, Xinning, Xuefeng Shan), Jiangxi (Wugong Shan), Sichuan, S and SE Xizang, Yunnan [Bhutan, India, Indonesia, Laos, Myanmar, Nepal, Pakistan, Thailand, N Vietnam].

10. *Valeriana hengduanensis* D. Y. Hong, Acta Phytotax. Sin. 30: 373. 1992.

横断山缬草 heng duan shan xie cao

Plants 40–100 cm tall. Rhizomes reduced; roots fascicled, 1–1.5 mm in diam. Stolons sometimes present. Stems solitary, erect, simple, glabrous or sparsely puberulent. Basal leaves caducous; lower 1 or 2 pairs of cauline leaves with petiole 2–9 cm; blade simple, broadly elliptic or obovate, 3–8 × 2–4.5 cm, subentire or serrate; upper leaves petiolate to subsessile; petiole to 7 cm; blade 5–10 × 3–5 cm, glabrous or sparsely villous, lyrate; segments 3–7, crenulate or serrate; terminal segment broadly elliptic to orbicular, much larger than others, 4–8 × 2–5 cm. Inflorescence laxly capitate; bracts linear. Corolla rose or red, funnelform, 3–4.5 mm. Achenes lanceolate, 3–3.5 mm, glabrous.

• Forests, ravines; 3100–3700 m. SW Sichuan (Muli), NW Yunnan (Dèqên, Weixi, Zhongdian).

11. *Valeriana hiemalis* Graebner, Bot. Jahrb. Syst. 29: 600. 1901.

全缘叶缬草 quan yuan ye xie cao

Plants 20–50 cm tall. Rhizomes reduced; roots fascicled, 0.5–1.5 mm in diam. Stems solitary, simple, hirsute. Leaves simple; basal leaves spatulate, caducous; cauline leaves in 3–5 pairs; lower leaves petiolate, petiole 0.5–3 cm; upper leaves subsessile to sessile; blade ovate or oblong, 1–5 × 0.7–3 cm, hirsute, margin entire or serrate, apex obtuse to acute. Inflorescence capitate at anthesis, 1–2 cm in diam., ca. 5 cm in diam. in fruit; bracts linear, 0.7–1.1 cm. Corolla white or light pink, funnelform, 2.5–3.5 mm; lobes ca. 1 mm. Achenes narrowly ovoid,

3–3.5 mm, glabrous. Fl. late Jun–Aug, fr. Sep.

• Forests; 2000–3000 m. Shaanxi (Taibai Shan), NW Sichuan.

12. *Valeriana hirticalyx* L. C. Chiu, Acta Phytotax. Sin. 17(3): 124. 1979.

毛果缬草 mao guo xie cao

Plants 5–18 cm tall, stoloniferous. Rhizomes reduced; roots fascicled, fibrous, ca. 1 mm in diam.; stolons terminating in leafy rosettes. Stems solitary, erect, simple, glabrous or sparsely hirsute except at nodes. Rosette leaves long petiolate; blade orbicular, entire, caducous. Cauline leaves in 2 or 3 pairs, lowermost long petiolate; petiole 3–6 cm, subsessile apically; blade obovate, 1.5–3 × 1–1.5 cm, pinnatisect; segments 3–9, oblong to obovate, margin entire and ciliate; terminal segment 1–1.5 × 0.6–0.8 cm; lateral segments reduced. Inflorescence capitate at anthesis, ca. 1 cm in diam., expanding to 3–4 × 2–3 cm in fruit; bracts and bracteoles spatulate to lanceolate; bracteoles slightly shorter than fruit. Corolla red, tubular, ca. 5 mm, inside villous, lobes elliptic-oblong, ca. 2 mm. Stamens and style exerted. Achenes ellipsoid-ovoid, 3.5–4 × ca. 2 mm, both surfaces hirsute. Fl. Jul–Aug, fr. Aug–Sep.

• Grassy slopes with shrubs, stony places; 4000–5000 m. Qinghai (Henan, Nangqên, Qilian, Zadoi), NE Xizang (Amdo, Biru, Sogxian).

13. *Valeriana jatamansi* W. Jones, Asiat. Res. 2: 416. 1790.

蜘蛛香 zhi zhu xiang

Valeriana harmsii Graebner; *V. jatamansi* var. *frondosa* Handel-Mazzetti; *V. jatamansi* var. *glabra* Merrill; *V. jatamansi* var. *hygrobia* (Briquet) Handel-Mazzetti; *V. hygrobia* Briquet; *V. mairei* Briquet; *V. wallichii* Candolle; *V. wallichii* var. *violifolia* Franchet.

