

## 14. POLYALTHIA Blume, Fl. Javæ, Annonaceæ, 68. 1830.

暗罗属 an luo shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Trees or shrubs. Inflorescences axillary, internodal, or leaf-opposed, sessile or shortly pedunculate, 1- to many flowered. Flowers usually bisexual. Sepals 3, usually small, valvate or rarely subimbricate in bud, free. Petals 6, in 2 whorls, free, valvate or rarely subimbricate in bud, subequal, flat and spreading; inner petals sometimes slightly larger or smaller than outer, concave and arched over stamens. Stamens usually many; anther locules cuneate; connectives apically orbicular or rhomboidal, concealing anther locules, apex flat-topped or slightly convex. Carpels rather few to many, free; ovules 1 or 2(or 3) per carpel, basal or sutural; styles absent, very short, or long; stigmas mostly dilated. Fruit apocarpous; monocarps few to many, short to long stipitate, mostly globose or ovoid, fleshy. Seeds 1 or 2(or 3) per monocarp, with a longitudinal circumferential groove.

About 120 species: Old World tropics from Africa to the W Pacific, with the center of distribution in SE Asia; 17 species (six endemic, one introduced) in China.

Molecular data (Mols et al., Amer. J. Bot. 91: 590–600. 2004) have shown that *Polyalthia* as traditionally delineated is polyphyletic and will eventually have to be divided among several genera.

### Key to flowering material

- 1a. Inner petals 0.2–1 cm.
  - 2a. Sepals 8–9 mm ..... 8. *P. cerasoides*
  - 2b. Sepals 2–2.5 mm.
    - 3a. Leaf blade leathery, glabrous; carpels at least partly hairy ..... 9. *P. littoralis*
    - 3b. Leaf blade membranous to papery, adaxially minutely hairy along midrib; carpels glabrous or pubescent.
      - 4a. Inner petals ca. 3.5 mm; carpels ca. 7, glabrous ..... 10. *P. florulenta*
      - 4b. Inner petals ca. 10 mm; carpels many, pubescent.
        - 5a. Leaf blade 5–11 × 2–4 cm, secondary veins inconspicuous; stigmas glabrous ..... 12. *P. suberosa*
        - 5b. Leaf blade 13.5–24 × 4–5 cm, secondary veins raised; stigmas villous ..... 15. *P. lancilimba*
- 1b. Inner petals (1–)1.3–9 cm.
  - 6a. Petals 6–9 cm.
    - 7a. Sepals ca. 12 mm ..... 2. *P. litseifolia*
    - 7b. Sepals 3–5 mm ..... 17. *P. liukiensis*
  - 6b. Petals (1–)1.3–5.5 cm.
    - 8a. Petals 0.6–3 cm wide.
      - 9a. Leaf blade secondary veins 24–28 on each side of midvein ..... 7. *P. pingpiensis*
      - 9b. Leaf blade secondary veins 7–18 on each side of midvein.
        - 10a. Petiole puberulent; leaf blade secondary veins 7–10 on each side of midvein; inflorescences several flowered; petals 2–3.5 × 1–1.5 cm ..... 11. *P. laui*
        - 10b. Petiole glabrous; leaf blade secondary veins 14–18 on each side of midvein; inflorescences 1-flowered; petals 3–5.5 × 1.5–3 cm ..... 16. *P. rumphii*
    - 8b. Petals 0.2–0.5 cm wide.
      - 11a. Pedicel 1–1.8 cm; petals white, 1–1.3 cm ..... 14. *P. obliqua*
      - 11b. Pedicel 2–4 cm; petals green to yellow, 1.3–3.8(–5) cm.
        - 12a. Leaf blade margin undulate, secondary veins 18–24 on each side of midvein ..... 13. *P. longifolia*
        - 12b. Leaf blade margin not undulate, secondary veins 13–20 on each side of midvein.
          - 13a. Petals densely minutely hairy, to 3.8(–5) cm ..... 4. *P. fragrans*
          - 13b. Petals glabrous or only very sparsely hairy on inside, 1.3–3.5 cm.
            - 14a. Leaf blade with pellucid dots; ovaries pubescent and with 1 basal ovule ..... 5. *P. simiarum*
            - 14b. Leaf blade without pellucid dots; ovaries glabrous and with 2 ovules.
              - 15a. Branches and leaf midvein and secondary veins pubescent; leaf blade 18–28 × 5–8.5 cm, smooth; petals ca. 3 cm ..... 6. *P. viridis*
              - 15b. Branches and leaf midvein and secondary veins glabrous; leaf blade 9–17 × 2.5–5 cm; petals ca. 1.3 cm.
                - 16a. Leaf blade membranous, densely verrucate, secondary veins 15–18 on each side of midvein, apex acuminate ..... 1. *P. verrucipes*
                - 16b. Leaf blade thinly papery, not verrucate, secondary veins 8–10 on each side of midvein, apex caudate ..... 3. *P. chinensis*

