

PASSIFLORACEAE

西番莲科 xi fan lian ke

Wang Yinzheng (王印政)¹; Shawn E. Krosnick², Peter M. Jørgensen³, David Hearn⁴

Climbing herbs or lianas with axillary tendrils, rarely shrubs or trees, vegetative ramification through a supra-axillary bud. Leaves alternate (rarely subopposite), spirally arranged, simple or rarely compound, stipulate or not, petiolate, petiole or base of blade often with 1 to many glands; leaf blade entire or lobed, venation pinnate or palmate, often with glands on margin and abaxial surface. Inflorescence cymose, axillary, sessile or pedunculate, primary axis often a tendril, secondary axis often reduced; bracts minute to foliaceous, sometimes glandular. Pedicels articulate distal to bracts. Flowers mostly actinomorphic, bisexual, functionally unisexual, or polygamous; perianth persistent, segments free or partially fused at base. Sepals (3–)5(or 6). Petals (3–)5(or 6), imbricate. Corona inserted on hypanthium, composed of filaments or hairs often in multiple series. Stamens (4 or)5(–60), inserted on androgynophore or at base of hypanthium; filaments free to base or sometimes partially fused; anthers dorsifixed, 2-celled, dehiscing via longitudinal slits, sometimes with apical appendage. Ovary (1–)3(–5)-carpellate, superior, 1-loculed, sessile or stipitate on elongate androgynophore; placentation parietal; ovules many, anatropous; styles (1–)3(–5), free to partially fused at base; stigmas globose, capitate, papillate, or divided. Fruit a berry or loculicidally 3(–5)-valved capsule. Seeds numerous, compressed, often beaked, enclosed by fleshy aril; testa reticulate or pitted; endosperm copious, oily; embryo straight; cotyledons foliaceous.

About 16 genera and 660 species: mainly in tropical and subtropical areas, particularly diverse in the New World tropics; two genera and 23 species (seven endemic, seven introduced) in China.

Bao Shihying. 1999. Passifloraceae. In: Ku Tsuechih, ed., Fl. Reipubl. Popularis Sin. 52(1): 97–120.

- 1a. Androgynophore long; flowers large, bisexual; corona well developed; fruit a berry 1. *Passiflora*
1b. Androgynophore absent or short; flowers small, unisexual or polygamous; inner corona lacking, outer corona reduced; fruit a capsule 2. *Adenia*

1. PASSIFLORA Linnaeus, Sp. Pl. 2: 955. 1753, nom. cons.

西番莲属 xi fan lian shu

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Granadilla Miller; *Tripsilina* Rafinesque.

Herbaceous or woody perennial vines, rarely shrubs or trees. Leaves simple or rarely compound, alternate (subopposite in one species), entire or dissected, petiolate, usually with extra-floral nectaries on petiole and/or blade; stipules linear to leaflike, often glandular. Inflorescence axillary, cymose; peduncle often highly reduced or absent, central axis developed into a tendril, secondary axes often highly reduced to 1 or 2 flowers; bracts minute to foliaceous, sometimes glandular. Flowers bisexual (rarely plants dioecious). Hypanthium broad to campanulate. Sepals 5, often petaloid, sometimes with a subapical projection. Petals 5 (rarely absent). Corona present at base of perianth in one to several series of showy filaments; innermost series (operculum) membranous, partially to entirely fused, margin entire or fimbriate, often incurved over nectar chamber; extra-staminal nectariferous disk (limen) present around base of androgynophore, fused to base of hypanthium. Stamens (4 or)5(–8); filaments free (rarely connate into a tube around ovary); anthers linear or oblong, dorsifixed, versatile. Ovary on androgynophore, stipitate or sessile, 3(–5)-carpellate; styles 3(–5), free; stigmas capitate. Fruit a berry (rarely a dehiscent capsule). Seeds arillate, compressed, testa pitted; endosperm oily, abundant; embryo straight; cotyledons elliptic or oblong-elliptic; germination epigeal (rarely hypogeal).

About 520 species: mainly in tropical America and tropical Asia; 20 species (seven endemic, seven introduced) in China.

Passiflora “*alato-caerulea*” (Lindley, Bot. Reg. 10: t. 848. 1824), a hybrid of horticultural origin, is grown in China and elsewhere for its flowers and robust, vigorous vegetative growth. The epithet “*alato-caerulea*” is considered to be a hybrid formula (i.e., *P. alata* Curtis × *P. caerulea* Linnaeus) and not a true epithet (*Vienna Code*, Art. H.10.3).

The reader is referred to the following references: Killip, The American Species of Passifloraceae (Publ. Field Mus. Nat. Hist., Bot. Ser. 19(1–2): 1–331, 333–613. 1938); de Wilde, A monograph of the genus *Adenia* Forsk. (Passifloraceae) (Meded. Landbouwhogeschool Wageningen 71(18): 1–281. 1971); and de Wilde, The Indigenous Old World Passifloras (Blumea 20: 227–250. 1973 [“1972”]).

- 1a. Bracts not entire, pinnatifid or lacerate.

