

12. PHOEBE Nees, Syst. Laur. 98. 1836.

楠属 nan shu

Wei Fa'nan (韦发南); Henk van der Werff

Evergreen trees or shrubs. Leaves alternate, pinnately veined. Flowers bisexual, cymose paniculate or subracemose. Perianth lobes 6, equal in size or sometimes outer ones slightly short, becoming leathery or woody after flowering. Fertile stamens 9, in 3 series; 1st and 2nd series without glands and with introrse 4-celled anthers; 3rd series with 2 glands and extrorse 4-celled anthers. Staminodes triangular or sagittate. Ovary ovoid or globose; stigma dish-shaped or capitate. Fruit ovoid, ellipsoid, or globose, rarely oblong, base surrounded by persistent and enlarged perianth lobes; fruiting pedicel not thickened or conspicuously thickened.

Up to 100 species: tropical and subtropical Asia; 35 species (27 endemic) in China.

- 1a. Perianth lobes outside and inflorescences glabrous or appressed puberulent.
 - 2a. Midrib of leaf blade completely elevated adaxially.
 - 3a. Branchlets and leaf blade abaxially glaucous 1. *P. lichuanensis*
 - 3b. Branchlets and leaf blade not as above.
 - 4a. Fruit oblong or ellipsoid.
 - 5a. Leaf blade elliptic, 7–13(–15) × 2–4 cm, lateral veins 6 or 7 pairs; petiole 1–2 cm; infructescences 3–7 cm; fruit ellipsoid, 1.1–1.3 cm × 5–7 mm 5. *P. yaiensis*
 - 5b. Leaf blade broadly oblong-lanceolate or oblong-oblancheolate, 10–28 × 4–8 cm, lateral veins 9–15 pairs; petiole 2–4 cm; infructescences 10–17 cm; fruit oblong, 1.6–1.8 cm × ca. 8 mm 6. *P. hainanensis*
 - 4b. Fruit ovoid.
 - 6a. Leaf blade narrowly lanceolate, usually 15–25 × 1–2.5 cm 2. *P. angustifolia*
 - 6b. Leaf blade lanceolate, elliptic, or elliptic-lanceolate, much wider, 3–6.5 cm in diam.
 - 7a. Leaf blade thickly papery, veinlets not foveolate on both surfaces; inflorescences slender; pedicel glaucous; fruit beaked at apex 3. *P. lanceolata*
 - 7b. Leaf blade leathery, veinlets foveolate on both surfaces; inflorescences thick; pedicel not glaucous; fruit not beaked at apex 4. *P. calcarea*
 - 2b. Midrib of leaf blade partly or completely impressed adaxially.
 - 8a. Inflorescences mostly slender, much branched, each branch with persistent bracts at base; leaf blade lateral veins and veinlets deeply impressed adaxially 7. *P. kwangsiensis*
 - 8b. Inflorescences thick, each branch without persistent bracts at base; leaf blade lateral veins and veinlets not impressed or slightly impressed adaxially.
 - 9a. Fruit globose or subglobose.
 - 10a. Flowers large, 5–6 mm; petiole to 4 cm, 2–3 mm thick 8. *P. chinensis*
 - 10b. Flowers smaller, 2.5–3.5 mm; petiole not more than 2.5 cm, more slender.
 - 11a. Leaf blade not lustrous on both surfaces, abaxially not glaucescent 11. *P. minutiflora*
 - 11b. Leaf blade lustrous on both surfaces, abaxially glaucescent.
 - 12a. Leaf blade leathery, ovate-elliptic or lanceolate, 4–6 × 1–3.5 cm, lateral veins 5–7 pairs 9. *P. microphylla*
 - 12b. Leaf blade thickly leathery, oblong-lanceolate or elliptic, 7–12(–15) × 2–4.5 cm, lateral veins 12–15 pairs 10. *P. faberi*
 - 9b. Fruit ovoid.
 - 13a. Young leaf blade densely appressed sericeous abaxially; perianth lobes conspicuously ciliate 12. *P. hunanensis*
 - 13b. Young leaf blade glabrous or sparsely pubescent abaxially; perianth lobes glabrous or somewhat hairy at margins.
 - 14a. Leaf blade elliptic, lateral veins 6–9 pairs, inconspicuous on both surfaces, margin revolute; perianth lobes glabrate inside 13. *P. nigrifolia*
 - 14b. Leaf blade oblanceolate, lanceolate, pandurate-oblanceolate, or pandurate-obovate, lateral veins 8–13(–17) pairs, conspicuous abaxially, margin not revolute; perianth lobes densely pubescent inside 14. *P. neuranthoides*
- 1b. Perianth lobes outside and inflorescences densely pubescent, villous, or tomentose.
 - 15a. Midrib of leaf blade completely elevated adaxially.
 - 16a. Panicles usually 9–16 cm; leaf blade 9–22 cm, base attenuate and decurrent, lateral veins 10–15 pairs 15. *P. tavoyana*
 - 16b. Panicles 3.5–10 cm; leaf blade 3–12 cm, base obtuse, not decurrent, lateral veins 6–8(–10) pairs.
 - 17a. Leaf blade lanceolate or oblanceolate, 8–12 × 3–3.5(–4) cm, veinlets conspicuous abaxially;

- inflorescences 6–10 cm 16. *P. legendrei*
- 17b. Leaf blade oblong or elliptic-oblong, 3–6 × 1.5–2 cm, veinlets slightly conspicuous abaxially; inflorescences ca. 3.5 cm 17. *P. brachythyrso*
- 15b. Midrib of leaf blade completely or partly impressed adaxially.
- 18a. Midrib of leaf blade impressed at lower part only adaxially.
- 19a. Leaf blade obovate or oblanceolate, base attenuate and decurrent 18. *P. crassipedicella*
- 19b. Leaf blade lanceolate or elliptic-lanceolate, base cuneate, not decurrent 16. *P. legendrei*
- 18b. Midrib of leaf blade completely impressed adaxially (but elevated distally in *P. neurantha* var. *cavaleriei*).
- 20a. Fruit globose 19. *P. forrestii*
- 20b. Fruit shape not as above.
- 21a. Fruit large, more than 1.8 cm.
- 22a. One-year-old branchlets glabrous or puberulent.
- 23a. Apex of leaf blade shortly acuminate, abaxially puberulent; fruit oblong or ellipsoid, 2–3.2 × 1.1–2 cm 20. *P. rufescens*
- 23b. Apex of leaf blade orbicular or slightly mucronate, abaxially usually glaucous; fruit long ovoid, ca. 1.8 × 1 cm 21. *P. glaucophylla*
- 22b. One-year-old branchlets conspicuously hairy.
- 24a. Branchlets sparsely pubescent; leaf blade 10–20 cm, lateral veins 10–12 pairs 22. *P. yunnanensis*
- 24b. Branchlets densely yellowish brown tomentose or pubescent; leaf blade 15–45 cm, lateral veins more than 20 pairs.
- 25a. Base of leaf blade shallowly cordate, oblique; fruit obovoid-oblong or obovoid; persistent perianth lobes ligneous, ca. 15 × 5–6 mm 23. *P. megacalyx*
- 25b. Base of leaf blade symmetrical; fruit ellipsoid; persistent perianth lobes leathery, 5–6 × 3.5–4 mm.
- 26a. Leaf blade acuminate or shortly acuminate at apex, abaxially sparsely yellowish brown pubescent; fruit 3.5–3.8(–4.2) × 1.9–2.2 cm, apex glabrous 24. *P. macrocarpa*
- 26b. Leaf blade obtuse or mucronate at apex, abaxially densely yellowish brown villous especially along veins; fruit 2–2.2 × 1.5–1.6 cm, apex hairy 25. *P. motuonan*
- 21b. Fruit smaller, below 1.5 cm.
- 27a. One-year-old branchlets very thick, 4.5–6 mm in diam.
- 28a. Leaf blade obovate-lanceolate, elliptic-oblanceolate, or oblanceolate, 10–15 × 2–4.5 cm, lateral veins 12–14 pairs; branchlets, young leaf blade, petioles, and buds densely reddish brown or ferruginous villous 26. *P. hungmoensis*
- 28b. Leaf blade obovate-elliptic or broadly obovate-lanceolate, 10–23 × 5–9 cm, lateral veins 12–20 pairs; branchlets and petioles densely yellowish brown tomentose 27. *P. puwenensis*
- 27b. One-year-old branchlets slender or very slender, 2–3.5 mm in diam.
- 29a. Leaf blade lateral veins very slender, conspicuous or inconspicuous, veinlets nearly disappearing or completely disappearing abaxially; leaf blade gray-white appressed pubescent abaxially 28. *P. hui*
- 29b. Leaf blade lateral veins thick and veinlets conspicuous or very conspicuous abaxially; leaf blade hairy abaxially but not as above.
- 30a. Fruit larger, 1.1–1.5 cm, ellipsoid-ovoid, ellipsoid, or suboblong; persistent perianth lobes clasping base of fruit.
- 31a. Leaf blade obovate-elliptic or obovate-lanceolate, 7–17 × 3–7 cm; seed with numerous embryos, cotyledons unequal 29. *P. chekiangensis*
- 31b. Leaf blade elliptic, lanceolate, or oblanceolate, smaller; seed with solitary embryo, cotyledons equal.
- 32a. Leaf blade leathery, lanceolate or oblanceolate, veinlets very distinct, reticulate abaxially; branchlets hairy or glabrate; panicles shorter, 3–7(–10) cm, not patent 30. *P. bournei*
- 32b. Leaf blade thinly leathery, elliptic, veinlets indistinct, not reticulate abaxially; branchlets densely yellowish brown or gray-brown pubescent; panicles longer, 7.5–12 cm, patent 31. *P. zhennan*

