

89. SPATHOLOBUS Hasskarl, Flora 25(2, Beibl.): 52. 1842.

密花豆腐属 mi hua dou shu

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Woody climbing shrubs. Leaves pinnately 3-foliolate; stipules small, caducous; stipels persistent or deciduous. Panicles axillary or terminal. Flowers small and numerous, usually few clustered at nodes of rachis or branches; bracts and bracteoles small. Calyx campanulate or terete, usually with short teeth, 2-lipped; upper 2 teeth connate into entire or emarginate upper lip, lower lip with 3 teeth; teeth ovate, triangular, or lanceolate. Corolla exserted; petals all clawed; standard ovate or suborbicular, shorter than wings, base not appendaged, apex emarginate or lobed; wings oblong, obovate-oblong, or subspatulate, base sometimes auriculate, apex obtuse or rounded; keel shorter or longer than wings, nearly straight, base sometimes auriculate, apex obtuse. Stamens diadelphous; vexillary stamen free; anthers elliptic or suborbicular, equal in size or 5 larger and 5 smaller. Ovary shortly stipitate or sessile, 2-ovuled; style slightly incurved, glabrous or hairy; stigma small, terminal, capitate. Legumes sessile or stipitate, falcate or oblong, compressed, reticulate, densely puberulent or velutinous, thicker at top and 1-seeded, dehiscent only at seed bearing apex when mature, lower part indehiscent. Seed flat.

About 30 species: tropical Asia; ten species (seven endemic) in China.

- 1a. Anthers unequal in size, 5 larger and 5 smaller.
 - 2a. Terminal and lateral leaflets equal in shape or nearly so, apex rounded or subtruncate, with short awn, lateral veins straight.
 - 3a. Leaflets obovate, base broadly cuneate or obtuse; wings subspatulate, like keel auriculate on one side 7. *S. varians*
 - 3b. Leaflets narrowly obovate or oblanceolate, base narrowly cuneate; wings oblong, base biauriculate; keel with an obtuse auricle 8. *S. bauritus*
 - 2b. Terminal and lateral leaflets unequal in shape, apex rounded and mucronate, lateral veins slightly curved or arched.
 - 4a. Rachis of panicles elongated, longer than branches; wings oblong, base obliquely truncate on both sides, with small rounded auricle on one side; keel base truncate and without auricle on lower side, upper side with small, rounded auricle at base; leaflets ca. 27 × 13.5 cm 9. *S. gengmaensis*
 - 4b. Rachis of panicles not elongated, shorter than branches; wings obovate-oblong, like keel with long obtuse auricle on one side at base; leaflets 11–15 × 5–7.5 cm 10. *S. uniauritus*
- 1b. Anthers equal or nearly equal in size.
 - 5a. Terminal and lateral leaflets equal in shape or nearly so, lateral ones symmetric or nearly so; corolla purplish red.
 - 6a. Leaflets 5–9.5 × 2–4 cm, sparsely puberulent abaxially; petiolules strigose; wings obovate-oblong, base with an acute auricle on one side; keel shorter than wings, falcate-oblong, base truncate, without auricle 1. *S. sinensis*
 - 6b. Leaflets 7.5–13 × 3–6 cm, glabrous on both surfaces or ± puberulent abaxially; petiolules glabrous or slightly puberulent; wings and keel oblong, subequal in length, base with rounded auricles on both sides 2. *S. harmandii*
 - 5b. Terminal and lateral leaflets conspicuously unequal in shape, lateral ones asymmetric; corolla white, red, or purple before flowering, becoming white in full bloom.
 - 7a. Calyx teeth rounded or slightly obtuse at apex, to 1 mm, 2–3 × shorter than calyx tube; leaflets often with tufts of hairs in axils of veins abaxially 3. *S. suberectus*
 - 7b. Calyx teeth acute or long acuminate at apex, 2–2.7 mm, as long as or slightly shorter than calyx tube; leaflets not with tufts of hairs abaxially.
 - 8a. Calyx teeth lanceolate, as long as calyx tube; corolla white; standard 2-lobed at apex 6. *S. pulcher*
 - 8b. Calyx teeth triangular, slightly shorter than calyx tube; corolla red or purple before flowering, becoming pinkish white or white in full bloom; standard emarginate at apex.
 - 9a. Lateral veins of leaflets usually not branched, tertiary veinlets often transverse; corolla red before flowering, becoming pinkish white or white in full bloom; standard ovate-triangular; keel shorter than standard and wings 4. *S. parviflorus*
 - 9b. Lateral veins of leaflets usually branched, tertiary veinlets forming a network; corolla purple before flowering, becoming white in full bloom; standard suborbicular; keel longer than standard and wings or as long as wings 5. *S. discolor*

