

9. PARIS Linnaeus, Sp. Pl. 1: 367. 1753.

重楼属 chong lou shu

Liang Songyun (梁松筠 Liang Song-jun); Victor G. Soukup¹

Daiswa Rafinesque; *Euthyra* Salisbury; *Kinugasa* Tatewaki & Suto.

Herbs perennial. Rhizome slender or thickened. Stem erect, simple. Leaves 4 to many, very rarely 3, in a terminal whorl, petiole late, lanceolate to ovate, with 3 main veins and anastomosing veinlets. Flowers bisexual, solitary, terminal, pedunculate. Tepals 3–8, in 2 whorls, free; outer ones green, rarely ± white, ovate to lanceolate; inner ones linear or occasionally absent. Stamens 8–24 or more, 2–8 × as many as tepals; filaments narrow, flat; anthers basifixed, often with convex connective apically. Ovary subglobose, 1-loculed with parietal placentation or 4–10-loculed with axile placentation. Style short; stigma lobes 4–10. Fruit a berry or a berrylike capsule, indehiscent or loculicidal, several to many seeded.

About 24 species: Bhutan, China, India, Japan, Korea, Laos, Mongolia, Myanmar, Nepal, Russia, Sikkim, Thailand, Vietnam; Europe; 22 species (12 endemic) in China.

The rhizomes of many species are used medicinally in China.

- 1a. Ovary 4–10-loculed, with axile placentation; berry indehiscent; seeds sometimes with a spongy (never succulent) aril on 1 side.
- 2a. Rhizome creeping, elongate, slender, 2–5 mm thick; seeds without aril, funicle not swollen.
- 3a. Leaves usually 6–8; outer tepals oblong-lanceolate to ovate-lanceolate, 10–25(–30) mm wide 20. *P. verticillata*
- 3b. Leaves usually 4; outer tepals narrowly lanceolate, 3–9 mm wide.
- 4a. Leaves oblong-lanceolate or ovate-elliptic; outer tepals reflexed, 3–5 mm wide 21. *P. bashanensis*
- 4b. Leaves broadly obovate or ovate; outer tepals spreading horizontally, 5–9 mm wide 22. *P. quadrifolia*
- 2b. Rhizome 8–45 mm thick; seeds ± enveloped by whitish green, spongy aril formed by swollen funicle.
- 5a. Leaves 9–10 19. *P. dulongensis*
- 5b. Leaves 4–6.
- 6a. Leaves wrinkled, obovate, 10–15 × 6.3–10 cm, basally rounded 18. *P. rugosa*
- 6b. Leaves not wrinkled.
- 7a. Leaves elliptic or oblanceolate, base subcuneate 17. *P. vaniotii*
- 7b. Leaves oblong, ovate- or obovate-oblong, or oblong-lanceolate, base shallowly cordate or rounded.
- 8a. Seeds white or yellow-red, slightly enveloped by swollen funicle 16. *P. forrestii*
- 8b. Seeds yellow-brown, 1/2 enveloped by greenish white or rarely orange, spongy aril formed by enlarged funicle 15. *P. axialis*
- 1b. Ovary 1-loculed with parietal placentation; berrylike capsule dehiscent irregularly; seeds with a succulent aril.
- 9a. Stamens 4–6 × as many as outer tepals; seeds enveloped by orange aril 1. *P. dunniana*
- 9b. Stamens 2 or 3 × as many as outer tepals; seeds enveloped by red aril.
- 10a. Leaves with white, yellowish, or purple markings.
- 11a. Leaves with purple markings; stamens ca. 3 × as many as leaves 12. *P. polyandra*
- 11b. Leaves with white or yellowish markings; stamens 2 × as many as leaves.
- 12a. Outer tepals as many as leaves, shorter than inner ones 10. *P. luquanensis*
- 12b. Outer tepals fewer than leaves, longer than inner ones 11. *P. marmorata*
- 10b. Leaves without markings.
- 13a. Plants pubescent or papillose-pubescent.
- 14a. Free portion of connective 0.5–1 mm 8. *P. mairei*
- 14b. Free portion of connective 13–15 mm 9. *P. wexianensis*
- 13b. Plants glabrous or nearly so.
- 15a. Free portion of connective 6–15 mm.
- 16a. Inner tepals pendulous, margin undulate 7. *P. undulata*
- 16b. Inner tepals (if present) not pendulous, margin not undulate 14. *P. tibetica*
- 15b. Free portion of connective 1–4(–5) mm (except in *P. polyphylla* var. *pseudothibetica*).
- 17a. Filaments ca. 1 mm, shorter than free portion of connective 5. *P. daliensis*
- 17b. Filaments more than 2 mm, longer than free portion of connective.
- 18a. Free portion of connective transversely ellipsoid, subglobose, or shortly conical, as wide as or wider than long 13. *P. fargesii*
- 18b. Free portion of connective inconspicuous or longer than wide.
- 19a. Leaves (18–)23–26 × (11–)14–16 cm 3. *P. vietnamensis*

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19b. Leaves 5–17 × 2–11 cm.

20a. Leaves ovate 2. *P. cronquistii*

20b. Leaves oblong to lanceolate.

21a. Inner tepals dark purple, usually much shorter than outer ones 4. *P. delavayi*

21b. Inner tepals yellow-green, usually slightly shorter or longer than outer ones 6. *P. polyphylla*

1. *Paris dunniana* H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 78. 1910.

海南重楼 hai nan chong lou

Daiswa dunniana (H. Léveillé) Takhtajan; *D. hainanensis* (Merrill) Takhtajan; *Paris hainanensis* Merrill.