- 30b. Fruit smaller, not more than 1 cm, ovoid or ellipsoid-ovoid; persistent perianth lobes loose, rarely clasping base of fruit.
- 33a. Older leaf blade abaxially and fruiting pedicel glabrous or sparsely pubescent.
- 34a. Flowers smaller, 2–2.5 mm; persistent perianth lobes ca. 3 mm; leaf blade obovate or obovate-lanceolate, 9–15(–20) × 4–6(–8) cm, glaucous abaxially 32. *P. formosana*
- 34b. Flowers larger, 4–5 mm; persistent perianth lobes 4–5 mm; leaf blade lanceolate or oblanceolate, 3–16 × 1–4 cm 33. *P. neurantha*
- 33b. Older leaf blade abaxially and fruiting pedicel densely villous or pubescent.
- 35a. Leaf blade densely or sparsely pubescent, ± glaucous abaxially; persistent perianth lobes unequal, clasping base of fruit 34. *P. glaucifolia*
- 35b. Leaf blade densely or sparsely gray-brown villous, not glaucous abaxially; persistent perianth lobes subequal, loose, not clasping base of fruit 35. *P. sheareri*

1. *Phoebe lichuanensis* S. K. Lee, Acta Phytotax. Sin. 17(2): 57. 1979.

利川楠 li chuan nan

Trees, over 10 m tall; trunk 30–40 cm d.b.h., all parts glabrous except for perianth lobes inside. Branchlets glaucous, longitudinally angular when dry. Petiole 1.5–3 cm; leaf blade conspicuously glaucous abaxially, lustrous adaxially, elliptic, 8–10 × 3–4 cm, leathery, midrib elevated or plane adaxially, lateral veins 7 or 8 pairs, conspicuously raised abaxially, veinlets slightly foveolate abaxially, base cuneate, apex acuminate. Panicles arising from middle and lower parts of newly sprouted branchlet, 6–10 cm, branched at top. Pedicel 5–7 mm. Flowers large, 4.5–5 mm. Perianth lobes subequal, ovate or long ovate, 4–4.5 × 2–2.2 mm, apex obtuse or acute, glabrous or glabrate outside, densely gray-yellow pubescent inside. Fertile stamens ca. 3.5 mm; filaments flat, hairy, those of 3rd series with reniform sessile or subsessile glands adnate at middle. Staminodes triangular, ca. 2 mm, with gray-yellow villous stalks. Ovary globose; style slender, erect or slightly curved, glabrous. Fl. May.

- Mountain valleys, mixed forests; ca. 700 m. SW Hubei.

2. *Phoebe angustifolia* Meisner in A. Candolle, Prodr. 15(1): 34. 1864.

沼楠 zhao nan

Phoebe angustifolia var. *annamensis* H. Liu.

Small shrubs. Branchlets blackish, sometimes older ones yellowish, younger branchlets glabrous or gray-brown puberulent. Terminal buds small; bud scales brownish puberulent outside. Petiole 1–1.5 cm, glabrous or glabrate; leaf blade lanceolate or narrowly lanceolate, (10–)15–25(–37) × 1–2.5(–3.5) cm, leathery, puberulent or glabrous abaxially, glabrous or puberulent along midrib adaxially, midrib elevated on both surfaces, lateral veins 10–16(–20) pairs, abaxially conspicuous, adaxially slightly conspicuous or inconspicuous, base attenuate and decurrent, apex acuminate. Panicles subterminal, numerous, 8–18(–20) cm, branched at above middle of peduncle; peduncle and pedicel outside glabrous. Perianth lobes ovate, ca. 2.5 mm, glabrous outside, pubescent inside. Stamens ca. 2 mm; fila-

ments slightly hairy, those of 3rd series with shortly stalked glands at base. Fruit ovoid, 9–12(–14) × 5–7 mm; fruiting pedicel 6–8 mm, slender; persistent perianth lobes straw-yellow or brownish, leathery, clasping base of fruit. Fl. Apr, fr. May–Jun.

Lowlands, marshlands, streamsides. SE Yunnan [India, Myanmar, Vietnam].

3. *Phoebe lanceolata* (Nees) Nees, Syst. Laur. 109. 1836.

披针叶楠 pi zhen ye nan

Ocotea lanceolata Nees in Wallich, Pl. Asiat. Rar. 2: 71. 1831; *Laurus lanceolaria* Roxburgh; *O. ligustrina* Nees.

Trees, 4–15(–20) m tall. Bark gray-white. Branchlets slender, older ones gray-brown or brown, young ones glabrous or yellowish brown puberulent and soon caducous. Buds densely yellowish gray tomentose. Petiole 1–2.5 cm, glabrous; leaf blade usually purplish red on both surfaces when young, lanceolate or elliptic-lanceolate, 13–22(–25) × 3–5.5(–6.5) cm, thickly papery, abaxially pubescent when young, glabrous on both surfaces when old, midrib thick, elevated adaxially, lateral veins 9–13(–15) pairs, slender but conspicuous, veinlets invisible on both surfaces or slightly conspicuous abaxially, base attenuate and decurrent, apex acuminate or long acuminate, summit usually falcate. Panicles variable in length, usually 12–15 cm, longer one to 20 cm, shorter one 4–5 cm, branched near top of peduncle; peduncle and pedicel glabrous. Pedicel as long as perianth, usually glaucous. Flowers pale green or yellowish green, 3–4 mm. Perianth lobes subequal, ovate, 2.5–3 mm, glabrous outside, gray-white pubescent inside. Filaments gray-white pubescent at base, those of 3rd series with sessile glands at base. Ovary glabrous. Fruit ovoid, 9–12 × 6–7 mm, usually with short rostrum at apex; fruiting pedicel slightly thickened; persistent perianth lobes straw-yellow, leathery, clasping base of fruit or lax. Fl. Apr–May, fr. Jul–Sep.

Broad-leaved mountain forests, common; usually below 1500 m. S Yunnan [Bhutan, India, Indonesia, Malaysia, Nepal, Thailand].

4. *Phoebe calcarea* S. K. Lee & F. N. Wei, Guihaia 3: 7. 1983.

石山楠 shi shan nan

Trees, up to 13 m tall. Branchlets castaneous, angular, ca. 2.5 mm in diam., glabrous. Petiole 1.5–3 cm, canaliculate adaxially, glabrous; leaf blade shiny adaxially, elliptic, 11–19 × 3.5–6 cm, leathery, glabrous on both surfaces, midrib and lateral veins elevated on both surfaces, lateral veins 9–13 pairs, slender, reticulate veinlets dense, foveolate and usually conspicuous on both surfaces, base attenuate or cuneate, apex long acuminate. Panicles many, terminal, 15–25 cm, glabrous. Pedicel 1–1.3 cm. Perianth lobes ovate, subequal, 3–4 × ca. 2 mm, outer 3 lobes glabrous on both surfaces, inner 3 lobes glabrous outside, densely gray-white villous inside. Filaments of 1st and 2nd series sparsely villous, of 3rd series densely villous, with reniform glands. Staminodes sagittate, ca. 2 mm, stalked. Ovary ovoid; stigma capitate. Fruit ovoid, 8–10 × 5–6 mm; persistent perianth lobes leathery, clasping at base of fruit. Fl. Apr–May, fr. Aug.

• Limestone hills, mixed broad-leaved forests. Guangxi, S Guizhou (Libo).