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- 2a. Bracts pinnatifid, lobes apically with glandular hairs; leaves shallowly 3-lobed or entire; flowers 2–3 cm in diam.; petiole without glands 16. *P. foetida*
- 2b. Bracts lacerate, not glandular; leaves 3- or 5-lobed, never entire; flowers 3–5 cm; petiole with 2 stipitate glands 15. *P. adenopoda*
- 1b. Bracts entire, or caducous, never with glandular hairs.
- 3a. Leaves unlobed, entire.
- 4a. Inflorescence reduced to only one flower; outer corona in 5 or 6 series.
- 5a. Stem 4-angled; leaves broadly ovate or suborbicular; stipules large, leaflike, 2–4 cm; petiole with 4–6 glands; fruit ovoid, 20–25 cm 19. *P. quadrangularis*
- 5b. Stem terete; leaves ovate-oblong; stipules linear; petiole with 2 glands; fruit globose, 5–6 cm in diam. 20. *P. laurifolia*
- 4b. Inflorescence of more than one flower; coronal filaments in 1 or 2 series.
- 6a. Laminar nectaries absent on abaxial surface; petiolar glands 2, small, at middle of petiole; inflorescence 1- or 2-flowered 4. *P. kwangtungensis*
- 6b. Laminar nectaries present on abaxial surface; petiolar glands various; inflorescence 2- to many flowered.
- 7a. Leaves broadly ovate to cordate, with 20–50 tiny nectaries scattered on abaxial surface; sepals with apical appendage 5. *P. eberhardtii*
- 7b. Leaves ovate-elliptic, broadly lanceolate, linear-lanceolate, or suborbicular, with 2 to many nectaries on abaxial surface; sepals lacking apical appendage.
- 8a. Leaves suborbicular to broadly orbicular; inflorescence 2–8-flowered 6. *P. henryi*
- 8b. Leaves linear-lanceolate, broadly lanceolate, or lanceolate to ovate; inflorescence 2–16-flowered.
- 9a. Flowers with 5 stamens and 3 carpels; leaves ovate, subopposite to opposite, abaxially white pubescent 2. *P. cochinchinensis*
- 9b. Flowers with variable numbers of stamens and carpels; leaves lanceolate to oblanceolate, glabrous or pubescent.
- 10a. Stem and leaves pubescent; leaves oblanceolate, alternate 1. *P. siamica*
- 10b. Stem and leaves glabrous; leaves lanceolate, spirally arranged 3. *P. tonkinensis*
- 3b. Leaves 2- or 3-lobed or 5-palmatifid.
- 11a. Inflorescences 1-flowered; coronal filaments in 2–6 series.
- 12a. Leaves (3–)5(–9)-palmatifid, lobes entire; petiole with 2–4(–6) glands; stipules large, reniform, clasping 18. *P. caerulea*
- 12b. Leaves deeply 3-lobed, lobes dentate; petiole with 2 glands apically; stipules linear-subulate 17. *P. edulis*
- 11b. Inflorescences 2–20-flowered; coronal filaments in 1 or 2 series.
- 13a. Laminar nectaries absent on abaxial surface; petals absent; corona in 2 series 14. *P. suberosa*
- 13b. Laminar nectaries present on abaxial surface (2–25); petals present; corona in 1 or 2 series.
- 14a. Coronal filaments ca. 1/2 as long as sepals or shorter; leaves truncate, lobes generally equal in length.
- 15a. Petiole with 2 discoid nectaries at base; laminar nectaries in 2 lines near midvein 8. *P. jianfengensis*
- 15b. Petiole with 2 peg-shaped nectaries; laminar nectaries 2–4 on abaxial surface.
- 16a. Plants strongly pubescent throughout; leaf blade often with 2 or 3 pairs of glands near apex of midvein on abaxial surface, apex truncate, usually 3-lobed 9. *P. jugorum*
- 16b. Plants glabrous, rarely glabrescent; leaf blade usually with 1 pair of glands near apex of midvein on abaxial surface, apex strongly truncate, usually 2-lobed 10. *P. wilsonii*
- 14b. Coronal filaments more than 1/2 as long as sepals; leaves shallowly to deeply lobed, lobes unequal in length, midvein often conspicuously shortened.
- 17a. Lobes of leaves apically obtuse; abaxial surface with 6–25 nectaries; sepals with apical appendage 7. *P. cupiformis*
- 17b. Lobes of leaves apically acute; abaxial surface with 2–8 nectaries; sepals lacking awn.
- 18a. Inflorescence 5–8-flowered; leaves truncate, lobes ovate-oblong; petiole with 2 conspicuous, auriculate glands 11. *P. papilio*
- 18b. Inflorescence 1–16-flowered; leaves deeply truncate; base of leaves lanceolate.
- 19a. Stem striate; leaves and stems pubescent; flowers 2–16 per inflorescence; coronal filaments white throughout 12. *P. altilobata*
- 19b. Stem subtriangular, smooth; leaves and stems glabrous, veins white; flowers 1 or 2 per inflorescence; coronal filaments brown at base, yellow at apex 13. *P. xishuangbannaensis*

1. *Passiflora siamica* Craib, Bull. Misc. Inform. Kew 1911: 55. 1911.

长叶西番莲 chang ye xi fan lian

Passiflora octandra Gagnepain; *P. octandra* var. *attopensis* Gagnepain; *P. octandra* var. *cochinchinensis* Gagnepain.

Herbaceous vines to lianas, 6–8 m long. Stem ± angular, striate; younger stems densely pubescent. Petiole 1–4 cm, often with 2 ovoid glands at middle; leaf blade ovate-elliptic to lanceolate, 6–18(–25) × 2.5–7 cm, leathery, usually pubescent, abaxially with (0–)2–8 laminar nectaries, base cuneate to subcordate, apex acute or acuminate. Inflorescences (sub)sessile, axillary, (2–)4–15-flowered, sometimes rust-brown pubescent. Pedicel 3–15 mm, pubescent. Flowers white, 2.5–3 cm in diam.; hypanthium 7–10 mm in diam. Sepals 9–12 × 6–7 mm, margin membranous, pubescent. Petals 9–10 × 3–4 mm. Corona in 2 filamentous series; outer series 7–10 mm, inner series 1.5–4 mm; operculum incurved, plicate, 2–2.5 mm high, membranous; disk ca. 0.5 mm high; androgynophore 3–5 mm tall. Stamens 5–8; filaments 1–1.1 cm, basally connate for 1.5–4.5 mm. Ovary (sub)sessile, ellipsoid, 2–3 × 1.5–2.5 mm, pubescent; styles 3–5, 4–9 mm, fused basally up to 2 mm. Fruit 1 or 2 per inflorescence, blue at maturity, subglobose, 1.5–2 cm in diam., sparsely pubescent. Fl. Mar–Apr, fr. Jun–Jul.

Forests, scrub; 500–1600 m. EC Guangxi (Guiping), S Yunnan (Xishuangbanna) [India, Laos, Myanmar, Thailand, Vietnam].

2. *Passiflora cochinchinensis* Sprengel, Syst. Veg. 4: (Cur. Post): 346. 1827.

蛇王藤 she wang teng

Anthactinia horsfieldii M. Roemer; *Disemma horsfieldii* Miquel; *D. horsfieldii* var. *teysmanniana* Miquel; *Passiflora hainanensis* Hance; *P. horsfieldii* Blume; *P. horsfieldii* var. *elbertiana* H. G. Hallier; *P. ligulifolia* Masters; *P. moluccana* Reinwardt ex Blume var. *teysmanniana* (Miquel) W. J. de Wilde; *P. pallida* Loureiro (1790), not Linnaeus (1753); *P. philippinensis* Elmer.

Herbaceous vines, ca. 6 m long. Stem striate, sparsely pubescent. Leaves subopposite, dimorphic; petiole 7–10 mm, with two glands 2–8 mm from base of blade; leaf blade lanceolate to elliptic, 6–10 × 2.5–4(–6) cm, leathery, abaxially canescent, pinninerved, abaxially with 4–6 laminar nectaries, base subcordate, apex obtuse or rounded. Inflorescence sessile, 2(–12)-flowered, ± glabrous; bracts linear. Pedicel 5–25 mm, glabrous. Flowers pinkish white, 3–4.5 cm in diam.; hypanthium 6–9 mm in diam. Sepals greenish, with occasional purple mottling, 1.5–2 cm × ca. 5 mm, glabrous, margin membranous. Petals whitish, 1.2–1.6 cm × ca. 5 mm. Corona in 2 series; outer series 1–1.6 cm, brown at base, white at middle, purple at apices; inner series 1–3 mm, brownish; operculum incurved, brownish, plicate, 1.5–2 mm tall, membranous; disk dark brown, ca. 0.5 mm high; androgynophore 5–10 mm tall. Stamens 5; filaments (5–)6–10 mm, free; anthers 3–5 × 1.5–2 mm. Ovary (sub)sessile, ellipsoid, 2–4 × 1.5–3 mm, glabrescent; styles 3, free, 5–8 mm. Fruit blue at maturity, 1.5–2.5 cm in diam., glabrescent.

Scrub in mountain valleys; 100–1000 m. Guangdong, Guangxi, Hainan [Laos, Malaysia, Vietnam].

3. *Passiflora tonkinensis* W. J. de Wilde, Blumea 20: 241. 1973 [“1972”].

