

#### 4. VERATRUM Linnaeus, Sp. Pl. 2: 1044. 1753.

藜芦属 li lu shu

Chen Xinqi (陈心启 Chen Sing-chi); Hiroshi Takahashi<sup>1</sup>

Herbs perennial, usually andropolygamous, with short, thick rhizomes and stout, slightly fleshy roots. Stems erect, terete, stout, usually pubescent, leafy, usually enclosed basally by fibers or reticulate fibers formed from disintegrated sheaths. Leaves alternate, sheathed and clasping, broad to narrow, strongly plicately veined, basally usually narrowed. Inflorescence usually a terminal panicle, many flowered. Flowers shortly pedicellate or sessile, white, yellowish, green, or dark purple-brown, funnellform, cupular to opening flat. Tepals 6, usually free, spreading, persistent in fruit. Stamens 6, inserted at base of tepals; anthers reniform to cordate-orbicular, with locules confluent and dehiscent by an apical valve. Ovary 3-loculed, slightly 3-lobed apically, ovules usually many. Styles 3, short, persistent, stigmatic adaxially. Fruit a septicidal capsule. Seeds several per valve, flattened, narrowly winged.

About 40 species: mainly in temperate regions of the N hemisphere; 13 species (eight endemic) in China.

- 1a. Basal sheath of stem with only longitudinal veins, becoming fibrous when disintegrated.
  - 2a. Leaves glabrous or sparsely pubescent ..... 2. *V. oxysepalum*
  - 2b. Leaves densely pubescent abaxially.
    - 3a. Leaves silvery pubescent abaxially ..... 1. *V. dahuricum*
    - 3b. Leaves brownish or grayish pubescent abaxially.
      - 4a. Tepals prominently erose-denticulate at margin; ovary densely woolly ..... 4. *V. grandiflorum*
      - 4b. Tepals scarcely erose-denticulate at margin; ovary glabrous ..... 3. *V. lobelianum*
- 1b. Basal sheath of stem with both longitudinal and transverse veins, becoming reticulate when disintegrated.
  - 5a. Leaves conspicuously petiolate.
    - 6a. Plants rather small, to 40 cm tall; flowers relatively small, with tepals 2–3 × ca. 1 mm; capsule pendulous ..... 8. *V. micranthum*
    - 6b. Plants relatively large, usually to 1 m tall; flowers relatively large, with tepals more than 4 × 2 mm; capsule erect.
      - 7a. Leaf blade papillose-pubescent on abaxial veins ..... 7. *V. oblongum*
      - 7b. Leaf blade glabrous.
        - 8a. Pedicels on branches of panicle 1 cm or more, ca. 2 × as long as perianth ..... 6. *V. maackii*
        - 8b. Pedicels on branches of panicle less than 1 cm, subequaling perianth ..... 9. *V. schindleri*
  - 5b. Leaves sessile or sometimes shortly petiolate in distal part of stem.
    - 9a. Leaf blade usually broadly elliptic to broadly ovate-lanceolate, to 10 cm wide; flowers black-purple ..... 5. *V. nigrum*
    - 9b. Leaf blade narrowly oblong or lorate, 1–3(–8.5) cm wide; flowers usually yellowish green or greenish white, rarely dark purple (in *V. formosanum*).
      - 10a. Tepals adaxially with 2 conspicuous glands in proximal part ..... 12. *V. mengtzeanum*
      - 10b. Tepals eglandular.
        - 11a. Bracts glabrous; flowers usually dark purple ..... 10. *V. formosanum*
        - 11b. Bracts white woolly-ciliate; flowers yellowish to greenish.
          - 12a. Branches of panicle horizontally spreading or slightly recurved, sometimes zigzagged, pedicels 7–15 mm ..... 13. *V. taliense*
          - 12b. Branches of panicle suberect or spreading at an acute angle, pedicels (1–)2–3(–4) mm ..... 11. *V. stenophyllum*

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**1. *Veratrum dahuricum*** (Turczaninow) Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 134. 1926.

兴安藜芦 xing an li lu

*Veratrum album* Linnaeus var. *dahuricum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 28(1): 295. 1855.