5. *Phoebe yaiensis* S. K. Lee, Acta Phytotax. Sin. 8: 190. 1963.

崖楠 ya nan

Phoebe cuneata Blume var. *glabra* H. Liu.

Trees, usually 5–8 m tall. Branchlets glabrous, older branchlets with conspicuous leaf scars and lenticels. Buds glabrous or puberulent. Petiole 1–2 cm, glabrous; leaf blade elliptic, 7–13(–15) × 2–4 cm, leathery, glabrous on both surfaces or puberulent abaxially, midrib and lateral veins more slender, elevated on both surfaces, lateral veins 6 or 7 pairs, veinlets abaxially conspicuous. Flowers not seen. Infructescences subterminal, 3–7 cm, glabrous. Fruit ellipsoid, 1.1–1.3 cm × 5–7 mm; fruiting pedicel 6–8 mm, slightly thickened; persistent perianth lobes ovate, 3–4 × ca. 2.5 mm, leathery, glabrous outside, gray-brown pubescent inside, apex obtuse, clasping at base of fruit. Fr. Sep–Nov.

Lowlands of mixed forests. SW Guangxi, Hainan [Vietnam].

6. *Phoebe hainanensis* Merrill, Philipp. J. Sci. 21: 343. 1922.

茶槁楠 cha gao nan

Trees, glabrous throughout except for perianth lobes inside. Petiole 2–4 cm; leaf blade shiny and tea-colored, broadly oblong-lanceolate or oblong-oblancheolate, 10–25(–28) × 4–8(–10) cm, thinly leathery, midrib and lateral veins elevated on both surfaces, lateral veins distant, 9–15 pairs, veinlets densely reticulate, slightly conspicuous on both surfaces. Panicles axillary at upper part of newly sprouted branchlet, 10–15(–17) cm, with few flowers. Perianth lobes ovate or elliptic-ovate, ca. 4 mm, brownish sericeous inside, apex obtuse. Ovary glabrous. Fruit oblong, 1.6–1.8 cm × ca. 8 mm; fruiting pedicel ca. 6 mm; persistent perianth lobes elliptic-ovate, clasping at base of fruit. Fr. Nov.

• Mixed forests, rare. Hainan.

7. *Phoebe kwangsiensis* H. Liu, Laurac. Chine & Indochine, 70. 1932.

桂楠 gui nan

Small trees, 2–8 m tall. Branchlets terete, pubescent. Petiole 6–15 mm, hairy; leaf blade oblanceolate or elliptic-oblancheolate, 9–19(–21) × 2–4 cm, blackish when dry, leathery, abaxially gray-brown pubescent, adaxially glabrous or hairy along midrib, midrib, lateral veins, and veinlets elevated abaxially, impressed into small canals adaxially, lateral veins 10–13 pairs, curved, anastomosing at margin, base cuneate, apex acuminate. Cymose panicles slender, 13–18 cm; peduncle 10–12 cm, sparsely pubescent, much branched at top, each branch with persistent bracts at base. Flowers small, ca. 2.5 mm. Perianth lobes ovate-triangular, glabrous or puberulent outside, canescent villous inside. Filaments of 1st and 2nd series glabrate, those of 3rd series with subsessile glands at base. Ovary subovoid; style slender; stigma dish-shaped. Fl. Jun, fr. Sep.

• Limestone hills, mixed forests by streamsides, rare; 700–1000 m. NW Guangxi, SW Guizhou.

8. *Phoebe chinensis* Chun, Chinese Econ. Trees, 158. 1921.

山楠 shan nan

Machilus macrophylla Hemsley (1891), not Blume (1851), nor Nees (1836); *Phoebe macrophylla* Gamble (1914), not Blume (1851).

Large trees, 15–20 m tall; trunk to 70 cm d.b.h. Branchlets terete, glabrous, blackish brown when dry. Terminal buds ovoid or subglobose, 5–8 mm in diam.; bud scales glabrate except for margins, blackish when dry. Petiole thick, 2–3(–4) cm, glabrous, blackish when dry; leaf blade broadly oblanceolate, broadly lanceolate, or oblong-lanceolate, 11–17(–20) × 3–5(–5.5) cm, leathery to thickly leathery, glabrous on both surfaces or abaxially puberulent, midrib thick, abaxially very elevated, adaxially impressed, lateral veins indistinct or sometimes slightly distinct abaxially, veinlets invisible on both surfaces, base cuneate, apex acute or acute-acuminate, rarely mucronate. Panicles thick, subterminal or from base of newly sprouted branchlet, 8–17 cm, glabrous, branched at above middle of peduncle. Flowers yellowish green, 5–6 mm. Perianth lobes ovate-oblong, glabrous or puberulent outside, hairy inside and at margins. Filaments glabrous or hairy at base only, those of 3rd series with long stipitate glands at base. Ovary ovoid; style slender; stigma slightly enlarged. Fruit globose or subglobose, ca. 1 cm in diam.; fruiting pedicel ca. 6 mm, reddish brown when alive; persistent perianth lobes clasping at base of fruit or lax, upper half usually not becoming hard and not caducous, lower half somewhat becoming hard. Fl. Apr–May, fr. Jun–Jul.

• Mountain slopes or valleys, evergreen broad-leaved forests, scattered or pure forests; ca. 1500 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan, Xizang, Yunnan.

9. *Phoebe microphylla* H. W. Li, Acta Phytotax. Sin. 17(2): 57. 1979.

小叶楠 xiao ye nan

Trees, ca. 10 m tall. One-year-old branchlets terete, glabrous, conspicuously lenticellate. Leaves congested at apex of branchlet; petiole 1–1.5(–2) cm; leaf blade abaxially conspicuously glaucous, adaxially shiny, ovate-elliptic or lanceolate, rarely oblanceolate, 4–6 × 1–3.5 cm, leathery, glabrous on both

surfaces, midrib abaxially elevated, adaxially impressed, lateral veins 5–7 pairs, somewhat distinct on both surfaces, veinlets slightly visible abaxially, base cuneate to broadly cuneate, apex acuminate or subacutely acuminate. Infructescences arising from lower part of newly sprouted branchlet, 4.5–7 cm, branched at upper part; peduncle 2.5–4.5 cm, glabrous. Fruit globose, ca. 9 mm in diam.; fruiting pedicel enlarged, glabrous; persistent perianth lobes slightly thickened, ovate-oblong, equal, 4–5 × ca. 1.8 mm, glabrous outside, pubescent inside, loose or clasping at base of fruit. Fr. May–Jun.

- Mountain valleys, open forests; 400–1800 m. SE Yunnan.

10. *Phoebe faberi* (Hemsley) Chun, Contr. Biol. Lab. Sci. Soc. China 1(5): 31. 1925.

竹叶楠 zhu ye nan

Machilus faberi Hemsley, J. Linn. Soc., Bot. 26: 375. 1891; *Phoebe omeiensis* R. H. Miao.

Trees, usually 10–15 m tall. Branchlets thick, blackish or blackish brown when dry, glabrous. Petiole 1–2.5 cm; leaf blade abaxially glaucous or glaucous-green, adaxially shiny, oblong-lanceolate or elliptic, 7–12(–15) × 2–4.5 cm, thickly leathery or leathery, glabrous on both surfaces or appressed canescent abaxially when young, midrib abaxially elevated, adaxially concave, lateral veins 12–15 pairs, veinlets invisible on both surfaces, revolute at margin, base cuneate or rounded-obtuse, usually oblique, apex obtuse or acute, rarely shortly acuminate. Inflorescences many, axillary at lower part of newly sprouted branchlet, 5–12 cm, glabrous, branched at above middle of peduncle, each umbellule with 3–5 flowers. Pedicel 4–5 mm. Flowers yellowish green, 2.5–3 mm. Perianth lobes ovate, glabrous outside, hairy inside and at margin. Filaments glabrous or only hairy at base, those of 3rd series with shortly stipitate or sessile glands at base. Ovary glabrous; style slender. Fruit globose, 7–9 mm in diam.; fruiting pedicel ca. 8 mm, slightly thickened; persistent perianth lobes ovate, leathery, slightly clasping or lax, apex extrorse. Fl. Apr–May, fr. Jun–Jul.

- Mountain slopes, broad-leaved forests; 800–1500 m. Guizhou, W Hubei, Shaanxi, Sichuan, C and N Yunnan.

11. *Phoebe minutiflora* H. W. Li, Acta Phytotax. Sin. 17(2): 57. 1979.

