

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 laciniate 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 laciniate 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 laciniate, 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, $7\text{--}25 \times 5\text{--}19$ 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, $9\text{--}25 \times 3\text{--}8$ 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, $3\text{--}5 \times$ 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, $15\text{--}25 \times 2\text{--}5$ 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, $2\text{--}4 \times 0.5\text{--}1$ 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).

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