Plants 1.5–3 m tall. Rhizome 2–5 cm thick. Leaves 4–8; petiole 5–10 cm; leaf blade obovate-oblong 15–30 × 7.5–16 cm. Peduncle 60–140 cm. Outer tepals (5 or)6–8, green, oblong-lanceolate, 5–10 × 1.5–2.4 cm; inner ones green, filiform-linear, longer than outer ones. Stamens 20 or more; filaments (0.4–)0.8–1.5 cm; anthers 1.2–2.1 cm; free portion of connective 0.5–4 mm, apex acute. Ovary 1-loculed; stigma lobes (5 or) 6–8, ca. 5 mm. Capsule berrylike, subglobose, ca. 4 cm in diam., dehiscent, pale green at maturity. Seeds white, wholly enveloped by orange, succulent, aril, ca. 4 mm wide. Fl. Mar–Apr, fr. Oct–Nov. $2n = 10^*$.

• Forests; near sea level to 1100 m. Guizhou, Hainan, Yunnan.

Many plants of this species have been cultivated and closely investigated by Li (Bull. Bot. Res., Harbin 6(1): 109–111. 1986). The stamens are 20 (e.g., in *Cavalerie 3652*, the type gathering of *Paris dunniana*) or more, rather than 10–12, as described by Takhtajan (Brittonia 35: 257–258. 1983).

2. *Paris cronquistii* (Takhtajan) H. Li, Acta Bot. Yunnan. 6: 357. 1984.

凌云重楼 ling yun chong lou

Plants to 1 m tall. Rhizome 2–10 × 2–3 cm. Stem scabrous. Leaves 4–6; petiole 2.5–7.5 cm; leaf blade ovate, 11–17 × 6–11 cm, adaxially sometimes with purple markings, abaxially purple or mottled with purple. Peduncle 12–60 cm. Outer tepals 5 or 6, green, ovate-lanceolate or lanceolate, 3.5–9 × 1.3–2 cm; inner ones yellow-green, narrowly linear, 3–8 cm × 1–5 mm. Stamens usually 15–18; filaments 3–8 mm; anthers 0.7–1.5 cm; free portion of connective 1–2 mm, apex acute. Ovary green or pale purple, globose, 1-loculed, 5- or 6-ribbed. Style short; stigma lobes 5 or 6. Capsule red at maturity, dehiscent. Seeds subglobose, wholly enveloped by red aril. Fl. May–Jun, fr. Oct–Nov.

• Evergreen forests on limestone slopes, ravine forests, mossy forests; 900–2100 m. SW Guangxi, Guizhou, Sichuan, SE Yunnan.

1a. Inner tepals 3.2–8 cm × ca. 1 mm 2a. var. *cronquistii*

1b. Inner tepals ca. 3 cm × 5 mm 2b. var. *xichouensis*

2a. *Paris cronquistii* var. *cronquistii*

凌云重楼(原变种) ling yun chong lou (yuan bian zhong)

Daiswa cronquistii Takhtajan, Brittonia 35: 262. 1983.

Inner tepals 3.2–8 cm × ca. 1 mm. $2n = 10^*$.

• Ravine forests, mossy forests; 900–2100 m. SW Guangxi, Guizhou, Sichuan, SE Yunnan.

2b. *Paris cronquistii* var. *xichouensis* H. Li, Bull. Bot. Res., Harbin 6(1): 113. 1986.

西畴重楼 xi chou chong lou

Inner tepals ca. 3 cm × 5 mm.

• Evergreen forests on limestone slopes; 1400–1500 m. SE Yunnan (Xichou Xian).

3. *Paris vietnamensis* (Takhtajan) H. Li, Acta Bot. Yunnan. 6: 357. 1984.

南重楼 nan chong lou

Daiswa hainanensis (Merrill) Takhtajan subsp. *vietnamensis* Takhtajan, Brittonia 35: 259. 1983.

Plants 1–1.5 m tall. Rhizome 1.5–3.5 cm thick. Leaves 4–6; petiole 4–10 cm; leaf blade obovate to obovate-oblong, (18–)23–26 × (11–)14–16 cm, base shallowly cordate or subrounded. Peduncle (5–)30–90 cm. Outer tepals 4–7, green, lanceolate to oblong-lanceolate, usually 6–8 × 2–3 cm; inner ones narrowly linear, 5.5–11 × ca. 1 mm, distally slightly widened. Stamens 2(or 3) × as many as outer tepals; filaments 2–5 mm; anthers 0.6–1.6 cm; free portion of connective 1–5 mm, apex acute. Ovary violet, conical-ovoid, 1-loculed. Style short; stigma lobes 6. Fl. Apr–Jul. $2n = 10^*$.

Evergreen broad-leaved forests; 1200–1900 m. Guangxi, Yunnan [Vietnam].

4. *Paris delavayi* Franchet, J. Bot. (Morot) 12: 190. 1898.

金线重楼 jin xian chong lou

Daiswa delavayi (Franchet) Takhtajan; *Paris henryi* Diels.

Plants 0.5–1.5 m tall. Rhizome 1.5–5 × 0.8–1.5 cm. Stem 30–70 cm. Leaves 6–8; petiole 0.8–1.5 cm; leaf blade lanceolate or oblong-lanceolate, 6–15 × 2–3 cm. Peduncle 16–75 cm. Outer tepals (3 or)4 or 5, usually recurved, purple-green or green, narrowly lanceolate, 2–4 cm × 4–9 mm; inner ones usually dark purple, filiform-linear, shorter than outer ones. Stamens usually 8 or 10; filaments 2–4 mm; anthers 0.6–1.8 cm; free portion of connective purple, 1.5–4 mm, acute-tipped. Ovary green or distally purple, conical-ovoid. Style 3–5 mm; stigma lobes (3 or)4–6. Capsule green at maturity, conical-ovoid. Seeds enveloped by red, succulent aril. Fl. Apr–May, fr. Sep–Oct. $2n = 10^*$.

