

## Pithecellobium dulce

(Roxb.) Benth.

Fabaceae - Mimosoideae

### LOCAL NAMES

Amharic (temar); Arabic (tamar hindi); Bengali (amil,dekhani babul,balati); Burmese (kway-tanyeng); English (blackbead tree,bread and cheese tree,madras thorn,manila tamarind,vilayati chinch,sweet Inga,quamachil); Filipino (kamatsile,damortis,kamanchilis); Hawaiian (opiuma); Hindi (jangle jalebi,vilayati babul,dakhani babul,jangal jelbi,vilayati imli,imli); Indonesian (asam koranji); Javanese (asem londo,asam belanda); Khmer (âm'pül tük); Lao (Sino-Tibetan) (khaam th'ééd); Malay (asam tinja,asam kranji); Spanish (madre de flecha,guamuchil,guama americano,quamachil); Swahili (mkwaju wa kihindi,maramata); Tamil (kodukapuli,kodukkaapuli); Thai (makham-khong,makham-that); Tigrigna (temri-hindi); Vietnamese (me keo,keo tây)

### BOTANIC DESCRIPTION

The height of *Pithecellobium dulce* is commonly 10-15 m, but ranges from 5-18 m. Crown is broad spreading with irregular branches up to 30m across; bole short, up to 1 m thick. The bark is grey, becoming rough, furrowed, and eventually peeling.

Leaves are bipinnate, with 2 pairs of 2 kidney-shaped leaflets each 2-2.5 x 1-2 cm, rather resembling *Hardwickia binnata*. New leaf growth coincides with the loss of old leaves, giving the tree an evergreen appearance. Thin spines are in pairs at the base of leaves, and range from 2 to 15 mm in length.

The flowers are in small white heads 1 cm in diameter. Each flower has a hairy corolla and calyx surrounding about 50 thin stamens united in a tube at the base.

Pods are 10-15 x 1.5 cm; the colour becoming spiral and reddish-brown as they ripen. Each pod contains 5-10 shiny black seeds up to 2 cm long. The grey bark and tightly-coiled seed pods are characteristic of this tree, and make it easy to distinguish.

The genus is often written as *Pithecollobium* or *Pithecolobium*. The genus name is derived from the greek words *pithekos* (an ape) and *lobos* (a lobe), alluding to the pods, shaped like the human ears. This species was named and described botanically in 1795 from Coromandel, India, where it had been introduced. The specific name, meaning sweet, doubtless refers to the edible seed pulp.

### BIOLOGY

In the Philippines they flower from October to November and bear mature fruits in abundance during January and February; in west Java bloom is between April and June and the pods ripen 2-3 months later, from June to August.



*P. dulce*: medium-sized trees lopped for dry season livestock fodder, Oaxaca, Mexico. (Colin E. Hughes)



*P. dulce*: cream-coloured flower heads. (Colin E. Hughes)



*P. dulce* cultivated for hedging, Rajasthan, India. (Colin E. Hughes)

**ECOLOGY**

P. dulce is not exacting in its climatic requirements and grows well at low and medium altitudes in both wet and dry areas under full sunlight. It is a strong light demander, but can stand a considerable shade. Generally found in the plains, it can also survive in undulating terrain. P. dulce can grow on poor soils, on wastelands and even with its roots in brackish water. It is a drought resistant species but susceptible to frost, coming up well in areas of low rainfall due to its extensive root system.

**BIOPHYSICAL LIMITS**

Altitude: 900-1 800 m, Mean annual temperature: 0-48 deg. C, Mean annual rainfall: 250-1 650 mm

Soil type: P. dulce is found on most soil types including clay, limestone, and wet sand with a brackish watertable. The tree is rated highly tolerant to soil salinity and impoverished soils. It however grows best on well-drained, deep, fertile loamy agricultural soils.

