

**LOCAL NAMES**

English (Papua New Guinea walnut, Pacific walnut, New Guinea walnut, Argus pheasant tree); Filipino (dao); German (Drachenapfel); Indonesian (dahu); Malay (sengkuang); Thai (sang-kuan, phrachao ha phra ong, ka-kho, dao); Vietnamese (s[aas]u)

**BOTANIC DESCRIPTION**

*Dracontomelon dao* is a large tree up to 45(-55) m tall, bole branchless for up to 20(-25) m, up to 100(-150) cm in diameter, with narrow buttresses up to 6 m high, bark surface irregularly scaly, greyish-brown with brown or greenish patches, inner bark pink or red.

Leaves arranged spirally, crowded towards the ends of twigs, large, imparipinnate; leaf rachis 6-25(-44) cm long, leaflets (7-)9-19, alternate to opposite, 4.5-20(-27) cm x 2-7(-10.5) cm, glabrous or sometimes pubescent below, with hairy domatia.

Inflorescence axillary or terminal, paniculate; bracts and bracteoles caducous; flowers bisexual, actinomorphic, 5-merous, slightly fragrant, white to greenish-white, 7-10 mm long, in panicles of up to 50 cm long; petals valvate but imbricate at the apical part, puberulous outside or on both surfaces, or glabrous; stamens 10, in 2 whorls, those opposite the calyx lobes longer than those alternating with them, filaments glabrous, anthers dorsifixed, disk intrastaminal, puberulous but glabrescent, or glabrous; pistil composed of 5 carpels which are free but connate at base and apically, ovary superior, 5-celled with a single ovule in each cell, styles 5, stigma capitate with the stigmatic tissue lateral.

Fruit a drupe, globose, 5-celled, or seemingly 1-celled by abortion, each cell with a distinct operculum, endocarp woody and hard.

Seed pendulous from an apical, axial placenta.

The specific epithet is the common name for the species in Filipino.

**BIOLOGY**

In peninsular Malaysia, Sarawak and Brunei, *D. dao* sheds leaves for only a short while after periods of marked dry weather. In Papua New Guinea, it is deciduous to semi-deciduous and leaves are often shed before the rainy season. Inflorescences are produced at the base of new shoots and the tree flowers when almost leafless before new bronze-coloured leaves appear, although the tree is reported to bear flowers almost throughout the year.

The bat-adapted fruits with strong musty odour and colour duller than those of bird-dispersed ones. The fruits ripen on the tree and at a distance from the foliage, to facilitate visits by bats.



Mature tree: A mature tree in a stand, illustrating the prominent buttresses and pale bark. (Rafael T. Cadiz)



Dracontomelon dao crown (Rafael T. Cadiz)



Foliage (French B)

**ECOLOGY**

*D. dao* occurs in primary or secondary, evergreen or semi-deciduous (monsoon) forest at low altitude 0-500(-1 000) m, in areas with high rainfall or less frequently in areas with a short dry season where it is deciduous or partly so. It is found scattered on well drained to poorly drained clayey to stony soils, mainly alluvial flats and in swampy areas.

**BIOPHYSICAL LIMITS**

Altitude: 0-500 m

Mean annual rainfall: 1 800-2 900 mm

Soil type: In Kalimantan, the tree is found on organols, gley humus soils or red-yellow podzolic soils.

**DOCUMENTED SPECIES DISTRIBUTION**

Native: Cambodia, China, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Solomon Islands, Thailand

Exotic:



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

**PRODUCTS**

**Food:** The fruit is edible but considered inferior and mostly eaten by children, the kernel of the seed is also edible. Flowers and leaves are cooked and eaten as a vegetable in Papua New Guinea, and used as food flavouring in the Moluccas.

**Fuel:** The tree is used for firewood.

**Timber:** *D. dao* is the main source of dao timber, density of the wood is (330-) 370-790 kg/cu m at 15 % moisture content. The heartwood is greyish, greenish-yellow to walnut brown, often with irregular dark brown to nearly black bands or fine streaks, the more or less clearly differentiated sapwood is pale yellow with pinkish or greyish tinge, up to 10 cm wide. Grain straight or interlocked, texture moderately coarse to coarse and even, lustrous, wavy grain sometimes producing a coarse fiddle-back figure. It is used for veneers, furniture, plywood, interior trim and light frames.

**Medicine:** The bark is used against dysentery, leaves and flowers are also employed in traditional medicine.

**SERVICES**

**Ornamental:** The tree is planted as an ornamental in roadside plantings.

**TREE MANAGEMENT**

Young trees reach a height of 3-4 m after 2 years and 6.5 m after 5.5 years. In Java, trial plantations are established at a spacing of 1 m x 3 m and the canopy closes after 8 years. The tree tolerates shade and since natural pruning is good, artificial pruning is seldom necessary.

**GERMPLASM MANAGEMENT**

Seed should be extracted immediately after the fleshy fruits have been collected. Pulp and seed can be separated by maceration. There are 520-620 seeds/kg. Seeds are recalcitrant and there is a 33 % germination when sown fresh and no germination at all after 6 months under ambient conditions in Java. In Malaysia, 85-95 % of fresh seeds germinate after 28-67 days.

**PESTS AND DISEASES**

The timber is liable to attack by bostrychid beetles. Logs should be sprayed with insecticides to prevent attack by *Platypus* spp., *Xyleborus* spp. and *Heterobostrycus aequalis*.

**FURTHER READNG**

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**SUGGESTED CITATION**

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