

4. STRYCHNOS Linnaeus, Sp. Pl. 1: 189. 1753.

马钱属 ma qian shu

Shrubs, trees, or lianas, armed or unarmed; lianas with axillary simple or double curled tendrils, sometimes with axillary thorns. Stipules often reduced to a straight ciliate ridge connecting petiole bases. Leaves petiolate to sometimes sessile; leaf blade margin entire; basal veins 3–7; secondary veins distinct, 1–3 per side, from or near base and curved along margin. Inflorescences terminal and/or axillary, thyrsoïd; bracts scalelike to sepal-like. Flowers pedicellate or sessile, 4- or 5-merous. Corolla rotate to salverform; lobes valvate in bud, spreading to reflexed when open. Stamens inserted at corolla throat to middle of corolla tube, exerted to included; filaments long to short, mostly filiform; anthers orbicular to narrowly oblong, base mostly slightly 2-cleft, introrse, 2-locular and separate. Ovary (1 or)2-locular; ovules few to many per locule. Style cylindrical; stigma capitate or faintly 2-cleft. Berry orange or red when ripe in species represented, usually globose to ellipsoid, thin to thick walled, outside smooth to minutely warty, glabrous; pulp fleshy, usually orange; 1–15-seeded. Seeds ± flattened to saucer-shaped, circular to elliptic in outline; seed coat sericeous, felty, or scabrous and glabrous; embryo spatulate; endosperm horny; cotyledon leaflike.

About 190 species: tropics and subtropics; 11 species in China.

Many species are medicinal and poisonous.

- 1a. Trees, tendrils absent.
- 2a. Petiole 2–4 mm; leaf blade abaxially granular; young plants spiny; inflorescences terminal 3. *S. lucida*
- 2b. Petiole 5–15 mm; leaf blade abaxially smooth; plants never spiny; inflorescences axillary.
- 3a. Sepals ovate, outside densely pubescent; fruit 2–4 cm in diam. 1. *S. nux-vomica*
- 3b. Sepals narrowly oblong, subglabrous; fruit 6–8 cm in diam. 2. *S. nux-blanda*
- 1b. Lianas, sometimes with axillary tendrils.
- 4a. Flowering specimen.
- 5a. Flower buds 3–4.5 mm.
- 6a. Flowers 4(or 5)-merous; anthers exerted; inflorescences 6–12 cm 5. *S. umbellata*
- 6b. Flowers 5-merous; anthers included; inflorescences 1–5 cm.
- 7a. Corolla inside pubescent at mouth and on base of lobes, lobes longer than tube; leaf blade 8–13 cm 4. *S. ovata*
- 7b. Corolla inside with a row of erect bristlelike hairs at base or to middle of lobes, lobes ± as long as tube; leaf blade 2–10 cm 7. *S. axillaris*
- 5b. Flower buds 8–17 mm.
- 8a. Corolla lobes ± as long as tube; filaments longer than anthers 6. *S. angustiflora*
- 8b. Corolla lobes shorter than tube; filaments shorter than anthers.
- 9a. Corolla 0.8–1.2 cm, tube glabrous inside 8. *S. cathayensis*
- 9b. Corolla 1.4–1.7 cm, tube pubescent inside.
- 10a. Corolla tube pubescent at mouth; style villous 9. *S. nitida*
- 10b. Corolla tube pubescent on lower half; style glabrous.
- 11a. Inflorescences axillary; anther connective apiculate at apex; sepal margin glabrous 10. *S. ignatii*
- 11b. Inflorescences terminal; anther connective obtuse or rounded at apex; sepal margin ciliate 11. *S. wallichiana*
- 4b. Fruiting specimen.
- 12a. Seeds 0.6–1.8 cm.
- 13a. Fruit to 2 cm in diam., 1–3-seeded.
- 14a. Leaf apex acute to rounded; inflorescences 6–12 cm 5. *S. umbellata*
- 14b. Leaf apex acuminate; inflorescences 1–5 cm 7. *S. axillaris*
- 13b. Fruit 2–5.5 cm in diam., often more than 3-seeded.
- 15a. Branchlets spiny; tendrils absent; petiole ca. 1.5 cm; leaf blade 8–13 cm 4. *S. ovata*
- 15b. Branchlets not spiny but older branches spiny; tendrils present; petiole 0.4–0.6 cm; leaf blade 3–8 cm 6. *S. angustiflora*
- 12b. Seeds 2–3 cm.
- 16a. Fruit wall not woody, to 3 mm thick.
- 17a. Fruit 1.5–3 cm in diam., 2–7-seeded; petiole 2–4 mm 8. *S. cathayensis*
- 17b. Fruit 4–6 cm in diam., many seeded; petiole 5–7 mm 11. *S. wallichiana*
- 16b. Fruit wall woody, ca. 5 mm thick.
- 18a. Tendrils double; leaf blade base cuneate to broadly cuneate 9. *S. nitida*

