

# 1. KNEMA Loureiro, Fl. Cochinch. 2: 604. 1790.

红光树属 hong guang shu shu

Evergreen trees. Leaf blade papery to leathery, abaxially often papillose and glaucous and rusty tomentose; tertiary veins parallel. Inflorescences short, unbranched or bifurcate, stout, tuberculate by scars of fallen pedicels; flowers densely racemose or subumbellate; bracts caducous; bracteoles inserted on pedicels. Plants dioecious. Flowers red in China. Male flowers often rather large, subglobose or urceolate, with long pedicels. Perianth of 3(or 4) tepals. Filaments connate into stipitate peltate disk; anthers 8–20, short, with bases adnate to margin of disk. Ovary pubescent; style short, stout; stigma lobes connate into a disk with 2 shallow fissures or with lacerate margin. Fruit often with dense tomentum. Aril entire or lacerate at apex.

About 85 species: S Asia from E India to the Philippines, Papua New Guinea; six species in China.

*Knema yunnanensis* Hu (J. Roy. Hort. Soc. 63: 387. 1938), described from Yunnan, could not be treated here because no material was seen by the present authors.

- 1a. Leaf blade large, widest part more than 7 cm, apex acuminate, base rounded or cordate.
  - 2a. Leaf blade broadly lanceolate or oblong-lanceolate, rarely oblanceolate, (15–)30–55(–70) × (7–)8–15 cm, base cordate or rounded, lateral veins 24–35 pairs; fruit with hairs 1–3 mm ..... 1. *K. tenuinervia*
  - 2b. Leaf blade oblanceolate, (15–)24–40 × 7–13 cm, widened at middle, base rounded, lateral veins 20–25 pairs; fruit with hairs 0.5–1 mm ..... 2. *K. linifolia*
- 1b. Leaf blade smaller, widest part often less than 7 cm, apex acute, shortly acuminate, or acuminate, base cuneate or nearly rounded or subtruncate, never cordate.
  - 3a. Anthers sessile; fruit with hairs 0.1–1 mm.
    - 4a. Leaf blade with margins often not parallel, often early glabrescent abaxially; style ca. 1.5 mm; fruit small, less than 2 cm, with rusty nearly granular pubescence ..... 3. *K. globularia*
    - 4b. Leaf blade with margins nearly parallel, abaxial surfaces with stalked stellate pubescence, glabrous with age; style ca. 0.5 mm; fruit large, 2–3 cm, with rusty dendritic pubescence ..... 4. *K. elegans*
  - 3b. Anthers nearly stalked; fruit with hairs 1–2 mm.
    - 5a. Leaf blade often oblong-lanceolate, apex acute or acuminate, abaxial surface finely stellate hairy; fruit longer, usually more than 3 cm ..... 5. *K. tonkinensis*
    - 5b. Leaf blade often lanceolate or linear-lanceolate, apex acuminate or long acuminate, abaxial surface often pallid, early glabrescent, at first with minutely granular or powdery stellate hairs, persistent along midvein and lateral veins; fruit usually less than 3 cm ..... 6. *K. lenta*

## 1. *Knema tenuinervia* W. J. de Wilde, Blumea 25: 405. 1979.

红光树 hong guang shu

Trees to 25 m tall, 20–30 cm d.b.h.; bark grayish white, with longitudinal streaks, easily cracking; branches drooping; twigs with dense rusty scurfy pubescence, glabrescent. Petiole stout, 1.5–2.5 cm, pubescent, glabrous when old; leaf blade broadly lanceolate or oblong-lanceolate, rarely oblanceolate, (15–)30–55(–70) × (7–)8–15 cm, subleathery, glabrous on both surfaces, juvenile leaves hairy on abaxial surface, base cordate or rounded, apex acuminate or long acuminate, tip often obtuse; lateral veins 24–35 pairs, prominent on both surfaces. Male inflorescences stout, 1–1.5 cm, axillary or arising from axils of deciduous leaves. Male flowers large, bud obovoid or pyriform, 6–7 × 4–6 mm; pedicels 0.7–1 cm, with rusty pubescence; bracteoles near base of perianth; perianth lobes 3(or 4); staminal disk slightly concave; anthers 10–13, sessile. Female flowers without or with short pedicel; perianth ca. 6 × 4 mm; ovary ovate, rusty pubescent; stigma many lobulate, concave at center. Infructescences short, often with 1 or 2 fruits; fruiting pedicel 3–5 mm. Fruit ellipsoid or ovoid, 3.5–4.5 × 2.5–3 cm, with dense rusty dendritic hairs 1–3 mm; pericarp thick, 4–5 mm. Seeds ellipsoid or ovoid-ellipsoid, 2–2.6(–3) × 1.2–1.4 cm, rounded at both ends; testa thinly leathery, tawny when dry,

with dense irregular slender grooves; aril red, slightly tearing at apex; chalaza nearly apical, concave, close to micropyle with distinct aperture. Fl. Nov–Feb, fr. Jul–Sep.

