

Carapa guianensis

crabwood, bastard mahogany, andiroba

Aublet

Meliaceae

LOCAL NAMES

English (bastard mahogany, crabwood, carapa); French (cabirma de Guinea, bois rouge, carapa, andiroba); Spanish (andiroba, caobilla, najesi, cedro macho, masábalo, cabrima de guiana); Trade name (bastard mahogany, crabwood, andiroba)

BOTANIC DESCRIPTION

Carapa guianensis is a deciduous or semi-evergreen, monoecious, medium-sized to large trees up to 35 (max. 55) m tall; bole straight and cylindrical; branchless up to 20 (max. 30) m; up to 100 (max. 200) cm in diameter, sometimes fluted, with short buttresses up to 2 m high. Bark surface flaking into squarish scales or in horizontal strips, light grey to greyish brown or dark brown, sometimes reddish; inner bark fibrous, red or pinkish brown. Young plants produce taproots but the trees tend to become surface rooted.

Leaves alternate, paripinnate with a dormant glandular leaflet at the apex, exstipulate; leaflets opposite, entire. Shows gigantic leaves in the monocaulous juvenile stage, decreasing in size when branching is initiated.

Flowers small, white, borne in a large, axillary or subterminal thyrse; unisexual but with well-developed vestiges of the opposite sex; tetramerous to pentamerous (max. sextamerous); calyx lobed almost to the base; petals slightly contorted.

Fruit dehiscent, 4-lobed, pendulous, subglobose, woody capsule containing 2-4 seeds in each lobe. Seeds smooth, pale brown, angular, with woody sarcotesta.

BIOLOGY

Flowering period depends heavily on the climate but is usually concentrated in 1 short period per year. Pollination is probably by insects; trees are often found swarming with ants visiting extrafloral nectaries at shoot apices and leaflet tips. Usually only 1-2 fruits in an inflorescence mature in 8-12 months. Seeds float and are thus dispersed by water but at least in Costa Rica, are also scatter-hoarded by agoutis and occasionally by pigs.

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ECOLOGY

C. guianensis is a locally common element of the canopy or subcanopy layer of the South American evergreen to semi-evergreen rainforest. It sometimes occurs as a dominant tree or even in almost pure stands and is found predominantly along rivers and on periodically flooded or swampy locations but also on higher ground and low hills. In South America, foresters recognize 2 types of wood: 'red' or 'hill crabwood' and 'white crabwood'. The former is said to be superior and is obtained from trees growing on higher land, whereas white crabwood is derived from trees in swampy locations.

Distributed from Central America (Belize) and the Caribbean south to Amazonian Brazil.

BIOPHYSICAL LIMITS

Altitude range: 0 - 1200 m

Mean annual rainfall: 1500 - 3200 mm

Soil: Prefers a light, medium or heavy textured soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, French Guiana, Guadeloupe, Guyana, Haiti, Honduras, Panama, Peru, Puerto Rico, Surinam, Trinidad and Tobago, Venezuela

Exotic: Indonesia, Malaysia, Singapore



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

Fibre: The wood is suitable for the production of pulp and paper.

Timber: *C. guianensis* yields a medium-weight hardwood with a density of 580-750 kg/cubic m at 12% mc. Heartwood pale pink to red-brown when fresh, darkening to a medium reddish-brown to greyish sapwood; grain generally straight, sometimes interlocked; texture fine to coarse. Seasoning must be done carefully to avoid warping and checking. The timber is moderately soft to moderately hard, strong and moderately tough. Good working properties with a moderate dulling effect on tools and a slight tendency to split on nailing; glues well and polishes satisfactorily. Heartwood is moderately durable and resistant to termites.

Its main attraction is for high-quality furniture and cabinetwork, stairs and flooring, and as veneer for furniture, interior work and plywood. It is used for masts, building material and as a substitute for okoumé (*Aucoumea klineana*) and walnut (*Juglans regia*). In Colombia, shoemakers prefer it for making shoe pieces.

Tannin or dyestuff: The bark is used for tanning.

Lipids: Oil obtained from the seeds, called 'crab oil' or 'andiroba', is well known and used as lamp oil and for making soap and candles.

Poison: Seed oil has insecticidal properties.

Medicine: The bark contains an alkaloid, carapina, that is used as a febrifuge. Leaves boiled in water are applied to itchy skin; a fruit rind decoction is taken orally for fever and intestinal worms; a seed oil decoction is taken orally for hepatitis and tetanus and applied externally for skin diseases and ringworm.

SERVICES

Soil improver: *C. guianensis* is suitable for enrichment planting.

Ornamental: Planted as an ornamental in the Caribbean, where it is locally naturalized.

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TREE MANAGEMENT

In South America, *C. guianensis* showed a mean annual diameter increment of 1.6-2 m in 25-year-old plantations. A large tree may produce 750-4000 seeds/year, but seed production may be almost zero in unfavourable years.

C. guianensis may be considered for cultivation on swampy soils, since in a trial in Indonesia it proved resistant to oxygen deficiency, and mortality was not observed until after 90 days. In swamp forest, trees reach felling size in 20-25 years; at higher elevations probably in 40-60 years. *Carapa* is moderately tolerant of shade, but full overhead light is required for fast growth. It coppices freely and is resistant to fire.

GERMPLASM MANAGEMENT

Seed storage behaviour is recalcitrant; 100% germination after 2 months, nothing after 3 months of open storage with 90% r.h., or 24-31 deg. C; no seeds survive following 7 months of storage in paper bags at 12 deg. C and 30% r.h., or 14 deg. C and 80% r.h., whereas viability is halved with fresh seeds sealed in polythene bags at these temperatures after 7 months; there is loss in viability on desiccation. There are 40-110 seeds/kg.

PESTS AND DISEASES

Sapwood is susceptible to *Lyctus* and pinhole borer attack. Logs are susceptible to severe ambrosia beetle attack. *C. guianensis* is attacked by shoot borer, for example *Hypsipyla grandella*; the insects tunnel into the leading shoots and cause malformation of the stem. Young trees are badly browsed by deer.

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FURTHER READNG

Sosef MSM, Hong LT, Prawirohatmodjo S. (eds.). 1998. PROSEA 5(3) Timber trees: lesser known species. Backhuys Publishers, Leiden.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestry Database:a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/af/treedb/>)