**Key to fruiting material** (not seen for *P. lancilimba*)

- 1a. Monocarps 0.5–0.8 cm, spherical.
  - 2a. Monocarp stipes 1.5–2 cm ..... 8. *P. cerasoides*
  - 2b. Monocarp stipes 0.3–1 cm.
    - 3a. Monocarps to 7, stipes 3–4.5 mm ..... 10. *P. florulenta*
    - 3b. Monocarps to 18, stipes 8–10 mm ..... 12. *P. suberosa*
- 1b. Monocarps 1–5 cm, globose, ovoid, or cylindrical.
  - 4a. Monocarps globose, densely minutely verrucate ..... 14. *P. obliqua*
  - 4b. Monocarps ovoid or cylindrical, smooth or more coarsely verrucose.
    - 5a. Monocarps 1–1.5 cm.
      - 6a. Leaf blade secondary veins 24–28 on each side of midvein, parallel ..... 7. *P. pingpienensis*
      - 6b. Leaf blade secondary veins 7–13 on each side of midvein, arcuately ascending.
        - 7a. Monocarp stipes 0.2–0.5 cm ..... 9. *P. littoralis*
        - 7b. Monocarp stipes 1–7 cm ..... 16. *P. rumphii*
    - 5b. Monocarps 1.7–5 cm.
      - 8a. Young stems glabrous.
        - 9a. Pedicel 0.5–0.7 cm; petals ca. 1.3 cm; monocarp stipes 0.5–0.7 cm.
          - 10a. Leaf blade membranous, densely verrucate, secondary veins 15–18 on each side of midvein, apex acuminate ..... 1. *P. verrucipes*
          - 10b. Leaf blade thinly papery, not verrucate, secondary veins 8–10 on each side of midvein, apex caudate ..... 3. *P. chinensis*
        - 9b. Pedicel 2–3.5 cm; petals 2.2–9 cm; monocarp stipes 1–7 cm.
          - 11a. Leaf blade secondary veins 10–16 on each side of midvein ..... 2. *P. litseifolia*
          - 11b. Leaf blade secondary veins 8 or 9 on each side of midvein ..... 17. *P. liukiensis*
      - 8b. Young stems hoary or minutely hairy.
        - 12a. Monocarp stipes 1–2 cm ..... 13. *P. longifolia*
        - 12b. Monocarp stipes 2.5–5 cm.
          - 13a. Young branches hoary; monocarps hoary ..... 4. *P. fragrans*
          - 13b. Young branches pubescent or puberulent; monocarps glabrous.
            - 14a. Leaf blade with pellucid dots, membranous to papery ..... 5. *P. simiarum*
            - 14b. Leaf blade without pellucid dots, thinly leathery to leathery.
              - 15a. Leaf blade 18–28 cm, secondary veins pubescent ..... 6. *P. viridis*
              - 15b. Leaf blade 8–20 cm, secondary veins glabrous ..... 11. *P. laui*

**1. *Polyalthia verrucipes*** C. Y. Wu ex P. T. Li, Acta Phytotax. Sin. 14(1): 110. 1976.

疣叶暗罗 you ye an luo

Trees to 12 m tall. Branches grayish black, glabrous. Petiole 3–7 mm, with transverse striations; leaf blade oblong to oblong-lanceolate, 10–17 × 2.5–5 cm, membranous, both surfaces glabrous and densely verrucate, midvein abaxially elevated and adaxially flat, secondary veins 15–18 on each side of midvein, delicate, and prominent on both surfaces, base broadly cuneate to obtuse, apex acuminate. Inflorescences axillary, 1- or 2-flowered. Pedicel 5–7 mm; bracteoles at middle and base, ovate to semiorbicular. Sepals orbicular to broadly ovate, apex rounded. Petals yellowish, linear-lanceolate, ca. 1.3 × 2–3 mm, membranous, glabrous; outer petals larger than inner petals. Stamens numerous; connectives slightly convex. Carpels 10–15, oblong, glabrous; ovary with 2 basal ovules; stigma ovoid. Fruiting pedicel 5–7 × ca. 3 mm; monocarp stipes 5–8 mm, verrucate; monocarps ovoid, 2–2.5 × 1–1.5 cm, glabrous. Seed 1 per monocarp, yellowish, ovoid, 18–20 × 8–11 mm. Fr. Apr–Jul.

- Densely forested slopes; 1000–1900 m. S Yunnan.

*Polyalthia verrucipes* is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; <http://www.iucnredlist.org>; accessed on 7 Oct 2010).

X. L. Hou and P. T. Li (Acta Phytotax. Sin. 45: 369. 2007) included *Polyalthia chinensis* within *P. verrucipes*, but this is no longer accepted.