长叶蛇王藤 chang ye she wang teng

Passiflora cochinchinensis Sprengel subsp. *glaberrima* (Gagnepain) Cusset; *P. moluccana* Reinwardt ex Blume var. *glaberrima* (Gagnepain) W. J. de Wilde; *P. octandra* Gagnepain var. *glaberrima* Gagnepain.

Herbaceous vines to lianas, ca. 6 m long. Stem terete, glabrous. Leaves spirally arranged; petiole 1–3 cm, with 2 discoid glands 2–8 mm from base of blade; leaf blade lanceolate or elliptic to oblong, 6–10 × 2.5–4(–6) cm, membranous, both surfaces glabrous, laminar nectaries 4–6, base subcordate, apex acute. Inflorescences axillary, (sub)sessile, 1- or 2-flowered, glabrous; bracts linear. Pedicel 5–25 mm, glabrous. Flowers whitish, 3–4.5 cm in diam.; hypanthium 6–9 mm in diam. Sepals green, 1.5–2 cm × ca. 5 mm, glabrous. Petals white, 1.2–1.6 cm × 3–4 mm. Corona in 2 filamentous series; outer series 1–1.6 cm, yellow at base, purple at apices; inner series 1–3 mm, filaments yellow, apices capitate; operculum incurved, green, plicate, 1.5–2 mm tall, membranous; disk purple-brown, ca. 0.5 mm high; androgynophore 5–10 mm tall. Stamens (5 or)6–8, filaments 6–10 mm, connate and enclosing ovary; anthers 3–5 × 1.5–2 mm. Ovary (sub)sessile on androgynophore, ellipsoid, glabrous; styles (3 or)4 or 5, 5–8 mm. Fruit blue at maturity, 1.5–2.5 cm in diam., glabrous.

Scrub in mountain valleys; 100–200 m. SE Yunnan (Hekou) [Laos, Vietnam].

4. *Passiflora kwangtungensis* Merrill, Lingnan Sci. J. 13: 38. 1934.

广东西番莲 guang dong xi fan lian

Herbaceous vines, 5–6 m long. Stem slender, glabrous, thinly striate. Petiole 1–2 cm, with 2 glands in distal 1/3; leaf blade lanceolate to oblong-lanceolate, 6–13 × 2–4(–6) cm, membranous, abaxially puberulous, laminar nectaries absent, base cordate, margin entire, apex long acuminate. Inflorescences sessile, 1- or 2-flowered, glabrescent. Pedicel 1–1.5 cm. Flowers white, 1.5–2 cm in diam.; hypanthium 4–5 mm in diam. Sepals 7–9 mm × ca. 2.5 mm, membranous. Petals 6–7 × 2–3 mm. Corona a single filamentous series, white, 2–3 mm, apices clavate; operculum plicate, ca. 1.5 mm high, membranous; disk ca. 0.3 mm high; androgynophore ca. 4.5 mm tall. Stamens 5; filaments ca. 3.5 mm, basally connate for ca. 1 mm; anthers oblong, ca. 2.5 × 1 mm. Ovary subsessile on androgynophore, ellipsoid, ca. 2.5 × 1.5 mm, glabrous; styles 3, free, 2.5–4 mm; stigmas capitate. Fruit blue at maturity, globose, 1–1.5 cm in diam., glabrous. Fl. Mar–May, fr. Jun–Jul.

• Scrub at forest margins; 600–700 m. N Guangdong, NE Guangxi, SE Jiangxi.

5. *Passiflora eberhardtii* Gagnepain in Lecomte, Fl. Indo-Chine 2: 1020. 1921.

心叶西番莲 xin ye xi fan lian

Herbaceous vines, 2–3 m long. Stem terete, pubescent. Petiole (2–)5–6 cm, pubescent, with two large discoid glands at

base; leaf blade broadly ovate, ca. 15 × 12 cm, membranous to leathery, puberulous to densely pubescent, abaxially with 20–50 small scattered laminar nectaries, base cordate, margin entire, apex acute or shortly acuminate. Inflorescences (sub)sessile, 15–20(–30)-flowered. Pedicel 1–2 cm. Flowers white, 1–1.5 cm in diam. Sepals ca. 6 × 3 mm, awn 1.5–2 mm, pubescent. Petals ca. 5 × 2 mm. Corona in a single series, 1.5–3 mm; operculum plicate, ca. 1.2 mm tall, membranous; disk absent; androgynophore ca. 2 mm tall. Stamens 5; filaments ca. 2.5 mm, free; anthers ca. 2.5 × 0.7 mm. Ovary sessile on androgynophore, obvoid, pubescent; styles 3, free, 2–2.5 mm. Fruit globose, 1.5–1.8 cm in diam., densely pubescent. Fl. Feb–May, fr. Jun.

Forests on limestone hills; ca. 1200 m. W Guangxi (Jingxi), SE Yunnan (Xichou) [Vietnam].

6. *Passiflora henryi* Hemsley, Hooker's Icon. Pl. 27: sub t. 2623. 1899.

圆叶西番莲 *yuan ye xi fan lian*

Herbaceous vines, 2–3 m long. Stem angular, glabrous. Petiole 1.5–4 cm, with 2 tuberculate glands near base; leaf blade suborbicular to broadly orbicular, 3.5–5.5 × 3–6 cm, leathery, abaxially with 4–6 nectaries, base rounded or subcordate, margin entire, apex truncate, sometimes slightly acute. Inflorescences sessile, 2–8-flowered, glabrescent. Pedicel 1–2.5 cm. Flowers greenish yellow, 2–2.5 cm in diam.; hypanthium ca. 5 mm wide. Sepals green, 8–10 × 2–3 mm. Petals 7–8 × 1–2 mm. Coronal filaments in 2 filamentous series; outer series 6–8 mm, center brown, apices whitish; inner series ca. 4 mm, yellow-green, apices brown and capitate; operculum incurved, green, plicate, 1–2 mm tall, membranous; disk greenish brown, ca. 0.3 mm high; androgynophore brown mottled, 4.5–5 mm tall. Stamens 5; filaments 4–5 mm, free. Ovary sessile on androgynophore, subglobose, 1.5–2 × ca. 1.5 mm, pubescent; styles 3, free, 4–5 mm. Fruit blue at maturity, globose, 1.2–1.5 cm in diam., glabrous. Fl. Jun–Jul, fr. Aug–Oct.

• Scrub on slopes and in valleys; 400–1600 m. Yunnan.

7. *Passiflora cupiformis* Masters, Hooker's Icon. Pl. 18: t. 1768. 1888.

杯叶西番莲 *bei ye xi fan lian*

Passiflora franchetiana Hemsley; *P. kwangsiensis* H. L. Li; *P. seguinii* H. Léveillé & Vaniot; *P. yunnanensis* Franchet.