1. *Spatholobus sinensis* Chun & T. C. Chen, Acta Phytotax. Sin. 7: 31. 1958.

红血藤 hong xue teng

Woody climbers. Young branchlets purplish brown,

sparsely puberulent, glabrescent. Stipels subulate, 3–4 mm, persistent; petiolules densely strigose; leaflets equal in shape or nearly so, oblong-elliptic, terminal leaflet 5–9.5 × 2–4 cm, lateral smaller, leathery, sparsely puberulent abaxially, glabrous and shiny adaxially, midrib prominent, impressed adaxially,

raised and densely brownish strigose abaxially, lateral veins and veinlets slender, slightly raised on both surfaces, base rounded, apex abruptly contracted to a slightly blunt mucro. Panicles usually axillary, 5–10 cm, densely brownish strigose; bracts and bracteoles subulate, ca. 1 mm. Calyx ca. 4 mm, subequal to pedicel in length, densely strigose on both sides; teeth ovate, 1.5–2 mm, as long as tube, upper 2 teeth \pm connate. Corolla purplish red; standard orbicular, 5–5.5 \times 6–6.5 mm, apex 2-parted, claw ca. 2 mm; wings obovate-oblong, ca. 5 mm, base with short acute auricle on one side, claw ca. 2.5 mm; keel falcate, oblong, ca. 3.5 mm, apex rounded, base truncate, without auricle, claw ca. 2.5 mm. Anthers subglobose, equal in size. Ovary sessile, densely strigose along ventral suture, other parts pilose or subglabrous. Legumes obliquely oblong, 6–9 cm, 2–2.5 cm wide from middle downward, narrower in upper part, brownish villous, especially on beak and 2 sutures; stipe 1–3 mm or absent. Seeds blackish, dull, oblong, ca. 1.5 \times 0.8 cm. Fl. Jun–Jul, fr. Jan.

• Wet areas in dense forests, valleys at low elevation. S Guangdong, SW Guangxi, Hainan.

2. *Spatholobus harmandii* Gagnepain, Notul. Syst. (Paris) 2: 368. 1913.

光叶密花豆 *guang ye mi hua dou*

Woody climbers. Young branchlets puberulent, glabrescent. Stipels subulate, 2–3 mm; petiolules 3–5 mm, glabrous or sparsely hairy; leaflets equal in shape, oblong, elliptic, or broadly obovate, 7.5–13 \times 3–6 cm, leathery to thickly leathery, glabrous or \pm puberulent abaxially, glabrous and shiny adaxially, midrib raised abaxially, flat or slightly impressed adaxially, lateral veins slightly raised on both surfaces, veinlets obscure, base rounded, apex acuminate or rounded and with a short blunt mucro. Panicles axillary, solitary or 2 or 3 fascicled, sparsely brownish puberulent or glabrescent. Pedicels as long as or slightly shorter than calyx; bracteoles linear, caducous. Calyx ca. 4 mm; teeth bluntly triangular, 1.5–2 mm, sparsely puberulent outside, slightly hairy inside. Corolla purplish red; standard orbicular, 5–6 mm in diam., apex emarginate; wings and keel oblong, subequal in length, apex rounded, base with a rounded auricle on one side. Anthers equal in size. Ovary sessile, hairy. Legumes 8–9 cm, 2.2–2.5 cm wide in lower part, 1.6–1.8 cm wide in upper part, adpressed brownish puberulent, apex obtuse, without stipe. Seeds blackish, dull, oblong or narrowly elliptic, 1.9–2.9 \times 1–1.3 cm. Fl. Mar, fr. Jun–Jul.