Moist dense forests, mountains, ravines; 500–1000 m. Yunnan (Jinping, Xishuangbanna, Yingjiang) [NE India (Sikkim), Laos, Nepal, Thailand].

This species, which was formerly confused with *Knema furfuracea* (J. D. Hooker & Thomson) Warburg (*Myristica furfuracea* J. D. Hooker & Thomson) from Malaysia (e.g., in FRPS 30(2): 178. 1979), is close to *K. pierreii* Warburg from S Vietnam.

The seeds contain ca. 24% fat, which is used in industry. The bark and heart wood secrete red latex. The timber of this species is rather heavy, with coarse fiber.

## 2. *Knema linifolia* (Roxburgh) Warburg, Monogr. Myristic. 558. 1897.

大叶红光树 da ye hong guang shu

*Myristica linifolia* Roxburgh, Fl. Ind., ed. 1832, 3: 847. 1832; *Knema linifolia* var. *clarkeana* (King) Warburg; *M. clarkeana* King; *M. longifolia* Wallich ex Blume.

Trees to 20 m tall, 25–35 cm d.b.h.; bark rough, grayish brown; branches slightly drooping, arising at top, with dense rusty pubescence. Petiole 1–2 cm, with rusty powdery pubes-

cence; leaf blade obovate-lanceolate, (15–)24–40 × 7–13 cm, widened at middle, papery or subleathery, finely hairy, glabrescent on both surfaces, base rounded, apex acuminate or long acuminate; lateral veins 20–25 pairs, prominent on both surfaces. Male inflorescences 0.8–1 cm. Male flowers 2–5-fascicled on short peduncle; buds ovoid or obovoid, 7–10 × 5–6 mm, with dense brown pubescence; pedicel 1.2–1.5 cm; bracteole inserted at about middle or in lower part of pedicel; perianth lobes 3; staminate disk concave; anthers 13–18, sessile. Female flowers 2–4-fascicled, ca. 6 mm; ovary broadly ovoid, pubescent; stigma bifid, each lobe again shallowly 2-lobulate. Inflorescences short, often with 1 fruit. Fruit nearly sessile, ellipsoid or ovoid, 2.5–4 × 2.2–2.5 cm, with rusty hairs 0.5–1 mm; pericarp 2–3 mm thick. Aril red, lacinate at apex. Fl. Aug–Sep.

Moist dense forests, ravines; 800–900 m. SW Yunnan [Bangladesh, NE India, Myanmar].

**3. *Knema globularia*** (Lamarck) Warburg, Monogr. Myristic. 601. 1897.

小叶红光树 xiao ye hong guang shu

*Myristica globularia* Lamarck, Mém. Acad. Sci. (Paris) 1788: 162. 1791; *Knema corticosa* Loureiro; *K. corticosa* var. *tonkinensis* Warburg; *K. missionis* (Wallich ex King) Warburg; *K. sphaerula* (J. D. Hooker) Airy Shaw; *K. wangii* Hu; *M. corticosa* (Loureiro) J. D. Hooker & Thomson; *M. glaucescens* J. D. Hooker, p.p.; *M. lanceolata* Wallich; *M. missionis* Wallich ex King; *M. sphaerula* J. D. Hooker.