小花楠 xiao hua nan

Trees, usually 7–15(–25) m tall; trunk to 35 cm d.b.h. One-year-old branchlets terete, glabrous, older ones usually with oblong lenticels. Bud scales glabrous outside, ciliate. Petiole 7–15 mm, glabrous; leaf blade oblong or oblong-lanceolate, 6–15 × 2–4.5 cm, leathery, most glabrous on both surfaces, midrib raised abaxially, impressed adaxially, lateral veins 6–10 pairs, slender, curved, somewhat conspicuous on both surfaces, veinlets densely reticulate, base cuneate or subrounded, sides unequal. Cymose panicles numerous, subterminal, slender, (3.5–)6–15 cm, glabrous, many flowered. Pedicel slender, 4–6 mm or more. Flowers yellowish green, small, 2–3 mm. Perianth lobes subequal, ovate-oblong, ciliate, outer ones hairy inside only, inner ones puberulent outside, villous inside. Filaments canescent villous at base, those of 3rd series with shortly

stipitate glands at base. Stamines triangular, long stipitate, villous. Ovary ovoid, glabrous; style slender; stigma subulate. Fruit globose, ca. 8 mm in diam.; fruiting pedicel ca. 6 mm, enlarged; persistent perianth lobes slightly thickened, loose, apex extrorse or patent. Fl. Jan–Mar, fr. Apr.

- Mountain slopes, valley forests; 500–1500 m. S Yunnan.

12. *Phoebe hunanensis* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 58: 146. 1921.

湘楠 xiang nan

Shrubs or small trees, usually 3–8 m tall. Branchlets reddish brown or reddish black, angular when dry, glabrous. Petiole 7–15(–24) mm, glabrous; leaf blade sometimes reddish purple adaxially when young, glaucous or white-farinoso abaxially when old, broadly oblanceolate, rarely obovate-lanceolate, (7.5–)10–18(–23) × 3–4.5(–6.5) cm, leathery or subleathery, densely appressed silvery sericeous abaxially when young, glabrous or appressed pubescent abaxially and glabrous adaxially when old, midrib thick, abaxially very conspicuous, adaxially impressed, rarely plane, lateral veins 6–14 pairs, usually 10–12, abaxially raised, veinlets abaxially conspicuous, base cuneate or narrowly cuneate, apex shortly acuminate, sometimes summit falcate. Inflorescences from upper part of current year branchlet, slender, 8–14 cm, subracemose or branched at upper part of peduncle, glabrous. Pedicel ca. as long as flower. Flowers 4–5 mm. Perianth lobes slightly unequal, puberulent to glabrous outside, densely canescent inside. Filaments glabrous or hairy at base only, those of 3rd series with sessile glands at base. Ovary compressed globose, glabrous; stigma cap-shaped or somewhat enlarged. Fruit ovoid, 1–1.2 cm × ca. 7 mm; fruiting pedicel slightly thickened; persistent perianth lobes ovate, lax with longitudinal veins, ciliate. Fl. May–Jun, fr. Aug–Sep.

- Mountain valleys, streamsides. Anhui, Gansu, Guizhou, Hubei, C, SE, and W Hunan, Jiangsu, Jiangxi, Shaanxi.

13. *Phoebe nigrifolia* S. K. Lee & F. N. Wei, Acta Phytotax. Sin. 17(2): 58. 1979.

黑叶楠 hei ye nan

Shrubs to small trees, 2–6 m tall. Branchlets subterete, blackish when dry, glabrous, lenticellate; older branchlets usually with leaf scars. Buds pubescent. Petiole 5–7 mm, glabrous; leaf blade elliptic, 3.5–9 × 1.5–3.5 cm, leathery, blackish when dry, abaxially glabrous or puberulent, adaxially glabrous and shiny, midrib abaxially raised, adaxially concave or plane, lateral veins 6–9 pairs, inconspicuous on both surfaces, veinlets dense, inconspicuous or conspicuous, foveolate, base cuneate, margin revolute, apex acuminate or shortly acuminate. Panicles axillary at upper part of newly sprouted branchlet, slender, 2.5–7(–11) cm, glabrous, branched at above middle of peduncle. Pedicel 4–7 mm. Flowers 3–3.5 mm. Perianth lobes ovate, subequal, 2.5–3 × ca. 2 mm, with 5–7 veins, glabrous outside, glabrate inside, apex round or obtuse. Filaments hairy, those of 3rd series with sessile glands at base. Stamines triangular, stipitate, hairy. Ovary globose, together with style glabrous; stigma capitate. Fruit ovoid, ca. 1 cm × 8 mm; fruiting pedicel slightly thickened; persistent perianth lobes ovate, leathery, clasping base of fruit. Fl. Apr–May, fr. Aug–Sep.

- Limestone hills, thickets. SW Guangxi.

14. *Phoebe neuranthoides* S. K. Lee & F. N. Wei, *Acta Phytotax. Sin.* 17(2): 58. 1979.

光枝楠 *guang zhi nan*

Phoebe pandurata S. K. Lee & F. N. Wei.

Large shrubs to small trees, to 11 m tall. Branchlets blackish brown or brownish, angular, glabrous. Terminal buds ovoid, yellowish brown appressed pubescent. Petiole 1–2 cm, slender, glabrous; leaf blade oblanceolate, lanceolate, or sometimes pandurate-oblanceolate to pandurate-obovate, 8–17 × 2–5.5 cm, thinly leathery, abaxially glabrous, midrib abaxially elevated, adaxially impressed or at least lower part impressed, lateral veins 8–13(–17) pairs, abaxially conspicuous, veinlets abaxially somewhat conspicuous or invisible, base attenuate or cuneate, sometimes pandurate-oblanceolate to decurrent, apex acute-acuminate to acuminate. Inflorescences 6–10(–13) arising from middle of newly sprouted branchlet, subracemose, or branchlet at upper part of peduncle, few flowered; peduncle 3–7 cm, glabrous. Pedicel (4–)7–9 mm, glabrous. Flowers 3–3.5 mm. Perianth lobes subequal or outer ones smaller, glabrous outside, pubescent or villous inside. Filaments ± pubescent, those of 3rd series densely pubescent, with glands at base. Stamines sagittate, with villous or pubescent stalks. Ovary ovoid, glabrous. Fruit ovoid, 1–1.2 cm × 5–8 mm; fruiting pedicel 8–9 mm, slightly thickened; persistent perianth lobes ovate, lax. Fl. Apr–May, fr. Sep–Oct.

- Mountain slopes, valleys, dense forests; 600–2000 m. N Guangxi, Guizhou, W Hubei, W Hunan, S Shaanxi, NE and S Sichuan.

15. *Phoebe tavoyana* (Meisner) J. D. Hooker, *Fl. Brit. India* 5: 143. 1886.

乌心楠 *wu xin nan*

Machilus tavoyana Meisner in A. Candolle, *Prodr.* 15(1): 41. 1864; *M. henryi* Hemsley; *Phoebe cuneata* Blume var. *poilanei* H. Liu; *P. henryi* (Hemsley) Merrill.

Trees, usually 8–12 m tall. Two-year-old branchlets sparsely pubescent or glabrate; current year branchlets densely yellow-gray villous. Petiole 1–2 cm, pubescent; leaf blade lanceolate or elliptic-lanceolate, 9–22 × 2.5–5.5 cm, thinly leathery, abaxially densely gray-white or gray-brown villous becoming pubescent, adaxially glabrous, midrib adaxially elevated, lateral veins 10–15 pairs, anastomosing and disappearing near margin, abaxially distinct, adaxially indistinct or slightly distinct, veinlets somewhat visible, base attenuate, usually decurrent, apex caudate-acuminate. Panicles numerous, axillary at upper part of newly sprouted branchlet, usually 9–16 cm, rarely to 25 cm, branched on top, densely yellowish gray pubescent. Flowers and pedicel 4–5 mm. Perianth yellowish brown, ovate, pubescent on both surfaces, apex obtuse. Filaments hairy, those of 3rd series with sessile or subsessile glands at base. Stamines stipitate, densely villous. Ovary subglobose, glabrous or sparsely pubescent at upper part; style filiform, erect or somewhat curved; stigma dish-shaped. Fruit ellipsoid-obovoid or ellipsoid, ca. 1.2 cm; fruiting pedicel short, thickened; persistent perianth hairy on both surfaces. Fl. usually Feb–Mar, fr. May–

Aug.

Mixed forests and thickets, very common in Hainan. Guangdong, SE Guangxi, Hainan, Yunnan [Cambodia, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

16. *Phoebe legendrei* Lecomte, *Nouv. Arch. Mus. Hist. Nat.*, sér. 5, 5: 103. 1913.