Forests, bamboo forests, thickets; 1300–2000 m. Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan [Vietnam].

5. *Paris daliensis* H. Li & V. G. Soukup in H. Li, Acta Bot. Yunnan., Suppl. 5: 15. 1992.

大理重楼 da li chong lou

Plants 70–90 cm tall. Rhizome 5–6 × 1–1.5 cm. Leaves 7–9; petiole 3–4.5 cm; leaf blade oblong, 11–15.5 × 3.2–4.5 cm, base rounded or obtuse. Peduncle 10–18 cm. Outer tepals (3–)5, green, lanceolate, 5–6.5 × 1.8–2 cm; inner ones erect, yellow-green, linear, slightly thickened distally, 6–8 cm × ca. 1 mm. Stamens (6–)10, deep purple, 5–7 mm; filaments ca. 1 mm; anthers ca. 4 mm; free portion of connective thickened, oblong-ovoid, 2–3 mm, apex obtuse. Ovary deep purple, ovoid, (3–)5-loculed. Style short; stigma lobes (3–)5. Fl. Jun.

- Forests; ca. 2600 m. W Yunnan (Dali Xian).

6. Paris polyphylla Smith in Rees, Cycl. 26: *Paris* no. 2. 1813.

七叶一枝花 qi ye yi zhi hua

Plants 10–100 cm tall. Rhizome 1–2.5 cm thick. Leaves 5–10(–22); petiole (0.5–)1–6 cm; leaf blade variable, usually oblong to lanceolate, 6–15(–30) × 0.5–5 cm, base rounded to cuneate. Peduncle 5–24(–65) cm. Outer tepals (3 or)4–6(or)7, green or yellow-green, narrowly ovate-lanceolate to lanceolate, (3–)4.5–7(–11) × 1–4 cm; inner ones usually yellow-green, narrowly linear, shorter or longer than outer ones, 1–1.5(–5) mm wide. Stamens 2 × as many as outer tepals, (6–)8–12(–14) or sometimes more; filaments 4–10 mm; anthers 5–12 mm; free portion of connective usually 0.5–4 mm. Ovary subglobose, ribbed, 1-loculed, sometimes tuberculate. Style short, base enlarged, purple to white; stigma lobes (4 or)5. Capsule globose, sometimes tuberculate. Seeds enveloped by red, succulent aril. Fl. and fr. Mar–Nov.

Forests, bamboo forests, thickets, grassy or rocky slopes, stream-sides; 100–3500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, Thailand, Vietnam].

- 1a. Ovary and capsule tuberculate 6h. var. *latifolia*
- 1b. Ovary and capsule smooth.
 - 2a. Free portion of anther connective 3–15 mm.
 - 3a. Filaments 1–2 mm; anthers ca. 6 mm 6g. var. *minor*
 - 3b. Filaments 4–6 mm; anthers 12–18 mm 6i. var. *pseudothibetica*
 - 2b. Free portion of anther connective 1–2 mm.
 - 4a. Filaments to 10 mm; stigma lobes 7 6j. var. *kwantungensis*
 - 4b. Filaments 4–7 mm; stigma lobes (4 or)5.
 - 5a. Inner tepals (2–)3–5 mm wide, distally usually widened and narrowly spatulate 6b. var. *yunnanensis*
 - 5b. Inner tepals 1–2 mm wide, distally never widened.
 - 6a. Style and apical part of ovary white 6e. var. *alba*
 - 6b. Style and apical part of ovary green or purple.
 - 7a. Anthers ca. 2 × as long as filaments 6c. var. *chinensis*
 - 7b. Anthers shorter than or nearly as long as filaments.

- 8a. Plants ca. 10 cm tall; free portion of anther connective inconspicuous 6d. var. *nana*
- 8b. Plants more than 30 cm tall; free portion of anther connective conspicuous, 0.5–1 mm.
 - 9a. Leaf blade oblong, elliptic, or obovate-lanceolate, 2.5–5 cm wide 6a. var. *polyphylla*
 - 9b. Leaf blade lanceolate to linear-lanceolate, 1.5–2.5 cm wide 6f. var. *stenophylla*

6a. Paris polyphylla var. **polyphylla**

七叶一枝花(原变种) qi ye yi zhi hua (yuan bian zhong)

Daiswa polyphylla (Smith) Rafinesque; *Paris biondii* Pampanini; *P. debeauxii* H. Léveillé; *P. taitungensis* S. S. Ying.

Plants 30–100 cm tall. Leaves 6–10, 2.5–5 cm wide. Inner tepals narrowly linear, 1–2 mm wide, usually slightly longer than outer ones. Filaments 4–7 mm; anthers 5–8 mm; free portion of connective 0.5–1 mm. $2n = 10^*$.

Forests, thickets, grassy slopes; 100–2400 m. Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Nepal, Vietnam].

6b. Paris polyphylla var. **yunnanensis** (Franchet) Handel-Mazetti, Symb. Sin. 7: 1216. 1936.

