

## 9. PHYLLANTHODENDRON Hemsley, Hooker's Icon. Pl. 26: ad t. 2563, 2564. 1898.

珠子木属 *zhu zi mu shu*

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Trees or shrubs, monoecious or dioecious, hairs simple, often absent. Leaves alternate, usually distichous; stipules small, caducous; petiole short; leaf blade simple, margin entire, venation pinnate. Inflorescences axillary, 1-flowered; pedicels often slender. Male flowers: sepals (4 or)5 or 6, free, in 2 series, imbricate, oblong-elliptic, midrib elevated abaxially, apex caudate-acuminate; petals absent; disk segments (4 or)5 or 6, shorter than sepals, ligulate or oblong, entire; stamens 3(or 4); filaments connate into a terete column; anthers 2-locular, longitudinally dehiscent, connectives subulate-acuminate at apex. Female flowers: sepals and disk segments 5 or 6; ovary 3-locular; ovules 2 per locule; styles 3, apex usually not lobed, often erect. Fruit a capsule, subglobose, septicidally and loculicidally dehiscent into 3 2-valved cocci when mature. Seeds 3-angled.

About 16 species: Peninsular Malaysia to China; ten species (nine endemic) in China.

*Phyllanthodendron* is a very easily identifiable segregate that nests within *Phyllanthus*, retained here for convenience. It can be easily distinguished by the distinctly caudate-acuminate sepals, linear to spatulate disk glands, and extended anther connectives.

- 1a. Branches terete.
  - 2a. Branches, ovaries, and fruits pubescent or hispidulous; leaves abaxially brown or brown-red when dry.
    - 3a. Young leaves and stipules abaxially puberulent, glabrescent; midrib and lateral veins raised on both surfaces ..... 1. *P. yunnanense*
    - 3b. Leaves and stipules abaxially glabrous; midrib and lateral veins adaxially flattened ..... 2. *P. roseum*
  - 2b. Branches, ovaries, and fruits glabrous; leaves abaxially glaucous when dry.
    - 4a. Leaf blade obovate, papery, base cuneate or broadly so; lateral and reticulate veins abaxially flattened; disk segments spatulate; ovary globose, styles short, bifid to middle ..... 3. *P. petraeum*
    - 4b. Leaf blade rounded, leathery, base rounded or shallowly cordate; lateral and reticulate veins abaxially raised; disk segments ligulate or oblong; ovary ovoid, styles longer, bifid to nearly base ..... 4. *P. orbicularifolium*
- 1b. Branches angular to prominently winged.
  - 5a. Branchlets angular, pubescent.
    - 6a. Leaf blade base oblique; male sepals 6 ..... 5. *P. breynioides*
    - 6b. Leaf blade base symmetrical; male sepals 5.
      - 7a. Pedicels 1–2 mm; branches usually apically clustered; leaves of fertile branches 1–3 × 0.5–1.5 cm, leaf blade abaxially glaucous, lateral veins 6–8 pairs; veins of leaves, petioles, and stipules pilose; fruits glabrous ..... 6. *P. anthopotamicum*
      - 7b. Pedicels 10–25 mm; branches not clustered; leaves of fertile branches 6–12 × 2.5–4.5 cm, leaf blade abaxially greenish, lateral veins 8–12 pairs; veins of leaves, petioles, and stipules glabrous; fruits pubescent ..... 7. *P. lativenium*
  - 5b. Branchlets prominently winged, glabrous.
    - 8a. Male sepals, disk segments, and stamens 4; ovaries and fruits pubescent ..... 8. *P. moi*
    - 8b. Male sepals and disk segments 5 or 6, stamens 3; ovaries and fruits glabrous.
      - 9a. Leaf blade apex caudate, acumen ca. 1.2 cm, base cuneate or obtuse, lateral veins 10–14 pairs; male sepals and disk segments 6 ..... 9. *P. caudatifolium*
      - 9b. Leaf blade apex acute or acuminate, base rounded, lateral veins 6–8 pairs; male sepals and disk segments 5 ..... 10. *P. dunnianum*

**1. *Phyllanthodendron yunnanense*** Croizat, J. Arnold Arbor. 23: 36. 1942.

云南珠子木 *yun nan zhu zi mu*

*Phyllanthus yunnanensis* (Croizat) Govaerts & Radcliffe-Smith.

