

## 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, funnellform, 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, funnellform, 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 (Gaoxiong, 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, funnellform, 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 (Dêqên).

**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.  $10 \times 7$ – $10$  mm, puberulent, ultimately glabrescent, base cuneate, margin entire or remotely dentate, ciliate, apex obtuse to acute; lateral lobes similar but smaller, ca.  $4 \times 2$  mm, gradually reduced distally; upper leaves remote, smaller; leaflets 3–5. Inflorescence corymbiform, 1–2 cm in diam.; bracts linear, ca.  $4 \times 0.5$  mm, base dilated and amplexicaul, auriculate, ciliate, margin entire, apex obtuse. Flowers sessile. Corolla tubular-campanulate, ca.  $2.7 \times 1.5$  mm; lobes oblong-deltoid, ca.  $0.7 \times 0.7$  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– $10 \times 0.5$ – $3$  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.,  $\pm$  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  $\times$  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  $\pm$  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, funnellform; tube 1.5–3 × 0.8–1.2 mm, inside villous; lobes elliptic, 1.5–2 × ca. 1 mm. Stamens and style exserted. 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, funnellform, 5–6 mm; lobes obovate, nearly as long as tube. Stamens and style exserted. 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 subsessile 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, funnellform, ca. 7 mm; tube ca. 4 mm, inside hirsute; lobes obo-

vate-oblong. Stamens ca. as long as corolla. Ovary densely hirsute; style exserted by ca. 2 mm. Achenes not seen. Fl. Jul–Aug, fr. Sep.

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