18b. Tendrils single; leaf blade base obtuse to rounded 10. *S. ignatii*

1. *Strychnos nux-vomica* Linnaeus, Sp. Pl. 1: 189. 1753.

马钱子 ma qian zi

Strychnos nux-vomica var. *oligosperma* Dop; *S. spireana* Dop.

Trees to 25 m tall. Branchlets slightly pubescent, glabrescent. Petiole 0.5–1.5 cm; leaf blade suborbicular, broadly elliptic, or ovate, 5–18 × 4–12.5 cm, papery, abaxially minutely hairy especially on veins, adaxially glabrous and shiny, base rounded to cordate, apex short acuminate to acute and often mucronulate; basal veins 3–5. Thyrses axillary, 3–6 cm; peduncle puberulent; bracteoles pubescent. Flowers 5-merous. Pedicel puberulent. Calyx lobes ovate, outside densely pubescent. Corolla greenish white to white, salverform, ca. 1.3 cm; tube longer than lobes, outside glabrous, inside sparsely villous at base or on lower half; lobes narrowly ovate, ca. 3 mm, margin thickened and puberulent. Stamens inserted at mouth or corolla tube; filaments very short; anthers elliptic, ca. 1.7 mm, apex exerted. Pistil 1–1.2 cm. Ovary ovoid, glabrous. Style to 1.1 cm, glabrous; stigma capitate. Berry orange when ripe, globose, 2–4 cm in diam., glabrous, 1–4-seeded. Seeds orbicular to elliptic, 2–4 cm wide, densely sericeous. Fl. spring to summer.

Cultivated in Fujian, Guangdong, Guangxi, Hainan, Taiwan, and S Yunnan [native in India, cultivated throughout tropical Asia].

Medicinal; tools.

2. *Strychnos nux-blanda* A. W. Hill, Bull. Misc. Inform. Kew 1917: 189. 1917.

山马钱 shan ma qian

Strychnos nux-blanda var. *hirsuta* A. W. Hill; *S. nux-vomica* Linnaeus var. *grandifolia* Dop.

Trees to 15 m tall. Branchlets glabrous or glabrescent. Petiole 1–1.5 cm; leaf blade broadly ovate, elliptic, or suborbicular, 9–22 × 7–16 cm, papery, glabrous, base rounded, apex acute to acuminate; basal veins 5–7. Thyrses axillary, 4–6 cm; bracteoles puberulent. Flowers 5-merous. Pedicel puberulent. Calyx lobes narrowly oblong, 1.5–2 mm, outside puberulent. Corolla white, salverform, 1.2 cm; tube ca. 9 mm, outside villous near base; lobes narrowly elliptic, ca. 3 mm, outside glandular. Stamens inserted at corolla mouth; filaments very short; anthers subovate, ca. 2 mm, apex exerted. Ovary ovoid, glabrous. Style to 1.2 cm, glabrous; stigma capitate. Berry globose, 6–8 cm in diam., 4–15-seeded. Seeds ovoid, suborbicular, or ellipsoid, 1.5–2.2 × 1.3–2 cm, compressed. Fl. Mar–Jun, fr. Aug–Dec.

300–600 m. Cultivated in S and SW Guangdong [native in Cambodia, India, Laos, Myanmar, Thailand, and Vietnam].