Shrubs or treelets 2–7 m tall, monoecious; bark brown; branches terete, brown pubescent when young, glabrescent. Stipules ovate-lanceolate, puberulent outside; petiole 2–5 mm, puberulent when young, glabrous at maturity; leaf blade elliptic or oblong, 6–12 × 2.5–4 cm, thinly leathery, both surfaces glabrous or glabrescent, base obtuse to rounded, apex acuminate; midrib and lateral veins slightly elevated on both surfaces,

lateral veins in 8–10 pairs, obliquely ascending, arcuately anastomosing before margins. Inflorescences 1–4-flowered; with several bracteoles at base. Male flowers: pedicel filamentous, 15–40 mm, glabrous; sepals 5, ovate-lanceolate, 3–5 × 1.5–1.8 mm, glabrous midrib elevated abaxially; disk segments 5, ca. 0.8 mm; stamens 3; filaments connate into a terete column; anthers oblong, connectives subulate. Female flowers as in male but larger; pedicel glabrous; sepals and disk segments 6, persistent in fruit; ovary globose, ca. 2.5 mm in diam., 3-locular, hispidulous; styles 3, spreading, entire. Fruiting pedicels 3–4 cm; capsules globose, hispidulous. Fl. Apr–Jul, fr. Jul–Oct.

• Open montane forests; 1600–2300 m. Guizhou, Yunnan.

2. **Phyllanthodendron roseum** Craib & Hutchinson, Bull. Misc. Inform. Kew 1910: 23. 1910.

玫花珠子木 mei hua zhu zi mu

*Phyllanthodendron album* Craib & Hutchinson; *P. roseum* var. *glabrum* Craib ex Hosseus; *Phyllanthus roseus* (Craib & Hutchinson) Beille.

Shrubs or treelets 3–6 m tall, monoecious; branches terete, puberulent when young. Stipules ovate-lanceolate, ca. 4 mm; petiole 5–8 mm; leaf blade oblanceolate, oblong, or elliptic, 7–16 × 2–5 cm, subleathery, both surfaces glabrous, brown-red when dried, base cuneate or rounded, apex acuminate; midrib and lateral veins flattened adaxially, elevated abaxially, lateral veins in 9–12 pairs, anastomosing before margin. Inflorescences 3–6-flowered. Male flowers: pedicel ca. 10 mm; sepals 5, lanceolate, ca. 3 × 1.5 mm, margins membranous, midrib elevated abaxially; disk segments 5, linear, ca. 1.5 × 0.25 cm, flattened; stamens 3; filament column ca. 0.5 mm; anthers ca. 0.75 mm, connectives acuminate, ca. 1 mm. Female flowers: pedicel ca. 4 cm, slender; sepals 6, oblong-lanceolate, ca. 3.5 × 2 mm; disk segments 6, linear, ca. 1.7 mm; ovary subglobose, 3-locular; styles 3, ca. 0.5 mm. Capsules subglobose, ca. 1.5 cm in diam., reddish, exocarp membranous, endocarps horny. Seed ca. 8 × 3–3.5 mm. Fl. Jun–Sep, fr. Sep–Nov.

Montane evergreen broad-leaved woodlands; ca. 1600 m. Yunnan (Menghai) [Laos, Malaysia, Thailand, Vietnam].

3. **Phyllanthodendron petraeum** P. T. Li, Bull. Bot. Res., Harbin 7(3): 4. 1987.

岩生珠子木 yan sheng zhu zi mu

*Phyllanthus guangxiensis* Govaerts & Radcliffe-Smith (1996), not *Phyllanthus petraeus* Beille (1908).