滇重楼 dian chong lou

Paris yunnanensis Franchet, Mem. Soc. Philom. (Paris) 1888: 290. 1888; *Daiswa birmanica* Takhtajan; *D. yunnanensis* (Franchet) Takhtajan; *P. aprica* H. Léveillé; *P. atrata* H. Léveillé; *P. birmanica* (Takhtajan) H. Li & Noltie; *P. cavaleriei* H. Léveillé & Vaniot; *P. christii* H. Léveillé; *P. franchetiana* H. Léveillé; *P. gigas* H. Léveillé & Vaniot; *P. mercieri* H. Léveillé; *P. pinfaensis* H. Léveillé; *P. polyphylla* var. *platypetala* Franchet; *P. polyphylla* var. *yunnanensis* f. *velutina* H. Li & Noltie.

Plants 30–100 cm tall. Leaves 5–9. Inner tepals (2–)3–5 mm wide, distally slightly widened, usually slightly shorter than outer ones. Filaments 4–7 mm; anthers 7–12 mm; free portion of connective 1–2 mm. $2n = 10^*$.

Broad-leaved or coniferous forests, bamboo forests, thickets, grassy slopes; 1400–3100 m. Guizhou, Sichuan, SE Xizang, Yunnan [India, Myanmar].

6c. Paris polyphylla var. **chinensis** (Franchet) H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, 10: 176. 1969.

华重楼 hua chong lou

Paris chinensis Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 10: 97. 1887; *Daiswa chinensis* (Franchet) Takhtajan; *D. chinensis* subsp. *brachysepala* (Pampanini) Takhtajan; *P. brachysepala* Pampanini; *P. brevipedata* Y. K. Yang; *P. formosana* Hayata.

Plants 40–130 cm tall. Leaves 5–10(or)11. Inner tepals shorter than outer ones. Filaments 5–6 mm; anthers 1–1.2 cm;

free portion of connective 0.5–1.5(–2) mm. $2n = 10^*$.

Forests, bamboo forests, thickets; 2800–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan [Laos, Myanmar, Thailand, Vietnam].

6d. *Paris polyphylla* var. *nana* H. Li, Bull. Bot. Res., Harbin 6(1): 123. 1986.

矮重楼 ai chong lou

Plants ca. 10 cm tall. Leaves 4–6. Inner tepals 1–2 mm wide, much longer than outer ones. Filaments ca. 4 mm; anthers ca. 3 mm; free portion of connective very short or inconspicuous.

- S Sichuan (Yibin Shi).

6e. *Paris polyphylla* var. *alba* H. Li & R. J. Mitchell in H. Li, Bull. Bot. Res., Harbin 6(1): 123. 1986.

白花重楼 bai hua chong lou

Paris marchandii H. Léveillé.

Leaves 8. Inner tepals equaling outer ones. Anthers slightly longer than filaments; free portion of connective less than 1 mm. Apical part of ovary and style white.

- 1500–2900 m. Guizhou, Hubei, Yunnan.

6f. *Paris polyphylla* var. *stenophylla* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 10: 97. 1887.

狭叶重楼 xia ye chong lou

Daiswa bockiana (Diels) Takhtajan; *D. lancifolia* (Hayata) Takhtajan; *Paris arisanensis* Hayata; *P. bockiana* Diels; *P. hamifer* H. Léveillé; *P. lancifolia* Hayata; *P. polyphylla* var. *brachystemon* Franchet.

Plants 35–115 cm tall. Leaves (6–)8–14(–22), 1.5–2.5 cm wide. Inner tepals 1–2 mm wide, nearly as long as outer ones. Filaments 4–6 mm; anthers 5–6 mm; free portion of connective ca. 0.5 mm. $2n = 10^*$.

Forests, rocky slopes; near sea level to 3500 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Myanmar, Nepal, Sikkim].

6g. *Paris polyphylla* var. *minor* S. F. Wang, Bull. Bot. Res., Harbin 8(3): 139. 1988.

小重楼 xiao chong lou

Plants 7–15 cm tall. Leaves 7–14. Inner tepals equaling or slightly longer than outer ones. Filaments 1–2 mm; anthers ca. 6 mm; free portion of connective ca. 4 mm. $2n = 10^*$.

- Forests; 1500–2500 m. Sichuan.

6h. *Paris polyphylla* var. *latifolia* F. T. Wang & C. Yu Chang in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 250. 1978.

宽叶重楼 kuan ye chong lou

Plants 50–55 cm tall. Leaves 8–13. Inner tepals slightly shorter than outer ones. Filaments ca. 6 mm; anthers 6.5–11 mm; free portion of connective 0.2–0.5 mm. Ovary and capsule

tuberculate. $2n = 10^*$.

• Forests, streamsides; 300–2300 m. Anhui, Henan, Hubei, Jiangxi, Shaanxi, Shanxi.

6i. *Paris polyphylla* var. *pseudothibetica* H. Li, Bull. Bot. Res., Harbin 6(1): 126. 1986.

长药隔重楼 chang yao ge chong lou

Paris polyphylla var. *pseudothibetica* f. *macrosepala* H. Li.

Leaves 9. Inner tepals absent or 3.5–7 cm, equaling or slightly longer than outer ones. Filaments 4–6 mm; anthers ca. 3 × as long as filaments; free portion of connective variable in length, 3–10(–15) mm.

- Forests, thickets; 1800–1900 m. NE Yunnan (Yiliang Xian).

6j. *Paris polyphylla* var. *kwantungensis* (R. H. Miao) S. C. Chen & S. Yun Liang, Acta Phytotax. Sin. 33: 490. 1995.

广东重楼 guang dong chong lou

Paris kwantungensis R. H. Miao, Acta Sci. Nat. Univ. Sunyatseni 1982(3): 74. 1982.

Leaves 7. Inner tepals ca. 6 cm, equaling outer ones. Filaments to 10 mm; anthers ca. 15 mm; free portion of connective ca. 1 mm. Stigma lobes usually 7.

- SW Guangdong (Xinyi Xian).

