

## *Acacia mangium* Willd.

**Family:** Fabaceae (bean family); **Subfamily:** Mimosoideae

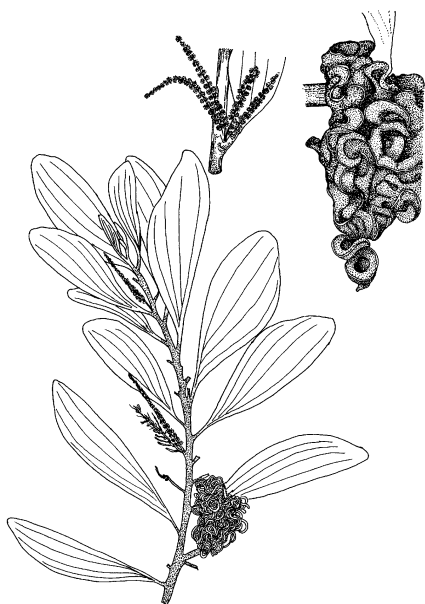
**Common Name:** black wattle, brown salwood, hickory wattle, mangium, sabah salwood, Akasia, Coast Myall, Mountain Brigalow, Sally Wattle

**Vernacular names:** Filipino – *maber*; Indonesian – *mange hutan, nak, tongge hutan, tange hutan, laj, jerri*; Malay – *mangium*; Polynesia – *arr*; Spanish – *zamorano*; Thai – *kra thin tepa, krathin-thepa*; Pohnpei – *tuhkehr pwelmwahu*;

**Trade name:** brown salwood

**Description:** Evergreen tree, 25-35 m in height. Bole in older trees branchless for up to 15 m, fluted, up to 90 cm in diameter. Leaves (phyllodes) large, 25 cm in length and 3.5-10 cm in width. Inflorescence is composed of many tiny white or cream flowers in spikes. Flowers are bisexual. Dehiscent pod tightly coiled when ripe, brown in colour, slightly woody, 3-5 mm wide and 7-10 cm long. Seeds are black and shiny, longitudinal, elliptical, ovate to oblong, 3-5 mm by 2-3 mm. There are about 66,000-120,000 seed/kg.

**Uses:** As food (vegetable); fodder (for buffalo and cattle); fuelwood (4,800-4,900 kcal/kg); for charcoal and charcoal briquettes and artificial carbon; pulpwood; timber for construction, boat building, furniture and cabinet making, veneer; cabinets, handles of sporting goods, boxes, crates, door frames, window parts, mouldings, particle board and pulp; tannin (18-39%); sawdust as substrate for shiitake mushrooms; erosion control; shade tree; wind or firebreak;

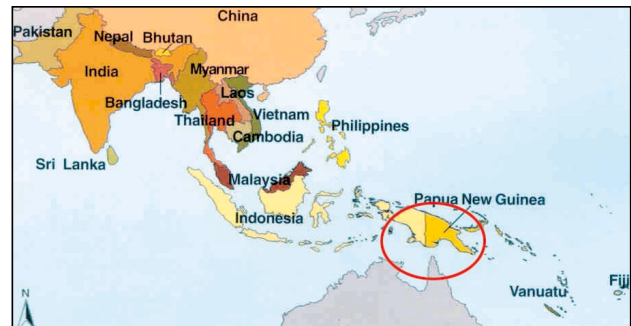


Leaves, flower and seeds of *Acacia mangium*.

nitrogen fixation; ornamental tree; for intercropping with maize or peanuts; leaves as soil mulch.

**Reproductive biology:** The species flowers precociously producing viable seed within 24 months after planting but commercial quantities are obtained after 4 years. It requires about 6-7 months from the onset of flower buds to pod maturity. The tree is a hermaphrodite and generally outcrosses, with a tendency towards selfing. Insects are the general pollinators; active insect vectors are *Trigona* and *Apis* spp. It flowers in May and the seed matures in October-December in its native range in Australia. Mature fruits can be collected in July in Indonesia and late September in Papua New Guinea. Somatic chromosome number is  $2n=26$ .

**Genetic diversity and conservation status:** Natural stands occur in Northern Queensland, the Western Province of Papua New Guinea and the Indonesian provinces of Irian Jaya and Maluku. These are examples of *in situ* conservation areas. Genetic differentiation between populations exists. High levels of inbreeding are possible due to the absence of strong self-incompatibility system.



Natural distribution of *Acacia mangium*.

An international provenance trial was conducted in the 1980s. The best performers were the Papua New Guinea and the Claudie River provenance from north Queensland. Seed production areas and seed orchards have been established in Australia, Indonesia, Malaysia and Viet Nam. The Australian Tree Seed Centre of CSIRO maintains seed stocks of representative provenances from the natural range of the species.

Significant areas of plantations have been or are being established in India, Indonesia, Malaysia, Papua New Guinea, Sri Lanka, Thailand and the Philippines. There are patch plantings in Saipan, Pohnpei and Yap. The plantations, seed orchards, seed production areas and seed stocks are examples of *ex situ* conservation strategies. The species appears to be invasive in Sabah and Africa and on Melville Island, Northern Territory, Australia.

**Research on genetic conservation and breeding:** Seed storage behaviour is orthodox and seed can be stored at 4-5°C with little loss in viability (6%) after 1-2 years storage. Pollens are successfully preserved for three years using vacuum drying.

Improved breeds from wide genetic bases of the best provenances are being developed by Australia and several Southeast Asian organizations. Seed orchards are established in Australia, Indonesia, Malaysia, Philippines and Thailand. *A. mangium* forms hybrids with *A. aulacocarpa*, *A. auriculiformis*, *A. crassicaarpa*, *A. leptocarpa* and *A. polystachya*. The resulting progenies inherit the better stem straightness of *A. mangium* and the self-pruning ability and better stem roundness of *A. auriculiformis*. An experimental *A. mangium* x *A. auriculiformis* seed orchard established in Indonesia.

Hybrid clones are propagated by tissue culture of meristems and by striking cuttings from coppice shoots. An integrated genetic linkage map was constructed which can provide a sound basis to carry out molecular breeding of the species. Subsequently, a multiallelic, PCR-based, co-dominant microsatellite loci was developed to make possible efficient studies of gene flow and breeding systems for *A. mangium*, a species with low allozyme variation.

**Agencies active in genetic conservation and/or research of the species:** CSIRO, Australia; World Agroforestry Centre and CIFOR, Indonesia; FRIM, UPM and Forest Research Centre Sabah, Malaysia; Department of Forests, PNG; Ecosystems Research and Development Bureau, Paper Industries Corporation of the Philippines and Provident Tree Farm Inc., Philippines; Royal Forest Department and Kasetsart University, Thailand; and Forest Science Institute of Viet Nam and Research Centre for Forest Tree Improvement, Viet Nam.

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