Adenanthera pavonina

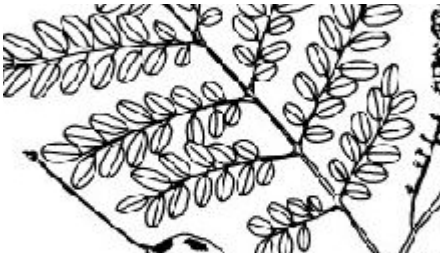
L.

Fabaceae - Mimosoideae

LOCAL NAMES
Bengali (rakta kambal); Burmese (mai-chek); Creole (legliz,reglisse); English (jumbie bead,false sandalwood,crab's eyes,coral wood,circassian seed,circassian bean,red wood,red sandalwood,red bead tree,bead tree); Filipino (malatinglin); French (bois de condori,église,reglisse); German (condoribaum,indischer korallenbaum); Hindi (saga,raktakambal,manjadi,anikundumani,lopa); Indonesian (kitoke laut,saga telik,segawe sabrang); Javanese (segawe sabrang); Khmer (chan'trèi); Lao (Sino-Tibetan) (lam); Malay (saga tumpul,saga,saga daun tumpul); Samoan (lopa); Sanskrit (kunchandana); Spanish (coralitos peonía,arbol de coral,coral,peronías,jumbie bread,peronía,caralillo,carolina,caralín); Thai (ma hok daeng,ma klam ta chang,ma clam ton,ma clam ta cheng,ma klam ton); Tongan (lopa)

Coppice stand: Mid picture. (Rafael T. Cadiz)

Adenanthera pavonina folliage (Rafael T. Cadiz)



Adenanthera pavonina folliage (Rafael T. Cadiz)

BOTANIC DESCRIPTION
Adenanthera pavonina is a medium-sized to large deciduous tree, 6-15 m tall and up to 45 cm diameter, depending on location; generally erect; bark dark brown to greyish; inner bark soft, pale brown; crown spreading; multiple stems common, as are slightly buttressed trunks in older trees.

Leaves bipinnate; 2-6 opposite pairs of pinnae, each with 8-21 leaflets on short stalks; alternate leaflets 2-2.5 x 3 cm, oval-oblong, with an asymmetric base and blunt apex, dull green on topside and blue-green underside; leaves turn yellow with age.

Flowers borne in narrow spikelike racemes, 12-15 cm long, at branch ends; flowers small, creamy yellow, fragrant; each flower star shaped with 5 petals, connate at the base, and having 10 prominent stamen-bearing anthers tipped with minute glands.

Pods long and narrow, 15-22 x 2 cm with slight constrictions between seeds, dark brown, turning black upon ripening, leathery, curve and twist upon dehiscence to reveal 8-12 hard-coated, showy seeds, 7.5-9 mm in diameter, lens shaped, vivid scarlet; seeds adhere to pod. Ripened pods remain on the tree for long periods, sometimes until the following spring.

The name 'Adenanthera' is derived from a combination of the Greek words 'aden', a gland, and 'anthera', anther, alluding to the anther's characteristics of being tipped and having a deciduous gland.

BIOLOGY
Most Adenanthera species are deciduous but are leafless for only a few days. They have been observed to be flowering and fruiting almost throughout the year, though for short intervals. Inflorescence appears at the apex of the small fruit. Seeds are probably eaten and dispersed by birds.

ECOLOGY
A. pavonina is a secondary forest tree favouring precipitation. Adenanthera species are found scattered in primary and secondary, evergreen to dry deciduous rainforests, but also in open savannah.

BIOPHYSICAL LIMITS
Altitude: Up to 300-400 m, Mean annual rainfall: 3 000-5 000 mm.

Soil type: Found on a variety of soils from deep, well-drained to shallow and rocky, this tree prefers neutral to slightly acidic soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: China, India

Exotic: Australia, Brunei, Cambodia, Cuba, Dominica, Haiti, Indonesia, Jamaica, Japan, Kenya, Laos, Malaysia, Myanmar, Puerto Rico, Solomon Islands, Sri Lanka, Taiwan, Province of China, Tanzania, Thailand, US, Vietnam

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: Known as ‘food tree’ in Melanesia and Polynesia, the seeds of this tree are roasted over a fire and eaten by children and adults alike. Nutritional studies have shown that 1/4 of the seed weight is oil, with a high percentage of protein and a fatty acid composition, resulting in high digestibility in humans. Seeds may require boiling to neutralize toxicity. Young leaves are eaten as a vegetable.

