

SEED LEAFLET

No. 18 September 2000



Swietenia mahagoni (L.) Jacq.

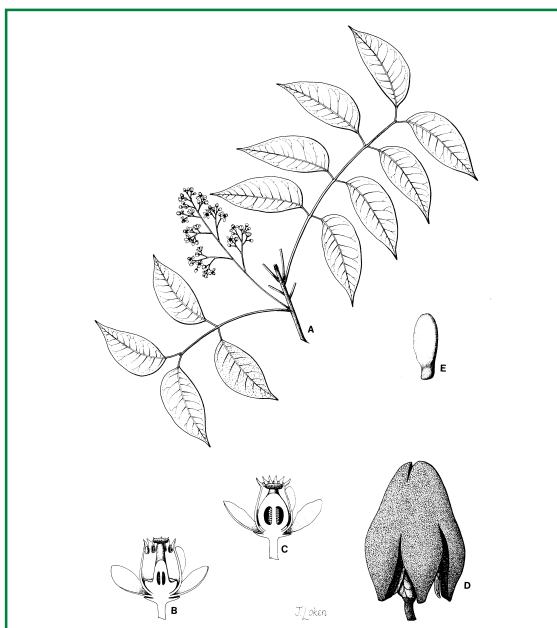
Taxonomy and nomenclature

Family: Meliaceae

Synonyms: *Swietenia mahagoni* (L.) Lam., *Swietenia fabrilis* Salisbury, *Cedrus mahogany* (L.) Miller

Vernacular/common names: Small leaved, West Indian, Spanish or Cuban mahogany (Eng.); caoba (Sp.); madeira (Bahamas); coabilla (Cuba); caoba dominicana (Dom.Rep.); acajou (Fr., Haiti).

Related species of interest: The genus consist of two other species, *S. macrophylla* and *S. humilis*. The three species are poorly defined biologically, in part because they hybridise freely. *Swietenia aubrevilleana* Stehle & Cusin is a putative hybrid between *S. macrophylla* and *S. mahagoni*.



A, flowering branchlet; B, male flower; C, female flower; D, fruit; E, seed. Illustrations by J. Loken from Pennington, T. D., 1981. Meliaceae, Flora Neotropica, 28. Used with permission.

Distribution and habitat

S. mahagoni is a humid zone species, with natural distribution in the Caribbean region (S. Florida, Bahamas, Antilles, Haiti and Jamaica). The species is overexploited in much of its natural area of distribution and has been registered on CITES Appendix II (1992) as an endangered species. It has been extensively planted mainly in southern Asia (India, Sri Lanka, Bangladesh) and in the Pacific (Malaysia, Philippines,

Indonesia and Fiji), and has been introduced into cultivation in West Africa. The most important ecological characteristic that distinguishes *S. mahogany* from *S. macrophylla* is the ability to grow under dry conditions. It occurs naturally in climates with annual rainfall of only 580-800 mm. The yields from plantations is generally lower than for *S. macrophylla* but on dry sites it is superior and the wood quality is better.

Uses

The commercial importance of this species is insignificant as available quantities are small. It has potential use for large scale timber production plantations, especially in dry areas, due to the excellent timber quality. The wood density is 560-850 kg/m³ at 15% moisture content. It is also used in agroforestry, for soil improvement and as an ornamental.

Botanical description

Evergreen to semi-evergreen tree, up to 30-35 m. Bark grey and smooth when young, turning dark brown, ridged and flaky when old. Leaves clustered, glabrous, 12-15 (-25) cm long paripinnately compound with 2-4 pairs of leaflets. Leaflets ovate-lanceolate, 5-6 cm long, 2-3 cm wide, dark green, glabrous. Flowers unisexual, small, white in 8-15 cm long slender panicles.

Fruit and seed description

Fruit: erect, 5-10 cm long, 3-6 cm in diameter, oblong, usually 5-celled dehiscent capsule. The valves are thick and becoming woody with a coriaceous surface when mature. Outer valves 4-5 cm thick, inner valves thin.

