

Caesalpinia sappan

sappanwood, sappan lignum, brazilin

L.

Fabaceae - Caesalpinioideae

LOCAL NAMES

Burmese (teing-nyet); English (false sandalwood, Indian brazilwood, Indian redwood, sappanwood); Filipino (sapang, sibukao); French (bois de sappan, sappan); Hindi (bokmo, bakan, patungam, vakum, vakam, patunga); Indonesian (soga jawa, secang, kayu sekang, kayu cang); Javanese (soga jawa); Lao (Sino-Tibetan) (fang deeng, faang); Malay (sepang); Thai (ngai, faang, fang som); Trade name (sappan lignum, brazilin, sappanwood); Vietnamese (tô mộc, hang nhuôm)

BOTANIC DESCRIPTION

Caesalpinia sappan is a small to medium-sized, shrubby tree, 4-8(-10) m tall; trunk up to 14 cm in diameter; bark with distinct ridges and many prickles, greyish brown; young twigs and buds hairy, brownish.

Leaves stipulate, bipinnate, alternate, 20-45(-50) cm long, 10-20 cm broad, with 8-16 pairs of up to 20 cm long pinnae; pinnae with prickles at the base and with 10-20 pairs of oblong, 10-20 mm x 6-10 mm long, subsessile leaflets, very oblique at base, rounded to emarginated at apex.

Flowers in terminal panicles, racemes pubescent, primary peduncles 30-40 cm long, the flowering 9-15 cm long, bracts ovate-acuminate, about 6 mm long, flowers fragrant, 2-3 cm long, 5-merous; sepals glabrous, petals pubescent, the superior one smaller; calyx tube 3 mm long; corolla yellow, uppermost lobes cuneate, other obovate, all clawed and gland-punctate; stamens 10, filaments densely tomentose in the lower half; ovary superior, pubescent.

Fruit a dehiscent pod, glabrous, thick, flattened, obliquely oblong, prominently beaked, woody, polished-brown, 7-10 cm x 3-4 cm, 2-3(-5) seeded.

Seeds ellipsoid, flattened, 18-20 mm x 10-12 mm, brown.

The generic name is after A. Caesalpini, 1519-1603, Italian physician and botanist.

BIOLOGY

Flowering can occur after 1 year of growth and usually during the rainy season, fruiting about 6 months later. The tree flowers in August in Myanmar, and in Indonesia pods are produced 13 months after planting.

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ECOLOGY

Under natural conditions *C. sappan* grows mostly in hilly areas with clayey soil and calcareous rocks at low and medium altitudes. In Peninsular Malaysia it grows best on sandy riverbanks. It does not tolerate too wet soil conditions.

BIOPHYSICAL LIMITS

Mean annual temperature: 24-28 deg C

Mean annual rainfall: 700-4 300 mm

Soil type: *C. sappan* tolerates sand and slope and soil pH of 5-7.5.

DOCUMENTED SPECIES DISTRIBUTION

Native: China, India, Malaysia, Myanmar, Thailand

Exotic: Indonesia, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Taiwan, Province of China, United States of America



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.

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PRODUCTS

Fuel: The wood is used for firewood and its energy value is about 25 000 kJ/kg.

Timber: The tree is the source of the commercial redwood or Brazilwood. Sapwood is white, heartwood makes up to 90 % of the total volume, is yellow or deep orange when fresh turning to dark red. The wood is straight grained with a fine to moderately fine texture, fairly heavy (600-780 kg/m³), hard and lustrous. It is difficult to dry and susceptible to warping and collapse, but moderately easy to work; it takes high finish and is tough and resistant to termite attack. It is used for inlaying work, cabinet making, violin bows and for walking sticks.

Gum or resin: The stem produces a gum.

Tannin or dyestuff: The heartwood yields a valuable red crystalline dye, brazilin, used on cotton, silk and wool fabrics. Bakam gives bright red and violet shades, and with garcine produces a chocolate tint. Bark and pods yield similar dyes, pods contain ca. 40% tannin used for production of light leather goods. Roots give a yellow dye.

Essential oil: Leaves contain a pleasant smelling volatile oil.

Medicine: A decoction of the wood is a powerful emmenagogue and, because of its tannic and gallic acids, is an astringent used in mild cases of dysentery and diarrhoea. It is also given internally for certain skin ailments. The sappan is given as a tonic to women after confinement and to relieve vomiting of blood. It is one of the ingredients in a mixture prescribed for malaria. The dried heartwood is widely used in oriental medicine, particularly against inflammation. Seeds serve as a sedative.

Other products: Seeds are reported to contain trypsin and chymotrypsin inhibitors. Protosappanin A isolated from C. sappan heartwood has a mild sedative effect. Six 3-benzylchroman derivatives (isoflavonoids) were isolated from Sappan Lignum, the dried heartwood of C. sappan. Screening showed that the methanolic extract had significant anti-hypercholesterolaemic activity. Brazilin (7,11b-dihydrobenz[b]indeno-[1,2-d]pyran-3,6a,9,10(6H)-tetrol), the principle component of C.sappan has been found to exhibit hypoglycaemic properties and to increase glucose metabolism in diabetic rats.

SERVICES

Boundary or barrier or support: The tree is planted as a hedge and boundary marker in villages.

Other services: The leaves are used to hasten ripening of fruits such as bananas and mangoes.

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TREE MANAGEMENT

Initially *C. sappan* grows straight but at about 2.5 m height, the branches start to droop and entwine with branches of nearby trees to form thickets, generally free from undergrowth. After the tree is felled the stump sprouts profusely within 2 weeks. For use as dyewood the tree is harvested every 6-8 years and for firewood every 3-4 years when the trunk has attained 5-6 cm diameter. The tree is cut about 1 m above the ground to allow sprouts to grow from the stump.

GERMPLASM MANAGEMENT

Usually mature pods burst open in the dry season and scatter the seeds, which remain dormant until the start of the rainy season. Pods are gathered, pounded and put into cold water. After 2-3 hours the mixture is rubbed and mixed with a solution of iron sulphate. Seed germination occurs readily but is enhanced by dipping seeds wrapped in cotton cloth in boiling water for 5 seconds. Germination rate is then 90%.

PESTS AND DISEASES

Auricularia auricula-judae and *Meliola caesalpiniae* fungi attack the tree.

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SUGGESTED CITATION

Orwa C, A Mutua, Kindt R, Jamnadass R, S Anthony. 2009 *Agroforestry Database: a tree reference and selection guide version 4.0* (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)