Climbing vines, ca. 6 m long. Stem terete, glabrescent. Petiole 3–7 cm, sparsely pubescent, with 2 discoid glands on basal 1/4; leaf blade 6–12(–15) × 4–10 cm, leathery, abaxially with 6–25 scattered nectaries, base rounded to cordate, truncate to deeply 2-lobed, lobes 3–8 cm, apically rounded or obtuse. Inflorescences (sub)sessile, (1–)5–20-flowered. Pedicel 2–3 cm. Flowers creamy-white, 1.5–2 cm in diam.; hypanthium 5–7 mm wide. Sepals 8–10 × 3–4 mm, often with apical appendage, glabrescent. Petals 7–8.5 × 2–3 mm. Coronal filaments in 2 series; outer series 8–9 mm, filaments purple-brown mottled in proximal half, creamy-white in distal half; inner series 2–3 mm, base brown, apex white and capitate; operculum incurved, brownish green, plicate, ca. 1.5 mm tall, membranous; disk purplish brown, ca. 0.25 mm high; androgynophore brown mottled, 3–5

mm tall. Stamens 5; filaments 4.5–6 mm, free; anthers ca. 2.5 × 1.5 mm. Ovary sessile on androgynophore, subglobose, ca. 2 × 1.5–2 mm, pubescent; styles 3, free, ca. 4 mm. Fruit blue at maturity, globose, 1–1.6 cm in diam., glabrous. Fl. Apr, fr. Sep.

Grass and scrub on slopes, valleys, roadsides; 1000–2000 m. Guangdong, Guangxi, Hubei (Badong), Sichuan, Yunnan [Vietnam].

8. *Passiflora jianfengensis* S. M. Hwang & Q. Huang, Acta Phytotax. Sin. 23: 64. 1985.

尖峰西番莲 *jian feng xi fan lian*

Herbaceous vines, 8–10 m long. Stem terete, angular, brownish pubescent. Leaves alternate; petiole 2–3 cm, glabrescent, with 2 discoid glands at base; leaf blade 10–16 × 6–8.5 cm, leathery, abaxially glabrescent, with 2 lines of laminar nectaries scattered along midvein, base rounded, margin slightly undulate, apex 2- or 3-lobed, lobes equal in length or central lobe longer. Inflorescences sessile, 2-flowered. Pedicel 3–4 cm. Flowers whitish, 4–5 cm in diam.; hypanthium ca. 1 cm wide. Sepals pinkish, ovate, 2.5–3 × ca. 1 cm, membranous, sparsely pubescent. Petals white, 2.5–3 cm × ca. 5 mm. Coronal filaments in 2 series; outer series 1–2 cm, inner series ca. 5 mm; operculum incurved, plicate, membranous; androgynophore ca. 1 cm tall. Stamens 5; filaments ca. 1 cm; anthers ca. 8 mm. Ovary ellipsoid, densely pubescent; styles 3, free, ca. 1 cm; stigmas capitate. Fruit ovoid or ellipsoid, ca. 3 cm in diam.

• Dense forests. Guangxi (Guiping, Longmen), Hainan.

9. *Passiflora jugorum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 115. 1916.

山峰西番莲 *shan feng xi fan lian*

Passiflora burmanica Chakravarty.

Woody vines, ca. 8 m long. Stem terete, sparsely white pubescent, striate. Petiole 3–5 cm, pubescent, with 2 peg-shaped glands in lower 1/3 part; leaf blade 3–11 × 3–10 cm, membranous, pubescent, often with 2 or 3 pairs of glands near apex of midvein on abaxial surface, apex truncate, (2 or)3-lobed; lobes 5–10 mm, base broadly rounded to cordate, apex acute to acuminate. Inflorescences (sub)sessile, 5–15-flowered, pubescent. Pedicel 2.5–3 cm, pubescent. Flowers whitish, 3–4 cm in diam.; hypanthium 9–12 mm wide. Sepals light purple, 1–2 cm × ca. 5 mm, glabrous. Petals 1–1.5 cm × ca. 5 mm. Coronal filaments in a single series, 6–8 mm; operculum plicate, 2.5–3 mm tall, membranous; disk ca. 0.5 mm high; androgynophore 7–10 mm tall. Stamens 5; filaments 6–10 mm, basally fused for 1.5–3(–4) mm; anthers 3.5–5 × 2–3 mm. Ovary sessile on androgynophore, ellipsoid, glabrous; styles 3, free, 4–5 mm. Fruit blue at maturity, subglobose to ellipsoid, ca. 2 cm in diam., glabrous. Fl. Mar–Apr, fr. May–Jul.

Forests on limestone hills; 1000–1800 m. S Yunnan [Myanmar].

10. *Passiflora wilsonii* Hemsley, Bull. Misc. Inform. Kew 1908: 17. 1908.

镰叶西番莲 *lian ye xi fan lian*

Passiflora assamica Chakravarty; *P. celata* G. Cusset; *P.*

perpera Masters; *P. rhombiformis* S. Y. Bao; *P. spirei* G. Cusset.

Herbaceous vines, 6–10 m long. Stem terete, glabrous, rarely glabrescent. Petiole 2–2.5 cm, with 2 peg-shaped glands in lower 1/3 part; leaf blade 4–6(–11) × (3.5–)6–13 cm, membranous, glabrous, rarely glabrescent, with 1(or 2) pairs of glands near apex of midvein on abaxial surface, base broadly rounded to subcordate, apex strongly truncate, 2(or 3)-lobed. Inflorescences (sub)sessile, glabrous or sparsely puberulous, 2–15-flowered. Pedicel 5–15 mm. Flowers white, (2–)2.5 cm in diam.; hypanthium 5–10 mm wide. Sepals purplish brown, 7–11 × 2–3 mm, glabrous. Petals whitish, 7–10 × 2–3 mm. Corona in a single series; filaments purple at base, white at apex, 3–6 mm; operculum white, plicate, ca. 2 mm tall, membranous; disk brown, 2–3 mm high; androgynophore 6–10 mm tall. Stamens 5; filaments (2.5–)3–6 mm, free; anthers 2–3(–4) × 1–1.5(–2) mm. Ovary sessile on androgynophore, ellipsoid, 2–3 mm, glabrous; styles 3, free, 3–5 mm. Fruit blue at maturity, subglobose, 2.5–3 cm in diam., glabrous. Fr. Jul.

• Scrub on slopes, along streams in mountain valleys, forest margins; 1300–2500 m. SW Guizhou (Wangmo), SE Xizang (Médog), C, E, and S Yunnan.

11. *Passiflora papilio* H. L. Li, J. Arnold Arbor. 24: 447. 1943.

蝴蝶藤 hu die teng

Herbaceous vines, 1–2 m long. Stem slender, glabrous or glabrescent, striate. Petiole 2–3 cm, sparsely pubescent, with 2 conspicuous, auriculate glands in proximal 1/4; leaf blade 2.5–3.5 × 6–10 cm, leathery, glabrous, truncate-bilobed; lobes ovate, 5–7 × 2.5–3.5 cm, abaxially with 4–8 discoid laminar nectaries, lateral veins 2 or 3 per side of midvein, base truncate or subrounded, apically acute or obtuse. Inflorescences sessile, 5–8-flowered, sparsely pubescent. Pedicel 2–6 mm. Flowers yellow-green, 1.5–2 cm in diam.; hypanthium ca. 4.5 mm wide. Sepals 8–10 × 3–4 mm, villous. Petals 6–8 × 2–3 mm. Corona in 2 series; outer series 3.5–4 mm, filaments green at base, yellow at apex, apex thickened; inner series ca. 1.5 mm, filaments green at base, apex yellow and capitate; operculum yellow-green, ca. 1.5 mm tall; disk brownish, ca. 0.4 mm high; androgynophore 4–5 mm tall. Stamens 5; filaments ca. 3 mm, free; anthers oblong, ca. 2.5 × 1 mm. Ovary sessile on androgynophore, ovoid, ca. 2 × 1.5 mm, glabrous; styles 3, free. Fruit blue at maturity, globose, 1–1.2 cm in diam. Fl. Apr–May, fr. Jun–Jul.