7. *Paris undulata* H. Li & V. G. Soukup in H. Li, Acta Bot. Yunnan., Suppl. 5: 16. 1992.

卷瓣重楼 juan ban chong lou

Rhizome 1–1.5 cm thick. Stem 70–80 cm. Leaves 7–9; petiole ca. 3.5 cm; leaf blade suboblong, 10–12 × 4–4.5 cm, base subrounded or broadly cuneate. Peduncle 20–30 cm. Outer tepals 4 or 5, green, lanceolate or oblanceolate, 5–6 × ca. 2 cm; inner ones pendulous, yellow-green, linear, 5–6 cm × 2–3 mm, margin undulate. Stamens 8 or 10; filaments 5–6 mm; anthers 1.1–1.2 cm; free portion of connective cylindrical, 1.1–1.5 mm, apex acute. Ovary green, ovoid-globose, 1-loculed, apex truncate. Stigma lobes 4 or 5, purple, 6–7 mm. Fl. Apr–May.

- C Sichuan (Emei Shan).

8. *Paris mairei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 302. 1912.

毛重楼 mao chong lou

Daiswa pubescens (Handel-Mazzetti) Takhtajan; *D. violacea* (H. Léveillé) Takhtajan; *Paris polyphylla* Smith var. *pubescens* Handel-Mazzetti; *P. pubescens* (Handel-Mazzetti) F. T. Wang & Tang; *P. violacea* H. Léveillé.

Plants papillose-pubescent, to 1 m tall. Rhizome 1–2 cm thick. Leaves 5–9; petiole rather short; leaf blade deep green, tinged with pale green along veins, oblong, obovate-oblanceolate, or oblanceolate, 5–14 × 2–5 cm, base cuneate or subrounded. Outer tepals (4 or)5–8(or 9), green, oblong-lanceolate, 3–7 × 1–2 cm; inner ones equaling or longer than outer ones, 1(–2) mm wide. Stamens (8–)10–16(–18), 1.1–1.5 cm; filaments usually 5–8 mm; anthers 7–9 mm; free portion of con-

nective 0.5–1 mm, apex acute. Ovary purple-red, conical-ovoid, 1-loculed. Style short; stigma lobes 5–8. Capsule purple. Seeds wholly enveloped by red aril. Fl. May–Jul, fr. Aug–Sep. $2n = 10^*$.

• Forests, thickets, alpine grassy slopes; 1800–3500 m. Guizhou, W Sichuan, N Yunnan.

9. Paris wenzianensis Z. X. Peng & R. N. Zhao, Acta Bot. Bor.-Occid. Sin. 6: 133. 1986.

文县重楼 wen xian chong lou

Plants pubescent, 60–100 cm tall. Rhizome 4–6 × 1.2–2 cm. Stem densely pubescent. Leaves 10–13; petiole very short; leaf blade elliptic-lanceolate, 14–19 × 2.5–5.5 cm, base cuneate, densely pubescent along abaxial veins and at margin. Peduncle 14–25 cm, pubescent. Outer tepals 6, green, lanceolate, 5.5–9.5 × 1.2–2 cm, pubescent along abaxial veins; inner ones yellow-green, linear, conspicuously shorter than outer ones, 1–2 mm wide. Stamens 12, 2.7–3.7 cm; filaments 7–8 mm; anthers 1.1–1.4 cm; free portion of connective cylindric, 1.3–1.5 cm, apex acute. Ovary yellow-green or pale purple, subglobose, 1-loculed. Style short; stigma lobes 6. Capsule purplish green. Fl. Apr–Jul, fr. Aug.

• Forests; 1900–2400 m. S Gansu (Wen Xian).

10. Paris luquanensis H. Li, Acta Bot. Yunnan. 4: 353. 1982.

禄劝花叶重楼 lu quan hua ye chong lou

Plants 6–12 cm tall. Rhizome terete, 2–3 × 0.6–0.8 cm. Stem purple. Leaves 4 or 5; petiole very short or absent; leaf blade obovate, obovate-oblong, or rhombic-obovate, 3.2–5 × 2–3.7 cm, base cuneate, with pale green marking along veins, abaxially deep purple. Peduncle purple, 2.5–5 cm. Outer tepals 4 or 5, deep green adaxially, purplish abaxially, ovate, ovate-lanceolate, or narrowly elliptic, 8–9 × 4–5.5 mm; inner ones linear-filiform, much longer than outer ones, ca. 1.7 cm × 1 mm. Stamens 8 or 10, ca. 5 mm; filaments ca. 5 mm, equaling anthers; connective inconspicuous. Ovary purple, 1-loculed, 4- or 5-ribbed. Style short; stigma lobes inconspicuous. Capsule purple, ribbed. Seeds ovoid, wholly enveloped by deep red aril. Fl. Jun, fr. Sep. $2n = 10^*$.

• Forests, thickets; 2100–2800 m. NC Yunnan (Luquan Xian).

11. Paris marmorata Stearn, Bull. Brit. Mus. (Nat. Hist.), Bot. 2(3): 79. 1956.

花叶重楼 hua ye chong lou

Paris polyphylla Smith subsp. *marmorata* (Stearn) H. Hara.

Plants 10–15 cm tall. Rhizome ca. 3 × 1.4 cm. Leaves 5 or 6; petiole very short; leaf blade narrowly elliptic or lanceolate, 6.5–8.5 × 1.2–2 cm, adaxially green with white markings, abaxially purple-red, base cuneate. Peduncle 1–2 cm. Outer tepals 3 or 4, adaxially green with white markings, abaxially purple-red, narrowly lanceolate, 3–4 cm × 6–8 mm; inner ones purple and slightly widened distally, green proximally, filiform-linear. Stamens 6–8; filaments 2.5–3.5 mm; anthers 1.5–2.5 mm, connective inconspicuous. Ovary green, subglobose. Style short; stigma lobes 3(or 4). Capsule deep purple. Fl. May, fr. Jun. $2n =$

10*, 20.

