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Aquilaria malaccensis Lam.

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Aquilaria malaccensis Lam.

Taxonomy and nomenclature

Family: Thymelaeaceae

Synonyms: *Aquilariella malaccensis* (Lam.) v. Tieghem, *Aquilaria agallocha* Roxb.

Vernacular/common names: agarwood, Malayan eagle wood, Malayan aloe wood (Eng.); calambac, calambour (Fr.); gaharu (Indonesia); karas (Sundanese); kekeras and kepang (Malaysia).

Related species: The genus *Aquilaria* consists of a number of species in SE Asia – Pacific several of which produce 'eagle wood'. The most widely used are *A. crassna* (Indochina) and *A. sinensis* (S. China). Because of the valuable agarwood several *Aquilaria* species have been overexploited and are critically endangered.

Distribution and habitat

A. malaccensis occurs in India, Burma, Malaysia, Philippines and Indonesia. In Indonesia mainly in Sumatra (Sibolangit, Bangka, Jambi, Riau and South Sumatra), Kalimantan, Sulawesi, Moluccas and Papua. It is found in primary and secondary forest, mainly in lowland and on hillsides at 200-750 m altitude, Koeppen climate type A – B with temperatures of 14 – 32°C and annual rainfall of 2.000-4.000 mm. It grows on sandy clay soil.

Uses

The wood is hard and light with rough texture, white or brownish yellow. Main use is the agarwood, a highly appreciated and priced fragrant wood caused by accumulation of scented resin. Production of agarwood may be influenced both by genetic and environmental factors but the general understanding is that the fragrant oleoresin that permeates the heartwood of some trees is produced as a response to wounding and/or fungal infection. Agarwood contains more than 12 chemical components that can be extracted. They have a wide use in medicine (general pain reducer, dental pain, kidney and rheumatism medicine), as venom repellent, in perfume and as incense raw material. Wood without or with low content of resin can be used for boxes, interior or veneer. The inner fibrous bark has occasionally been used locally as raw material for clothing and ropes.

Aquilaria malaccensis Lam. in Desa Pulau Aru, Kec. Tabir Ulu, Kab. Merangin. B. Twig, flower and leaf.

Botanical description

Up to 20 - 40 m tall and 60 cm in diameter. Young bark is light brown with fine hairs, older bark is smooth and whitish in colour. Wood without resin is white, light and soft, while wood with resin is hard, dark and heavy. Leaves alternate, elliptic or lanceolate, 3-3.5 cm wide and 6-8 cm long with 12-16 pairs of veins. Inflorescence a terminal or axillary umbel. Flowers hermaphroditic, up to 5 mm long, fragrant and yellowish green or white.

Fruit and seed description

Fruit: green, egg-shaped capsule, leathery exocarp with fine hairs, 4 cm long and 2.5 cm wide. There are two seeds per fruit.

Seed: ovoid, blackish brown and densely covered with red-brown hair. There are about 1500 seeds per kg.

Flowering and fruiting habit

The tree starts flowering and fruiting at the age of 5-6 years and medium sized trees are reported to produce about 1.5 kg of seed during good seed years. Flowering and fruiting occur in the dry season. In Sumatra, flowering and fruiting season is twice a year. Trees flowering in July-August have mature fruits in November-December; trees flowering in March-April bear fruits in July-August.

Harvest

Mature fruits are blackish brown. The fruits should be collected directly from the tree.

Processing and handling

Seed is separated from the fruit by drying until the fruit splits open.

Storage and viability

Seeds are recalcitrant. Viability drops when the seeds are dried to a moisture content between 35% and 20% mc, with rapid loss in viability occurring below 20% mc and total loss at 7-11% mc. The seed cannot be stored for long and it is recommended to sow shortly after harvest. Storing in open sacks in a dry room may prolong viability.

Sowing and germination

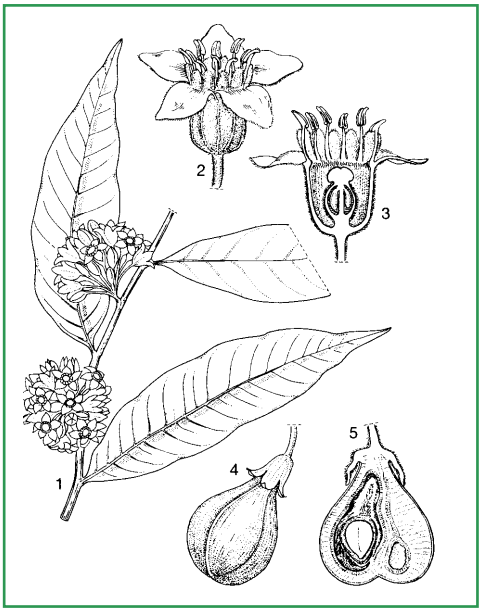
Viable and non-viable seeds can be separated before sowing by flotation. Empty or dead seed float while full and viable seeds sink in water. A light sowing media is preferred e.g. prepared by mixing soil, organic compost and paddy husk 1:1:1. Seeds are sown on top of the seedbed, then pressed lightly into the medium and covered with a layer of 1-2 cm fine compost. Nursery beds, and later transplant beds, should be kept under shade. Most seeds germinate within three weeks and fresh seed should have about 70-80% germination. When the seedlings have three leaves they are transplanted into polybags. Before planting out, the shade should be gradually reduced.

Phytosanitary problems

Seedlings of *A. malaccensis* are prone to a leaf tip flea, which sucks leaf fluid of the seedling and causes leaves to curl and seedlings to get stunted. Treatment with pesticide may be necessary. Germinating seeds and young seedlings are prone to damping off disease caused by fungi. Careful preparation of seedbed avoiding too much moisture is the best precaution.

Vegetative propagation

Vegetative propagation is relatively easy. Mass propagation can be done by rooting of cuttings after treatment with rooting hormones. Other types of vegetative propagation are marcotting (air-layering), occultation and tissue culture.



Aquilaria malaccensis Lam. 1. twig, 2. flower, 3. longitudinal section of flower, 4. fruit, 5. longitudinal section of fruit. From: Plant Resources of South-East Asia 19.

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