3. *Strychnos lucida* R. Brown, Prodr. 469. 1810.

腺叶马钱 xian ye ma qian

Trees to 12 m tall, with spines when young. Branchlets sparsely pubescent or glabrous; branches grayish, rough with

many small lenticels. Petiole 2–4 mm; leaf blade 2.5–10 × 1.5–6 cm, thin papery, glabrous, abaxially granular, base cuneate to slightly cordate, apex rounded, obtuse, or acute; basal veins 3–5. Thyrses terminal, ca. 9-flowered, pubescent. Calyx lobes broadly ovate. Corolla salverform, 1–1.5 cm; tube 7–12 mm, outside pubescent. Stamens inserted at corolla mouth, glabrous; filaments short; anthers oblong, 1.5–1.7 mm, apex exerted. Ovary globose, ca. 1 mm in diam. Style ca. 1.2 mm; stigma truncate. Berry globose, 2–2.5 cm in diam., smooth, glabrous, 2- or 3-seeded. Seeds nearly disc-shaped, 1.2–1.5 × 1–1.2 cm, densely pubescent. Fl. Mar–Jun, fr. Aug–Nov.

300–500 m. Cultivated in Hainan [native in Australia, Indonesia, and Thailand].

4. *Strychnos ovata* A. W. Hill, Bull. Misc. Inform. Kew 1909: 360. 1909.

密花马钱 mi hua ma qian

Strychnos confertiflora Merrill & Chun.

Lianas to 10 m. Stems to 4 cm in diam.; branchlets spiny, glabrous. Petiole ca. 1.5 cm; leaf blade ovate, elliptic, or oblong, 8–13 × 3–8 cm, papery, glabrous, base obtuse to rounded, apex acute to acuminate; basal veins 3–5, lateral veins more delicate than midrib, reticulate veins slightly conspicuous on both surfaces. Thyrses axillary and terminal, 1.5–2.5 cm, many flowered, sparsely pubescent. Flowers 5-merous. Pedicel 2–3 mm, pubescent. Calyx lobes broadly ovate, ca. 1 mm, outside slightly puberulent, apex obtuse. Corolla rotate, 3–4.5 mm, thin to fairly thick, fleshy especially lobes, outside pubescent, inside pubescent at mouth and on base of lobes, tube 1–1.5 mm; lobes ovate-elliptic, 2.5–3 mm. Stamens inserted at corolla mouth, included; filaments short; anthers oblong, ca. 1.2 mm, base bearded, connective mucronate. Ovary ovoid, ca. 1 mm, glabrous or apically villous. Style ca. 2 mm, basally hairy; stigma capitate. Berry orange when ripe, globose, 2–5.5 cm in diam., smooth, thin walled, 1- or 2-seeded. Seeds orbicular, flat, ca. 1 cm in diam., surface feltlike. Fl. Mar–Jun.

Forests and thickets in mountains; 200–600 m. S Guangdong, Hainan [Indonesia, Malaysia, Philippines].

5. *Strychnos umbellata* (Loureiro) Merrill, Philipp. J. Sci. 15: 252. 1919.

伞花马钱 san hua ma qian

Cissus umbellata Loureiro, Fl. Cochinch. 1: 84. 1790; *Strychnos paniculata* Champion ex Benth.

Lianas to 10 m. Branchlets glabrous. Petiole 4–6 mm; leaf blade 4–9 × 2–3.5 cm, ovate to narrowly elliptic, leathery, glabrous, base obtuse, apex acute to rounded; basal veins 3–7. Thyrses terminal or axillary, 6–12 cm; peduncle pubescent. Flowers 4(or 5)-merous. Pedicel 1–4 mm, pubescent. Calyx lobes broadly ovate, ca. 1 × 1 mm, outside pubescent. Corolla campanulate, ca. 4 mm, outside glabrous; tube 0.5–1 mm, mouth pubescent; lobes narrowly oblong, 1.5–3 mm. Stamens

inserted at corolla mouth, exserted; filaments ca. 1.5 mm; anthers narrowly ovate, ca. 1 mm, cordate, base bearded. Ovary ovoid, ca. 3 mm, glabrous or apically villous. Style 2.5–3 mm; stigma capitate. Berry globose, ca. 1.2 cm in diam., 1–3-seeded. Seeds pale yellowish gray, orbicular, ca. 7 mm, very finely sericeous. Fl. Mar–Jun.