Shrubs ca. 3 m tall, monoecious, glabrous throughout; stem gray-brown; branches usually apically clustered, terete. Stipules caducous; petiole 3–7 mm; leaf blade obovate, 3–5 × 2–3.5 cm, papery, base cuneate or broadly so, apex rounded, mucronulate; midrib flattened adaxially, slightly elevated abaxially, lateral veins in 6 or 7 pairs, raised above, flattened beneath, anastomosing before margins. Inflorescences 1-flowered. Male flowers: pedicel ca. 2 mm; sepals 6, oblong-lanceolate, ca. 5.5 × 2 mm, midrib elevated abaxially; disk segments 6, spatulate; stamens 3; filaments connate into a terete column; anthers oblong, connectives subulate. Female flowers: pedicel ca. 5 mm; sepals and disk as in male; persistent in fruit; ovary globose, 3-locular; styles 3, short, bifid to middle. Fruiting pedicels ca. 5 mm; capsules globose, ca. 5 mm in diam., smooth. Fl. May–Aug, fr. Jul–Nov.

• Limestone scrub; ca. 1000 m. SW Guangxi.

4. **Phyllanthodendron orbicularifolium** P. T. Li, Bull. Bot. Res., Harbin 7(3): 5. 1987.

圆叶珠子木 yuan ye zhu zi mu

*Phyllanthus orbicularifolius* (P. T. Li) Govaerts & Rad-

cliffe-Smith.

Shrubs ca. 3.5 m tall, monoecious, glabrous throughout; stem dark brown; branches terete. Stipules oblong, 3–5 mm, caducous; petiole ca. 5 mm; leaf blade orbicular or rotund, 3.5–6.5 × 3–5.5 cm, leathery, red when young, lucid green at maturity, base shallowly cordate or rounded, apex rounded, mucronulate; midrib flattened or slightly retuse adaxially, elevated abaxially, lateral veins in 5 or 6 pairs, reticulate veins raised on both surfaces, anastomosing before margins. Inflorescences 1-flowered. Male flowers: pedicel ca. 2 mm; sepals 5 or 6, oblong-lanceolate, ca. 4 × 1.5 mm, yellow-white, slightly concave inside, midrib elevated abaxially; disk segments 5 or 6, ligulate; stamens 3; filaments connate into a terete column; anthers oblong-ellipsoid, connectives lanceolate. Female flowers: sepals and disk segments 6, shaped as in male; persistent in fruit; ovary ovoid, 3-locular; styles 3, bifid to near base. Fruiting pedicels ca. 7 mm; capsules subglobose, ca. 1.3 cm in diam., brownish, smooth, endocarp yellowish. Seed obscurely 3-angled, ca. 5 × 3 mm, chestnut. Fl. and fr. Aug–Dec.

• 700–800 m. Guangxi.

5. **Phyllanthodendron breynioides** P. T. Li, Bull. Bot. Res., Harbin 7(3): 6. 1987.

龙州珠子木 long zhou zhu zi mu

*Phyllanthus breynioides* (P. T. Li) Govaerts & Radcliffe-Smith.

Erect shrubs 1–3 m tall, monoecious; branches angular, dark gray, pubescent, internodes shorter than leaf blade. Leaves distichous; stipules lanceolate, ca. 2 mm; petiole 1–2 mm, pubescent; leaf blade ovate to oblong, 1–3 × 0.5–1.5 cm, papery to thickly so, abaxially greenish, adaxially dark green, base obliquely rounded to shallowly cordate; midrib slightly elevated on both surfaces, lateral veins in 5–7 pairs, flattened on both surfaces. Inflorescences 1-flowered, with many bracteoles at base. Male flowers: pedicel ca. 5 mm; sepals 6, oblong-lanceolate, ca. 3.5 × 1–1.5 mm, yellow, apex caudate, midrib elevated abaxially; disk segments 6, linear, ca. 2 mm; stamens 3; filaments connate into a terete column; anthers oblong, connectives lanceolate, as long as thecae. Female flowers: pedicel ca. 6 mm, bracteolate at base; sepals and disk as in male; ovary globose, ca. 1 mm in diam., 3-locular; styles 3, connate at base. Capsules globose, ca. 1 cm in diam. Fl. Jul–Aug, fr. Aug–Dec.

• Sparse lowland forests, limestone scrub; 400–600 m. SW and W Guangxi (Debao, Longzhou).

6. **Phyllanthodendron anthopotamicum** (Handel-Mazzetti) Croizat, J. Arnold Arbor. 23: 37. 1942.

珠子木 zhu zi mu

*Phyllanthus anthopotamicus* Handel-Mazzetti, Symb. Sin. 7(2): 223. 1931.