Plants 20–70 cm tall. Rhizomes short, robust, usually 0.5–2 cm in diam., nodes crowded; roots fibrous. Stems 1 to several, erect, glabrate to pubescent, more densely so at nodes. Basal leaves persistent, rosulate; petiole 4–10 cm; blade simple, cordate to cordate-ovate, 2–14 × 3–10 cm, hispidulous or glabrous, margin irregularly crenulate, crenate, or dentate, apex acute. Cauline leaves in 2 or 3 pairs, sessile or subsessile, 1–3 cm, simple or trifoliolate; lateral lobes reduced; terminal lobe ovate. Inflorescence corymbiform, villous at nodes; bracts subulate, margin scarious; bracteoles ca. as long as achenes. Corolla white or pinkish, funnelform; flowers polygamous; bisexual flowers 3–4 mm, female flowers ca. 1.5 mm. Stamens and style exerted. Achenes narrowly ovoid, 2–2.5 × 1–1.5 mm, both sides villous. Fl. (Apr–)May–Jul, fr. Jun–Sep. $2n = 16, 32$.

Grassy slopes, forests, by streams; below 2500(–3100) m. Chongqing (Kaixian, Nanchuan), Gansu, Guizhou (Leishan, Zunyi), Henan (Xixia), W Hubei, Hunan (Longshan), Sichuan (Emei Shan), Xizang (Zayü), Yunnan [Bhutan, E and N India, Nepal, N Thailand, Vietnam].

14. *Valeriana kawakamii* Hayata, Icon. Pl. Formosan. 5: 82. 1915.

高山缬草 gao shan xie cao

Plants 10–20 cm tall, stoloniferous. Rhizomes short, slender. Stems simple, glabrous. Lower cauline leaves long petiolate; petiole ca. as long as leaf blade, semiamplexicaul; blade obovate-spatulate, 2–3 × 0.8–1 cm, pinnatisect; terminal lobe

ovate, ca. 10×7 – 10 mm, puberulent, ultimately glabrescent, base cuneate, margin entire or remotely dentate, ciliate, apex obtuse to acute; lateral lobes similar but smaller, ca. 4×2 mm, gradually reduced distally; upper leaves remote, smaller; leaflets 3–5. Inflorescence corymbiform, 1–2 cm in diam.; bracts linear, ca. 4×0.5 mm, base dilated and amplexicaul, auriculate, ciliate, margin entire, apex obtuse. Flowers sessile. Corolla tubular-campanulate, ca. 2.7×1.5 mm; lobes oblong-deltoid, ca. 0.7×0.7 mm, glabrous, apex obtuse. Filaments inserted at middle part of corolla tube, ca. 1 mm, included, glabrous. Stamens 4, inserted distally in tube. Style exerted, 1–1.5 mm; stigma clavate. Achenes oblong-ovoid, ca. 3 mm. Fl. Apr–Jul, fr. Jul.

- Forests; high elevations. Taiwan.

15. *Valeriana lancifolia* Handel-Mazzetti, Acta Horti Gothob. 9: 181. 1934.

披针叶缬草 pi zhen ye xie cao

Plants 15–50 cm tall. Rhizomes reduced; roots fascicled, 0.5–1 mm in diam. Stems solitary, erect, simple, glabrous or subglabrous except at nodes. Leaves in 3 or 4 pairs near base of stem, sessile or shortly petiolate; blade oblong or lanceolate, 2– 10×0.5 – 3 cm, base truncate, rounded, or broadly cuneate, margin coarsely serrate, apex rounded to acute. Inflorescence laxly paniculiform at anthesis; branches elongating in fruit, to ca. 30 cm; bracts spatulate, margin incised-dentate. Corolla rose, funnelform, 3–4 mm; lobes ovate, ca. 1/2 as long as tube. Stamens slightly exerted. Style evidently exerted. Achenes sublanceolate, 2.5 – $3 \times$ ca. 1 mm, glabrous; calyx segments ca. 5.5 mm. Fl. Jun–Jul, fr. Jul–Aug.

- Grassy slopes; 3200–4300 m. W Sichuan.

16. *Valeriana minutiflora* Handel-Mazzetti, Acta Horti Gothob. 13: 233. 1939.

小花缬草 xiao hua xie cao

Plants 8–45 cm tall. Rhizomes reduced; roots fascicled, clavate, 1.5–2 mm in diam., ± fleshy. Stems solitary, erect, simple. Cauline leaves in 3–5 pairs; petiole of lowermost leaves 1.5–3 cm; blade obovate to elliptic, 1 – 2×0.7 – 1.5 cm, sparsely pubescent, base rounded, margin coarsely serrate or crenulate, apex obtuse. Middle and upper leaves with shorter petiole; blade lyrate; terminal segment ovate to elliptic, 1–2 cm, margin sparsely serrate or crenulate, apex obtuse or acute; lateral segments much smaller, in 1 or 2 pairs. Inflorescence capitate at anthesis; bracts and bracteoles linear, entire or serrate, subequal to achenes in length. Corolla whitish rose, white, rose-purple, or pink, funnelform, 2.5–3 mm (bisexual) or ca. 1.5 mm (female), glabrous or pilose within; lobes ovate, equal to tube in length. Achenes ovoid-oblong, ca. 2.5 mm, glabrous or partially pilose. Fl. Jul–Aug, fr. Aug–Sep.