Forests and thickets in mountains; 200–500 m. S Guangdong, SE Guangxi, Hainan [Vietnam].

The seeds and roots contain the poisonous alkaloids strychnine and brucine.

6. *Strychnos angustiflora* Benth., J. Linn. Soc., Bot. 1: 102. 1857.

牛眼马钱 niu yan ma qian

Strychnos usitata Pierre ex Dop var. *cirrosa* Dop.

Lianas to 10 m, glabrous except for inflorescences and flowers. Branchlets with axillary tendrils 2–5 cm; older branches with axillary thorns. Petiole 4–6 mm; leaf blade ovate, elliptic, or suborbicular, 3–8 × 2–4 cm, leathery, base obtuse to rounded or sometimes slightly cordate, apex acute to obtuse; basal veins 3–5, lateral veins more delicate than midrib. Thyrses terminal, 2–4 cm, pubescent. Flowers 5-merous, 8–11 mm. Calyx lobes ovate to triangular, 1–1.5 mm, outside puberulent. Corolla white, salverform; tube 4–5 mm, throat and base of lobes long woolly; lobes narrowly oblong, ± as long as tube. Stamens inserted at mouth or corolla tube, ca. 2 mm; filaments filiform, longer than anthers; anthers oblong, exserted, base glabrous. Pistil ca. 1 cm, glabrous. Ovary ovoid, ca. 0.7 mm. Style slender. Berry orange when ripe, globose, 2–4 cm in diam., smooth, 1–6-seeded. Seeds pale yellowish gray, orbicular, flat, 1–1.8 cm in diam., covered with extremely fine sericeous hairs. Fl. Apr–Jun, fr. Jul–Dec.

Open woodlands, scrub; 300–800 m. Fujian, Guangdong, Guangxi, Hainan, S Yunnan [Philippines, Thailand, Vietnam].

The seeds, bark, and young leaves contain the poisonous alkaloids strychnine and brucine, which are used to treat sore throats and for antiswelling.

7. *Strychnos axillaris* Colebrooke, Trans. Linn. Soc. London 12: 356. 1819.

腋花马钱 ye hua ma qian

Lianas to 20 m. Branchlets puberulent or glabrous; axillary spines spirally curved apically. Petiole to 1 cm; leaf blade elliptic, narrowly elliptic, ovate, or suborbicular, 2–10 × 1–5 cm, papery to leathery, abaxially pubescent or glabrous, adaxially glabrous or pubescent only on midrib, base attenuate to subcordate, apex acuminate; basal veins 3–5. Cymes axillary and/or terminal, 2- or 3-branched, 1–5 cm, many flowered, pubescent or glabrous. Flowers 5-merous. Calyx 1–2 mm, outside pubescent or glabrous, inside glabrous; lobes ovate to suborbicular. Corolla 3–4 mm; tube ± as long as lobes, glabrous or outside puberulent; lobes narrowly ovate, outside glabrous or very rarely puberulent, inside with a row of erect bristlelike hairs at base or to middle of lobes, apically strongly thickened. Stamens inserted at middle of corolla tube, included; filaments very short; anthers

ovate, apex apiculate, base bearded to ciliate. Pistil 1.5–2 mm, glabrous. Ovary globose, ca. 1 mm in diam. Berry ovoid to globose, to 2 cm in diam., 1- or 2-seeded. Seeds ellipsoid to rounded, 6–12 mm in diam. Fl. Mar–Aug, fr. Jun–Dec.

Montane forests, forest edges; 500–800 m. S Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Thailand, Vietnam; Australia].

8. *Strychnos cathayensis* Merrill, Lingnan Sci. J. 13: 14. 1934.