• Scrub, forests on limestone hills; 400–500 m. SW Guangxi.

12. *Passiflora altilobata* Hemsley, Bull. Misc. Inform. Kew 1908: 17. 1908.

月叶西番莲 yue ye xi fan lian

Herbaceous vines, ca. 2 m long. Stem striate, pubescent. Petiole 1.5–2.5 cm, with 2 glands in basal 1/3 to middle; leaf blade 2.5–9 × 2–7 cm, abaxially with 4 small nectaries near apex of midvein, deeply 2-lobed, pubescent, base rounded. Inflorescences 2–16-flowered. Pedicel 1–5 mm, pubescent. Flowers greenish, 7–10 mm in diam.; hypanthium ca. 4 mm wide. Sepals green, 3–6 × 3–4 mm, pubescent. Petals whitish, 3–6 × 2–3 mm, glabrous. Coronal filaments in two series; outer series

ca. 5 mm, filaments white; inner series ca. 1 mm, filaments white, capitate at apex; operculum incurved, white, plicate, 1–1.5 mm tall, membranous; disk green, ca. 0.2 mm high; androgynophore 2.5–3 mm tall. Stamens 5; filaments ca. 3 mm, free; anthers ca. 2 × 1.5 mm. Ovary sessile on androgynophore, ovoid-ellipsoid, ca. 1.5 mm, glabrous; styles 3, free, 2.5–3 mm. Fruit blue at maturity, globose, 1–1.5 cm in diam., glabrous. Fl. Apr–May.

• Forests in valleys; 600–1500 m. S Yunnan (Simao, Xishuangbanna).

13. *Passiflora xishuangbannaensis* Krosnick, Novon 15: 160. 2005.

版纳西番莲 ban na xi fan lian

Vines, 1–3 m long. Stem subtriangular, glabrous. Petiole 1.5–2.5 cm, with 2 nectaries in distal 1/4; leaf blade 4.5–8.5 × 2.5–5 cm, abaxially white variegated along the three major veins, abaxially with 8–12(–15) nectaries arranged in 2 lines outward from midvein, margin entire, lateral lobes greatly exceeding midvein, creating a sinus ca. 1/2 as long as leaf. Inflorescence sessile, 1- or 2-flowered. Pedicel 1.5–2 cm. Flowers 3.2–3.8 cm in diam.; hypanthium 8–10 mm wide. Sepals light green, 1.6–1.8 cm × 5–7 mm. Petals white, 1–1.2 cm × 2–3 mm. Coronal filaments in 2 series; outer series ca. 1 cm, purple-brown in basal 1/3, distal portion bright yellow; inner series ca. 5 mm, purple-brown, apex yellow and capitate; operculum incurved, green, with purple striations, plicate, 3–4 mm high, membranous; disk greenish purple, ca. 1 mm tall; androgynophore ca. 7 mm tall. Stamens 5; filaments basally connate for ca. 1 mm; anthers 3–4 × ca. 1 mm. Ovary ellipsoid, 4–6 × 2–3 mm, sessile on androgynophore, glabrous; styles 5–7 mm, free. Fruit dark blue at maturity, ovoid, ca. 1 cm in diam.

• Shaded areas near streams in forests and fields; ca. 1200 m. S Yunnan (Xishuangbanna).

14. *Passiflora suberosa* Linnaeus, Sp. Pl. 2: 958. 1753.

细柱西番莲 xi zhu xi fan lian

Herbaceous vines, 1–4(–10) m long. Stem white or whitish gray, triangular, slender, striate. Petiole 2–4 cm, white strigose, with 2 glands at middle or slightly above; leaf blade 5–5.5(–8) × 5–6(–11) cm, abaxially gray-green, sparsely villous, base cordate, 3-lobed, lobes ovate, apex acute, mucronate. Flowers axillary, solitary or in pairs, light green or white, 1.5–2.5 cm in diam. Sepals 5–8 mm, oblong or lanceolate, outside hispidulous. Petals absent. Corona in 2 series, filamentous, outer series 3–7 mm, inner series ca. 1 mm; operculum plicate, 1–2 mm high; disk 0.5–1 mm; androgynophore 2–4 mm tall. Filaments flat, 1.5–4 mm, free; anthers oblong, 2–3 mm. Ovary subglobose, glabrous; styles 3, almost threadlike, 7–8 mm; stigma capitate. Berry turning bluish black at maturity, subglobose, 1–1.2 cm in diam. Fl. Aug–Sep, fr. Sep–Nov. *2n* = 24.

Escaped weed. Taiwan, S Yunnan (Xishuangbanna) [native to the West Indies and Central and South America].

This species was treated as *Passiflora gracilis* J. Jacquin ex Link by Bao (in FRPS 52(1): 110. 1999). The two species are distinguished by their leaf lobes in that they are obtuse or rounded in *P. gracilis* vs.

acute in *P. suberosa*; the petiolar glands are placed below the middle in *P. gracilis* (occasionally with one additional gland above middle) vs. at or above the middle in *P. suberosa*; the fruit are bluish black and ovoid or spheroid in *P. suberosa* vs. orange or red and ovoid and at least twice as large in *P. gracilis*; the largest leaves of *P. gracilis* have two small teeth less than 1 cm from the petiole vs. no such teeth in *P. suberosa*.

15. *Passiflora adenopoda* Candolle, Prodr. 3: 330. 1828.

腺柄西番莲 xian bing xi fan lian

Passiflora acerifolia Chamisso & Schlechtendal; *P. aspera* Sessé y Lacasta & Mociño; *P. scabra* Sessé y Lacasta & Mociño.

Herbaceous vines. Stem angulate, striate, hispid. Stipules suborbicular to reniform, 1–1.3 × 1.7–2 cm; petiole 2.5–6 cm, with 2 stipitate glands; leaf blade 7–12 × 7.5–15 cm, membranous, hispidulous, 3- or 5-lobed, lobes ovate, base deeply cordate, margin dentate, apex acute. Inflorescence reduced to 1 or 2 flowers; bracts 3, ovate-oblong, lacerate, placed at or slightly above middle. Flowers white, with violet purple center, 3–5 cm in diam. Sepals oblong-lanceolate, 1.8–2.7 × 1–1.5 cm, obtuse, awned. Petals linear-lanceolate, 8–9 × 4–5 mm, apex obtuse. Corona uniseriate, ca. 1.8 cm, base violet-purple, apex white; operculum incurved, white, plicate; limen annular; androgynophore ca. 9 mm tall. Ovary ovoid, densely tomentose. Fruit bluish black, subglobose, ca. 3.5 × 3 cm; aril bright orange. Seeds brown to black, ca. 6 × 4 mm, reticulate. $2n = 12$.

Naturalized weed, grassy slopes on limestone hills. SW Yunnan (Menglian) [native to Central and South America (Mexico to Peru)].

16. *Passiflora foetida* Linnaeus, Sp. Pl. 2: 959. 1753.