Erect shrubs ca. 3 m tall, monoecious; stem gray-brown; branches usually apically clustered, angular, up to 20 cm, gray-green, pubescent when young, glabrescent. Stipules lanceolate

2–4 mm, chestnut, membranous, usually caducous; petiole 2–5 mm, pubescent; leaf blade elliptic, ovate, to broadly ovate, usually smaller, 1–3 × 0.5–1.5 cm, and denser on flowering or fruiting branches, but larger, 5–13 × 3–6 cm, and more distant on sterile shoots, papery to leathery, abaxially glaucous, adaxially green, base broadly cuneate to obtuse, margins slightly revolute, apex acuminate, acute, or obtuse; lateral veins in 6–8 pairs, flattened adaxially, elevated abaxially. Inflorescences 2–4-flowered, with several imbricate bracteoles at base; bracteoles ovate, ca. 1.5 mm. Male flowers: pedicel 1–2 mm; sepals 5, elliptic-lanceolate, 3–4 × ca. 1.5 mm, slightly concave inside, margins membranous, apex caudate-acuminate, midrib keeled abaxially; disk segments 5, ca. 1 mm; stamens 3, ca. 1.2 mm; filament column ca. 0.6 mm; anthers ellipsoid, ca. 0.3 mm, connectives subulate, ca. 0.3 mm. Female flowers: sepals 6, shaped as in male, persistent in fruit; disk segments 6, ca. 0.5 mm; ovary ovoid, 3-locular; styles 3, shallowly bifid. Capsules globose, 0.5–0.8 cm in diam., brown, endocarp tawny. Seed trigonous-ovoid, ca. 3 × 1.5 mm, tawny. Fl. May–Sep, fr. Sep–Dec.

• Montane sparse forests or scrub; 800–1300 m. Guangdong, Guangxi, Guizhou, Yunnan.

**7. *Phyllanthodendron lativenium*** Croizat, J. Arnold Arbor. 23: 36. 1942.

宽脉珠子木 kuan mai zhu zi mu

*Phyllanthus lativenius* (Croizat) Govaerts & Radcliffe-Smith.

Erect shrubs to 3 m tall, monoecious; branches angular, pubescent. Stipules ovate-lanceolate, ca. 3.5 × 2 mm, base cordate; petiole 1–2 mm; leaf blade oblong-elliptic or obovate, 6–12 × 2.5–4.5 cm, papery to thinly leathery, both surfaces glabrous, base cuneate, apex acuminate or obtuse; midrib and lateral veins in 8–12 pairs, elevated on both surfaces. Male flowers: pedicel filamentous, ca. 10 mm; sepals 5, oblong-elliptic, ca. 3 × 1 mm, yellow, apex caudate, midrib elevated abaxially; disk segments 5, ca. 1.5 mm; stamens 3, ca. 2 mm; filaments connate into a terete column. Female flowers: pedicel filamentous, 20–25 mm, slightly thick at apex; sepals 6, oblong, ca. 5 × 2 mm, acute at apex; persistent in fruit; ovary ovoid, 3-locular, pubescent; styles 3. Fruiting pedicels solitary, 3–3.5 cm, slender; capsules globose, pubescent. Fl. May–Jul, fr. Jul–Aug.

• Montane scrub on slopes or sparse forests; 800–1000 m. S and SW Guizhou (Anlong, Ceheng, Wangmo, Xingyi).

**8. *Phyllanthodendron moi*** (P. T. Li) P. T. Li, Bull. Bot. Res., Harbin 7(3): 9. 1987.

弄岗珠子木 nong gang zhu zi mu

*Phyllanthus moi* P. T. Li, Guihaia 3(3): 167. 1983.