雅奢江楠 *ya long jiang nan*

Trees. Branchlets sparsely pubescent, later glabrate. Petiole ca. 1 cm; leaf blade lanceolate or elliptic-lanceolate, rarely obovate, 8–12 × 3–3.5(–4) cm, leathery, abaxially glabrate or pubescent along veins, midrib raised on both surfaces or at least upper part distinctly raised, lateral veins 7 or 8(–10) pairs, abaxially conspicuous. Inflorescences 6–10 cm, few flowered, pubescent; peduncle 3.5–4 cm. Perianth lobes subequal, ovate-oblong, ca. 3 × 2 mm, densely gray-white villous on both surfaces. Filaments sparsely (or densely) villous, those of 3rd series with subsessile glands at base. Stamines triangular with villous stalks. Ovary globose, glabrous; stigma capitate. Fruit ovoid, 7–9 mm; persistent perianth lobes lax, apex extrorse; fruiting pedicel distinctly thickened or somewhat thickened, sparsely pubescent. Fl. Jun, fr. Oct.

- Dense mixed forests; higher elevations. SE and W Sichuan, NW Yunnan.

17. *Phoebe brachythyrso* H. W. Li, *Acta Phytotax. Sin.* 17(2): 59. 1979.

短序楠 *duan xu nan*

Small shrubs, ca. 2 m tall. Branchlets slender, 2–3 mm in diam., pubescent. Buds pubescent. Petiole 2–4 mm, pubescent; leaf blade oblong or elliptic-oblong, 3–6 × 1.5–2 cm, leathery, abaxially appressed pubescent, adaxially glabrous, midrib slender, raised on both surfaces, lateral veins 6–8 pairs, very slender, abaxially slightly distinct, adaxially usually inconspicuous, veinlets almost invisible, base cuneate, apex shortly acuminate. Flowers not seen. Infructescences short, ca. 3.5 cm, subracemose with few fruits, pubescent. Fruit ovoid, ca. 1.1 cm × 7 mm; fruiting pedicel ca. 6 mm; persistent perianth lobes subovate, hard, pubescent, clasping base of fruit. Fr. Sep.

- Thickets of lowland slopes. NE Yunnan.

18. *Phoebe crassipedicella* S. K. Lee & F. N. Wei, *Guihaia* 3: 8. 1983.

粗柄楠 *cu bing nan*

Trees, ca. 8 m. Branchlets angular, glabrous or glabrate. Petiole 5–15 mm, glabrous or puberulent; leaf blade abaxially pale green or glaucous, obovate or oblanceolate, 8–14 × 2.5–3.5 cm, leathery, abaxially puberulent, adaxially glabrous, midrib adaxially impressed at lower part and raised at upper part, lateral veins ca. 9 pairs, slender, elevated on both surfaces, reticulate veinlets distinct abaxially, base attenuate and decurrent, apex acuminate or obtuse. Infructescences usually arising from middle of newly sprouted branchlet, 3–9 cm, puberulent or glabrous. Fruit ovoid, ca. 1 cm × 8 mm; persistent perianth lobes equal, ovate, 3–4 × 2.5–3 mm, glabrous or glabrate outside, pubescent inside; fruiting pedicel 3–4 mm, conspicuously thick-

ened, glabrous. Fl. May–Jun, fr. Sep.

• Limestone hills, mixed broad-leaved forests. NW Guangxi, S Guizhou (Libo).

19. *Phoebe Forrestii* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 176. 1921.

长毛楠 chang mao nan

Trees, to 15 m tall. Bark gray-white. Branchlets slender, terete, densely yellow-brown villous. Petiole 7–15 mm, densely yellow-brown villous; leaf blade narrowly lanceolate or narrowly oblanceolate, 8–14(–20) × 1–3(–3.5) cm, leathery, abaxially densely or sparsely yellow-brown villous, adaxially glabrous or yellow-brown pubescent along midrib, midrib adaxially impressed, rarely plane, lateral veins 7–13 pairs, abaxially distinct, base attenuate, apex acute or obtuse, sometimes rounded. Inflorescences subracemose, slender, axillary at middle and upper part of newly sprouted branchlet, 4–8(–9) cm; peduncle and pedicel densely yellow-brown pubescent. Perianth lobes subequal, ca. 4 mm, yellow-brown pubescent on both surfaces, apex obtuse or subacute. Filaments hairy, at least hairy at base, those of 3rd series with shortly stipitate glands at base. Ovary subglobose; stigma large, usually 3-lobed. Fruit globose, ca. 1.3 × 1 cm; fruiting pedicel slightly thickened; persistent perianth lobes lax, apex somewhat extrorse. Fl. Jun–Jul, fr. Oct–Nov.

• Mixed forests of mountain slopes or valleys; 1700–2500 m. SE Xizang, C and W Yunnan.

20. *Phoebe rufescens* H. W. Li, Acta Phytotax. Sin. 17(2): 59. 1979.

红梗楠 hong geng nan

Trees, 12–20 m tall; trunk ca. 40 cm d.b.h. Bark grayish brown. Branchlets reddish brown, subterete, puberulent, with distinct leaf scars and lenticels. Buds tomentose. Petiole 1–2 cm, puberulent; leaf blade oblong or lanceolate-oblong, 9.5–17 × 2.5–6 cm, leathery, abaxially puberulent, adaxially glabrous or puberulent along midrib, midrib adaxially impressed, lateral veins 8–15 pairs, veinlets distinct, foveolate on both surfaces, base cuneate or narrowly cuneate, apex obtuse or acute, rarely shortly acuminate. Inflorescences 7.5–18 cm, thick, branched on top of peduncle, yellowish brown puberulent. Fruit long ovoid or ellipsoid, 2–3.2 × 1.1–2 cm, purple-black when mature; fruiting pedicel somewhat thickened; perianth lobes oblong-ovate, conspicuously hairy on both sides, clasping base of fruit. Fr. Sep–Nov.

• Moist mixed broad-leaved forests; 1800–2000 m. SW Yunnan.

21. *Phoebe glaucophylla* H. W. Li, Acta Phytotax. Sin. 17(2): 60. 1979.

粉叶楠 fen ye nan

Trees, to 20 m tall. Branchlets subterete, glabrous, with large distinct leaf scars and lenticels. Bud scales pubescent outside. Petiole 1–2.3 cm, stout, hairy; leaf blade broadly obovate-lanceolate or suboblong, 6–18 × 3–9 cm, leathery, abaxially glaucous or not and appressed puberulent, adaxially shiny and glabrous, midrib abaxially elevated, adaxially impressed, lateral

veins 7–11 pairs, obliquely extended, disappearing near margin, veinlets usually inconspicuous on both surfaces, base attenuate-cuneate, apex obtuse or slightly mucronate, rarely acute. Cymose panicles 7.5–20 cm, thick, puberulent, branched on top of peduncle, lowest ramification ca. 7.5 cm. Pedicel 4–7 mm, pubescent. Flowers yellowish green, 4–5 mm. Perianth lobes subequal, ovate, 3.5–4 × ca. 2.5 mm, pubescent on both surfaces, apex acute. Filaments hairy, those of 3rd series with shortly stipitate glands at base. Ovary ovoid, upper part hairy; style filiform, glabrous; stigma somewhat enlarged or not. Fruit long ovoid, ca. 1.8 × 1 cm; persistent perianth lobes hard, ca. 5 mm, hairy, clasping fruit. Fl. Jun, fr. Nov.

• Limestone hills, mixed forests; 900–1200 m. SE Yunnan.

22. *Phoebe yunnanensis* H. W. Li, Acta Phytotax. Sin. 17(2): 60. 1979.

景东楠 jing dong nan

Trees, 8–14 m tall; trunk ca. 20 cm d.b.h. Bark gray-black. Branchlets robust, pubescent, conspicuously lenticellate. Terminal bud large, reddish brown tomentose. Petiole 1.3–3.5 cm, thick, hairy; leaf blade yellowish brown on both surfaces when dry, obovate-oblong, ovate-round, or oblong, 10–22 × 3.5–12 cm, leathery, abaxially sparsely or densely yellow pubescent, adaxially glabrous, midrib thick, abaxially elevated, adaxially concave, lateral veins 10–12 pairs, obliquely extended, near margin anastomosing, veinlets abaxially reticulate, base cuneate or broadly cuneate, apex shortly acuminate or acute-acuminate. Inflorescences 14–27 cm, with fewer fruits, puberulent; peduncle thick to 20 cm. Fruit ovoid, 2–2.2 × ca. 1.3 cm, glabrous or only apex slightly pubescent; fruiting pedicel thickened, very short, densely yellowish brown tomentose; persistent perianth lobes ovate, thickened, 6–7 × 4–5 mm, apex obtuse, hairy on both sides, clasping base of fruit. Fr. Oct.