**2. *Polyalthia litseifolia*** C. Y. Wu ex P. T. Li, Acta Phytotax. Sin. 14(1): 110. 1976.

木姜叶暗罗 mu jiang ye an luo

Trees to 40 m tall. Bark grayish brown. Branches brown, glabrous. Petiole 6–10 mm, adaxially furrowed, glabrous, [with axillary bud at base]; leaf blade elliptic to broadly elliptic, 9–20 × 4.5–8 cm, membranous to subleathery, both surfaces glabrous and densely papillose, secondary veins 10–16 on each side of midvein, reticulate veins elevated on both surfaces, base rounded to broadly cuneate, apex shortly acuminate to obtuse. Inflorescences axillary, 1-flowered. Pedicel 2–3.5 cm, glabrous. Sepals triangular-lanceolate, ca. 12 mm, outside puberulent, inside glabrous. Petals broadly linear, 6–9 × 0.7–1.1 cm, subequal, glabrous, margin slightly revolute, with a midrib and 2–4 parallel secondary veins. Stamens many, ca. 1.5 mm; connectives apically truncate. Carpels 5 or 6, glabrous; ovules 3 per carpel; stigmas clavate, puberulent. Monocarp stipes 1–3 cm; monocarps oblong to ovoid, 3–3.5 × 2–2.5 cm, constricted between seeds, glabrous, verrucose. Seeds 3 per monocarp. Fl. Apr–Jul, fr. May–Sep.

- Sparsely forested slopes, moist valleys; ca. 600 m. S Yunnan.

*Polyalthia liseifolia* is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; <http://www.iucnredlist.org>; accessed on 7 Oct 2010).

**3. *Polyalthia chinensis*** S. K. Wu & P. T. Li, Acta Phytotax. Sin. 14(1): 108. 1976.

西藏暗罗 xi zang an luo

Trees to 10 m tall. Bark grayish white. Branches gray, with many lenticellate and irregular stripes. Petiole ca. 5 mm; leaf blade oblong-elliptic to obovate-lanceolate, 9–13 × 2.5–3.8 cm, thinly papery, glabrous, adaxially glossy, secondary veins 8–10 on each side of midvein, reticulate veins abaxially slightly elevated, base cuneate to broadly cuneate, apex caudate. Inflorescences axillary, 1- or 2-flowered. Pedicel ca. 7 mm; bracteoles at middle and base, semiorbicular to ovate. Sepals broadly ovate, apex rounded. Petals green, linear, ca. 13 × 2–3 mm, subequal, membranous, flat, glabrous. Stamens many; connectives apically rounded to subtruncate. Carpels many, oblong, glabrous; stigma slightly oblique. Carpels each with 2 ovules. Fruit not seen. Fl. Aug.

• Montane forests; ca. 1000 m. SE Xizang (Médog).

**4. *Polyalthia fragrans*** (Dalzell) Bentham & J. D. Hooker in J. D. Hooker, Fl. Brit. India 1: 63. 1872.

伞花暗罗 san hua an luo

*Guatteria fragrans* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 206. 1851.

Trees to 18 m tall. Branches hoary when young. Petiole 1–1.8 cm; leaf blade ovate-oblong to oblong-lanceolate, 10–24 × 5–12.5 cm, membranous, abaxially minutely puberulent on major veins but glabrescent, adaxially glabrous or puberulent, secondary veins 14–16 on each side of midvein, oblique, close-set, parallel, and abaxially very prominent, reticulate veins inconspicuous, base rounded, apex rounded to long acuminate. Inflorescences in axils of fallen leaves or on woody tubercles on branches, cymose, pedunculate, few to many flowered, hoary-tomentose. Flowers fragrant. Pedicel to 2.5 cm, slender; bracteoles inserted below middle of pedicel, orbicular. Sepals orbicular, ca. 3 mm in diam., recurved at anthesis, outside densely felted puberulent. Petals greenish yellow to pale yellow, linear, 3.8(–5) × ca. 0.5 cm, subequal, densely minutely hairy. Stamens many; connectives apically truncate. Carpels many, hairy. Fruiting pedicel to 3.5 cm; monocarp stipes to 5 cm, densely pubescent; monocarps broadly ovoid, 2.5–4 cm, walls thin and brittle, surface hoary. Seed 1 per monocarp. Fl. Apr–May, fr. Jun–Aug.

Forested slopes; ca. 700 m. S Yunnan [India].

**5. *Polyalthia simiarum*** (Buchanan-Hamilton ex J. D. Hooker & Thomson) Bentham ex J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 1: 63. 1872.

腺叶暗罗 xian ye an luo

*Guatteria simiarum* Buchanan-Hamilton ex J. D. Hooker & Thomson, Fl. Ind. 1: 142. 1855; *Polyalthia cheliensis* Hu; *P. simiarum* subsp. *cheliensis* (Hu) Bân; *Unona simiarum* (A. Hamilton ex J. D. Hooker & Thomson) Baillon ex Pierre.