Broad-leaved forests; 2400–2800 m. Sichuan, S Xizang, Yunnan [Bhutan, N India, Nepal].

12. Paris polyandra S. F. Wang, Bull. Bot. Res., Harbin 5(1): 169. 1985.

多蕊重楼 duo rui chong lou

Plants 25–65 cm tall. Rhizome 2–3 × 1–1.5 cm. Leaves 5 or 6; petiole 1.5–4 cm; leaf blade ovate, 7–9 × 3.5–5 cm, with purple marking adaxially, base subcordate or rounded. Peduncle 7–12 cm. Outer tepals 6, green, ovate-lanceolate, 3–4 × 1–1.3 cm, apex long acuminate; inner ones narrowly linear, 2.3–4 × 0.1–0.3 mm. Stamens 18, 1.2–1.5 cm; filaments ca. 2 mm; anthers 1–1.3 cm; free portion of connective purple-brown, less than 0.5 mm. Ovary ellipsoid, angular. Style red; stigma lobes 6. Fl. May–Jun.

• Moist and shady places along valleys; 1200–1600 m. SW Sichuan.

13. Paris fargesii Franchet, J. Bot. (Morot) 12: 190. 1895.

球药隔重楼 qiu yao ge chong lou

Plants 50–100 cm tall. Rhizome 1.5–5 × 0.8–2.5 cm. Leaves (3 or)4–6(or 7); petiole 2–5(–9.5) cm; leaf blade ovate, broadly ovate, or ovate-oblong, 9–20 × 4.5–15 cm. Peduncle 20–40 cm. Outer tepals 4 or 5(or 6), green, lanceolate or ovate-lanceolate, 4.5–5 × 1–2 cm, basally narrowed into a short claw; inner ones yellow-green or purple-black, narrowly linear, usually 1–2 cm × 1–2.5(–3.5) mm, very rarely to 3.5–6 mm wide. Stamens 8 or 10(–12), 0.5–1.5 cm; filaments shorter than anthers; free portion of connective purple-black, transversely ellipsoid, subglobose, or shortly conical, 1–2 mm. Ovary conical-ovoid. Style short; stigma lobes 4 or 5. Capsule ovoid-globose. Fl. Apr–Jun, fr. Jul–Sep.

Forests, shady places; 500–2100 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan [Vietnam].

- 1a. Stamens 5–7 mm; free portion of anther connective transversely ellipsoid or subglobose, ca. 1 mm 13a. var. *fargesii*
- 1b. Stamens 12–15 mm, free portion of anther connective shortly conical, 1–2 mm 13b. var. *petiolata*

13a. Paris fargesii var. fargesii

球药隔重楼(原变种) qiu yao ge chong lou (yuan bian zhong)

Daiswa fargesii (Franchet) Takhtajan; *D. fargesii* var. *brevipetalata* T. C. Huang & K. C. Yang; *Paris fargesii* var. *brevipetalata* (T. C. Huang & K. C. Yang) T. C. Huang & K. C. Yang; *P. fargesii* var. *latipetala* H. Li & V. G. Soukup; *P. hookeri* H. Léveillé; *P. petiolata* Baker ex C. H. Wright var. *membranacea* C. H. Wright; *P. polyphylla* Smith subsp. *fargesii* (Franchet) H. Hara.

Stamens 5–7 mm; free portion of anther connective transversely ellipsoid or subglobose, ca. 1 mm. $2n = 10^*$.

Forests, shady places; 500–2100 m. Guangdong, Guizhou, Hubei,

Hunan, Jiangxi, Sichuan, Yunnan [Vietnam].

13b. *Paris fargesii* var. *petiolata* (Baker ex C. H. Wright) F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 91. 1978.

具柄重楼 *ju bing chong lou*

Paris petiolata Baker ex C. H. Wright, J. Linn. Soc., Bot. 36: 145. 1903; *P. delavayi* Franchet var. *ovalifolia* H. Li; *P. delavayi* var. *petiolata* (Baker ex C. H. Wright) H. Li.

Stamens 1.2–1.5 cm; free portion of anther connective shortly conical, 1–2 mm.

• Shady places in forests; 1200–2000 m. Guangxi, Guizhou, Jiangxi, Sichuan.

14. *Paris thibetica* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 10: 184. 1887.

黑籽重楼 *hei zi chong lou*

Plants 35–90 cm tall. Rhizome 0.8–2 cm thick. Leaves 7–12; petiole usually very short; leaf blade lanceolate or narrowly so, 4–15 × 1–3(–5) cm, base cuneate. Outer tepals 4 or 5, green, lanceolate or narrowly so, 3–5 × (0.7–)1.4–1.6 cm; inner ones absent or narrowly linear and equaling or longer than outer ones. Stamens 8–10; filaments 4–5 mm; anthers 8–10 mm; free portion of connective 0.6–2.7 cm. Ovary green, ovoid-globose, 1-loculed, inconspicuously 5-ribbed. Style short; stigma lobes 4 or 5. Capsule ovoid-globose. Seeds black, 1/2 enveloped by red, succulent, crested aril. Fl. Apr–Jul, fr. Jul–Aug.

Forests, forest margins; 1400–3800 m. S Gansu, Guizhou, Sichuan, S Xizang, NW Yunnan [Bhutan, Myanmar, Sikkim].