Trees to 15 m tall, 10–25 cm d.b.h.; bark grayish brown, ± flaking; branches spreading or slightly drooping, juvenile branches with pubescence of short stellate hairs ca. 0.5 mm or less, glabrescent, tawny or black. Petioles 8–15 mm, glabrescent; leaf blade oblong to lanceolate, 10–20(–24) × 2–4(–7) cm, abaxially pallid, adaxially lucid, papery, glabrous, sometimes along veins with nearly scurfy pubescence, base broadly cuneate to ± rounded, apex acute or acuminate; lateral veins 12–20 pairs. Male flowers (2–)6–9, tufted on tubercular peduncles 3–8 mm; pedicel 4–11 mm; buds globose, 3–5 mm in diam., with hairs 0.2–0.5 mm; perianth lobes 3; bracteole inserted halfway or higher on pedicel; anthers 10–16, sessile. Female inflorescences 0.5–1 cm. Female flowers ovoid-oblong, ca. 4 mm; pedicel 2–4 mm; bracteole subapical; style ca. 1.5 mm. Fruiting pedicel 3–10 mm. Fruits 1–5, ellipsoid, 1.5–2(–2.5) × 1–1.5 cm, with hairs ca. 0.5 mm or less, glabrescent, at base often with persistent perianth; pericarp 1–2 mm thick. Aril red, enclosing seed or at apex slightly open. Fl. Dec–Mar of next year and fr. Jul–Sep at low altitude, fl. and fr. Jul–Sep at high altitude.

Low hilly forests, moist mountain slopes; 200–1000 m. Yunnan (Cangyuan, Hekou, Pingbian, Xishuangbanna, Yingjiang) [Cambodia, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

The seeds contain ca. 27% fat, which is used in industry.

**4. *Knema elegans*** Warburg, Monogr. Myristic. 615. 1897.

假广子 jia guang zi

*Knema siamensis* Warburg.

Trees to 20 m tall; bark grayish brown; branches spreading, slightly drooping; juvenile branches and juvenile leaves with dense rusty or grayish brown pubescence, hairs 0.2–0.5 mm, late glabrescent. Petiole 0.6–1.7 cm, pubescent; leaf blade papery to nearly leathery, oblong-lanceolate to linear-lanceolate, 12–25(–32) × 3–6(–8) cm, margins nearly parallel, apex acute or shortly acuminate, base broadly cuneate or nearly rounded, abaxially with dense rusty or grayish brown stalked stellate pubescence; midvein sunken adaxially, lateral veins 15–32(–36) pairs, prominent on both surfaces. Male inflorescences axillary or arising from axils of deciduous leaves, with 4–8 flowers; peduncles 3–4 mm, pubescent. Male flower buds 3–5 mm, obovoid or subglobose; pedicel 5–9 mm; bracteole inserted at middle (or higher) of pedicel; perianth lobes 3(or 4), with hairs 0.2–0.5 mm; staminate disk flat or ± concave; anthers 8–13. Female flowers 3–8(–10)-clustered; peduncle short, cylindrical, 3–4 mm, pubescent; ovary ovate, ca. 3 mm; style half as long as ovary; stigma bifid, each lobe again shallowly 2-lobulate. Inflorescences of 1 or 2 fruits; fruiting pedicel 0.5–1 cm, pubescent with hairs ca. 1 mm, glabrescent. Fruit ovoid or ellipsoid, 2.5–3.2 × 1.8–2 cm; perianth sometimes persistent; pericarp ca. 1 mm thick. Seeds ovoid-ellipsoid, 2–2.8 × 1.3–1.6 cm; aril orange-red to deep red, completely entire or at apex slightly open. Fl. Aug–Sep, fr. Apr–May.

Mountain slopes, low hills, ravines; 500–1700 m. Yunnan (Cangyuan, Jinghong, Luxi, Mengla, Ruili) [Cambodia, Myanmar, Thailand, Vietnam].

In FRPS (30(2): 182. 1979), this species was misidentified as *Knema erratica* (J. D. Hooker & Thomson) J. Sinclair (*Myristica erratica* J. D. Hooker & Thomson). True *K. erratica* is distributed in NE India.

The seeds contain ca. 20% fat, which is used in industry.

**5. *Knema tonkinensis*** (Warburg) W. J. de Wilde, Blumea 25: 381. 1979.

密花红光树 mi hua hong guang shu

*Myristica conferta* King var. *tonkinensis* Warburg, Monogr. Myristic. 581. 1897.