Trees to 25 m tall. Bark grayish white. Branches puberulent when young, glabrous and sparsely lenticellate with age. Petiole 5–10 mm, robust; leaf blade ovate-oblong, oblong, lanceolate, or oblanceolate, 9–28 × 3.5–12.5 cm, membranous to papery, hyalopunctate, glabrous or puberulent only on midvein, secondary veins 13–20 on each side of midvein, oblique, close-set, parallel, and prominent on both surfaces, base rounded to broadly cuneate and sometimes oblique, apex acuminate, shortly acuminate, or obtuse. Inflorescences axillary or on older or short branches, 1- to several flowered; bracts ovate, tomentulose. Pedicel ochraceous, 2.5–4 cm, tomentulose, bracteolate near base to middle. Sepals ovate-triangular, ca. 5 × 5 mm, outside pubescent, inside glabrous. Petals yellowish green; outer petals ± longer than inner petals; inner petals linear-lanceolate to linear, 1.5–3.5 × 0.3–0.4 cm, outside puberulent, inside ± glabrous. Stamens oblong; connectives apically broadly truncate to convex. Carpels oblong, pubescent; ovule 1 per carpel, basal; stigmas capitate, puberulent. Fruiting pedicel 2–3 cm; monocarp stipes 3–3.5 cm, glabrous; monocarps ovoid to ovoid-ellipsoid, 2.5–3 × 1.2–1.7 cm, glabrous. Seed 1 per monocarp. Fl. Apr–Sep, fr. Jul–Dec.  $2n = 14$ .

Forested slopes; 500–1200 m. S and SW Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, C and N Thailand, Vietnam].

The record of *Goniothalamus macrophyllus* (Blume) J. D. Hooker & Thomson from the Flora area (X. L. Hou, <http://www.abclunwen.com/lunwen-free-387606/>; accessed on 25 Nov 2010) was based on a misidentification of *Polyalthia simiarum*.

**6. *Polyalthia viridis*** Craib, Bull. Misc. Inform. Kew 1914: 4. 1914.

毛脉暗罗 mao mai an luo

Trees to 15 m tall. Branches tawny pubescent when young, gray lenticellate with age. Petiole ca. 1 cm, robust, transversely striate, tawny pubescent; leaf blade oblong to elliptic-oblong, 18–28 × 5–8.5 cm, thinly leathery, glabrous except for pubescent midvein and secondary veins, secondary veins 15–18 on each side of midvein, prominent on both surfaces and pubescent, base truncate, shallowly cordate, or sometimes rounded, apex acute. Inflorescences axillary, several flowered. Pedicel ca. 2.5 cm, pubescent. Sepals broadly ovate, 3.5–4 mm, outside pubescent, inside glabrous. Petals green, linear-oblong, ca. 3 cm × 4 mm, glabrous. Ovules 2 per carpel. Fruiting pedicel 2–7 cm, robust; monocarp stipes 3–5 cm, glabrous; monocarps oblong-ellipsoid, 2.5–4 × ca. 1.8 cm, glabrous. Seed 1 per monocarp. Fl. Apr–Jul, fr. Aug–Feb.

Densely forested slopes; 600–1100 m. S and SW Yunnan [Thailand].

**7. *Polyalthia pingpienensis*** P. T. Li, Acta Phytotax. Sin. 14(1): 110. 1976.

多脉暗罗 duo mai an luo

Trees to 10 m tall. Bark and branches grayish black, longitudinally striate. Branchlets glabrous. Petiole 1–1.5 cm, densely pubescent; leaf blade oblong to oblong-lanceolate, 7–18 × 2.5–5.5 cm, leathery, abaxially sparsely pubescent but denser along veins, adaxially glabrous except for pubescent midvein, midvein adaxially impressed, secondary veins 24–28 on each side

of midvein, closely parallel, and prominent on both surfaces, base attenuate to obtuse, apex shortly acuminate. Inflorescences axillary or terminal, 1- or 2-flowered. Flowers ca. 3 cm in diam. Pedicel ca. 2.5 cm, puberulent or glabrous. Sepals broadly ovate, ca. 1.3 × 1.5 cm, outside puberulent, inside glabrous. Petals elliptic to ovate, 2.5–3.5 × ca. 1.6 cm, outside puberulent, inside glabrous; inner petals oblong, 2.2–2.7 × ca. 0.9 cm. Stamens oblong-cuneate, ca. 4 mm; connectives apically rounded, pubescent. Carpels many, oblong, ca. 2.5 mm, villous; ovule 1 per carpel, basal; stigmas capitate. Fruiting pedicel ca. 4 cm; monocarp stipes 2–4 cm, glabrous; monocarps purple, ellipsoid, ca. 1.5 × 1 mm, apex mucronate. Fl. May, fr. Oct.