华马钱 hua ma qian

Lianas to 8 m. Young branchlets pubescent, glabrescent, with axillary double tendrils or erect spines. Petiole 2–4 mm; leaf blade elliptic to narrowly oblong, 2–10 × 0.5–4 cm, abaxially puberulent, adaxially green, glabrous, and shiny, base obtuse to rounded, apex acute to acuminate; basal veins 3(–5), veins adaxially impressed. Cymes terminal or axillary, 3–4 cm, many flowered; peduncle puberulent; bracteoles ovate to triangular, ca. 1 mm. Flowers 5-merous, 0.8–1.2 cm. Pedicel ca. 2 mm, puberulent. Calyx lobes ovate, ca. 1 × 0.5 mm, outside puberulent. Corolla white, salverform, ca. 1.2 cm, glabrous, outside sometimes papillose, tube ca. 9 mm; lobes oblong, to 3.5 mm, slightly thickened. Stamens inserted at corolla mouth, ca. 2 mm; filaments ca. 0.5 mm; anthers oblong, 1.5–2 mm, glabrous. Pistil to 1.1 cm, glabrous. Ovary ovoid, ca. 1 mm. Style slender, to 1 cm; stigma capitate. Berry globose, 1.5–3 cm in diam., 2–7-seeded. Seeds saucer-shaped, 2–2.5 cm wide, densely puberulent. Fl. Mar–Jun, fr. Jun–Dec.

300–800 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [N Vietnam].

- 1a. Branchlets with tendrils; leaf blade 6–10 cm 8a. var. *cathayensis*
- 1b. Branchlets with spines; leaf blade ca. 2 cm 8b. var. *spinata*

8a. *Strychnos cathayensis* Merrill var. *cathayensis*

华马钱(原变种) hua ma qian (yuan bian zhong)

Strychnos henryi Merrill & Yamamoto.

Branchlets with axillary double tendrils. Leaf blade 6–10 × 2–4 cm. Fl. Apr–Jun, fr. Jun–Dec.

Open woodlands, scrub; 300–800 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [N Vietnam].

The roots and seeds are medicinal, and the leaves and seeds are poisonous.

8b. *Strychnos cathayensis* var. *spinata* P. T. Li, J. South China Agr. Coll. 1: 126. 1980.

刺马钱 ci ma qian

Branchlets with erect spines 1–1.5 cm. Leaf blade ca. 2 cm × 5 mm. Fl. Mar–Jun, fr. Jun–Dec.

* Open woodlands; 300–500 m. S Guangdong.

9. *Strychnos nitida* G. Don, Gen. Hist. 4: 66. 1837.

毛柱马钱 mao zhu ma qian

Strychnos cheliensis Hu; *S. kerrii* A. W. Hill; *S. wallichiana* Steudel ex A. de Candolle var. *intermedia* A. W.

Hill; *S. wallichiana* var. *ovata* A. W. Hill; *S. yunnanensis* S. Y. Pao.

Lianas to 7 m. Branchlets terete to sometimes subangular, pubescent, glabrescent, with axillary double tendrils. Petiole 5–7 mm, adaxially ciliate; leaf blade oblong to elliptic, 8–14 × 3–6 cm, abaxially pubescent or glabrous, adaxially dark green, glabrous, and shiny, base cuneate to broadly cuneate, apex obtuse to acute; basal veins 3, reticulate veins present. Thyrses terminal, 4–8 cm; peduncle pubescent. Flowers 5-merous. Pedicel 2–3 mm, pubescent. Calyx lobes broadly ovate, ca. 1 mm, outside puberulent, margin membranous and ciliate, apex rounded. Corolla greenish, salverform, 1.4–1.5 cm, outside glabrous or glabrescent; tube ca. 1.2 cm, villous at mouth; lobes narrowly oblong, ca. 2.5 × 1.5 mm, inside usually papillose. Stamens inserted at corolla mouth; filaments shorter than anthers; anthers oblong, ca. 1 mm, glabrous, base 2-cleft, apex rounded. Ovary ovoid, ca. 3 mm, glabrous. Style ca. 1.2 cm, villous; stigma slightly concave. Berry globose, 3–5 cm in diam., smooth, usually 3-seeded; exocarp woody, thick. Seeds ovoid to suborbicular, flat, 2–3 × 1.8–2 cm, puberulent. Fl. Mar–Jul.