Sparse forests, streamsides. Hainan (Baisha, Danxian) [Laos, Vietnam].

3. *Spatholobus suberectus* Dunn, J. Linn. Soc., Bot. 35: 489. 1903.

密花豆 *mi hua dou*

Woody climbers, shrubby when young. Leaves papery or subleathery; stipels subulate, 3–6 mm; petiolules 5–8 mm, puberulent or glabrous; leaflets subglabrous or slightly puberulent, with tufts of hairs in axils of veins abaxially, lateral veins 6–8 pairs, slightly curved; terminal leaflet symmetric, broadly elliptic or broadly obovate to suborbicular, 9–19 \times 5–14 cm, base broadly cuneate, apex abruptly contracted to shortly ob-

tusely caudate; lateral leaflets asymmetric, as broad as or slightly narrower than terminal one, base broadly cuneate or rounded. Panicles axillary or at apex of branchlets, to 50 cm; rachis and pedicels yellowish brown puberulent; bracts and bracteoles linear, persistent. Calyx 3.5–4 mm; teeth 2–3 \times shorter than tube, lower 3 with apex rounded or slightly obtuse, less than 1 mm, upper 2 slightly longer, \pm connate, densely yellowish brown puberulent outside, silvery gray hairy inside. Corolla whitish; standard orbicular, 4–4.5 \times 5–5.5 mm, apex emarginate, base broadly cuneate, claw 2–2.5 mm; wings obliquely cuneate-oblong, 3.5–4 mm, as keel base with an acute auricle on one side, claw 3–3.5 mm; keel obovate, ca. 3 mm. Anthers globose, equal in size or nearly so. Ovary subsessile, strigose in lower part. Legumes subfalcate, 8–11 cm, densely brownish velutinous; stipe 4–9 mm. Seeds oblong, ca. 2 \times 1 cm; testa purplish brown, thinly crustaceous, shiny. Fl. Jun, fr. Nov–Dec.

• Open or dense forests or scrub, mountain slopes, valleys; 800–1700 m. Fujian, Guangdong, Guangxi, Yunnan.

The stems are used medicinally.

4. *Spatholobus parviflorus* (Roxburgh ex Candolle) Kuntze, Revis. Gen. Pl. 1: 205. 1891.

显脉密花豆 *xian mai mi hua dou*

Butea parviflora Roxburgh ex Candolle, Prodr. 2: 415. 1825; *Spatholobus roxburghii* Bentham var. *demudatus* Baker.

Woody climbers. Branchlets subglabrous. Petiole 9–13 cm, puberulent; stipels subulate, ca. 1.5 mm; petiolules 5–6 mm, thick, puberulent; leaflets leathery, slightly puberulent abaxially, glabrous adaxially, lateral veins 7–9 pairs, usually not branched, tertiary veins transverse, quaternary veins slender, reticulate; terminal leaflet obovate or broadly elliptic, 14–17 \times 9.5–12 cm, rounded at both ends or slightly narrowed at base; lateral leaflets asymmetric, broadly ovate, 12–16 \times 6.5–10 cm, base rounded, apex obtuse. Inflorescence 30–40 cm; rachis puberulent. Calyx 3–4 mm, puberulent. Corolla white or pinkish white; standard broadly ovate, 5–6 \times 5.5–8 mm, apex emarginate, base truncate, claw 2–3 mm; wings 5–7.5 mm, auriculate, claw 3–4 mm; keel 4–5 mm. Ovary tomentose. Legumes falcate-oblong, 12–14 cm, thick, subwoody, apex rounded, densely brownish velutinous; stipe terete, 1.3–1.7 cm, densely velutinous. Seeds orbicular or reniform; testa brownish red. Fr. Feb–Mar.