- Densely forested slopes; 1000–1500 m. S Yunnan.

*Polyalthia pingpienensis* is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; <http://www.iucnredlist.org>; accessed on 7 Oct 2010). The epithet has been given incorrectly as “*pingpinensis*” in some standard indices.

**8. *Polyalthia cerasoides*** (Roxburgh) Benth & J. D. Hooker ex Beddome, Fl. Sylv. S. India, t. 1. 1869.

细基丸 xi ji wan

*Uvaria cerasoides* Roxburgh, Pl. Coromandel 1: 30. 1795; *Polyalthia crassipetala* Merrill.

Trees to 20 m tall. Bark grayish black. Branchlets densely pubescent, glabrescent, lenticellate with age. Petiole 2–3 mm, sparsely hispid; leaf blade oblong, oblong-lanceolate, or sometimes elliptic, 6–19 × 2.5–6 cm, abaxially yellowish and pubescent, adaxially often bluish green when dry and glabrous except for minutely hairy midvein, secondary veins 7 or 8 on each side of midvein, base broadly cuneate to rounded, apex obtuse. Inflorescences axillary, 1-flowered. Flowers 1–2 cm in diam. Pedicel 1–2 cm, puberulent, with 1 or 2 leafy bracteoles below middle. Sepals oblong-ovate, 8–9 mm, outside pilose, apex acuminate. Petals green but black when dry, subequal or inner petals shorter than outer petals, oblong-ovate, 8–9 mm, thickly leathery, puberulent. Stamens cuneate; connectives apically truncate. Carpels oblong, pubescent; ovule 1 per carpel; stigmas ovoid, apex entire. Monocarp stipes 1.5–2 cm, weak; monocarps red but black when dry, ovoid to subglobose, ca. 6 mm in diam., glabrous. Fl. Mar–May, fr. Apr–Nov.  $2n = 18$ .

Sparsely forested slopes; 100–1100 m. S Guangdong, S Guangxi, Hainan, S Yunnan [Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

A fine strong bast fiber obtained from the inner bark of *Polyalthia cerasoides* is used to make rope and sacks. The wood is used for farming tools and structural timbers. The flowers are very fragrant and are sometimes collected as a perfume.

**9. *Polyalthia littoralis*** (Blume) Boerlage in Hasskarl, Cat. Hort. Bot. Bogor. 34. 1844.

陵水暗罗 ling shui an luo

*Gutteria littoralis* Blume, Fl. Javae, Annonaceae, 99. 1830; *Polyalthia zhui* X. L. Hou & S. J. Li.

Shrubs or small trees, to 5 m tall. Branchlets dark purple, striate, appressed grayish yellow pubescent, soon glabrous. Petiole yellowish, 3–5 mm, puberulent; leaf blade oblong to

oblong-lanceolate, 9–19 × 2–6 cm, leathery, glabrous, abaxially glossy pale green, adaxially dark green, often bluish green when dry, secondary veins 8–10 on each side of midvein, at 60°–80° to midrib, arcuately ascending, and anastomosing 3–5 mm from margin, base cuneate to rounded, apex acuminate to bluntly acute. Inflorescences leaf-opposed, 1- or 2-flowered; peduncle ca. 1 mm. Flowers 1–2 cm in diam. Pedicel to 3 mm, pubescent; bracteole 1, broadly ovate, 1–2 × ca. 2 mm, apex acuminate. Sepals triangular, ca. 2 mm, outside pubescent, apex acute. Petals white, oblong-elliptic, 6–8 mm, spreading, subequal or inner petals slightly shorter than outer petals, slightly thick, outside pubescent, apex acute to obtuse. Stamens many; connectives apically truncate, puberulent. Carpels 7–11(–30), puberulent; ovule 1 per carpel, basal; stigmas obovate, shallowly 2-cleft. Monocarp stipes 2–5 mm, puberulent; monocarps 4–7(–11), red but purplish red when dried, ovoid-ellipsoid, 1–1.5 × 0.8–1 cm, glabrous, densely minutely dotted. Seed 1 per monocarp, red, ellipsoid, 10–12 × 6–8 mm. Fl. Apr–Jul, fr. Jul–Feb.  $2n = 36$ .

Forested slopes, margins of wet forests, along small streams; 100–800 m. Guangdong, Guangxi, Hainan, Yunnan [Indonesia, Thailand, Vietnam].

Molecular data (Mols et al., Amer. J. Bot. 91: 598. 2004) suggest that *Polyalthia littoralis* and related species are more closely related to the genus *Marsypopetalum* Scheffer rather than *Polyalthia* s.s. “*Polyalthia caloneura*,” proposed but not validly published by X. L. Hou (<http://www.abclunwen.com/lunwen-free-387606/>; accessed on 25 Nov 2010), belongs here. *Polyalthia zhui* was based on material with immature flowers.