1a. Inner tepals present 14a. var. *thibetica*
1b. Inner tepals absent 14b. var. *apetala*

14a. *Paris thibetica* var. *thibetica*

黑籽重楼(原变种) *hei zi chong lou* (yuan bian zhong)

Daiswa thibetica (Franchet) Takhtajan; *Paris polyphylla* Smith var. *appendiculata* H. Hara; *P. polyphylla* var. *thibetica* (Franchet) H. Hara.

Inner tepals present, narrowly linear, equaling or longer than outer ones. $2n = 10^*$.

Forests; 2400–3600 m. S Gansu, Guizhou, Sichuan, SE Xizang, NW Yunnan [Bhutan, Sikkim].

14b. *Paris thibetica* var. *apetala* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 149. 1925.

无瓣重楼 *wu ban chong lou*

Inner tepals absent.

Forests, forest margins; 1400–3800 m. W Sichuan, S Xizang, NW Yunnan [Bhutan, Myanmar, Sikkim].

15. *Paris axialis* H. Li, Acta Bot. Yunnan. 6: 273. 1984.

五指莲重楼 *wu zhi lian chong lou*

Paris axialis var. *rubra* H. H. Zhou et al.

Plants 30–55 cm tall. Rhizome brown, 7–8 × 1–1.3 cm. Leaves 4–6; petiole 2.5–4 cm; leaf blade ovate-oblong, 7–10 × 4.5–7 cm, base shallowly cordate or rounded. Peduncle 15–25 cm. Outer tepals 4–6, green, ovate-lanceolate, ca. 3 × 1 cm; inner ones yellow-green, filiform-linear, 5.5–6 cm × 1–2 mm. Stamens (2 or)3 × as many as outer tepals; filaments green, ca. 3 mm; anthers ca. 9 mm; free portion of connective ca. 1 mm, apex acute. Ovary green, subglobose, 4–6-loculed, 4–6-ribbed. Style short; stigma lobes 4–6, ca. 2 mm. Berry pale green, globose, indehiscent. Seeds many, yellow-brown, obovate, 1/2 enveloped by green-white, spongy aril. Fl. Apr–Jun, fr. Jul–Aug. $2n = 10^*$.

• Forests; 700–3000 m. Sichuan, NE Yunnan.

16. *Paris forrestii* (Takhtajan) H. Li, Acta Bot. Yunnan. 6: 359. 1984.

长柱重楼 *chang zhu chong lou*

Daiswa forrestii Takhtajan, Brittonia 35: 268. 1983; *Paris longistigmata* H. Li.

Plants 18–100 cm tall. Rhizome 2–4.5 × 0.8–2 cm. Leaves (4 or)5 or 6(–8); petiole 1–12 cm; leaf blade oblong, ovate-oblong, obovate-oblong, or oblong-lanceolate, 6.5–16 × 2.4–6.5 cm, base shallowly cordate or rounded. Peduncle 3–15(–20) cm. Outer tepals 4–6(or 7), green, ovate or lanceolate, 1.5–4.5 × 0.6–2 cm; inner ones yellow-green, filiform-linear, 2.5–6.5 cm × 1–2 mm. Stamens 8–12(–14); filaments 3.5–7 mm; anthers 5–8 mm; free portion of connective very short. Ovary purple, conical-ovoid, 4–6-loculed. Style with enlarged base; stigma lobes 5 or 6. Berry green, subglobose, 1.4–1.7 cm in diam. Seeds white or yellow-red, small, slightly enveloped by swollen funicle. Fl. May–Jul, fr. Aug–Nov. $2n = 10^*$.

Alpine coniferous forests, evergreen broad-leaved forests; 1900–3500 m. SE Xizang, W Yunnan [Myanmar].

17. *Paris vaniotii* H. Léveillé, Mem. Pontif. Accad. Romana Nuovi Lincei 24: 355. 1906.

平伐重楼 *ping fa chong lou*

Plants 30–50 cm tall. Rhizome 3–3.5 × ca. 1.2 cm. Leaves 5 or 6; petiole 1–1.5 cm; leaf blade elliptic or oblanceolate, 7.5–14 × 2.5–5.5 cm, base subcuneate. Outer tepals 5, green, lanceolate, 2.5–3.5 cm × 7–12 mm, base gradually narrowed into a short claw; inner ones filiform-linear, 3.5–5 cm × 1–2 mm. Stamens 10; filaments 3.5–4.5 mm; anthers 5.5–9 mm; free portion of connective 0.5–1.5 mm. Ovary green, 5-loculed; locules inconspicuous. Style with an enlarged base; stigma lobes 5. Fl. Jun. $2n = 10^*$.

Shady and moist places in forests. Guizhou, Hunan, Yunnan [Myanmar].

18. *Paris rugosa* H. Li & Kurita in H. Li, Acta Bot. Yunnan., Suppl. 5: 13. 1992.

皱叶重楼 *zhou ye chong lou*

Plants 50–70 cm tall. Rhizome ca. 12 × 3–4 cm. Leaves 4 or 5; petiole 1.8–6 cm; leaf blade obovate, 10–15 × 6.3–10 cm, wrinkled, base rounded. Peduncle 9–25 cm. Outer tepals 4 or 5,

green, ovate, 3.5–4.5 × 1.7–3.5 cm; inner ones erect, yellow-green, filiform-linear, ca. 7 cm × 1–2 mm. Stamens 12 or 15; filaments green, ca. 4 mm; anthers purple, ca. 1 cm; connective not prolonged. Ovary subglobose, ca. 5 mm in diam., 4- or 5-loculed, 4- or 5-ribbed. Style short; stigma lobes 4 or 5. Fl. May.