Plants 70–150 cm tall, basally with dense, non-reticulate fibers formed from disintegrated sheaths. Leaves cauline, sessile, basally clasping; leaf blade elliptic or ovate-elliptic, 13–23 × 5–11 cm, abaxially densely silvery pubescent, apex acuminate. Panicle ± fusiform, 20–60 cm, many flowered; lateral branches subequaling terminal raceme, basal one usually with branchlets; rachis densely white pubescent-woolly; bracts ovate-lanceolate, pubescent marginally and abaxially. Pedicel ca. 2 mm. Tepals yellowish green, with white margin, elliptic or ovate-elliptic, 0.8–1.2 cm × 3–4 mm, abaxially pubescent, base clawed, margin erose. Stamens 4–6 mm. Ovary ovoid, densely pubescent. Fl. Jun–Aug.

Meadows, moist grassy slopes; near sea level to 500 m. Heilongjiang, Jilin, Liaoning, ?Nei Mongol [Korea, Russia].

**2. *Veratrum oxysepalum*** Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 13: 79. 1840.

尖被藜芦 jian bei li lu

*Veratrum patulum* Loesener.

Plants to 1 m tall, basally with dense, non-reticulate fibers formed from disintegrated sheaths. Leaves cauline, sessile, basally clasping; leaf blade elliptic or oblong, (3–)14–22(–29) × ca. 14 cm, abaxially glabrous or sparsely pubescent, apex acute or acuminate. Panicle 30–35(–50) cm, many flowered; lateral branches and terminal raceme 8–12 cm; rachis densely pubescent-woolly. Pedicel 1–3(–6) mm, shorter than bracts. Tepals adaxially white, abaxially green, oblong to obovate-oblong, 7–11 × 3–6 mm, base narrowed, margin denticulate, apex rounded or subacute; outer tepals slightly pubescent at abaxial base. Stamens 4–7 mm. Ovary ca. 2 × 1 mm, sparsely pubescent or papillose-pubescent. Fl. Jul.  $2n = 32, 64, 70(–72), 80$ .

Forested slopes, moist meadows; near sea level to 2200 m. Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia].

**3. *Veratrum lobelianum*** Bernhadi, Neues J. Bot. 2: 356. 1807.

阿尔泰藜芦 a er tai li lu

Plants to more than 1 m tall, stout, basally with non-reticulate fibers formed from disintegrated sheaths. Leaves cauline, sessile or subsessile, basally clasping; leaf blade broadly ovate-elliptic, 18–22 × 10–16 cm, in apical part of stem lanceolate and much smaller, abaxially densely puberulent, apex obtuse or acuminate. Panicle to 30 cm, with many branches and branchlets, densely many flowered; rachis densely gray pubescent. Pedicel 1–2 mm, shorter than bracts, pubescent. Tepals yellowish green, narrowly elliptic, 1.1–1.2 cm × 4–4.5 mm, narrowed to a stalklike base, margin inconspicuously denticulate, apex subacute or obtuse. Stamens 6–7 mm. Ovary glabrous. Capsule 2–2.5 × ca. 1 cm. Fl. and fr. Aug–Sep.  $2n = 32$ .

Shaded and moist places in mountain forests; 1500–2000 m. N Xinjiang [Kazakstan, Mongolia, Russia; Europe].

**4. *Veratrum grandiflorum*** (Maximowicz ex Baker) Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 135. 1926.

毛叶藜芦 mao ye li lu

*Veratrum album* Linnaeus var. *grandiflorum* Maximowicz ex Baker, J. Linn. Soc., Bot. 17: 471. 1879; *V. bracteatum* Batalin var. *tibeticum* Loesener; *V. puberulum* Loesener.