**10. *Polyalthia florulenta*** C. Y. Wu ex P. T. Li, Acta Phytotax. Sin. 14(1): 107. 1976.

小花暗罗 xiao hua an luo

Shrubs ca. 2 m tall. Branchlets pubescent when young, glabrescent. Petiole 2–4 mm, pubescent; leaf blade oblong-lanceolate to oblanceolate, 5–14.5 × 2.3–4 cm, membranous, abaxially puberulent, adaxially glabrous except for minutely hairy midvein, secondary veins 10–13 on each side of midvein, obliquely ascending, and anastomosing near margin, base broadly cuneate, apex obtuse to acuminate. Inflorescences leaf-opposed, 1-flowered. Flowers ca. 0.4 cm in diam. Pedicel 1–10 mm, pubescent; bracteoles 2 at middle of pedicel, ovate-lanceolate, ca. 3.5 × 1 mm, abaxially pubescent, adaxially glabrous. Sepals ovate, ca. 2 × 2 mm, outside pubescent, inside glabrous. Petals yellowish green; outer petals ovate-lanceolate, ca. 2.5 × 1.5 mm, concave, outside pubescent, inside glabrous; inner petals ovate, ca. 3.5 × 2 mm, flat. Stamens cuneate, ca. 0.5 mm; connectives apically truncate, puberulent. Carpels ca. 7, oblong, ca. 0.8 mm, glabrous; ovule 1 per carpel, basal. Fruiting pedicel 1–1.5 cm; monocarp stipes 3–5 mm, pubescent; monocarps to 7, red, globose, ca. 8 mm in diam., glabrous. Fl. Dec–Feb, fr. Jun–Aug.

- Forested slopes; 1100–1400 m. S and W Yunnan.

**11. *Polyalthia laui*** Merrill, Lingnan Sci. J. 14: 5. 1935.

海南暗罗 hai nan an luo

Trees to 25 m tall, d.b.h. to 40 cm. Bark gray. Branches pubescent when young, glabrescent. Petiole 5–8 mm, trans-

versely rugosely striate, puberulent; leaf blade oblong to oblong-elliptic, 8–20 × 3.5–8 cm, thinly leathery to leathery, glabrous, adaxially shiny, secondary veins 14–18 on each side of midvein, parallel, ascending to margin, and adaxially conspicuous, base broadly cuneate to rounded, apex acuminate. Inflorescences axillary or on old branches, several flowered. Pedicel 1.5–3 cm, puberulent; bracteoles at base of pedicel, broadly ovate. Sepals broadly ovate, ca. 5 × 5 mm, outside puberulent, inside glabrous, apex obtuse to acute. Petals yellowish, oblong-ovate to ovate-lanceolate, 2–3.5 × 1–1.5 cm, outside puberulent or glabrous, inside glabrous; inner petals slightly longer than outer petals. Stamens cuneate; connectives apically obtuse. Carpels many, oblong, densely pubescent; ovule 1 per carpel, basal; stigmas capitate. Fruiting pedicel 3.5–4 cm; monocarp stipes 2.5–5 cm; monocarp red, ovoid-ellipsoid, 2.5–5 × 1–2 cm, glabrous, apex obtuse. Seed 1 per monocarp. Fl. Apr–Jul, fr. Oct–Dec.

Evergreen broad-leaved forests on slopes; 300–700 m. Hainan [Vietnam].

The wood of *Polyalthia laui* is used for making household implements and as structural timber.

**12. *Polyalthia suberosa*** (Roxburgh) Thwaites, Enum. Pl. Zeyl. 398. 1864.

暗罗 an lu

*Uvaria suberosa* Roxburgh, Pl. Coromandel 1: 31. 1795; *Gutteria suberosa* (Roxburgh) Dunal.

Shrubs or small trees, to 5 m tall. Bark corky, ridged. Branchlets dark red, rust-colored pubescent when young, glabrescent, with pink lenticels and corky ridges when older. Petiole 2–4 mm, puberulent; leaf blade oblong, elliptic-oblong, or narrowly obovate-oblong, 5–11 × 2–4 cm, membranous to papery, abaxially pale brown when dry and glabrescent, adaxially gray and glabrous except for sparse pubescence along midvein, secondary veins 8–10 on each side of midvein, spreading, and inconspicuous on both surfaces, reticulate veins lax and inconspicuous, base narrowed and slightly oblique, apex subobtuse to rounded and sometimes abruptly shortly acuminate. Inflorescences extra-axillary, leaf-opposed, or slightly below leaf, 1 (or 2)-flowered. Pedicel 0.7–2.5 cm, puberulent; bracteole near base of pedicel, minute, apex acute. Sepals ovate-triangular, 2–2.5 mm, outside pubescent, inside glabrous. Petals yellowish green; outer petals oblong-lanceolate, shorter than inner petals, leathery, flat and spreading, outside slightly pubescent, inside glabrous, apex acute; inner petals oblong, erect and curved, ca. 10 mm, apex obtuse. Stamens many, ca. 1 mm; connectives apically convex. Carpels many, ca. 2 mm, pubescent; ovules 1 or 2 per carpel; styles widening into a thickly triangular bladellike glabrous stigma. Monocarp stipes 8–10 mm, slender; monocarp to 18, red, almost spherical, ca. 5 mm in diam., sparsely appressed pubescent or glabrescent. Seeds 1 or 2 per monocarp, with a longitudinal circumferential band. Fl. almost year-round, fr. Jun–Dec.  $2n = 18$ .

