

Acacia leucophloea

(Roxb.) Willd.

Fabaceae - Mimosoideae

LOCAL NAMES

Bengali (safed babul); Burmese (ta-noung); English (brewers Acacia, white-bark acacia, distillers Acacia); Gujarati (hiwar, haribawal, himvaro, pilo-bawal); Hindi (rhea, karir, haribawal, reru, rinj, safed babul, safed kikkar, rayni); Indonesian (pelang, besok, opilan, pilang); Tamil (sarai, vel-vaghe); Thai (chalaep-daeng, phayamai); Vietnamese (a bu, chaaep daeng, a kawa)

BOTANIC DESCRIPTION

Acacia leucophloea is a large thorny tree attaining a height of 35 m and a diameter at breast height of 100 cm. Trunk stout, dividing into several large diameter branches. Open-grown specimens have a characteristic wide umbrella-like crown. Bark white to yellowish gray, smooth, exfoliating in long strips, on old trees becoming black and rough.

Leaves bipinnately compound, with 4-13 pairs of pinnae, each with 5-30 pairs of leaflets. Circular glands found on the rachis below the junction of paired-pinnae. The feathery green foliage offers a strong contrast to the light-coloured bark.

Spines 2-5 mm long, at the base of leaves.

Flowers conspicuous, light-yellow to cream in colour, in pendunculate glomerules aggregated in terminal or axillary panicles, 5-merous, corolla 1.2-2 mm long.

Pods yellow, green or brown in colour, flat and fairly straight, 10-20 cm long, 5-10 mm wide, containing 10-20 smooth, oblong seeds, dark brown in colour, 6 x 4 mm in size.

The generic name 'acacia' comes from the Greek word 'akis', meaning point or barb.

BIOLOGY

The leaves may fall during the cold (February) or dry seasons and re-grow with the rains (April) in India. Flowers are borne in abundance during the rainy season. Flowering occurs July-November in India and December-March in Indonesia. Pods ripen from April-June.



Acacia leucophloea pods (Anthony Njenga)

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ECOLOGY

A. leucophloea is a tree of tropical and subtropical climate. It is a component of dry-forests, savannas, bush woodlands, and desert ecosystems from sea level to elevations of 800 m. In these areas, rainfall is only 400-1 500 mm/year and dry seasons may persist for 9-10 months. Temperatures are extreme, varying from -1-49 deg C.

BIOPHYSICAL LIMITS

Altitude: 0-800 m

Mean annual temperature: 6-49 deg C.

Mean annual rainfall: 400-1500 mm

Soil type: *A. leucophloea* is common on sands, infertile rocky soils, limestone soils, organic clays and alluvial areas.

DOCUMENTED SPECIES DISTRIBUTION

Native: Bangladesh, India, Indonesia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam

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 germinated seeds are cooked and eaten as a vegetable. They contain crude protein 27 % dry matter. The other major nutrient contents are crude lipid 5 %, crude fibre 7 %, ash 4 % and total crude carbohydrates, 58 %. The seeds are a rich source of minerals such as calcium, magnesium, phosphorus, iron and manganese. The predominant seed protein fractions are globulins and albumins. The essential amino acids, cystine, methionine, tyrosine and phenylalanine, have been found to be low and threonine, valine, isoleucine and lysine fairly high compared with the FAO/WHO/UNO amino acid recommended pattern. The lipids contain high amounts of unsaturated fatty acids in which linoleic acid (51 %) is the major fatty acid.

Fodder: *A. leucophloea* is an important dry-season fodder and pasture tree throughout its range. Leaves, tender shoots and pods are eagerly consumed by goats, sheep and cattle. Leaves contain 15% crude protein and 19% crude fiber. However, due to hydrocyanic acid toxicity *A. leucophloea* should not be used as a sole feed.

Fuel: It is appreciated as firewood and is suitable for charcoal production.

Fibre: Fibres from the inner bark are used to make fish nets and rough rope.

Timber: Its wood is strong, heavy and hard, density 720-890 kg/cu m at 15 % moisture content. It seasons well and takes a good polish. The brick-red heartwood is very beautiful and is used to make decorative furniture. The pale yellow sapwood is perishable. The utilization of this species is limited because its wood has irregular interlocked grain, a rough texture and is difficult to work. Commodities produced from the wood include poles, farming implements, carts, wheels, turnery, indoor construction timbers, flooring and furniture.

Gum or resin: A water-soluble gum of fair quality can be extracted from the stem and root bark.

Tannin or dyestuff: The leaves yield a black dye and the bark produces a reddish-brown substance used to manufacture dyes and tannins.

Alcohol: The bark is used to distill liquor in India.

Medicine: Gum is used medicinally.

SERVICES

Shade or shelter: During dry seasons, this tree protects livestock and understory pasture from excessive temperatures. The tree is suitable as a firebreak due to its fire resistance.

Reclamation: *A. leucophloea* is a good reforestation species for poor soils in low rainfall areas.

Nitrogen fixing: It fixes atmospheric nitrogen through a symbiotic relationship with *Rhizobium* bacteria which enables it to survive on infertile sites.

Ornamental: The vivid colors of its leaves, flowers and bark make *A. leucophloea* a beautiful, yet underutilized, ornamental tree.

Intercropping: Interplanting *A. leucophloea* at low densities with crops or pasture grasses can benefit both crops and trees.

TREE MANAGEMENT

Direct sowing in the field can be done in lines 3 m apart and thinned after the first growing season to 0.5 m. Seedlings should be planted at 2.5-3 m x 2.5-3 m in July when 1 year old. Weed control must be maintained for a minimum of two years. Livestock must be excluded from plantations. Annual cultivation around the seedlings improves growth and survival. On fertile soils, *A. leucophloea* seedlings grow quickly, up to 60 cm a year. Under irrigation, height growth may reach 7-10 m in 5-6 years. Seedlings are light demanding and sensitive to weed competition, fire and frost. In order to exploit sufficient soil moisture, seedling root growth generally exceeds shoot growth. Once established, trees are very tolerant of drought, fire and frost. Pruned or injured trees produce thorny branches and stump sprouts. The tree coppices well, mean annual increment over the 12-year rotation period is 9 cu m/ha of stem wood and 11 cu m/ha for wood over 7 cm diameter.

GERMPLASM MANAGEMENT

There are 37 000-50 000 seeds/kg. Pretreatment is necessary to break the hard seed coat. To encourage uniform germination, seed should be scarified either by submerging in boiled water for 24 hours or soaking in sulfuric acid for 10-30 minutes followed by soaking in cool water for 24 hours. The visibly swollen seeds should be sown immediately. Seed storage behaviour is probably orthodox. Viability can be maintained for up to 2 years at room temperature.

PESTS AND DISEASES

Seeds are attacked by *Bruchidius andrewesi*.

FURTHER READNG

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SUGGESTED CITATION

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