- Shady places; 1500–1700 m. NW Yunnan.

19. *Paris dulongensis* H. Li & Kurita in H. Li, Acta Bot. Yunnan., Suppl. 5: 14. 1992.

独龙重楼 du long chong lou

Plants 50–115 cm tall. Rhizome ca. 25 × 4.5 cm. Leaves 9 or 10; petiole purple, ca. 6 cm, leaf blade oblanceolate or oblong, ca. 25 × 9 cm, wrinkled, base rounded. Peduncle (8–)35 cm. Outer tepals 6 or 7, green, ovate-lanceolate or lanceolate, ca. 8 × 2 cm; inner ones yellow-green, filiform-linear, ca. 8 cm × 1–2 mm. Stamens 12 or 14; filaments green, ca. 7 mm; anthers dark purple, ca. 1.5 mm; connective not exerted. Ovary green, ovoid, 6- or 7-loculed, 6- or 7-ribbed. Style short; stigma lobes 6 or 7. Fl. May.

- Thickets along ravines; 1500–1600 m. NW Yunnan.

20. *Paris verticillata* Marschall von Bieberstein, Fl. Taur.-Caucas. 3: 287. 1819.

北重楼 bei chong lou

Paris dahurica Fischer ex Turczaninow; *P. hexaphylla* Chamisso; *P. hexaphylla* var. *manshurica* (Komarov) Voroschilov; *P. hexaphylla* f. *purpurea* Miyabe & Tatewaki; *P. manshurica* Komarov; *P. obovata* Ledebour; *P. quadrifolia* Linnaeus var. *dahurica* (Fischer ex Turczaninow) Franchet; *P. quadrifolia* var. *hexaphylla* (Chamisso) B. Fedtschenko; *P. quadrifolia* var. *obovata* (Ledebour) Regel & Tiling; *P. verticillata* subsp. *manshurica* (Komarov) Kitagawa; *P. verticillata* var. *manshurica* (Komarov) H. Hara; *P. verticillata* var. *obovata* (Ledebour) H. Hara; *P. verticillata* f. *purpurea* (Miyabe & Tatewaki) Honda.

Plants 25–60 cm tall. Rhizome slender, 3–5 mm thick. Leaves (5 or)6–8(or 9); petiole very short; leaf blade lanceolate, narrowly oblong, oblanceolate, or obovate-oblanceolate, (4–)7–15 × 1.5–5 cm, base cuneate. Peduncle 4.5–12 cm. Outer tepals usually 4(or 5), green, oblong-lanceolate or ovate-lanceolate, 2–5.5 × 1–3 cm; inner ones yellow-green, 1–3 cm × 1–2 mm. Stamens 8(–10); filaments 5–8 mm; anthers 0.7–1.4 cm; free portion of connective 5–8(–10) mm. Ovary purple, subglobose, 4 (or 5)-loculed. Stigma lobes 4 or 5, long. Berry purple-black, globose, ca. 1 cm in diam. Seeds without aril. Fl. May–Jun, fr. Jul–Sep. $2n = 10, 15, 20^*$.

Forests, thickets, grassy and shady places, hillsides along ravines; 1100–3600 m. Anhui, Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, NW Sichuan, Zhejiang [Japan, Korea, Mongolia, Russia (Siberia)].

21. *Paris bashanensis* F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 250. 1978.

巴山重楼 ba shan chong lou

Paris quadrifolia Linnaeus var. *setchuenensis* Franchet; *P. setchuenensis* (Franchet) Barkalov.

Plants 25–45 cm tall. Rhizome slender, 2–4 mm thick. Leaves 4(or 5); petiole very short; leaf blade oblong-lanceolate or ovate-elliptic, 4–9 × 2–3.5 cm, base cuneate. Peduncle 2–7 cm. Outer tepals 4, reflexed, narrowly lanceolate, 1.7–3.5 cm × 3–5 mm; inner ones filiform-linear, 1.6–3.4 cm × 1–2 mm. Stamens 8; filaments 3–4 mm; anthers 6–11 mm; free portion of connective subulate, 4–9 mm. Ovary purple, globose, 2–3.5 mm in diam., 4(or 5)-loculed. Stigma lobes 4(or 5), slender. Berry purple, globose, many seeded. Seeds without aril. Fl. May–Jul, fr. Aug–Sep. $2n = 10^*$.

• Moist and shady places in forests; 1400–4300 m. W Hubei, Sichuan.

22. *Paris quadrifolia* Linnaeus, Sp. Pl. 1: 367. 1753.

四叶重楼 si ye chong lou

Paris quadrifolia var. *angustiovata* D. Z. Ma & H. L. Liu.

Plants 25–40 cm tall. Rhizome creeping, slender, 2–5 mm thick. Leaves usually 4 or 5, subsessile; leaf blade broadly obovate or ovate, 5–10 × 2.5–5 cm, base subcuneate. Peduncle 7–10 cm. Outer tepals 4, spreading horizontally, green, ovate-lanceolate, 2–3 cm × 5–9 mm; inner ones yellow-green, filiform-linear, 1.5–3 cm × 1–2 mm. Stamens 8; filaments 3–5 mm; anthers 3–6 mm; free portion of connective 4–5 mm. Ovary purple-red, globose, 4–8 mm in diam., 4(or 5)-loculed. Stigma lobes 4 or 5, slender. Berry globose, many seeded. Seeds without aril. Fl. Jul, fr. Aug. $2n = 15, 20, 25, 30$.

Forests, thickets, moist places. N Heilongjiang, N Xinjiang [Mongolia, Russia (Siberia); Europe].