Erect shrubs usually ca. 3 m tall, monoecious; stem nearly gray, striped; branchlets angular-winged, glabrous. Stipules narrowly triangular, 3–4 mm, base subauriculate; petiole less than 2 mm, glabrous; leaf blade elliptic to ovate-oblong, 5–10 × 2.5–4.5 cm, thinly papery, both surfaces glabrous, base rounded, apex caudate-acuminate; midrib and lateral veins in 5–7 pairs,

slightly elevated on both surfaces, anastomosing before margins. Inflorescences 1- or 2-flowered. Male flowers: pedicel filamentous, 30–35 mm, pubescent at base; sepals 4, lanceolate, ca. 4.5 × 1.5 mm, midrib elevated abaxially; disk segments 4, obovate, ca. 1 mm, membranous; stamens 4, ca. 5 mm; filaments connate into a terete column; anthers oblong, connectives lanceolate, elongated at apex; pistillode terete, shortly 3-fid at apex. Female flowers: pedicel 35–40 mm, pubescent at base; sepals 6, spatulate, ca. 3.5 × 1.5 mm, midrib elevated abaxially; disk segments 6, obovate, ca. 1 mm; ovary globose, 3-locular, pubescent. Capsules subglobose, ca. 0.8 cm in diam., pericarp with convex triangular-reticulate pattern, endocarp horny. Seed broadly ovoid, ca. 4 × 3 mm. Fl. May–Aug, fr. Aug–Nov.

• Montane slopes, valley scrub or thickets; 500–800 m. W Guangxi.

**9. *Phyllanthodendron caudatifolium*** P. T. Li, Bull. Bot. Res., Harbin 7(3): 7. 1987.

Fl. China 11: 190–193. 2008.

尾叶珠子木 *wei ye zhu zi mu*

*Phyllanthus lii* Govaerts & Radcliffe-Smith (1996), not *Phyllanthus caudatifolius* Merrill (1926).

Erect shrubs ca. 3 m tall, monoecious, glabrous throughout; branches angular-winged. Stipules lanceolate, ca. 4 mm; petiole 2–4 mm; leaf blade obovate or oblong, 5.5–12 × 2–3.5 cm, thickly papery, base broadly cuneate or obtuse, apex caudate-acuminate, acumen ca. 1.2 cm; midrib and lateral veins in 10–14 pairs, slightly elevated on both surfaces, subparallel, ascending to margins, curved anastomosing. Inflorescences 1–3-flowered, with several bracteoles at base; bracteoles ovate-triangular. Male flowers: pedicel filamentous, 20–25 mm; sepals 6, lanceolate, ca. 4 mm, white, midrib elevated abaxially; disk segments 6, linear, ca. 2 × 0.2 mm; stamens 3; filaments connate into a terete column; anthers oblong, connectives subulate. Female flowers: sepals 6, lanceolate, ca. 5 mm, midrib elevated abaxially, persistent in fruit; disk segments 6, linear, ca. 2 mm; ovary globose, 3-locular; styles 3, bifid. Fruiting pedicels to 4 cm, enlarged at apex; capsules globose, ca. 1.5 cm in diam. Fl. May–Jul, fr. Jul–Sep.

- 800–1300 m. Guangxi, Guizhou.

**10. *Phyllanthodendron dunnianum*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 324. 1911.

枝翅珠子木 *zhi chi zhu zi mu*

*Phyllanthodendron cavaleriei* H. Léveillé; *P. dunnianum* var. *hypoglaucum* H. Léveillé; *Phyllanthus dunnianus* (H. Léveillé) Handel-Mazzetti.

Shrubs or treelets 2–6 m tall, monoecious, glabrous throughout; stem terete; branches ± 2-winged. Stipules ovate-lanceolate, ca. 3 mm; petiole ca. 2 mm; leaf blade elliptic, ovate, oblong, or ovate-lanceolate, 2.5–10 × 1.5–4 cm, leathery or thickly papery, base rounded, apex acute or shortly acuminate; lateral veins in 6–8 pairs, anastomosing before margins. Inflorescences 1- or 2-flowered. Male flowers: pedicel 3–4 mm; sepals 5, ovate-elliptic, ca. 5 mm, with reticular lines, apex aristate-apiculate; disk segments 5, linear; stamens 3; filaments connate into a terete column; anthers oblong, connectives subulate at apex. Female flowers: pedicel ca. 5 mm; sepals 6, shaped as in male; disk segments 6; ovary ovoid, 3-locular; styles 3. Fruiting pedicels 5–6 mm; capsules globose, 1–1.5 cm in diam. Fl. May–Jul, fr. Jul–Oct.

- Montane broad-leaved forests or limestone scrub; 500–1000 m. Guangxi, Guizhou, Yunnan.

Fl. China 11: 190–193. 2008.