Fodder: As a supplemental source of fodder, the leaves are fairly high in digestible crude protein (17-22%) but low in mineral content.

Fuel: Esteemed in the Pacific Islands for fuelwood, the wood burns readily, producing significant heat, and is used in both above- and below-ground ovens. Good-sized fuelwood, larger than 11 cm in diameter can be produced in 5 years. The wood yields very good charcoal.

Timber: Adenanthera yields medium to heavy hardwood with a density of 595-1100 kg/cubic m at 15% moisture content. The heartwood is bright yellow when fresh, turning red; it is sharply demarcated from the light grey sapwood, which can be up to 5 cm wide. The heartwood is closely and even grained, with a moderately fine to slightly coarse and even texture. Wood moderately lustrous. Shrinkage is variable, and the wood seasons very well with only slight warping. The wood is very hard, durable and strong. It can be easy or somewhat difficult to work, easy to plane and it takes a high finish. The heartwood is resistant to dry wood termites. The wood is used for bridge and household construction (beams, posts, joists and rafters), flooring, paving blocks and vehicle bodies. It may also be suitable for furniture and cabinet work and turnery.

Tannin or dyestuff: The red dye has been used for dyeing clothes and by the Brahmins of India for marking the forehead.

Poison: Raw seeds are poisonous.

Medicine: In India a decoction of young leaves is used against rheumatism and gout. Pulverized wood mixed with water is taken orally for migraines and headaches; and dysentery, diarrhoea and tonsillitis are treated with a bark and leaf decoction.

Other products: The red, glossy seeds are used as toys and for necklaces, and in earlier days were used to weigh gold, silver and diamonds, because they have a narrow range in weight. The seeds are curiously similar in weight, four seeds making up about one gramme. The malay name 'saga' is traced to the Arabic term for goldsmith. The bark contains saponin and has been used to wash hair and clothing

SERVICES
Shade or shelter: The fast growth and spreading crown of light, feathery foliage offers attractive shade. In Indonesia and Malaysia trees are planted for shade in coffee, clove and rubber plantations. It is planted along field borders as part of a windbreak.

Nitrogen fixing: The legume is generally considered to be nitrogen fixing. Sparse, fast-growing, brown nodules with isolates confirmed to be Rhizobium have been observed, and Vesicular Arbuscular Mycorrhizae (VAM) have been found on the roots of nursery stock.

Soil improver: The small leaves break down easily, making the species a good green manure.

Ornamental: It is extensively cultivated as an ornamental for planting along roadsides and in common areas, notably for its red, glossy seeds.

Intercropping: It is compatible with most tropical field and tree crops, making it suitable to use in integrated production systems. It is interplanted among field and tree crops such as spices, coffee and coconuts.

TREE MANAGEMENT
Growth is initially slow but increases rapidly after the 1st year, during which average annual growth rates of 2.3-2.6 cm in diameter and 2-2.3 m in height (recorded in American Samoa) can be attained. Trees planted 1 x 2 m apart for windbreaks and at 2 x 2 m in plantations can be thinned in 3-5 years to provide fuelwood and construction materials. For shade trees, spacing varies from 5 to 10 m, depending on the companion crop and site. Trees resprout easily, allowing for coppice management with good survival. Despite inability to suppress weeds, seedlings are hardy and can survive with minimal maintenance. The tree is susceptible to breakage in high winds, with most of the damage occurring in the crown.

GERMPLASM MANAGEMENT
Seed storage behaviour is orthodox; 15% germination following 8 years open storage at room temperature; viability maintained following 3 years of hermetic storage at room temperature with 13% + or - 2% mc; 8% germination after 4 years of open storage at room temperature (Hong TD et al., 1996). There are approximately 3750 seeds/kg.

PESTS AND DISEASES
A. pavonina wood is very susceptible to sapstain. The sapwood is susceptible to dry wood termites.

FURTHER READNG

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SUGGESTED CITATION

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