Plants stout, to 1.5 m tall, basally with non-reticulate fibers formed from disintegrated sheaths. Leaves cauline, sessile, basally clasping; leaf blade broadly elliptic to oblong-lanceolate, 10–15(–26) × 6–9(–16) cm, abaxially densely brown or gray pubescent, apex obtuse-rounded or acuminate. Panicle 20–50 cm; lateral branches suberect or spreading at an acute angle, 5–10(–14) cm; terminal raceme ca. 2 × as long as lateral ones. Pedicel 2–3(–5) mm, shorter than bracts, sometimes densely pubescent. Tepals greenish white, broadly oblong or elliptic, 1.1–1.7 cm × ca. 6 mm, base slightly clawed, margin erose-denticulate, apex obtuse; outer tepals densely pubescent abaxially, particularly in proximal part. Stamens 6–10 mm. Ovary subconical, densely pubescent. Capsule 1.5–2.5 × 1–1.5 cm. Fl. and fr. Jul–Aug.  $2n = 32^*$ .

• Forested slopes, moist grassy places; 2600–4000 m. Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

**5. *Veratrum nigrum*** Linnaeus, Sp. Pl. 2: 1044. 1753.

藜芦 li lu

*Veratrum bracteatum* Batalin; *V. nigrum* var. *microcarpum* Loesener; *V. nigrum* subsp. *ussuriense* (Loesener) Voroschilov; *V. nigrum* var. *ussuriense* Loesener; *V. ussuriense* (Loesener) Nakai.

Plants stout, to 1 m tall, basally with black, reticulate fibers formed from disintegrated sheaths. Leaves cauline, sessile or sometimes shortly petiolate in distal part of stem; leaf blade broadly elliptic to broadly ovate-lanceolate, usually 22–25 × ca. 10 cm, glabrous, apex acute or acuminate. Panicle many flowered; lateral branches suberect or spreading at an acute angle, often with male flowers; terminal raceme usually with bisexual flowers; rachis densely white woolly; bracts pubescent marginally and abaxially. Pedicel on branches of panicle ca. 5 mm, subequaling bracts, densely woolly. Tepals black-purple, oblong, 5–8 × ca. 3 mm, spreading or slightly recurved in bisexual flowers, margin entire. Stamens 2.5–4 mm. Ovary glabrous. Capsule 1.5–2 × 1–1.3 cm. Fl. and fr. Jul–Sep.  $2n = 16, 64$ .

Forested or grassy slopes; 1200–3300 m. Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan [Kazakstan, Mongolia, Russia; C Europe].

**6. *Veratrum maackii*** Regel, Mém. Acad. Imp. Sci. Saint Pétersbourg, sér. 7, 4(4): 169. 1861.

毛穗藜芦 mao sui li lu

*Veratrum bohnhoffii* Loesener; *V. manschuricum* Loesener; *V. nigrum* Linnaeus var. *maackii* (Regel) Maximowicz; *Zigadenus japonicus* Miquel.

Plants rather slender, 60–100(–160) cm tall, basally with brown, reticulate fibers formed from disintegrated sheaths. Petiole to 10 cm; leaf blade oblong-lanceolate or narrowly oblong-elliptic, 25–32 × 1–4(–8) cm, glabrous, base cuneate, apex long acuminate. Panicle with 2 or 3 rather short branches, rarely with branchlets, laxly flowered; rachis densely woolly; bracts 3–4 mm, pubescent marginally and abaxially. Pedicel 1–1.4 cm, ca. 2 × as long as perianth. Tepals black-purple, subobovate-oblong, 5–7 × 2–3 mm, base not clawed, margin entire. Stamens 3–4 mm. Ovary glabrous. Capsule erect, 1–1.7 × 0.5–1 cm.  $2n = 16$ .

Mountain forests, alpine meadows; 400–1700 m. ?Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong [Japan, Korea, Russia].

**7. *Veratrum oblongum*** Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 142. 1926.

长梗藜芦 chang geng li lu

*Veratrum maximowiczii* Baker var. *hupehense* Pampanini.

Plants rather slender, to 1 m tall, basally with brown, reticulate fibers formed from disintegrated sheaths. Leaves long petiolate; leaf blade narrowly elliptic to oblong-lanceolate, usually 20–30 × 2–6 cm, usually papillose-pubescent along abaxial veins, base cuneate, apex long acuminate. Panicle to 80 cm, with many lateral branches ca. 15 cm, sometimes basal branches with branchlets, laxly many flowered; rachis woolly; bracts 2–5 mm, much shorter than pedicel. Pedicel slender, 1–1.5 cm. Tepals spreading or recurved, purple, oblong, 5–7(–8) × 2–3 mm, base not clawed, apex obtuse; outer tepals pubescent at abaxial base. Stamens 2.5–3.5 mm. Ovary glabrous. Capsule erect, 1.5–2 × ca. 0.7 cm. Fl. and fr. Aug–Sep.