Trees to 12 m tall, to 25 cm d.b.h.; branches spreading and slightly drooping; juvenile branches cylindrical, with hairs ca. 0.3 mm, glabrescent, then bark grayish brown, longitudinally striate. Petiole 1.2–1.5 cm, pubescent, glabrescent; leaf blade oblong-lanceolate or narrowly elliptic, 13–24 × 4–6.5 cm, papery to nearly leathery, abaxially grayish white, with grayish brown stellate-dendroid pubescence, glabrescent with age, base broadly cuneate to nearly rounded, margins nearly parallel, apex acute or shortly acuminate; lateral veins 18–25 pairs. Male inflorescences 1–6 mm, stalked, 2–10-flowered. Male flowers: pedicel 6–10 mm; bracteole at about middle; perianth in bud obovoid, ca. 5.5 × 3.5 mm, lobes 3 or 4; staminal disk circular or subtriangular, ± flat; anthers ca. 10. Female flowers not known. Fruiting pedicel 3–6 mm. Fruits 1–3, on 3–4 mm peduncle, ellipsoid or obovoid, 2.5–4 × 2–2.8 cm, with rusty pubescence, hairs 1–2 mm, late glabrescent; perianth ± persistent;

pericarp ca. 2 mm thick when dry. Aril open at apex. Fl. Dec–Feb, fr. May–Jun.

Moist bamboo groves, slopes, ravines; 1100–1200 m. Yunnan (Cangyuan) [Laos, Vietnam].

In FRPS (30(2): 185. 1979), this species was misidentified as *Knema conferta* (King) Warburg (*Myristica conferta* King). True *K. conferta* is distributed in Indonesia, Malaysia, and Singapore.

*Knema tonkinensis*, as here conceived, may include specimens of *K. petelotii* Merrill (described from Tonkin, Vietnam); the latter species was regarded as distinct by de Wilde (Blumea 25: 375–377. 1979).

**6. *Knema lenta*** Warburg, Monogr. Myristic. 584. 1897.

狭叶红光树 xia ye hong guang shu

Trees to 20 m tall, 10–35 cm d.b.h.; juvenile branches with dense grayish brown scurfy or stellate pubescence, hairs ca. 0.1 mm, glabrescent. Petiole rather slender, 8–20 mm, with dense appressed rusty or tawny pubescence, glabrescent; leaf blade oblong-lanceolate or linear-lanceolate, 8–30 × 2–8.5 cm, papery, abaxially pale or glaucous, early glabrescent from minute 0.1–0.3 mm hairs, adaxially glossy, glabrous, base cuneate to rounded, apex acuminate or long acuminate; midvein and lateral veins with granular or powdery stellate pubescence, lateral veins 20–25 pairs, midvein prominent abaxially and sunken adaxially, ultimate venation very fine, prominent on both surfaces. Male inflorescences up to 5 mm, pedunculate, simple. Male flowers 3–15; pedicel 5–10 mm; bracteole at or above middle; perianth in bud globose, ca. 4 mm in diam., lobes 3; staminal disk flattish; anthers 8–16. Female inflorescences with 2 or 3 flowers. Female flowers: pedicel 3–6(–10) mm; perianth in bud ovoid-oblong, ca. 6 mm; ovary ovoid, with dense pubescence, hairs 0.5–1 mm; style short; stigma deeply 2-lobed and each lobe shallowly many lobulate. Fruiting pedicel short, 3–8(–12) mm. Fruits 1–3 per infructescence, ellipsoid, 2–3.5 × 1.5–2 cm, base rounded, apex acute or rounded; perianth persistent, with dense pubescence of shaggy hairs 1–2 mm, partly glabrescent; pericarp ca. 1.5 mm thick. Seeds ellipsoid, 2–2.2 × 1.4–1.6 cm, base rounded, apex oblique, slightly pointed; aril thin, completely enclosing seeds or only at apex slightly open. Fl. Oct, fr. Apr–May.

Mountain slopes, ravines; 500–1200 m. Yunnan (Mengla, Ruili) [Bangladesh, India (including Andaman Islands), Myanmar, Thailand, Vietnam].

In FRPS (30(2): 187. 1979), this species was misidentified as *Knema cinerea* (Poiret) Warburg var. *glauc*a (Blume) Y. H. Li (*K. glauca* (Blume) Petermann; *Myristica glauca* Blume). True *K. cinerea* var. *glauc*a is distributed in Indonesia, Malaysia, and Peninsular Thailand.

*Knema lenta* resembles *K. andamanica* (Warburg) W. J. de Wilde (*K. cinerea* var. *andamanica* (Warburg) J. Sinclair; *K. glauca* var. *andamanica* Warburg), from SE India (Andaman and Nicobar Islands). *Knema andamanica* differs in having obovoid male flower buds and fruit with hairs 1 mm or less in length.

MYRISTICACEAE