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CATIE

SEED LEAFLET

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Calophyllum brasiliense Cambess.

Taxonomy and nomenclature

Family: Clusiaceae

Synonyms: *Calophyllum chiapense* Standley, *C. rekoi* Standley, *C. antillanum* Brit. Standley.

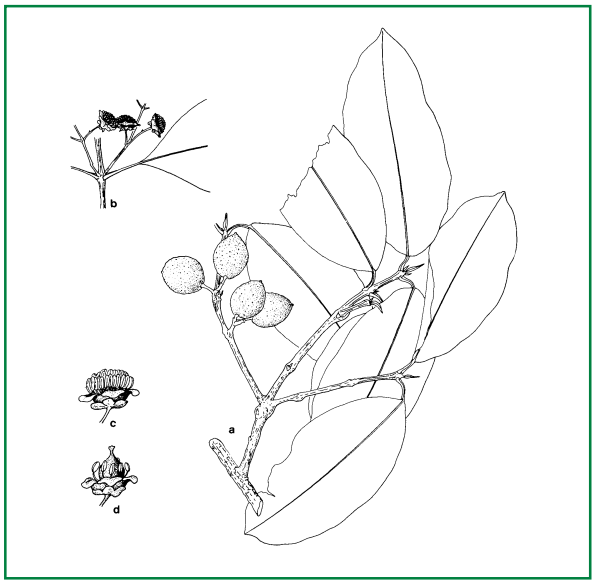
Vernacular/common names: Santa maría, maría, jaca, jacareúba, Brazil beauty-leaf.

Distribution and habitat

The natural range includes southern Mexico, Central America and northern South America. It is also found in the Antilles from Cuba to Jamaica and Trinidad-Tobago. It grows as a canopy tree in the humid tropical forests. It is found from sea level and up to 1500 m altitude in areas with annual rainfall of more than 3000 mm and temperatures of 24-28°C. It grows well on sloped areas with alluvial or clay soils even when very humid and acid (pH 4.5-6.0).

Uses

The species is mainly grown for the attractive wood. It is used for both outdoor and indoor constructions and is durable in contact with soil and water. Depending on origin, the wood is heavy or only moderately so, with specific weight of 0.45 – 0.69 g/cm^3. The fibres can be used for paper pulp and the latex has medicinal properties.



a, fruiting branch; b, part of inflorescence; c, staminate (male) flower; d, bisexual flower. From: Flores 1994.

Botanical description

Tree up to 45 m tall with straight bole without butresses and branchless for about 2/3 of the height. The bark is thick and contains a yellow-green latex. Leaves are simple and very variable in size depending on climatic conditions, the smallest leaves on trees growing in dry areas. The species is andromonoecious, i.e. each tree has both male and bisexual flowers. The flowers are about 1 cm in diameter with small, cream coloured petals. Male and bisexual flowers in separate, 3-9 cm long inflorescences, each with 2-10 flowers.

Fruit and seed description

Fruit: round berry, 2.5-3.0 cm long, green at first later with brown patches. The pericarp is leathery and dotted with numerous laticifers containing yellow latex. Each fruit contains one, large seed.

Seed: 1.8-2.3 cm long, with thick, brown testa and large, oily cotelydons. There are 415-440 seeds/kg.

Flowering and fruiting habit

In dry areas the trees defoliate at the end of the dry season but in other places the leaves remain. The flowers are visited by numerous insects but the pollinator is not known and it is also unknown whether both male and bisexual flowers produce viable pollen. There are large variations in flowering and fruiting times between zones, but in most of the geographical range flowering occurs in June-July. Most trees bloom only once every year but in Central America there can be a second period of flowering in November-December. The fruits mature in October-November but it is possible to find some fruits in December-January. In Central America a second fruiting often occurs in May-July. The trees begin to produce fruits when they are about 5 years old. They produce fruits every year but the annual harvest varies in size.

Harvest

The fruits are green at maturity but the colour becomes less bright as they ripen. When the pericarp is easy to remove, the seeds are mature and ready for collection. The fruits can be collected directly from the tree or from the ground. 3 kg of fruits yield about 1 kg seed.

Processing and handling

The mature seeds have high moisture content and the fruits must be transported to the processing site in gunny sacks or open bags allowing respiration. At the processing site the fruits are dried for one day in the shade. Extraction is done manually by placing the fruits in one layer in trays and crushing them gently to break the pericarp. Once the pericarp is loose it is easily removed.

Storage and viability

Fresh seeds have a moisture content of 60% and storage behaviour is probably recalcitrant but the results are not conclusive. A recent trial in Costa Rica showed that the seeds could be desiccated to 25% moisture content and still retain germination close to 100%. The preliminary results also indicate that the seeds are sensitive to 5°C.

Until more is known, it is recommended to store the seeds in loosely folded bags at no less than 25% moisture content and temperatures above 15°C.

It is also possible to store whole fruits and extract the seeds just before germination.

Dormancy and pretreatment

The seeds are not dormant but it is advisable to soak them for 24 hours prior to germination in order to soften the seedcoat. The soaking ensures a more uniform germination and minimises the number of seedlings with abnormal growth.

Sowing and germination

Germination is epigeal. Although the cotyledons remain inside the seedcoat, the petioles elongate and perforate the seedcoat to make an opening through which the shoot emerges. In 10-15% of the germinating seeds the petioles fail to make way for the shoot and the shoot is often damaged. In these cases axillary buds give rise to one or two shoots but these seedlings show slow or abnormal growth and have a lower survival rate.

The radicle begins to emerge after three weeks and in the nursery germination is normally complete after one month. If the seeds are germinated in a cabinet, germination may take longer. The seeds can be sown directly in containers or in germination boxes and then transferred to containers when the radicle has emerged. When the seedlings have been transferred they should be kept in the shade for 15 days. When the seedlings after 5-6 months are 25-30 cm tall they are ready for planting in the field.

Phytosanitary problems

The larvae of an unknown coleoptera can attack the seeds and the fruits are predated by monkeys and rodents.

Selected readings

CATIE, 1999. *Calophyllum brasiliense* Camb.. Nota Técnica sobre Manejo de Semillas Forestales, no. 58.

Flores, E. M., 1993. *Calophyllum brasiliense.* Trees and Seeds from the Neotropics Vol. 3, no 1. Museo National de Costa Rica.

IPGRI/DFSC. Preliminary results from the Project on Handling and Storage of Recalcitrant and Intermediate Tropical Forest Tree Seeds, phase 2.

Fruits and seeds of *Calophyllum brasiliense*. Photo: Dorthe Jøker, DFSC.

THIS NOTE WAS PREPARED IN COLLABORATION WITH CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA

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