• Shrubby slopes; 1000–2100 m. W Hubei, Jiangxi, E Sichuan.

**8. *Veratrum micranthum*** F T. Wang & Tang, Contr. Inst. Bot. Natl. Acad. Peiping 6: 215. 1949.

小花藜芦 xiao hua li lu

Plants rather slender, 30–40 cm tall, basally with brown, reticulate fibers formed from disintegrated sheaths. Leaves 3 or 4 in proximal part of stem; petiole 2–3 cm; leaf blade oblong-elliptic, 16–18 × 1.7–3.5 cm, glabrous, base cuneate, apex acute. Panicle 15–19 cm, laxly many flowered; lateral branches 3–5 cm, rather slender, usually with male flowers; terminal raceme longer, with bisexual flowers; rachis shortly woolly; bracts 1–2 mm, pubescent marginally and abaxially. Pedicel 1–2 mm. Tepals yellowish green, suboblong, 2–3 × ca. 1 mm, base not clawed, margin ciliate, apex obtuse. Stamens 1–1.5 mm. Ovary glabrous. Capsule pendulous, ca. 1 × 0.7 cm.

• NE and W Sichuan, Yunnan.

**9. *Veratrum schindleri*** Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 139. 1926.

牯岭藜芦 gu ling li lu

*Veratrum atroviolaceum* Loesener; *V. warburgii* Loesener.

Plants to 1 m tall, basally with brown, reticulate fibers formed from disintegrated sheaths. Leaves basally narrowed to a rather long or basally clasping petiole; leaf blade broadly elliptic to lorate, (15–)20–30(–60) × (0.5–)2–10(–13) cm, gla-

brous, base cuneate, apex acute to acuminate. Panicle variable in length, laxly many flowered; branches spreading; rachis gray-white woolly; bracts 5–7 mm, abaxially woolly. Pedicel 6–8 (–14) mm. Tepals yellowish green, greenish white, brownish, deep purple-violet, or black-purple, subelliptic, oblong, oblong-lanceolate, or obovate-elliptic, 5–8 × 2–3 mm, base not clawed, apex obtuse or subacute; outer tepals pubescent at least at abaxial base. Stamens 2–5 mm. Ovary glabrous. Capsule erect, 1–2 × ca. 1 cm. Fl. and fr. Jun–Oct.  $2n = 16^*$ .

• Shaded and moist places on forested slopes; 700–1400 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

Chinese records of *Veratrum japonicum* (Baker) Loesener (e.g., in FRPS) are referable to *V. schindleri*.

**10. *Veratrum formosanum*** Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 142. 1926.

台湾藜芦 tai wan li lu

*Veratrum formosanum* f. *albiflorum* (Masamune) Masamune; *V. formosanum* var. *albiflorum* Masamune; *V. kudoii* Masamune.

Plants stout, to more than 30 cm tall, basally usually with blackish, reticulate fibers formed from disintegrated sheaths. Leaves sessile, basally somewhat clasping; leaf blade linear-lanceolate, 12–20 × 1–2 cm, glabrous. Panicle many flowered; rachis densely woolly; bracts deltoid-lanceolate, 0.5–1.5 cm, glabrous. Pedicel 1–1.5 cm, densely woolly. Tepals dark purple, rarely white, oblanceolate, 1–1.5 cm × 2–3 mm, glabrous, base slightly cuneate. Ovary glabrous. Capsule ca. 2 × 1.3 cm. Seeds ca. 8 mm, winged. Fl. and fr. Aug.  $2n = 16^*$ .

• Grasslands, open dry places on mountains. Taiwan.

This description follows that by Liu and Ying (in Li et al., Fl. Taiwan 5: 84. 1978).