- Forests, grassy or stony slopes; 3000–4100 m. Qinghai, W Sichuan (Kangding, Qianning, Xiangcheng), Xizang, NW Yunnan.

17. *Valeriana officinalis* Linnaeus, Sp. Pl. 1: 31. 1753.

缬草 xie cao

Valeriana alternifolia Bunge; *V. alternifolia* f. *angustifolia* (Komarov) Kitagawa; *V. alternifolia* var. *angustifolia* (Komarov) S. H. Li; *V. alternifolia* f. *verticillata* (Komarov) S. X. Li;

V. chinensis Kreyer ex Komarov; *V. coreana* Briquet; *V. coreana* subsp. *leiocarpa* (Kitagawa) Voroschilov; *V. dubia* Bunge; *V. fauriei* Briquet; *V. fauriei* var. *leiocarpa* (Kitagawa) Kitagawa; *V. leiocarpa* Kitagawa; *V. nipponica* Nakai ex Kitagawa; *V. officinalis* var. *alternifolia* (Bunge) Ledebour; *V. officinalis* var. *latifolia* Briquet; *V. pseudofficinalis* C. Y. Cheng & H. B. Chen; *V. stubendorfii* Kreyer ex Komarov; *V. stubendorfii* f. *angustifolia* Komarov; *V. stubendorfii* f. *verticillata* Komarov; *V. subbipinnatifolia* A. I. Baranov; *V. tianschanica* Kreyer ex Handel-Mazzetti.

Plants up to 150 cm tall, infrequently stoloniferous. Rhizomes reduced; roots fascicled, clavate, 1.5–2.5 mm in diam. Stems hirsute or hispidulous, particularly at nodes, rarely glabrous. Basal and lowermost cauline leaves usually wilted at anthesis; cauline leaves petiolate to sessile; petiole 0–8 cm; blade ovate to broadly ovate, 5–15 \times 3–8 cm, pinnatisect; segments 7–15, lanceolate or linear, glabrous or ± hispidulous, base decurrent, margin entire or coarsely serrate; terminal and lateral segments similar in shape and size. Inflorescence corymbiform, large and compact even in fruit, or with 2 distinct, secondary lateral inflorescences; bracts leaflike below, small and linear-lanceolate otherwise; bracteoles elliptic-oblong, oblanceolate, or linear-lanceolate, margin scarious-ciliate, apex awned. Corolla purplish red, pink, or white, funnelform, 4–6 mm; lobes elliptic. Stamens and style strongly exerted. Achenes narrowly ovoid, 4–5 mm, both sides glabrous or pubescent. Fl. May–Jul, fr. Jun–Oct. $2n = 14, 28, 42, 56$.

Grassy slopes, forests, by streams; below 2500 m, but up to 4000 m in Qinghai, Sichuan, and Xizang. Anhui, Chongqing, Gansu, Guizhou (Fanjing Shan, Huangping, Kaili), Hebei, Henan, W Hubei, W Hunan (Sangzhi, Xinning), Jiangxi (Lu Shan), N and SE Nei Mongol, Qinghai, Shaanxi, Shandong (Changqing, Kunyu Shan, Taishan), Shanxi, Sichuan, Taiwan, Xizang (Jomda, Qamdo, Riwoqê), Zhejiang (Tianmu Shan) [Japan, Russia; Europe].

Valeriana officinalis is a very variable species for which several infraspecific taxa have been described.

18. *Valeriana sichuanica* D. Y. Hong, Acta Phytotax. Sin. 30: 371. 1992.

川缬草 chuan xie cao

Plants 25–55 cm tall. Rhizomes reduced; roots fascicled, fibrous, ca. 1 mm in diam. Stolons sometimes present. Stems solitary, erect, simple, densely retrorsely hispid below, gradually sparsely so upward. Leaves all cauline, sparsely hispidulous adaxially; lower 1 or 2 pairs with petiole 2–3 cm; blade ovate to elliptic, 2–5 \times 1.2–2 cm, margin subentire to serrate; upper leaves pinnatisect, segments 4- or 5-paired, linear to elliptic, 1.5–3 \times 0.2–0.7 cm; terminal segment similar or slightly broader. Inflorescence laxly corymbiform; peduncles 8–14 cm; bracts linear; bracteoles ca. as long as achenes. Corolla rose, funnelform, 4–4.5 mm; tube ca. 2.5 mm, inside villous; lobes 1.5–2 \times ca. 1 mm. Stamens and style exerted. Achenes narrowly ovoid, ca. 4 mm, sparsely hispid. Fl. Jul, fr. Aug.