龙珠果 long zhu guo

Dysosmia foetida (Linnaeus) M. Roemer; *Granadilla foetida* (Linnaeus) Gaertner; *Passiflora foetida* var. *hispida* (Candolle ex Triana & Planchon) Killip; *P. hispida* Candolle ex Triana & Planchon; *Tripsilina foetida* (Linnaeus) Rafinesque.

Herbaceous vines, foul smelling. Stem slender, striate, spreading pubescent. Stipules partly clasping, deeply parted, glandular pilose; petiole 2–6 cm, without glands, pubescent, indumentum dense, spreading, glandular pilose; leaf blade broadly ovate to oblong-ovate, (3–)4.5–13 × (2.5–)4–12 cm, membranous, glandular ciliate, abaxially pubescent with small nectaries in distal part, adaxially sericeous, mixed with occasional glandular hairs, base cordate, 3-lobed or unlobed, margin irregularly undulate, apex acute. Inflorescence reduced to a single flower, opposite tendril; bracts 3, 2- or 3(or 4)-pinnatifid; lobes threadlike, glandular pilose apically. Flowers white or light purple with white spots or lines, 2–3 cm in diam. Sepals ca. 1.5 cm, awned. Petals ca. 1.5 cm. Corona 3–5-seriate, filamentous, two outer series ca. 1 cm, inner three series 1–2.5 mm; operculum 1–1.5 mm, membranous; disk cupular, 1–2 mm high; androgynophore 5–7 mm tall. Stamens coherent at base, flat; anthers oblong, ca. 4 mm. Ovary shortly stipitate, ellipsoid, ca. 6 mm, glabrous; styles 3(or 4), 5–6 mm; stigmas capitate. Berry orange or orange-red, ovoid-globose, 2–3 cm in diam., glabrous. Seeds many, light brown to black, elliptic, 3–4 mm. Fl. Jul–Aug, fr. Apr–May of next year. $2n = 20$.

Naturalized weed, grassy slopes, forest margins, roadsides, riverine beaches, occasionally cultivated; 100–1200 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [native to the West Indies and N South America].

The Chinese material is rather uniform, and Killip's infraspecific taxonomy (loc. cit. under genus heading) would key to *Passiflora foetida* var. *hispida* (Candolle ex Triana & Planchon) Killip ex Gleason.

17. *Passiflora edulis* Sims, Bot. Mag. 45: t. 1989. 1818.

鸡蛋果 ji dan guo

Passiflora minima Blanco (1837), not Linnaeus (1753).

Herbaceous vines, woody at base, ca. 6 m long. Stem slender-striate, glabrous. Leaves 6–13 × 8–13 cm, membranous, base cuneate or cordate, deeply 3-lobed, middle lobe ovate, lateral lobes ovate-oblong, margin glandular-serrate, with 1 or 2 small cup-shaped glands near base of sinuses, glabrous. Inflorescence a reduced cyme, central flower not developed, one lateral branch converted to a tendril, flower opposite tendril; bracts green, broadly ovate or rhombic, 1–1.2 cm, margin irregularly serrulate. Pedicel 4–4.5 cm, biglandular at apex. Flowers 4–7 cm in diam.; hypanthium 0.8–1 × 1–1.2 cm. Sepals green outside, light green or white inside, 2.5–4 × ca. 1.5 cm, awn 2–4 mm. Petals 2.5–3 cm × ca. 8 mm. Corona in 4 or 5 series; outer 2 series ligulate with filiform distal half, 2–2.5 cm, base light green, middle purple, apex white; inner 2 or 3 series filiform, 1–3 mm, green and purple; operculum recurved, 1–1.2 mm, margin entire or irregularly lacerate apically; disk ca. 4 mm high, membranous; androgynophore 1–1.2 cm tall; trochlea (ring-shaped enlargement on androgynophore) just above disk. Filaments 5–6 mm, flat, coherent at base; anthers light yellow-green, oblong, 5–6 mm. Ovary obovoid, ca. 8 mm, glabrous to pubescent; styles flat; stigma reniform. Fruit purple at maturity, ovoid, 3–4 cm in diam., glabrous. Seeds many, ovoid, 5–6 mm. Fl. Jun, fr. Nov.

Cultivated, escaped in forests in mountain valleys; 100–1900 m. Fujian, Guangdong, Taiwan, Yunnan [native to South America (probably originally from S Brazil)].

18. *Passiflora caerulea* Linnaeus, Sp. Pl. 2: 959. 1753.

西番莲 xi fan lian

Passiflora caerulea Loureiro ex Candolle (1828), not Linnaeus (1753); *P. loureiroi* G. Don.

Herbaceous vines. Stem terete, slightly angulate, glabrous. Stipules reniform, ca. 1.2 cm, clasping, margin undulate; petiole 2–3 cm, with 2–4(–6) small glands; leaf blade 5–7 × 6–8 cm, papery, base cordate, margin entire, palmately (3–)5(–9)-lobed; lobes ovate-oblong, middle lobe slightly larger than lateral lobes, glabrous. Inflorescence a reduced cyme, central flower not developed, one lateral branch converted to a tendril, flower opposite tendril; bracts broadly ovate, 2–3 cm, margin entire. Pedicel 3–4 cm. Flowers 6–8(–10) cm in diam. Sepals light green outside, white inside, 3–4.5 cm, awn 2–3 mm. Petals white to light green, 2.5–4 cm. Corona in 3 or 4 series, filamentous; outer 2 series (0.6–)1–1.5 cm, base dark purple, middle white, apex bright blue; inner 1 or 2 series 1–2 mm, base light green, apex white and capitate; operculum fimbriate, lobes dark purple, with an-

nular nectary at base; disk 1–2 mm high; androgynophore 8–10 mm tall. Filaments ca. 1 cm, flat, free; anthers oblong, ca. 1.3 cm. Ovary ovoid-globose; styles free, purple, 6–8 mm; stigma reniform. Berry orange-yellow or yellow, ovoid-globose or sub-globose, ca. 6 cm. Seeds many, obcordate, ca. 5 mm. Fl. May–Jul.

Cultivated. Guangxi, Jiangxi, Sichuan, Yunnan [native to South America (N Argentina, S Brazil)].

19. *Passiflora quadrangularis* Linnaeus, Syst. Nat., ed. 10, 2: 1248. 1759.

大果西番莲 da guo xi fan lian

Granadilla quadrangularis (Linnaeus) Medikus.

Herbaceous vines, woody at base, 10–15 m long, glabrous. Young stem quadrangular, narrowly winged. Stipules ovate-lanceolate, 2–4 cm, margin entire, apex acute; petiole 3–5 cm, with 2 or 3 pairs of cupular glands; leaf blade broadly ovate to sub-orbicular, 7–13 × 5–15 cm, membranous, glabrous, lateral veins 8–12 pairs, tertiary veins somewhat prominent, base rounded to truncate, margin entire, apex acute. Inflorescence a reduced cyme, flower opposite tendril, tendril thick and strong; bracts leaflike, ovate, 3–5 cm, base cordate, apex acute. Pedicel 1–3 cm, triangular, articulate at middle. Flowers light red, 6–8(–10) cm in diam. Sepals green outside, red inside, ovate to ovate-oblong, 3–4 cm, sparsely pubescent. Petals light red, oblong to oblong-lanceolate, 2.5–3.5 cm. Corona in 5 series, white or purple, filamentous; outer 2 series 3–5 cm; middle series ca. 2 mm, capitate; inner 2 series 1–2 mm, threadlike, 4–5 mm, membranous, margin lacerate; operculum membranous, similar to fifth outer corona in shape; disk cupular. Stamens free. Ovary ovoid;

styles purple; stigma 3-lobed. Berry yellow or orange at maturity, ovoid, 20–25 cm, rind thick and fleshy. Seeds many, 7–9 mm, flat. Fl. Feb–Aug.