Forests in mountains, scrub; 200–1800 m. Guangxi, S and SW Yunnan [Bangladesh, India, Laos, Myanmar, Thailand, Vietnam].

The fruit are medicinal, and the seeds are poisonous.

10. *Strychnos ignatii* P. J. Bergius, *Mat. Med.* 1: 146. 1778.

吕宋果 *lu song guo*

Ignatia amara Linnaeus f.; *Ignatiana philippinica* Loureiro; *Strychnos hainanensis* Merrill & Chun; *S. ovalifolia* Wallich ex G. Don.

Lianas to 20 m. Branches grayish brown, lenticellate, glabrous; branchlets usually with axillary simple tendrils 3–7 cm. Petiole 7–10 mm; leaf blade ovate to elliptic, 6–17 × 3.5–7 cm, papery to leathery, glabrous, shiny, base obtuse to rounded, apex acute to acuminate; basal veins 3–5, reticulate veins present. Thyrses axillary, 2.5–3 cm, 10–20-flowered, minutely pubescent. Flowers fragrant, 5-merous. Calyx lobes ovate, ca. 1 mm, outside pubescent. Corolla yellowish, salverform, 1.5–1.7 cm, papillose; tube outside glabrous, inside with long woolly hairs basally, ca. 3 × as long as lobes; lobes oblong to elliptic, 4–5 mm, apex slightly thickened. Stamens inserted at corolla mouth; filaments very short; anthers oblong, 1.2–1.8 mm, glabrous, base shallowly 2-cleft, connectives apiculate at apex. Pistil ca. 1.5 cm. Ovary ovoid, ca. 1 mm. Style ca. 1.4 cm; stigma capitate. Berry orange when ripe, globose, 4–10 cm in diam., 1–15-seeded; pericarp to 5 mm thick, hard, woody, smooth, glabrous. Seeds ovate, flat, 2–2.5 × 1.5–1.8 cm, sericeous. Fl. Apr–Jun.

Open woodlands on limestone, scrub, sometimes along river banks; 400–800 m. Guangdong, Guangxi, Hainan, Yunnan [Indonesia, Malaysia, Philippines, Thailand, Vietnam].

Medicinal.

11. *Strychnos wallichiana* Steudel ex A. de Candolle, *Prodr.* 9: 13. 1845.

长籽马钱 *chang zi ma qian*

Strychnos bourdillonii Brandis; *S. cinnamomifolia* Thwaites; *S. cinnamomifolia* var. *wightii* A. W. Hill; *S. cirrhosa* Stokes; *S. gauthierana* Pierre ex Dop; *S. pierriana* A. W. Hill; *S. rheedei* C. B. Clarke; *S. tubiflora* A. W. Hill.

Lianas to 20 m. Stems grayish white, rugose; branchlets terete, smooth, usually with axillary simple or double tendrils. Petiole 5–7 mm; leaf blade 5–17 × 3–5 cm, base cuneate to subrounded, apex acuminate to acute; basal veins 3, reticulate veins present. Thyrses terminal, 4–5 cm; peduncle pubescent. Flowers 5-merous. Pedicel pubescent. Calyx lobes ovate, 1–1.3 mm, outside puberulent, margin ciliate. Corolla yellowish to yellow-white, salverform, ca. 1.4 cm, outside papillose; tube ca. 1.1 cm, inside basally villous; lobes oblong, ca. 4 mm, apex slightly thickened. Stamens inserted at corolla mouth; filaments very short; anthers oblong, ca. 1.5 mm, connectives obtuse to rounded at apex. Pistil ca. 8 mm. Ovary ovoid, ca. 1 mm in diam. Style slender; stigma capitate. Berry orange when ripe, globose, 4–6 cm in diam., many seeded; pericarp to 2–3 mm thick. Seeds orbicular, elliptic, or oblong, flat, 2–3 cm, densely pale brown-gray sericeous. Fl. Apr–Jun.

Tropical evergreen forests, mixed woodlands on limestone; 200–600 m. SE Yunnan [Bangladesh, India, Indonesia, Sri Lanka, Vietnam].

Medicinal, poisonous.