Slopes, open forests or thickets. W Yunnan (Luxi) [Bangladesh, Cambodia, India, Laos, Myanmar, Sri Lanka, Thailand, Vietnam].

5. *Spatholobus discolor* C. F. Wei, Bull. Bot. Res., Harbin 5(2): 49. 1985.

变色密花豆 *bian se mi hua dou*

Climbing shrubs. Branchlets blackish brown, with numerous lenticels; branchlets, petiolules, panicles, and calyces hispidulous with yellowish brown hairs. Petiole 2.5–4.5 cm, subglabrous; stipels subulate, stiff, ca. 1.5 mm; petiolules 4–5 mm, glabrescent; leaflets subleathery, yellowish brown hispidulous abaxially, subglabrous adaxially, lateral veins 5 or 6 pairs, often branched, tertiary veins often reticulate; terminal leaflet obovate or obovate-elliptic, 6–12.5 \times 4.2–9.6 cm, symmetric, base ob-

tuse, apex rounded; lateral leaflets narrowly elliptic or oblong, 6.5–11 × 4–7.3 cm, asymmetric, rounded at both ends or base slightly obtuse. Panicles terminal, 13–27 cm, many flowered; bracts narrowly triangular, 1.5–2 mm; bracteoles triangular, ca. 1 mm. Calyx 4–5 mm; teeth 1.5–2 mm, upper 2 ± connate, lower 3 triangular, apex acute, middle 1 slightly longer. Corolla purplish before flowering, becoming whitish in full bloom, membranous; standard suborbicular, 7–7.5 mm in diam., apex emarginate, claw 1–1.5 mm; wings narrowly elliptic, 7.5–8 mm, margin of lower part emarginate on one side, other side with short obtuse auricle at base, claw ca. 1.5 mm; keel obovate-oblong, 7.5–8 mm, curved in upper part, ± connate at back, apex rounded, base with acute auricle on one side, claw 2–2.5 mm. Anthers elliptic, equal in size, ca. 0.7 mm. Ovary narrowly oblong, 5–7 mm, slightly compressed, shortly stipitate. Legumes not seen. Fl. Sep.

• Mountain slopes, secondary forests or thickets; ca. 1700 m. S Yunnan (Lüchun).

6. *Spatholobus pulcher* Dunn, J. Linn. Soc., Bot. 35: 489. 1903.

美丽密花豆 mei li mi hua dou

Climbing shrubs. Branchlets blackish brown, with sparse lenticels; branchlets, petioles, petiolules, and inflorescences hirsute with ferruginous hairs. Stipels subulate, ca. 2.5 mm; terminal leaflet obovate or broadly elliptic, 3–13 × 3–8.6 cm, lateral ones slightly smaller, ovate or oblong, subleathery, ferruginous hirsute abaxially, subglabrous adaxially, lateral veins 5–7 pairs, slightly curved, veinlets reticulate, base rounded, asymmetric, apex rounded or with short blunt mucro. Panicles with congested flowers; bracts and bracteoles persistent; bracteoles narrowly lanceolate, ca. 1.5 mm. Calyx 5–5.5 mm; teeth as long as tube or nearly so, 2–2.7 mm, upper ovate, apex slightly acute, lower 3 lanceolate, apex long acuminate, middle one longest. Corolla white; standard suborbicular, ca. 5.5 × 5 mm, apex emarginate, base cuneate, claw 3–3.5 mm; wings obovate-oblong, 4.5–5 mm, base with acute auricle ca. 1 mm on one side, other side without auricle or occasionally with slightly obtuse auricle, claw 3–3.5 mm; keel oblong, ca. 4 mm, slightly curved at back, base with a broad and acute auricle ca. 0.5 mm on one side, claw ca. 3.5 mm. Anthers subglobose, equal in size. Ovary sessile, ferruginous hirsute. Legumes falcate, 7.5–9.5 cm, base rounded and incurved, upper part attenuate to a slightly curved beak. Seed oblong, immature. Fl. Jan–Feb, fr. May–Jun.