Cultivated. Guangdong, Guangxi, Hainan [native to tropical America].

20. *Passiflora laurifolia* Linnaeus, Sp. Pl. 2: 956. 1753.

樟叶西番莲 zhang ye xi fan lian

Passiflora acuminata Candolle; *P. tinifolia* Jussieu.

Woody vines. Stem terete, glabrous, striate. Stipules linear, 3–4 mm; petiole terete, ca. 1.2 cm, sparsely pubescent, with 2 glands near base of blade; leaf blade ovate-oblong, 7–10 × 3.5–6 cm, leathery, glabrous, lateral veins 8–10 per side of mid-vein, base rounded or subcordate, margin entire, apex mucronulate. Inflorescence reduced to a single flower; bracts 3, ovate, 2–3 cm, puberulous, base cuneate, margin glandular serrate, apex obtuse. Pedicel 1.5–3 cm, thick. Flower white, with red spots, 5–7 cm in diam. Sepals 5, ovate-oblong, 2–2.5 cm, awned and puberulous apically. Petals 5, similar to sepals. Outer corona in 6 whorls, purple with white bands; outer 2 whorls 2–4 cm, linear; inner 4 whorls 1.5–2 mm, threadlike; inner corona membranous, apically dentate; limen annular around base of androgynophore. Ovary ovoid, sparsely pubescent. Fruit citreous or reddish yellow, ovoid, 4–6 cm. Seeds many, obcordate, 5–7 mm. Fl. Jun.

Cultivated. Guangdong (Guangzhou) [native to Central and South America].

A white-flowered form was introduced to China; wild populations most often have red or reddish purple flowers.

2. ADENIA Forsskål, Fl. Aegypt.-Arab. 77. 1775.

蒴莲属 shuo lian shu

Wang Yinzheng (王印政); David Hearn

Modecca Lamarck.

Plants herbaceous or woody vines, perennial, tendrillate, glabrous. Roots tuberous or fleshy. Stems terete; tendrils axillary, (minutely 3-forked or) simple. Leaves simple, alternate, petiolate; stipules triangular, minute; petiole apex or blade base with 2 glands. Plants (monoecious or) dioecious. Inflorescences axillary, cymose-corymbose, pedunculate, few- to many flowered, tendrillate at center; bracts and bracteoles triangular, minute. Flowers yellowish or green, often red punctate, unisexual, with solid tissue (stipe) subtending hypanthium articulate at pedicel. Hypanthium narrowly to broadly cup-shaped. Sepals (calyx lobes) 5, partially connate into calyx tube, imbricate, persistent. Petals 5, free, attached at hypanthium apex, greenish, creamy, or white, mostly smaller than sepals, included. Septa, when present, adnate with hypanthium and filaments or staminodes, dividing hypanthium into 5 sacs. Corona absent or a lacinate to membranous ring at apex of hypanthium. Disk glands 5 or absent, ligulate, truncate, inserted at or near base of hypanthium, alternating with petals. Male flower: stamens 5, hypogynous or perigynous, variably inserted in hypanthium; filaments free or partially connate into tube, often fused abaxially to septa; vestigial ovary present. Female flower with stamens reduced to subulate staminodes; ovary superior on gynophore, globose, with 3 parietal placentas; remnant stamen tube, if present, not adnate with gynophore; ovules numerous, anatropous; styles 3, free or partially fused; stigmas lacinate or plumose to densely woolly. Fruit a 3-valved capsule, bright red. Seeds with pitted testa, black at maturity, enclosed in fleshy aril.

About 100 species: Old World tropics and subtropics; three species in China.

- 1a. Plants herbaceous vines, with tuberous rootstock; mature stems at soil-level narrow, less than 1 cm in diam.; leaf with paired glands on peltate extension of blade base; flowers with calyx lobes 2–10 × as long as depth of hypanthium, hypanthium soft; corona usually present 1. *A. penangiana*

- 1b. Plants woody lianas, with fleshy rootstock, rarely tuberous; mature stems at soil-level thick, 2–8 cm or more in diam.; leaf with paired glands on auriculate extension at apex of petiole; flower with calyx lobes 0.2–1 × as long as depth of hypanthium; hypanthium fleshy, turgid, thick; corona absent.
- 2a. Margins of mature leaves with irregularly spaced black-tipped glandular serrations, bases cordate; tertiary and secondary veins raised abaxially, distinctly trabeculate, veins from arcuate laterals parallel; exocarp hard-woody, mesocarp spongy, together 5–20 mm thick; elevation (800–)1000–2000 m 2. *A. cardiophylla*
- 2b. Margins of mature leaves entire or rarely serrate toward apex, bases variable, typically rounded; tertiary veins typically indistinct, veins from arcuate laterals with variable orientations; pericarp flexible-leathery externally and internally, 1–3 mm thick; elevation near sea level to 300(–1000) m 3. *A. heterophylla*

1. *Adenia penangiana* (Wallich ex G. Don) de Wilde, *Blumea* 15: 266. 1967.

滇南蒴莲 dian nan shuo lian

Passiflora penangiana Wallich ex G. Don, *Gen. Hist.* 3: 55. 1834; *Adenia nicobarica* King; *Disemma penangiana* (Wallich ex G. Don) Miquel; *Modecca nicobarica* Kurz.

Vines, to 6 m long, glabrous. Rootstock tuberous. Stems terete, slender; internodes 1–10 cm; tendrils simple or 3-forked, 1–10 cm. Stipules triangular, ca. 0.5 mm; petioles 0.5–2 cm; glands at blade-petiole junction 2, on slightly bi-lobed peltate extension of base of blade, ca. 1 mm in diam.; leaf blade elliptic to lanceolate, 2–16 × 0.5–4 cm, membranous to leathery, not punctate, glands near leaf margin 0–9, base rounded, margin entire, apex acute to acuminate. Plants (monoecious or) dioecious. Inflorescences usually tendrillate, occasionally of short racemose shoots, pedunculate for 1–10 cm, to 30-flowered in males, 1–3-flowered in females; bracts and bracteoles triangular, ca. 1 mm, apex acute. Pedicel 0.5–4 mm. Flowers narrowly campanulate, 6–17 × 1–4 mm; stipe cream-colored, 1–7 mm. Hypanthium narrowly cup-shaped, 1–2.5 mm deep. Calyx tube to 2 mm; lobes reflexed, oblong to linear, 4–15 mm, apex entire to irregular, rounded to acute. Petals inserted at level of corona, elliptic to linear, 4–10 mm, apex serrulate, rounded to acute. Septa 0.25–2 mm high. Corona lacinate, membranous, occasionally of woolly filaments at apex of hypanthium. Disk glands linear, ca. 1 mm, truncate. Male flowers: filaments 2–3 mm, connate for ca. 2 mm, inserted at base of hypanthium, septa occasionally spanning entire length of hypanthium; anthers ca. 3 × 0.5 mm, to 1 mm apiculate; vestigial ovary including gynophore ca. 1 mm. Female flowers: staminodes ca. 1 mm, connate for ca. 0.5 mm, inserted at base of hypanthium; ovary 3–6 mm; gynophore ca. 0.5 mm; styles 1–2 mm, connate for up to 0.5 mm; stigmas globose, woolly. Capsules 1 per inflorescence, scarlet at dehiscence, oblong, ca. 4 × 2 cm, with gynophore to 4 cm, exocarp and mesocarp leathery. Seeds ca. 10 per capsule, subglobose or flattened; funicles of seeds 5–10 mm. Fl. and fr. throughout year, mostly around Oct.