Open forests at lower elevations. S Guangdong, S Guangxi, Hainan [India, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].

**13. *Polyalthia longifolia*** (Sonnerat) Thwaites, Enum. Pl. Zeyl. 398. 1864.

长叶暗罗 chang ye an lu

*Uvaria longifolia* Sonnerat, Voy. Indes Orient. 2: 260. 1782; *Gutteria longifolia* (Sonnerat) Wallich; *Unona longifolia* (Sonnerat) Dunal.

Trees to 20 m tall; trunk straight. Branches finely striate, minutely puberulent when young, soon glabrous. Petiole 5–10 mm; leaf blade ovate-oblong to ovate-lanceolate, 11–31 × 2.5–8 cm, stiffly membranous to thinly leathery, glabrous, abaxially pale, adaxially dark glossy green, secondary veins 18–24 on each side of midvein, reticulate veins raised on both surfaces, base cuneate, obtuse, or rounded, margin undulate, apex acuminate. Inflorescences axillary, fasciculate and shortly pedunculate, racemose, or umbelliform and sessile, mostly many flowered; peduncle to 0.7–1.5 cm; rachis to 1 cm. Pedicel 2–4 cm; bracteole usually 1, at middle of petiole, to 1 mm, tomentulose. Sepals ovate-triangular, 1.5–3 × 1.5–1.8 mm, outside tomentulose, inside glabrous. Petals greenish yellow, narrowly triangular-lanceolate, 1.3–1.5 × 0.2–0.4 cm, subequal, spreading, inside puberulent except basally, base broad, apex acute. Stamens 8–10 cm; connectives apically convex. Carpels 20–25, ca. 1.5 mm, apex tomentulose; ovule 1 per carpel; stigmas sessile, rectangular to oblong, pubescent, with a groove on inner side and continuing down inner side of ovary. Monocarp stipes 1–2 cm; monocarp 4–8, purple, ovoid, 2–2.5 × ca. 1.5 cm, glabrous. Seed pale brown, ovoid, ca. 2 × 1.4 cm, usually with a longitudinal groove. Fl. May–Jun, fr. Jul–Sep.  $2n = 18$ .

Cultivated; 300–400 m. Hainan, Taiwan, Yunnan [native to India and Sri Lanka].

*Polyalthia longifolia* is grown for its wood and as an ornamental throughout SE Asia.

**14. *Polyalthia obliqua*** J. D. Hooker & Thomson, Fl. Ind. 1: 138. 1855.

沙煲暗罗 sha bao an lu

*Polyalthia consanguinea* Merrill.

Trees to 12 m tall. Bark dark gray. Branchlets reddish, minutely rust-colored pubescent, soon glabrous, with many lenticels when young. Petiole 3–5 mm, swollen, puberulent; leaf blade oblong-lanceolate to oblanceolate, 10–20 × 2.5–7 cm, thinly leathery to papery, abaxially dull, drying silvery green, and pubescent along midvein, adaxially glabrous and shiny, secondary veins 10–14 on each side of midvein, curving, forming a wide angle with midvein, anastomosing doubly, and adaxially flat, base narrowed and sometimes inequilateral, margin slightly revolute, apex bluntly acuminate. Inflorescences axillary, sometimes formed after leaf fall, 1–3-flowered. Pedicel 1–1.8 cm, pubescent; bracteoles 2 or 3, minute, 2 basal and other medial on pedicel. Sepals ovate-triangular, 2–3 mm, outside pubescent, inside glabrous, apex slightly obtuse. Petals white, oblong, 10–13 × 3–4.5 mm, subequal, outside pubescent, inside glabrous and rough, margins revolute, apex slightly obtuse. Stamens ca. 1 mm; connectives apically flat-topped to

convex, pubescent. Carpels ovate-oblong, ca. 1.5 mm, pubescent; ovules 2 per carpel; stigmas ovoid, pubescent. Monocarp stipes 0.7–2 cm; monocarps reddish brown, globose, 1–2 cm in diam., thinly walled, glabrous, densely minutely verrucate. Seeds 2 per monocarp, verrucose. Fl. Jan–Apr, fr. Jun–Dec.