• Open forests, mountain slopes, valleys, near roads, often climbing on trees; 700–1600 m. SW Yunnan.

7. *Spatholobus varians* Dunn, J. Linn. Soc., Bot. 35: 490. 1903.

云南密花豆 yun nan mi hua dou

Climbing shrubs. Branchlets strigose when young, glabrescent. Petiole 6–9 cm; stipels subulate, 5–7 mm; petiolules 4–5 mm; leaflets subequal, obovate, 7–13 × 4–6.5 cm, leathery, puberulent and strigose along veins abaxially, sparsely strigose adaxially, lateral veins 8 or 9 pairs, straight or arched toward margin, raised on both surfaces, veinlets reticulate, base broadly cuneate or obtuse, apex subtruncate, mucronate, strigose. Pani-

cles axillary or terminal, 15–20 cm; rachis and pedicels puberulent; bracts caducous; bracteoles linear, ca. 1 mm; pedicels 3.5–4.5 mm, slightly shorter than calyx. Calyx 5–5.5 mm, puberulent on both sides; upper 2 teeth ± connate, lower 3 ovate-lanceolate, 2.5–2.7 mm. Corolla purple; standard orbicular, ca. 7 mm in diam., apex emarginate, base cuneate, claw ca. 2 mm; wings subspatulate, 5–5.5 mm, apex 3–3.5 mm wide, base with obtuse auricle on one side, claw 4.5–5 mm; keel oblong or slightly broadened in upper part, 3.5–4 mm, curved and slightly connate at back, apex rounded, with obtuse auricle on one side, claw ca. 4.5 mm. Anthers globose, 5 larger and 5 smaller. Ovary narrowly oblong, ca. 4.5 mm, puberulent; style hairy. Legumes 6–9 cm, apex slightly narrowed and curved, with short acute beak, not stipitate. Fl. spring.

Forests, mountain slopes; ca. 1600 m. Yunnan (Simao) [Myanmar, Thailand].

8. *Spatholobus biauritus* C. F. Wei, Bull. Bot. Res., Harbin 5(2): 51. 1985.

双耳密花豆 shuang er mi hua dou

Climbing shrubs. Petiole 5.5–6 cm, villous; stipels subulate, as long as or slightly shorter than petiolules; petiolules ca. 4 mm, strigose; leaflets subequal, narrowly obovate or oblanceolate, 7–9.5 × 3–4 cm, papery, puberulent and strigose along veins abaxially, sparsely strigose adaxially, lateral veins 8–10 pairs, straight or arched toward margin, raised and with conspicuously reticulate veinlets on both surfaces, base narrowly cuneate, apex rounded or subtruncate, mucronate. Panicles terminal, to 30 cm; rachis elongated; branches short and dispersed; bracts ovate-triangular, ca. 2 mm, caducous, apex acuminate; bracteoles linear, ca. 1 mm. Flowers purplish red; pedicels slightly shorter than calyx. Calyx 5–5.5 mm, hairy on both sides; teeth shorter than tube, upper 2 ± connate, lower 3 ovate, apex obtuse or slightly acute. Standard orbicular, 6–7 mm in diam., apex emarginate, base cuneate, claw ca. 4 mm; wings oblong, ca. 5.5 mm, base with a rounded auricle on upper side, with an oblong auricle on lower side, claw ca. 4 mm; keel shorter than wings, ca. 4 mm, base with an obtuse long auricle, claw 3.5–4 mm. Anthers subglobose, 5 larger and 5 smaller. Ovary narrowly oblong, 3–4 mm, subsessile. Legumes not seen. Fl. Apr.