- Mountain slopes; ca. 3600 m. SW Sichuan (Muli).

19. *Valeriana stenoptera* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 295. 1912.

窄叶缬草 zhai ye xie cao

Valeriana stenoptera var. *cardaminea* Handel-Mazzetti.

Plants ca. 10 cm tall, infrequently stoloniferous. Rhizomes reduced; roots 3–6, fascicled, 1.5–2 mm in diam. Stems solitary, simple, erect, sparsely retrorsely puberulent below and at nodes above. Lower cauline leaves long petiolate; petiole 3–4 cm; blade obovate to ovate, 1–2 cm, undivided or with 1 or 2 pairs of small segments at base, margin serrulate. Middle and upper cauline leaves long petiolate to shortly petiolate or sessile; blade oblong or oblong-lanceolate, 2–5 × 1–2 cm, pinnatisect; segments 5–15, linear to linear-lanceolate, 12–20 × 1–2 mm, sparsely puberulent, margin entire or incised. Inflorescence capitate, becoming lax in fruit, 6–12 × 2–8 cm; bracts linear-lanceolate, sparsely dentate; bracteoles as long as or slightly shorter than achenes. Corolla rose, funnelform; tube 1.5–3 × 0.8–1.2 mm, inside villous; lobes elliptic, 1.5–2 × ca. 1 mm. Stamens and style exerted. Achenes ovoid-ellipsoid, ca. 4 mm, often pubescent. Fl. Jul–Aug, fr. Aug–Sep.

• Grassy slopes, forest margins, by water; 3000–4000 m. W Sichuan, Xizang, NW Yunnan.

20. *Valeriana tangutica* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 375. 1894.

小缬草 xiao xie cao

Plants 10–20 cm tall, glabrous throughout. Rhizomes ascending, 0.5–2 cm, usually covered with fibrous remains of old leaves; roots fibrous, ca. 0.5 mm in diam. Stems erect, simple. Basal and lower cauline leaves long petiolate; petiole to 5 cm; blade broadly ovate to oblong-ovate, 1–4 × 1–1.5 cm, margin entire. Middle cauline leaves lyrate; terminal lobe orbicular or oblong, ca. 1 × 1 cm; lateral lobes 1- or 2-paired, reduced, elliptic to linear-elliptic, margin entire, apex obtuse. Upper cauline

leaves pinnatifid; segments 5–7, linear-lanceolate, entire; terminal one larger. Inflorescence semiglobose, 1–2 cm in diam.; bracts and bracteoles lanceolate, membranous. Corolla white, rose, pink, or sometimes purplish, funnelform, 5–6 mm; lobes obovate, nearly as long as tube. Stamens and style exerted. Achenes ovoid-ellipsoid, ca. 3 × 1 mm, glabrous. Fl. Jun–Jul, fr. Jul–Aug.

• Meadows, forests; 2000–3900(–4200) m. Gansu (Jiayuguan, Lintan, Sunan), SW Nei Mongol (Alxa Zuoqi), NW Ningxia (Helan Shan), N and NE Qinghai, Sichuan (Xiangcheng).

21. *Valeriana trichostoma* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 117. 1923.

毛口缬草 mao kou xie cao

Valeriana muliensis S. K. Wu.

Plants less than 12 cm tall, stoloniferous. Rhizomes reduced; roots fascicled. Stems solitary, erect, simple, glabrous. Basal leaves not seen; cauline leaves undivided; petiole of lowermost leaves 2–5 cm; leaves shortly petiolate to sessile above; blade orbicular to orbicular-elliptic, 8–13(–30) mm, hispidulous, 3–5-veined, base rounded, margin entire or those of upper leaves coarsely crenulate, apex rounded. Inflorescence capitate, 1.3–2.5 cm in diam.; peduncles ca. 1 cm; bracts linear-spatulate, ca. 6 mm, sparsely ciliate. Corolla rose or pink, funnelform, ca. 7 mm; tube ca. 4 mm, inside hirsute; lobes obovate-oblong. Stamens ca. as long as corolla. Ovary densely hirsute; style exerted by ca. 2 mm. Achenes not seen. Fl. Jul–Aug, fr. Sep.

• Grassy slopes; 3600–4600 m. SW Sichuan (Muli), NW Yunnan (Lijiang, Zhongdian).