• Broad-leaved mountain forests; ca. 2000 m. W Yunnan.

23. *Phoebe megalyx* H. W. Li, Acta Phytotax. Sin. 17(2): 60. 1979.

大萼楠 da e nan

Small trees, ca. 5 m tall. Bark blackish brown. Branchlets subterete, thick, densely yellowish brown tomentose. Buds yellowish brown tomentose. Petiole thick, 1–2 cm, densely yellowish brown tomentose; leaf blade broadly oblanceolate or oblanceolate, 15–45 × 4.5–11.5 cm, thinly leathery, abaxially densely or sparsely pubescent and extended villous on veins, adaxially first yellowish brown pubescent or only hairy along veins, becoming glabrous after, midrib thick, adaxially impressed, lateral veins 22–28 pairs, curved, abaxially conspicuous, anastomosing near margin, base shallowly cordate, asymmetrical on both sides. Panicles to 23 cm, slightly branched on top of peduncle, patently yellowish brown tomentose; bracts linear-lanceolate, ca. 8 mm, hairy. Filaments hairy, those of 3rd series very compressed at base, to 2 mm broad, glands shortly stipitate. Staminodes triangular, stipitate, hairy. Ovary obovoid, apex yellowish brown pubescent. Fruit obovoid-oblong or obovoid, ca. 3.2 × 1.8 cm, apex with mucro, upper part yellowish brown pubescent; fruiting pedicel ca. 6 mm; persistent perianth lobes oblong-ovate, to 1.5 × 0.5–0.6 cm, very thickened ligne-

ous, densely yellowish brown pubescent on both surfaces, clasping at base of fruit. Fl. Apr–May, fr. Jun–Jul.

Mountain valleys, mixed forests; lower elevations. SE Yunnan [N Vietnam].

24. *Phoebe macrocarpa* C. Y. Wu, Acta Phytotax. Sin. 6: 211. 1957.

大果楠 da guo nan

Phoebe poilanei Kostermans.

Large trees, usually 15–20 m tall; trunk 40–60 cm d.b.h. Bark blackish brown. Branchlets thick, densely yellowish brown tomentose. Terminal buds ovoid, ca. 2 cm, yellowish brown hispidulous. Petiole 1–2 cm, thick, long hairy; leaf blade elliptic-oblongate or oblanceolate, 18–30(–38) × 4–7.5(–9) cm, thinly leathery, abaxially sparsely yellowish brown pubescent, patently hispidulous along veins, adaxially glabrous except for midrib, midrib adaxially impressed, lateral veins 23–34 pairs, subparallel, visible on both surfaces, veinlets numerous, conspicuous, subparallel, base attenuate, decurrent, equal on both sides, apex acuminate or shortly acuminate. Panicles 10–21 cm, densely yellowish brown strigose, branched at top; peduncle 7–15 cm. Flowers yellowish green, 4–6 mm. Perianth lobes subequal, ovate-rounded, ca. 4 × 3 mm, yellowish brown strigose on both surfaces. Filaments hairy, those of 3rd series with shortly stipitate or subsessile glands at base. Stamines sagittate, hairy. Ovary globose, all or upper half hairy; style linear, hairy; stigma inconspicuous or somewhat enlarged. Infructescences subligulous. Fruit ellipsoid or suboblong, 3.5–3.8(–4.2) × 1.9–2.2 cm, glabrous; fruiting pedicel ca. 1 cm; persistent perianth lobes ovate or ovate-elliptic, ca. 6 × 4 mm, leathery, hairy on both surfaces, clasping base of fruit. Fl. Apr–May, fr. Oct–Dec.

Mixed broad-leaved forests; 1200–1800 m. SE Yunnan [N Vietnam].

25. *Phoebe motuonan* S. K. Lee & F. N. Wei, Acta Phytotax. Sin. 17(2): 61. 1979.

墨脱楠 mo tuo nan

Large trees, ca. 20 m tall; trunk ca. 40 cm d.b.h. Branchlets very thick, 7–8 mm in diam. at middle, densely grayish brown villous. Buds large, appressed ferruginous villous. Petiole very thick and compressed, 1–1.5 cm, to 4.5 mm wide, densely grayish brown villous; leaf blade obovate-lanceolate, 18–32 × 7–10.5 cm, leathery, abaxially densely grayish brown villous, especially at veins, adaxially glabrous or hairy along midrib, midrib very thick, abaxially distinctly elevated, adaxially impressed into canal, lateral veins 18–32 pairs, anastomosing at margin, veinlets conspicuous, base attenuate, apex obtuse or mucronate. Infructescences 18–24 cm, hairy; peduncle 13–16 cm, ca. 4 mm in diam., very thick, ligneous. Fruit ellipsoid, 2–2.2 × 1.5–1.6 cm, apex hairy; persistent perianth lobes ovate, ca. 6 × 3.5–4 mm, lax, somewhat thickened, grayish brown pubescent on both surfaces, especially outside; fruiting pedicel ca. 3 mm, thickened, 2.5–3 mm in diam.

• Mountain slopes, broad-leaved forests; ca. 1700 m. SE Xizang.

26. *Phoebe hungmoensis* S. K. Lee, Acta Phytotax. Sin. 8:

190. 1963.

红毛山楠 hong mao shan nan

Trees, to 25 m tall; trunk ca. 1 m d.b.h. Branchlets, young leaves, petioles, and buds reddish brown or ferruginous villous. Branchlets thick, 4.5–6 mm in diam. at middle. Petiole 8–27 mm; leaf blade blackish or deep castaneous when dry, oblanceolate, obovate-lanceolate, or elliptic-oblongate, 10–15 × 2–4.5 cm, leathery, abaxially densely or sparsely pubescent and along veins tomentose, adaxially glabrous and shiny or pubescent along midrib, midrib thick, abaxially raised, adaxially impressed or plane, lateral veins 12–14 pairs, veinlets conspicuous abaxially, base attenuate, apex obtuse, subrounded, or somewhat mucronate. Panicles arising from middle and lower part of current year branchlet, 8–18 cm, pubescent or villous. Flowers 4–6 mm. Perianth lobes oblong or elliptic-ovate, densely yellowish gray pubescent. Filaments hairy, those of 3rd series with sessile glands at base. Stamines with broad and compressed short stalks, hairy. Ovary globose, apex gray-white pubescent; style slender, hairy. Fruit ellipsoid, ca. 1 cm × 5–6 mm; fruiting pedicel somewhat thickened; perianth lobe thickly leathery, clasping base of fruit. Fl. Apr, fr. Aug–Sep.

Shady mixed forests. S and SW Guangxi, Hainan [Vietnam].

27. *Phoebe puwenensis* W. C. Cheng, Sci. Silvae Sin. 8(1): 3. 1963.

普文楠 pu wen nan

Phoebe sheareri (Hemsley) Gamble var. *longepaniculata* H. Liu.

Large trees, to 30 m tall. Bark yellowish gray. Branchlets robust, 5–6 mm in diam. at middle, densely yellowish brown tomentose, older ones with conspicuous leaf scars. Petiole 1–2.5 cm, thick, densely yellowish brown or gray-black tomentose; leaf blade obovate-elliptic or broadly obovate-lanceolate, 10–23 × 5–9 cm, abaxially densely yellowish brown villous, adaxially glabrous or with scattered appressed hairs or hairy along veins only, midrib adaxially concave, lateral veins slender, 12–20 pairs, anastomosing at margin, veinlets abaxially distinct, base narrowly cuneate, apex acute or obtuse-acute. Panicles arising from middle and lower part of newly sprouted branchlet, 4.5–22(–25) cm, branched near top of peduncle, yellowish brown tomentose. Pedicel short, 2–3 mm, hairy. Flowers yellowish, 4–5 mm. Perianth lobes ovate, subequal, ca. 4 mm, apex acute, densely yellowish brown tomentose on both surfaces. Filaments long white tomentose, those of 3rd series with sessile glands at base. Ovary ovoid, upper part hairy; style slender; stigma dish-shaped. Fruit ovoid, to 1.3 cm × ca. 7 mm, glabrous; fruiting pedicel not enlarged; persistent perianth lobes leathery, clasping base of fruit. Fl. Mar–Apr, fr. Jun–Jul.

• Evergreen broad-leaved forests; usually 800–1500 m. S Yunnan.