**DOCUMENTED SPECIES DISTRIBUTION**

Native: Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Mexico, Paraguay, Peru, Surinam, United States of America, Uruguay, Venezuela

Exotic: Cambodia, China, Cuba, Eritrea, Ethiopia, Haiti, India, Indonesia, Jamaica, Kenya, Laos, Malaysia, Myanmar, Philippines, Puerto Rico, Reunion, Sudan, Tanzania, Thailand, Vietnam, Virgin Islands (US), Zanzibar



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:** Pods contain a pulp that is variously sweet and acid, commonly white but also red. The seed and pulp are made into a sweet drink similar to lemonade and also eaten roasted or fresh. The seeds are used fresh in curries in India. In Mexico, Cuba and Thailand, the pods are harvested and are customary sold on roadside stands.

**Fodder:** The pods and leaves gathered from hedge clippings are devoured by all livestock; horses, goats, camels, cattle and sheep. The presscake residue from seed oil extraction may be used as stock feed.

**Apiculture:** Flowers are visited by bees and yield good quality honey.

**Fuel:** Fast-growing and coppices vigorously but due to its smokiness and low calorific value (5 177-5 600 kcal/kg), *P. dulce* wood is not of very high quality. In parts of India, it is planted and harvested to fuel brick kilns.

**Timber:** Sapwood is yellowish, and heartwood yellowish or reddish-brown. The wood of *P. dulce* is strong and durable yet soft and flexible. It is moderately hard and usually straight grained. It weighs about 590 kg/m<sup>3</sup>, is easy to saw and finishes to a smooth surface. In south India, it is used to make drums, while in China, it is said to be used for matches. It can be used in construction and for posts. The short spines and irregular, crooked growth make it less attractive for wood uses.

**Gum or resin:** The wounded bark exudes a mucilaginous reddish-brown gum somewhat like gum arabic.

**Tannin or dyestuff:** Tannin, used to soften leather, can be extracted from the bark (about 25%), seeds and leaves; the bark is also used to dye fishnets a yellow colour.

**Lipids:** Seeds contain a greenish oil (20%), which, after refining and bleaching, can be used for food or in the making of soap and can substitute kapok and ground nut seed oils.

**Medicine:** In Haiti root and bark decoctions are taken orally against diarrhoea; fruit pulp is taken orally to stop blood flow in case of haemoptysis. The seed juice is inhaled into the nostrils against chest congestion and pulverised seeds are ingested for internal ulcers. The leaves, when applied as a plaster, can allay pain of venereal sores and taken with salt can cure indigestion, but can also produce abortion. The root bark may be used to cure dysentery. The bark is used medicinally as a febrifuge.

**SERVICES**

**Shade or shelter:** The tree is extensively planted for its dense shade.

**Reclamation:** Since it can grow on waste and denuded lands, *P. dulce* can afforest and conserve poor soils.

**Nitrogen fixing:** *P. dulce* forms root nodules with Rhizobium bacteria. Nodulation is common in all types of soil, but quantitative data on fixation has not been reported.

**Ornamental:** Very popular as an ornamental and is used in topiary (plant sculpturing). Trees with variegated leaflets are available as ornamental pot plants in Hawaii.

**Boundary or barrier or support:** With regular trimming, *P. dulce* makes a dense, almost impenetrable thorny hedge that keeps out livestock and forms useful shelter belts; for hedges, seeds may be sown in 2 rows of 15 x 30 cm.

**TREE MANAGEMENT**

The species is fast growing; trees reach a height of 12-15 m and a girth of 0.91-1.2 m in about 40 years. In favourable soil conditions, it may reach a height of 10 m in 5-6 years. It coppices vigorously and produces root suckers upon injury to roots. The tree can stand considerable amount of pruning, lopping and nibbling by sheep and goats. It also competes with weeds and outgrows fast.

**GERMPLASM MANAGEMENT**

Seed storage behaviour is recalcitrant. The seeds weigh 6 460-6 700/kg.

**PESTS AND DISEASES**

Larvae of *Subpandesma anysa* attack the fruit and seeds in Hawaii. A hemipteran insect (*Umbonia crassicornis*) is a pest in Puerto Rico. Larvae of *Indarbela* spp bore into the bark of trees in India. *Polydesma umbricola* is a serious pest on the Island of Reunion.

Leaf spot pathogens include *Cercospora mimosae*, *Collectotrichum dematium*, *C. pithecellobii*, *Phyllosticta ingae-dulcis* and *P. pithecellobii*. Heart rot (*Phellinus* spp) has been reported in India.

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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>)