The fruit splits open from the base or from the base and the apex simultaneously when dry. The centre of the fruit is a thick, woody, 5-angled columella extending to the apex from which the seeds hang pendulous by their wing, leaving conspicuous seed scars after their release. There are usually about 35-45 seeds per fruit.

Seed: chestnut brown, 4-5 cm long, compressed, crested and extended into a wing at the attachment end. The cotyledons are fused in the upper two thirds along the adaxial surface. The seeds are dispersed by wind. There are 3,350-3,500 seeds/kg.

Flowering and fruiting habit

Flowers are unisexual and the trees monoecious. Pollination by insects. Hybridisation is frequent, especially with *S. macrophylla* wherever the species grow together. Usually only one flower of the inflorescence develops into a fruit, the other flowers being aborted, even if fertilisation has taken place. Development from flower to mature fruit takes from 8 to 10 months. Due to the long development time for the fruit, crop assessment can usually be undertaken several months before harvest.

Flowering varies according to climate i.e. geographical site, it usually takes place shortly before the rainy season. *S. mahagoni* flowers in the Caribbean Islands between April and July and the fruits are mature 8-10 months later, between January and March. Mahoganies usually have regular annual flowering and fruiting of from about 10 to 15 years of age.

Harvest

The fruits are preferably collected from the trees just before opening or from the ground immediately after seed fall. Seed production varies according to site and year. A crucial factor for seed production is pollination efficiency, which may be erratic especially outside the natural area of distribution.

Processing and handling

Mature dry fruits or dry seeds collected from the forest floor can be stored for some days in sacks without significant deterioration. However, in order to reduce bulk it is often preferable to initiate processing in the field. The fruits will split open when dried for 1-4 days, depending on maturity, after which the seeds are easily released by gentle shaking or raking of the fruits. Fruit parts (valves and columella) are removed by hand. Further reduction of bulk by manual dewinging may be desired.

Typical moisture content for fresh seeds is 10-12%. After extraction, the seeds should be further dried to a moisture content of app. 6-7 % for short-term storage, or down to 4% for long-term cold storage.

Storage and viability

Germination percentage of fresh seeds is 60-90 %. Storage at ambient room temperature about 1-2 months. Storage at 15°C prolongs viability to 3-6 months. Cold storage (2-5°C) with 4-5% moisture content extends viability up to 1 or more years.

Pretreatment

Pretreatment is generally not necessary but germination of stored low moisture content seed may be enhanced by soaking in water for 12 hours.

Sowing and germination

The seeds are sown in a bed of light sand in 3-7 cm deep furrows or holes or directly in containers. Germinating seeds should be under shade and kept moist. Seeds will germinate in 10-21 days. Germination is hypogenous. The seedlings are kept under shade until outplanting. The seedlings can be planted in the field when they are about 50-100 cm tall.

Selected readings

Lamb, F.B., 1960. *An approach to mahogany tree improvement.* Carib. For. 21 (1/2): 12-20.

Lee, H.Y., 1967. *Studies in Swietenia (Meliaceae): Observations on the sexuality of the flowers.* Jour.Arnold.Arb. vol 48: 101104.

Lyhr, K. P., 1992. *Mahogany – Silviculture and Use of American Mahogany (Swietenia spp.).* The Royal Veterinary and Agricultural University, Copenhagen.

Pennington, T.D. and Styles, B.T. 1981. *Flora Neotropica Monograph No.28, Meliaceae.* New York Botanical Garden.

Soerianegara, I., Lemmens, R.H.M.J., eds., 1993. *Plant Resources of South-East Asia No. 5(1). Timber trees: major commercial timbers.* Wageningen, Netherlands: Pudoc Scientific Publishers.



Mature tree growing in open ground in Sri Lanka. Photo: D.K.N.G. Pushpakumara

THIS NOTE WAS PREPARED BY
DANIDA FOREST SEED CENTRE

Authors: Lars Schmidt and Dorthe Jøker

Danida Forest Seed Centre	Phone: +45-49190500
Krogerupvej 21	Fax: +45-49160258
DK-3050 Humlebaek	Email: dfsc@sns.dk
Denmark	Website: www.dfsc.dk