Dense forests and open fields, occasionally in seasonally marshy areas; ca. 500 m. Yunnan (Mengla) [India (Nicobar Islands), Indonesia (Sumatra), Laos, Malaysia, Thailand, Vietnam].

The above description is based on extra-regional specimens as no material from China was available for study.

2. *Adenia cardiophylla* (Masters) Engler, *Bot. Jahrb. Syst.* 14: 376. 1891.

三开瓢 san kai piao

Modecca cardiophylla Masters in J. D. Hooker, *Fl. Brit. India* 2: 602. 1879.

Canopy lianas, to 25 m long. Stems terete, to 8 cm in diam.; internodes 5–15 cm; tendrils to 20 cm. Stipules darkening with age, narrowly triangular, ca. 1 × 0.5 mm; petiole 3–12 cm, glands at blade-petiole junction 2, on concave ca. 4 mm in diam. auriculate extensions at apex of petiole, 2–3 mm in diam.; leaf blade cordate, rarely (2 or)3-lobed, 7–25 × 5–19 cm, membranous, not punctate, tertiary and secondary veins raised abaxially, venules distinctly trabeculate, veins from arcuate laterals parallel, base of mature leaves cordate, margins of mature leaves with irregularly spaced black-tipped glandular serrations, apex acute to acuminate, with mucro. Plants dioecious. Inflorescences with tendril emerging from center, pedunculate to 18 cm, to 30-flowered in males, 1–3-flowered in females; bracts and bracteoles triangular, ca. 1 mm, acute. Pedicel 0.5–10 mm. Flowers tubiform-campanulate, 9–25 × 3–8 mm, including stipe 6–12 mm. Hypanthium cupuliform, wall fleshy-leathery, ca. 0.75 mm thick, 6–10 mm deep. Calyx tube 0.5–3 mm; lobes narrowly triangular, 4–6 mm, rounded to acute, entire. Petals deltoid to lanceolate, 3–5 × ca. 2.5 mm, red punctate, rounded to acute, entire. Septa to 2 mm high. Corona absent. Disk glands linear, to 1 mm high, truncate. Male flowers: filaments 0.5–5.5 mm, connate up to 4 mm, inserted at base of hypanthium; anthers ca. 5 × 1.5 mm, acute, up to 0.5 mm apiculate; vestigial ovary to 3 mm, gynophore ca. 1 mm. Female flowers: staminodes 2–3 mm, connate for ca. 1 mm, inserted at base of hypanthium; ovary ellipsoid, ca. 4 × 4 mm; gynophore to 4 mm; style arms ca. 1 mm, connate for ca. 1 mm; stigmas lacinate. Capsules 1 or 2 per inflorescence, outside deep red at dehiscence, pear-shaped, fruit to 11 cm with gynophore to 7.5 cm, exocarp woody, mesocarp and endocarp spongy. Seeds to 40 per capsule, reniform; funicles of seeds 1–2 cm. Fl. Apr–Sep, fr. Jun–Nov.

Mixed forests, scrub; (800–)1000–2000 m. Yunnan [?Bhutan, Cambodia, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

3. *Adenia heterophylla* (Blume) Koorders, *Exkurs.-Fl. Java* 2: 637. 1912.

异叶蒴莲 yi ye shuo lian

Modecca heterophylla Blume, *Bijdr.* 940. 1826; *Adenia chevalieri* Gagnepain; *A. maclurei* Merrill; *A. parviflora* (Blanco) Cusset; *A. populifolia* K. Schumann & Lauterbach (1900), not Engler (1891); *Modecca formosana* Hayata; *Passiflora parviflora* Blanco.

Canopy lianas, to 30 m long. Roots fleshy, thickened. Stems terete, to 5 cm in diam.; internodes 2–20 cm; tendrils (3-forked or) simple, to 25 cm. Stipules flattened-triangular, ca. 1

mm; petiole 1–10 cm, glands at blade-petiole junction 2, on concave 2–4 mm in diam. auriculate extensions at apex of petiole in mature leaves, 1–3 mm in diam.; leaf blade ovate to lanceolate, membranous to leathery, glands often present, dotlike, base of mature leaf oblong, unlobed or (2 or)3-lobed with distal 1/3 of leaf often slightly constricted from slight lobation, margin entire to serrate, apex acute to acuminate. Plants (monoecious or) dioecious. Inflorescences often with tendril emerging from center, peduncle to 20 cm, to 40-flowered in males, 2–4-flowered in females; bracts and bracteoles narrowly triangular, ca. 1 mm, apex acute. Pedicel 0.5–13 mm. Flowers tubiform-urceolate, 15–25 × 2–5 mm, including stipe 1–15 mm. Hypanthium urceolate to cupuliform, wall fleshy-leathery, ca. 0.5 mm thick, 3–6 mm deep. Calyx tube 2–3 mm; lobes reflexed, triangular, 1–3 mm, rounded to acute, entire. Petals oblanceolate to triangular, 2–4 × 0.5–1 mm, red punctate, base hastate, apex entire to undulate, rounded to acute. Septa 0.25–3 mm high. Corona absent. Disk glands linear, to 3 mm high, truncate. Male

flowers: filaments 1–4 mm, connate up to 2 mm, inserted at base of hypanthium; anthers ca. 3 × 1 mm, acute, up to 0.5 mm apiculate; vestigial ovary ca. 1 mm, gynophore to 1 mm. Female flowers: staminodes 1–3 mm, connate to 1 mm, inserted at base of hypanthium; ovary subglobose to oblong, ca. 4 × 2.5 mm; gynophore ca. 3 mm; style arms ca. 1 mm, free or connate for ca. 0.5 mm; stigmas globose, papillate. Capsules 1–3 per inflorescence, outside deep red at dehiscence, ellipsoid, fruit body to 13 cm, with gynophore to 3 cm, fruit wall leathery. Seeds to 60 per capsule, orbicular; funicles of seeds 5–15 mm. Fl. and fr. throughout year, primarily during wet periods.

Forests, scrub; near sea level to 300(–1000) m. Guangdong, Guangxi, Hainan, Taiwan [Cambodia, Indonesia (Java, Sumatra), Laos, New Guinea, Philippines, Thailand, Vietnam; Australia, Pacific islands].

This is a widespread and highly variable species. It has been treated as *Adenia heterophylla* [subsp. *heterophylla*] var. *heterophylla* according to de Wilde (Meded. Landbouwhogeschool Wageningen 71(18): 216. 1971).