• Forests, mountain slopes; ca. 1400 m. Yunnan (Jingdong).

9. *Spatholobus gengmaensis* C. F. Wei, Bull. Bot. Res., Harbin 5(2): 53. 1985.

耿马密花豆 geng ma mi hua dou

Climbing shrubs. Petiole terete, ca. 6.5 cm, subglabrous; stipels subulate, as long as or slightly shorter than petiolules; petiolules thick, 5–6 mm; leaflets large, terminal one obovate-oblong, ca. 27 × 13.5 cm, symmetric, lateral ones ovate-elliptic, slightly smaller than terminal, asymmetric, subleathery, glabrous abaxially, glabrous adaxially, except pilose on midrib and lateral veins, lateral veins 6 or 7 pairs, slightly curved, raised on both surfaces, apex rounded. Panicles axillary, ca. 27 cm; rachis and pedicels densely light brown puberulent; bracts narrowly lanceolate, ca. 2.5 mm; bracteoles linear, ca. 1 mm. Calyx 5–5.5 mm, puberulent on both sides; teeth 1.5–2 mm,

upper 2 ± connate, apex subtruncate or emarginate, lower 3 ovate, apex obtuse or slightly acute. Corolla red; standard suborbicular, ca. 6 mm in diam., apex emarginate, base cuneate, claw ca. 3 mm; wings oblong, 5–5.5 mm, long ciliate at base, together with keel apex rounded, base obliquely truncate on 2 sides, with a small rounded auricle on one side, claw ca. 4 mm; keel oblong, 3.5–4 mm, claw ca. 4 mm. Anthers subglobose, 5 larger and 5 smaller. Ovary narrowly oblong, ca. 4 mm, puberulent, sessile. Legumes not seen. Fl. Mar.

• Open forests or secondary forests, mountaintops. Yunnan (Gengma).

10. *Spatholobus uniauritus* C. F. Wei, Bull. Bot. Res., Harbin 5(2): 54. 1985.

单耳密花豆 dan er mi hua dou

Climbing shrubs. Branchlets terete, pilose. Petiole 5–10 cm; stipels subulate, as long as or slightly shorter than petiolules; petiolules 4–5 mm; terminal leaflet elliptic or obovate-elliptic, 11–15 × 5–7.5 cm, symmetric, lateral ones as large as

terminal, narrowly ovate, asymmetric, thickly papery, puberulent and strigose along midrib and lateral veins abaxially, glabrous adaxially, lateral veins 8 or 9 pairs, raised on both surfaces, reticulate veinlets slender, conspicuous, base cuneate or subrounded, apex rounded, mucronate. Panicles axillary; rachis not elongated, shorter than branches, 5–10 cm; branches crowded, spreading, to 15 cm, densely yellowish brown puberulent. Flowers purple, crowded together. Calyx ca. 5 mm, yellowish brown puberulent on both sides; teeth 1.5–1.7 mm, upper 2 ± connate, emarginate, lower 3 ovate, apex obtuse or slightly acute. Standard suborbicular, 6–7 mm in diam., apex emarginate, base cuneate, claw ca. 2 mm; wings obovate-oblong, 5.5–6 mm, base with a long obtuse auricle on one side, claw ca. 3 mm; keel shorter than wings, nearly equal in shape, ca. 3.5 mm, base with a long obtuse auricle, claw ca. 3.5 mm. Anthers 5 larger and 5 smaller. Ovary narrow, sessile, ca. 3.5 mm. Legumes not seen. Fl. Mar.

• Dense forests in mountain regions; ca. 900 m. S Yunnan (Xishuangbanna).