28. *Phoebe hui* W. C. Cheng ex Yen C. Yang, J. W. China Border Res. Soc., Ser. B, 15: 74. 1945.

细叶楠 xi ye nan

Large trees, to 25 m tall; trunk to 60 cm d.b.h. Bark gray,

smooth. Branchlets slender, young branchlets angular, first densely gray-white or gray-brown pubescent, glabrate after. Petiole 6–16 mm, slender, hairy; leaf blade elliptic, elliptic-oblongate, or elliptic-lanceolate, 5–8(–10) × 1.5–3 cm, leathery, abaxially densely gray-white appressed pubescent, adaxially glabrous or puberulent along midrib, midrib slender, adaxially impressed, lateral veins fine, 10–12 pairs, abaxially conspicuous, adaxially inconspicuous, veinlets abaxially somewhat visible or invisible, base narrowly cuneate, apex acuminate or caudate-acuminate. Panicles arising from upper part of newly sprouted branchlet, 4–8 cm, very slender, branched on top of peduncle, pubescent. Flowers and pedicel 2.5–3 mm. Perianth lobes ovate, densely gray-white villous. Filaments hairy, those of 3rd series with sessile or subsessile glands at base. Ovary ovoid; style glabrous; stigma dish-shaped. Fruit ellipsoid, 1.2–1.4 cm × 6–9 mm; fruiting pedicel not enlarged; persistent perianth lobes clasping base of fruit. Fl. Apr–May, fr. Aug–Sep.

• Usually in dense forests, sometimes cultivated as an ornamental; below 1500 m. S Shaanxi, Sichuan, NE Yunnan.

29. *Phoebe chekiangensis* P. T. Li, J. S. China Agric. Univ. 21(4): 59. 2000.

浙江楠 zhe jiang nan

Large trees, to 20 m tall; trunk straight, to 50 cm d.b.h. Bark yellowish brown with distinct brown lenticels. Branchlets angular, densely yellowish brown or gray blackish pubescent or tomentose. Petiole 1–1.5 cm, densely yellowish brown pubescent or tomentose; leaf blade obovate-elliptic or obovate-lanceolate, rarely lanceolate, 7–17 × 3–7 cm, usually 8–13 × 3.5–5 cm, leathery, abaxially grayish brown pubescent and villous on veins, adaxially hairy, becoming glabrate or glabrous, midrib and lateral veins adaxially impressed, lateral veins 8–10 pairs, veinlets dense, abaxially conspicuous, base cuneate or subrounded, apex acute-acuminate or long acuminate. Panicles 5–10 cm, densely yellowish brown tomentose. Pedicel 2–3 mm. Flowers ca. 4 mm. Perianth lobes ovate, hairy on both surfaces. Filaments gray-white villous. Stamines sagittate, hairy. Ovary ovoid, glabrous; style slender; stigma dish-shaped. Fruit ellipsoid-ovoid, 1.2–1.5 cm, white farinose when mature; persistent perianth lobes leathery, clasping base of fruit. Seed with numerous embryos, unequal on both sides. Fl. Apr–May, fr. Sep–Oct.

• Wild or cultivated, former ones growing in broad-leaved mountain forests. N Fujian, E Jiangxi, N Zhejiang.

This name was originally published by C. B. Shang (Acta Phytotax. Sin. 12: 295. 1974) but not validly so because two gatherings were indicated as types (*Vienna Code*, Art. 37.2).

30. *Phoebe bournei* (Hemsley) Yen C. Yang, J. W. China Border Res. Soc., Ser. B, 15: 73. 1945.

闽楠 min nan

Machilus bournei Hemsley, J. Linn. Soc., Bot. 26: 373. 1891; *Persea bournei* (Hemsley) Kostermans; *Phoebe acuminata* Merrill; *P. blepharopus* Handel-Mazzetti.

Large trees, 15–20 m; trunk straight, few branched. Bark

gray-white when old, yellowish brown when young. Branchlets hairy or glabrate. Petiole 5–11(–20) mm; leaf blade lanceolate or oblanceolate, 7–13(–15) × 2–3(–4) cm, leathery, abaxially pubescent and patent villous along veins, adaxially shiny, midrib impressed adaxially, lateral veins 10–14 pairs, abaxially elevated, adaxially plane or impressed, veinlets numerous, dense, conspicuously foveolate abaxially, base attenuate or cuneate, apex acuminate or long acuminate. Panicles arising from middle and lower part of newly sprouted branchlet, 3–7(–10) cm, lowest ramifications 2–2.5 cm, hairy. Perianth lobes ovate, ca. 4 × 3 mm, pubescent on both surfaces. Filaments hairy, those of 3rd series especially hairy, with subsessile glands. Stamines triangular, stipitate, villous. Ovary subglobose, glabrous or upper part sparsely pubescent; style glabrous or partly pubescent; stigma capitate. Fruit ellipsoid or oblong, 1.1–1.5 cm × 6–7 mm; persistent perianth lobes hairy, clasping base of fruit. Fl. Apr, fr. Oct–Nov.

• Wild trees usually in mountain valleys and broad-leaved forests, also cultivated. Fujian, Guangdong, N and NE Guangxi, NE and SE Guizhou, Hainan, Hubei, Jiangxi.

31. *Phoebe zhennan* S. K. Lee & F. N. Wei, Acta Phytotax. Sin. 17(2): 61. 1979.

楠木 nan mu

Large trees, up to 30 m or more; trunk straight. Buds densely gray-yellowish appressed villous. Branchlets usually slender, somewhat angular or subterete, gray-yellowish or gray-brown villous or pubescent. Petiole 1–2.2 cm, hairy; leaf blade elliptic, rarely lanceolate or oblanceolate, 7–11(–13) × 2.5–4 cm, thinly leathery, abaxially pubescent and villous at veins, adaxially shiny and glabrous or pubescent along lower part of midrib, midrib abaxially conspicuously raised, adaxially impressed into canal, lateral veins 8–13 pairs, obliquely extended, abaxially distinct, anastomosing near margin and gradually disappearing, veinlets abaxially slightly distinct or invisible. Cymose panicles very patent, branched above middle of peduncle, (6–)7.5–12 cm, lowest ramifications usually 2.5–4 cm, slender, hairy, each cyme with 3–6 flowers. Flowers and pedicel 3–4 mm. Perianth lobes subequal, 3–3.5 × 2–2.5 mm, outer ones ovate, inner ones ovate-oblong, apex obtuse, gray-yellow inside. Filaments subequal in length, hairy, those of 3rd series with sessile glands at base. Stamines triangular, stipitate, hairy. Ovary glabrous or upper part together with style sparsely pubescent; stigma dish-shaped. Fruit ellipsoid, 1.1–1.4 cm × 6–7 mm; fruiting pedicel somewhat thickened; persistent perianth lobes ovate, leathery, pubescent on both surfaces or puberulent outside, clasping fruit. Fl. Apr–May, fr. Sep–Oct.

• Wild trees usually in mixed broad-leaved forests, also cultivated; below 1500 m. NW Guizhou, W Hubei, Sichuan.

32. *Phoebe formosana* (Hayata) Hayata, Icon. Pl. Formosan. 5: 162. 1925.

台楠 tai nan

Machilus formosana Hayata, J. Coll. Sci. Imp. Univ. Tokyo 22: 350. 1906; *Phoebe sheareri* (Hemsley) Gamble var. *formosana* (Hayata) Nakai; *P. sheareri* var. *stenophylla* Nakai.

Large trees; trunk to 60 cm d.b.h. Bark gray-brown, slightly rough. Branchlets gray-brown pubescent. Petiole ca. 2 cm, pubescent; leaf blade glaucous abaxially, usually obovate or broadly obovate-lanceolate, rarely elliptic, 9–15(–20) × 4–6(–8) cm, thinly leathery, adaxially glabrous, abaxially gray-white pubescent rarely glabrate when old, midrib thick and lateral veins adaxially impressed, lateral veins 7–10 pairs, veinlets abaxially reticulate, base attenuate or cuneate, apex shortly acuminate or abruptly acute. Inflorescences axillary or subterminal, slender, 7–16 cm, branched near top of peduncle, pubescent. Flowers small, 2–2.5 mm. Perianth lobes ovate, hairy on both surfaces. Filaments glabrate to pubescent, those of 3rd series with sessile glands at base. Stamines triangular, stipitate, hairy. Ovary globose; style ca. 2.5 mm; stigma cap-shaped. Fruit ovoid or ovoid-ellipsoid, 8–9 mm; perianth lobes lax. Fl. May, fr. Oct.

