

# 1. DIPTEROCARPUS C. F. Gaertner, Suppl. Carp. 50. 1805.

龙脑香属 long nao xiang shu

Trees, lofty, emergent, with grayish brown to orange flaky, prominently lenticellate bark and aromatic oily white resin, with stout buttresses. Stipules large, enclosing terminal bud, finally caducous and leaving an annular scar; leaf blade leathery, plicate in bud and ± corrugate when opened; lateral veins pinnate, straight; tertiary veins subscalariform, conspicuous, margin entire or sinuate-crenate. Raceme 3–9-flowered, hardly branched. Flowers large, sweetly scented. Calyx with urceolate or cup-shaped free basal tube; sepals valvate, unequal. Petals white or with a reddish median stripe, pubescent or stellate pubescent especially on parts exposed in bud. Anthers yellow, linear, equivalved; connective appendages aristate or filiform. Ovary narrowly ovoid, pubescent; style filiform; stigma slightly dilated. Fruit nutlike, enclosed in accrescent calyx tube; winglike calyx lobes 2, erect. Seed adnate to base of pericarp; cotyledons large, thick, unequal; radicle inconspicuous.

About 70 species: Cambodia, China, India, W Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; two species (one introduced) in China.

*Dipterocarpus gracilis* Blume, which was reported in FRPS (50(2): 114. 1990), is not found in China. It differs in the smaller size of all parts and rufous scabrous tomentum. Its nearest localities are in N Thailand, India (Andaman Islands), and SE Bangladesh.

- 1a. Fruit wings conspicuously 3–5-veined, calyx tube more than 3 cm in diam.; leaf buds obtuse, stout, glabrous, setose or woolly ..... 1. *D. retusus*
- 1b. Fruit wings with only 1 much ramified midvein, calyx tube less than 3 cm in diam.; leaf buds falcate, buds and young twigs densely gray puberulous ..... 2. *D. turbinatus*

## 1. *Dipterocarpus retusus* Blume, Catalogus, 77. 1823.

东京龙脑香 dong jing long nao xiang

Trees, lofty, to 45 m tall. Bark gray or brown, shallowly flaky, not longitudinally fissured or only at base. Branchlets glabrous or persistently buff pubescent; leaf buds obtuse, stout, glabrous, setose, or woolly. Stipules green or red, lanceolate, to 15 cm, glabrous or pubescent outside (always stellate pubescent on young trees); petiole glabrous; leaf blade broadly ovate, 16–28 × 10–15 cm, leathery, abaxially sparsely or densely golden-buff stellate pubescent, adaxially initially white strigose, sometimes glabrescent, lateral veins 16–19 pairs conspicuously raised abaxially, base rounded or somewhat cordate, margin entire or sinuate-crenate in distal half, apex acute. Racemes axillary, 8–10 cm, 2–5-flowered. Calyx segments: 2 rather long and linear, 3 shorter and triangular. Petals reddish, sweetly scented, narrowly elliptic, 5–6 cm, with dense squamate hairs, margin slightly reflexed, apex obtuse. Stamens (25–)30; anthers linear to lanceolate, ca. 5 mm, sagittate at base, coherent; connective appendages aristate; filaments filiform, dilated at base. Ovary narrowly ovoid, sericeous-tomentose, 3-loculed, with 2 ovules per locule; style finely terete, with long silky hairs on lower half. Nut ovoid, densely yellowish gray tomentellate; calyx tube to 3.5 cm in diam.; winglike calyx segments red, linear-lanceolate, to 19–23 × 3–4 cm, leathery, stellate-tomentellate, 3–5-veined, apex rounded. Fl. May–Jun, fr. Dec–Jan of following year.

Humid valley rain forests, dense forests on limestone; below 1000 m. SE Xizang, SE and W Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

Still locally abundant in the E Himalayan foothills, this species is now rare in Yunnan, its distribution affected by habitat loss. The wood is heavy and is used for building houses. The tree is a source of a balsam used for caulking boats.