**11. *Veratrum stenophyllum*** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 303. 1912.

狭叶藜芦 xia ye li lu

Plants to more than 1 m tall, basally with several whitish or brownish, membranous sheaths which usually become reticulate fibers apically. Leaves sessile, basally clasping; leaf blade lorate, narrowly oblong, oblanceolate, or subfalcate, 25–32 × 2.5(–8.5) cm, glabrous or papillose-puberulent on abaxial veins, base narrowed, apex long acuminate. Panicle densely many flowered; lateral branches slender, with male flowers; terminal raceme with bisexual flowers; bracts 2–3 mm, abaxially woolly. Pedicel (1–)2–3(–4) mm. Tepals pale yellow or yellowish green, oblong or ovate-oblong, 4–7 × 2–4 mm, slightly pubescent at abaxial base, base shortly clawed, apex subacute. Ovary glabrous. Capsule erect, appressed to rachis. Fl. and fr. Jul–Oct.

• Shaded places in forests, forest margins, grassy slopes; 2000–4000 m. W Sichuan, NW Yunnan.

- 1a. Leaf blade glabrous; flowers relatively large, tepals 5–7 × 3–4 mm ..... 11a. var. *stenophyllum*
- 1b. Leaf blade papillose-puberulent on abaxial

veins; flowers relatively small, tepals  
4–4.5 × 2–2.5 mm ..... 11b. var. *taronense*

**11a. *Veratrum stenophyllum* var. *stenophyllum***

狭叶藜芦(原变种) xia ye li lu (yuan bian zhong)

*Veratrum yunnanense* Loesener.

Leaf blade glabrous. Tepals 5–7 × 3–4 mm.

• Grassy slopes, shaded places in forests; 2000–4000 m. W Sichuan, NW Yunnan.

**11b. *Veratrum stenophyllum* var. *taronense*** F. T. Wang & Z. H. Tsi in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 282. 1980.

滇北藜芦 dian bei li lu

Leaf blade papillose-puberulent on abaxial veins. Tepals 4–4.5 × 2–2.5 mm.

• Forest margins; 2900–3800 m. NW Yunnan (Gongshan Drung-Nu Zu Zizhixian).

**12. *Veratrum mengtzeanum*** Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 145. 1926.

蒙自藜芦 meng zi li lu

*Veratrum wilsonii* C. H. Wright ex Loesener.

Plants to 1–1.5 m tall, basally with several brownish or whitish, membranous sheaths which usually become reticulate fibers apically. Leaves basal and cauline, sessile, basally clasping; leaf blade narrowly oblong or lorate, 22–50 × 1–3 cm, glabrous, apex long acuminate. Panicle 16–30(–50) cm, laxly branched; rachis stout, shortly woolly; bracts 8–10 mm, sparsely pubescent. Pedicel 1–1.3 cm. Tepals whitish or yellow-green, spreading, obovate-spatulate to elliptic-obovate, 8–12 × 4–6 mm, texture rather thick, base conspicuously clawed, apex obtuse-rounded, adaxially with 2 conspicuous glands in proximal part. Ovary glabrous. Capsule erect, 1.5–2 × ca. 1 cm. Fl. and fr. Jul–Oct.

• Forests, hillsides; 1200–3300 m. Guizhou, Yunnan.

**13. *Veratrum taliense*** Loesener, Verh. Bot. Vereins Prov. Brandenburg 68: 145. 1926.

大理藜芦 da li li lu

*Veratrum cavaleriei* Loesener.

Plants to more than 1 m tall, basally with several whitish or brownish, membranous sheaths which usually ± become reticulate fibers apically. Leaves basal and cauline, sessile, basally clasping; leaf blade sublorate, 20–40 × 1.5–3 cm, glabrous, apex long acuminate. Panicle to 85 cm, laxly branched; branches 12–16 cm, sometimes slightly zigzagged; terminal raceme more than 40 cm; rachis stout, shortly woolly; bracts 7–9 mm, pubescent. Pedicel 0.9–1.2 cm. Tepals yellowish green, oblong, 8–11 × 4–5 mm, eglandular, base subsessile, apex subacute. Ovary glabrous. Capsule 1.5–2 × ca. 1 cm. Fl. and fr. Oct–Nov.

• Grassy slopes; ca. 2400 m. SW Sichuan, Yunnan.