• Mixed broad-leaved forests, very common in Taiwan; 100–2000 m. Anhui, Taiwan.

33. *Phoebe neurantha* (Hemsley) Gamble in Sargent, Pl. Wilson. 2: 72. 1914.

白楠 bai nan

Large shrubs to trees, usually 3–14 m tall. Bark gray-black. Branchlets first sparsely pubescent or densely villous, glabrate after. Petiole 7–15 mm, pubescent or glabrate; leaf blade narrowly lanceolate, lanceolate, oblanceolate, obovate, or obovate-lanceolate, 3–16 × 1–4(–4.5) cm, leathery to thickly leathery, abaxially sometimes glaucous, first pubescent, gradually glabrate after, adaxially glabrous or hairy when young, midrib adaxially impressed (elevated in var. *cavaleriei*), lateral veins 8–12 pairs, abaxially elevated, veinlets slightly distinct, base attenuate and decurrent, rarely cuneate, apex caudate-acuminate, acuminate, or obtuse. Inflorescences 2–10(–12), paniculate or subracemose, branched near top of peduncle, pubescent to puberulent. Flowers 4–5 mm, hairy. Perianth lobes somewhat unequal, outer ones shorter and narrower, apex obtuse, hairy on both surfaces especially inside. Filaments villous, those of 3rd series with sessile glands at base. Stamines stipitate, villous. Ovary globose; style elongated; stigma dish-shaped. Fruit ovoid, ca. 1 cm × 7 mm; fruiting pedicel not enlarged or slightly thickened; persistent perianth lobes lax, leathery, longitudinally veined, apex sometimes extrorse. Fl. May, fr. Aug–Oct.

• Mountain slopes or valleys, dense forests, limestone hills, thickets, watersides. Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

- 1a. Midrib of leaf blade elevated adaxially, blade narrower and shorter, 4.5–7.5 × 1–2 cm; inflorescences subracemose 33b. var. *cavaleriei*
 1b. Midrib of leaf blade impressed adaxially, blade wider and longer, (3–)5–16 × ca. 4.5 cm; inflorescences paniculate.
 2a. Leaf blade narrowly lanceolate to lanceolate or oblanceolate, 8–16 cm, apex caudate-acuminate or acuminate, not rugose adaxially when dry 33a. var. *neurantha*

- 2b. Leaf blade obovate or obovate-lanceolate, 3–11 cm, apex obtuse, rugose adaxially when dry 33c. var. *brevifolia*

33a. *Phoebe neurantha* var. *neurantha*

白楠(原变种) bai nan (yuan bian zhong)

Machilus neurantha Hemsley, J. Linn. Soc., Bot. 26: 376. 1891.

Leaf blade narrowly lanceolate to lanceolate or oblanceolate, 8–16 cm, base attenuate and decurrent, apex caudate-acuminate or acuminate. Panicles 4–10(–12) cm, pubescent. Persistent perianth lobes with conspicuous longitudinal veins.

• Mountain slopes or valleys, dense forests. Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

33b. *Phoebe neurantha* var. *cavaleriei* H. Liu, Laurac. Chine & Indochine, 69. 1932.

兴义白楠 xing yi bai nan

Usually shrubs, 1–2 m tall. Leaf blade 4.5–7.5 × 1–2 cm, midrib elevated distally adaxially. Inflorescences subracemose, all parts sparsely pubescent to puberulent.

• Limestone hills. SW Guizhou (Xingyi).

33c. *Phoebe neurantha* var. *brevifolia* H. W. Li, Acta Phytotax. Sin. 17(2): 62. 1979.

短叶白楠 duan ye bai nan

Shrubs, ca. 1 m tall. Leaf blade obovate or obovate-lanceolate, 3–11 × 1.5–4 cm, adaxially rugose when dry, apex obtuse. Panicles short, 2–4 cm.

• Limestone hill forests or watersides, thickets. SE Yunnan.

34. *Phoebe glaucifolia* S. K. Lee & F. N. Wei, Guihaia 8: 298. 1988.

白背楠 bai bei nan

Trees, to 30 m tall. Branchlets slightly compressed, longitudinally striate, densely gray or gray-brown pubescent. Petiole thick, 1–2.5 cm, densely gray pubescent; leaf blade abaxially ± glaucous, adaxially shiny, obovate or obovate-lanceolate, 10–18 × 3.5–8 cm, leathery, abaxially densely or sparsely pubescent, adaxially glabrous except for hairs along midrib, midrib thick, abaxially raised, adaxially concave or plane, lateral veins 7–9 pairs, anastomosing near margin, veinlets numerous, only abaxially distinct, base attenuate or cuneate, apex acute or acuminate. Panicles arising from base of newly sprouted branchlet, 6–16 cm, densely gray pubescent. Pedicel ca. 5 mm. Perianth lobes ovate, unequal, 2.5–3.5 × ca. 2 mm, densely pubescent on both surfaces, apex mucronate. Filaments glabrous except for hairs at base, those of 3rd series with shortly stipitate glands at base. Staminate filaments villous. Ovary glabrous. Inflorescences densely gray pubescent, with few fruits. Fruit ovoid, ca. 10 × 5 mm; fruiting pedicel 3–4 mm, densely pubescent; persistent perianth lobes ovate, leathery, gray pubescent on both surfaces, conspicuously unequal, outer ones smaller than inner

ones. Fl. May, fr. Oct.

C. Yang, J. W. China Border Res. Soc., Ser. B, 15: 75. 1945.

• Mixed mountain forests. SE Xizang (Médog), C Yunnan (Xinping).

35. *Phoebe sheareri* (Hemsley) Gamble in Sargent, Pl. Wilson. 2: 72. 1914.

紫楠 *zi nan*

Large to small trees, 5–15 m tall. Bark gray-white. Branchlets, petioles, and inflorescences densely yellowish brown or gray-blackish pubescent to tomentose. Petiole 1–2.5 cm; leaf blade obovate, elliptic-obovate, broadly oblanceolate, or oblanceolate, 8–27 × 2.5–9 cm, leathery, abaxially pubescent to villous, adaxially glabrous or hairy along veins, midrib and lateral veins adaxially impressed, lateral veins 8–13 pairs, curved, anastomosing at margin, veinlets numerous, densely reticulate, base attenuate, apex acute-acuminate or acute-caudate-acuminate. Panicles 7–15(–18) cm, branched at top of peduncle. Flowers 4–5 mm. Perianth subequal, ovate, hairy on both surfaces. Filaments hairy, particularly in 3rd series, those of 3rd series with sessile glands at base. Staminodes hairy. Ovary globose, glabrous; stigma indistinct or dish-shaped. Fruit ovoid, ca. 1 cm × 5–6 mm; fruiting pedicel somewhat or conspicuously thickened, hairy; persistent perianth lobes hairy on both surfaces, loose. Seed with solitary embryo, symmetrical on both sides. Fl. Apr–May, fr. Sep–Oct.

Mixed broad-leaved forests; usually below 1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Vietnam].

- 1a. Leaf blade usually obovate to broadly oblanceolate, wider, 8–27 × 3.5–9 cm, abaxially always densely yellowish brown villous; fruiting pedicel somewhat thickened 35a. var. *sheareri*
- 1b. Leaf blade oblanceolate, much narrower, 8–15 × 2.5–4 cm, sparsely pubescent abaxially when older; fruiting pedicel conspicuously thickened 35b. var. *omeiensis*

35a. *Phoebe sheareri* var. *sheareri*

紫楠(原变种) *zi nan* (*yuan bian zhong*)

Machilus sheareri Hemsley, J. Linn. Soc., Bot. 26: 377. 1891.

Usually small trees. Branchlets, petioles, inflorescences, and leaf blade abaxially always densely yellowish brown pubescent. Leaf blade usually obovate to broadly oblanceolate, 8–27 × 3.5–9 cm. Fruiting pedicel somewhat thickened.

Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [Vietnam].

35b. *Phoebe sheareri* var. *omeiensis* (Yen C. Yang) N. Chao, Acta Phytotax. Sin. 17(2): 62. 1979.

峨眉楠 *e mei nan*

Phoebe neurantha (Hemsley) Gamble var. *omeiensis* Yen

Flora of China 7: 189–200. 2008.

Branchlets sparsely pubescent in fruiting stage. Leaf blade oblanceolate, rarely obovate, $8-15 \times 2.5-4$ cm, abaxially sparsely pubescent when older. Fruiting pedicel distinctly thickened.

- Mixed broad-leaved forests, common in W Sichuan basin; low elevations. Guizhou, Sichuan.