Woodlands at middle elevations. Hainan [Malaysia].

**15. *Polyalthia lancilimba*** C. Y. Wu ex P. T. Li, Acta Phytotax. Sin. 14(1): 109. 1976.

剑叶暗罗 jian ye an luo

Trees. Bark gray. Branchlets puberulent, glabrescent. Petiole 2–3 mm, pubescent; leaf blade oblong-lanceolate to oblanceolate, 13.5–24 × 4–5 cm, papery, abaxially pubescent along midvein, adaxially glabrous, secondary veins 10–13 on each side of midvein, adaxially flat, base broadly cuneate, apex acuminate to shortly acuminate. Inflorescences axillary, 1- or 2-flowered; peduncle short. Pedicel 5–10 mm, pubescent, bracteolate at base. Sepals broadly ovate, ca. 2 × 3 mm, outside puberulent, inside glabrous. Petals oblong, 6–10 × 2.5–4 mm, all similar and almost equal in length, leathery, outside pubescent, inside glabrous, apex obtuse. Stamens ovate-cuneate; connectives apically broadly truncate, puberulent. Carpels many, ovate-oblong, villous; ovules 2 per carpel, sutural; stigmas sessile, capitate, villous. Fruit not seen. Fl. Apr–May, fr. Jun–Aug.

• Forested slopes; ca. 200 m. SE Yunnan (Hekou).

*Polyalthia lancilimba* is listed as Critically Endangered (CR B1ab(i,ii,v)) by the IUCN Red List of Threatened Species (Version 2010.3; <http://www.iucnredlist.org>; accessed on 7 Oct 2010).

**16. *Polyalthia rumphii*** (Blume ex Henschel) Merrill, Enum. Philipp. Fl. Pl. 2: 162. 1923.

香花暗罗 xiang hua an luo

*Gutteria rumphii* Blume ex Henschel, Vita Rumphii, 153. 1833; *G. jenkinsii* J. D. Hooker & Thomson; *Polyalthia jenkinsii* (J. D. Hooker & Thomson) J. D. Hooker & Thomson.

Trees to 15 m tall. Branches minutely rust-colored pubescent when young, soon glabrous. Petiole 5–12 mm, glabrous; leaf blade oblong-lanceolate, 10–17 × 3–7 cm, papery to leathery, glabrous, adaxially shiny dark green, secondary veins 7–10 on each side of midvein and prominent on both surfaces, base cuneate to rounded and sometimes oblique, apex acuminate. Inflorescences axillary, 1-flowered. Flowers 4–7 cm in diam. Pedicel 1–2 cm, appressed pubescent. Sepals subovate to triangular, 6–15 × 3–8 mm, outside puberulent, apex acute. Petals greenish to yellowish, elliptic, oblong-elliptic, or oblong, 3–5.5 × 1.5–3 cm, thin, puberulent or glabrous, apex obtuse; inner petals slightly shorter than outer petals. Stamens oblong; connectives apically broadly rounded, concealing anther cells. Carpels many, oblong, pubescent; ovule 1 per carpel, basal; stigmas clavate to capitate. Fruiting pedicel ca. 2 cm × 2 mm; monocarp stipes 5–10 × ca. 1 mm, glabrous; monocarps many, ellipsoid, ca. 10 × 5 mm, base rounded, apex acute. Fl. May–Oct, fr. Jul–Apr.  $2n = 18$ .

Forested slopes at lower to middle elevations. Hainan [Indonesia,

Malaysia, Philippines, Thailand].

**17. *Polyalthia liukuensis*** Hatusima, J. Geobot. 26: 86. 1979.

琉球暗罗 liu qiu an luo

Trees to 12 m tall. Branches dark brown, longitudinally reticulately striate when dried, glabrous. Petiole dark; leaf blade oblong-elliptic, 14–17 × 7–9 cm, thinly leathery, glabrous, midvein abaxially raised and adaxially flat, secondary veins 8 or 9, at ca. 45° to midrib, and then arcuately ascending, reticulate veins elevated on both surfaces, base rounded, apex acuminate. Inflorescences axillary, 1–6-flowered; peduncle 1–1.5 cm. Pedicel 2–3 cm, glabrous or sparsely shortly hairy. Sepals rounded-triangular, 3–5 mm. Petals green to yellowish green, narrowly lanceolate, 6–7 cm, subequal. Fruiting peduncle ca. 2 × 0.5 cm; pedicel 2.5–3 cm; monocarps black when mature, ellipsoid, 1.7–2.5 × 1.5–2 cm, longitudinally 2-grooved. Fl. Aug.  $2n = 18$ .

Thickets on coral limestone at low elevations. Taiwan (Lan Yu [Japan (Ryukyu Islands)]).