This species is very variable at the extremes of its range: China, N Vietnam, and Indonesia (Java). *Dipterocarpus macrocarpus* was recog-

nized on account of its dense tomentum on twigs, leaf buds, and leaf abaxial surface, and *D. mannii* on account of its somewhat smaller parts and ca. 25 stamens. Two varieties of *D. retusus* can be recognized in China, and they may co-occur in the same stand.

- 1a. Parts glabrescent ..... 1a. var. *retusus*
- 1b. Parts persistently tomentose ..... 1b. var. *macrocarpus*

## 1a. *Dipterocarpus retusus* var. *retusus*

东京龙脑香(原变种) dong jing long nao xiang (yuan bian zhong)

*Dipterocarpus mannii* King ex Kanjilal et al.; *D. occidentoyunnanensis* Y. K. Yang & J. K. Wu; *D. pubescens* Koorders & Valetton; *D. retusus* subsp. *tonkinensis* (A. Chevalier) Y. K. Yang & J. K. Wu; *D. retusus* var. *yingjiangensis* Y.

K. Yang & J. K. Wu; *D. spanoghei* Blume; *D. tonkinensis* A. Chevalier; *D. trinervis* Blume.

Parts glabrescent.

Humid valley rain forests, dense forests on limestone; below 1000 m. SE Xizang, SE and W Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

**1b. *Dipterocarpus retusus* var. *macrocarpus*** (Vesque) P. S. Ashton, **stat. nov.**

多毛东京龙脑香 duo mao dong jing long nao xiang

Basionym: *Dipterocarpus macrocarpus* Vesque, Compt. Rend. Hebd. Séances Acad. Sci. 78: 627. 1874; *D. austroyunnanicus* Y. K. Yang & J. K. Wu; *D. luchunensis* Y. K. Yang & J. K. Wu; *D. retusus* subsp. *macrocarpus* (Vesque) Y. K. Yang & J. K. Wu.

Parts persistently tomentose.

Humid valley rain forests, dense forests on limestone; below 1000 m. SE Xizang, SE and W Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

**2. *Dipterocarpus turbinatus*** C. F. Gaertner, Suppl. Carp. 51. 1805.

羯布罗香 jie bu luo xiang

*Dipterocarpus jourdainii* Pierre; *D. laevis* Buchanan-Hamilton; *D. turbinatus* C. F. Gaertner var. *ramipiliferus* Y. K. Yang & J. K. Wu.

Trees, lofty, ca. 35 m tall. Bark gray or dark brown, shallowly longitudinally fissured and flaky. Branchlets glabrescent; leaf buds falcate, buds and young twigs densely gray puberulous. Stipules 2–6 cm, densely, shortly dark grayish or dark yellow puberulous; petiole 2–3 cm, densely gray puberulous or glabrescent; leaf blade ovate-oblong, 20–30 × 8–13 cm, leathery, glabrous or sparsely stellate pubescent, lateral veins 15–20 pairs conspicuously raised abaxially, base rounded or somewhat cordate, margin entire or sometimes sinuate, apex acuminate or acute. Racemes axillary, 3–6-flowered. Calyx segments: 2 linear, 3 shorter, all glabrous, outside glaucous. Stamens ca. 30; anthers linear-lanceolate; connective appendages filiform. Ovary densely pubescent; style terete, silvery gray tomentose on lower half. Nut ovoid or narrowly ovoid, densely appressed tomentose; calyx tube to 2.8 cm in diam., glabrous, glaucous; winglike calyx segments linear-lanceolate, 12–15 × ca. 3 cm, glabrous, minutely papillate near much-ramified solitary midvein. Fl. Mar–Apr, fr. Jun–Jul.

S and W Yunnan (cultivated) [native to Bangladesh, Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

This tree provides a source of balsam.

DIPTEROCARPACEAE