

Myroxylon balsamum

santos mahogany, Peruvian balsam, incienso, balsamo, balsam of

(L.) Harms

Fabaceae - Papilionoideae

LOCAL NAMES

English (Tolu balsam, Peru balsam); Portuguese (óleo-bálsamo, cabreúva, cabreúva-vermelha); Spanish (quinoquino, quina, palo de balsamo, Bálsamo de sonsonate, balsamo); Trade name (santos mahogany, Peruvian balsam, incienso, balsamo, balsam of Peru)

BOTANIC DESCRIPTION

Myroxylon balsamum is a tree growing to 34 m in height and 1 m in diameter. The bark is generally grey and spotted with rough yellow areas.

Leaves oddly pinnate, 3-11 leaves, 6-9 cm long and 3-4 cm wide with scattered translucent, glandular oil dots or lines.

Flowers are whitish, corolla 5-petalled.

Pods winged 8-13 cm long and 2.5 cm broad containing one seed at the tip.

The generic epithet is derived from Greek "myron" meaning perfume or sweet oil and "xylon" wood. There is confusion about the number of species and varieties in the genus *Myroxylon*, however, 2 species are assigned to the genus; *M. balsamum* and *M. peruiferum* both native to Central and South America. Two varieties are recognized namely var. *balsamum* (tolu balsam) and var. *pereirae* (Peru balsam).

BIOLOGY

Seeds are wind dispersed and may be collected from the tree as they begin to mature. Balsam trees flower from July-September and set seed in October and November in Brazil.



Myroxylon balsamum: Mature tree (Soraya Alvarenga Botelho)



Myroxylon balsamum: Leaves and flowers (Soraya Alvarenga Botelho)



Myroxylon balsamum: Flowers (Soraya Alvarenga Botelho)

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ECOLOGY

M. balsamum grows in areas with annual precipitation ranging from 1 350-4 030 mm (mean 2 640 mm), annual mean temp of 27-32 deg C, and soils with mildly acidic pH.

BIOPHYSICAL LIMITS

Altitude: up to 700 m

Mean annual temperature: 27-32 deg C

Mean annual rainfall: 1 350-4 030 mm

Soil type: Grows on soils with pH 5-8.

DOCUMENTED SPECIES DISTRIBUTION

Native: Argentina, Brazil, Colombia, El Salvador, Mexico, Panama, Peru, Venezuela

Exotic: India, United States of America



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

Timber: Balsam wood is used for flooring, furniture, cabinetwork, turnery and railroad ties. It is moderately difficult to work but can be finished smoothly with a high natural polish. Heartwood is reddish brown, turning deep red or purplish upon exposure, has a spicy scent and is very resistant to fungal decay. The wood has a density of 900-1 090 kg/cubic metre and a specific gravity of 0.74-0.81. Shrinkage values from green to oven dry are very low for a wood of this density. The wood is not commercially marketed.

Gum or resin: *M. balsamum*'s var. *balsamum* and *pereirae* yield gums called tolu and Peru balsam, respectively. These gums are used mainly as flavouring in cough syrups, soft drinks, confectionaries, ice cream and chewing gums.

Essential oil: Balsam gum contains about 60% cinnamoin, a volatile oil extracted by steam distillation. The oil is used in high-grade perfume, cosmetic and soap industries. Oil also used in flavouring baked goods. Its fragrance is attributed to vanillin, coumarin, cinnamic and benzoic acids.

Alcohol: The seeds are used to flavour aguardiente, a popular alcoholic beverage in Latin America.

Medicine: Tolu balsam is used as a feeble expectorant in cough mixtures and as an inhalant for catarrh and bronchitis. Peru balsam is used extensively as a local protectant, rubefacient, parasiticide in certain skin diseases, antiseptic, and applied externally as an ointment, or in alcoholic solutions. It is rarely used internally as an expectorant. Alcoholic extracts of tolu and Peru balsam inhibit *Mycobacterium tuberculosis*.

SERVICES

Shade or shelter: This is a good shade tree.

Nitrogen fixing: The balsam tree nodulates and fixes nitrogen.

Ornamental: The tree is sometimes grown as an ornamental in gardens.

Intercropping: The Peru Balsam is grown as a coffee shade tree in El Salvador.

Other services: Balsam oil is used as incense in churches and as a hair set and thickening agent.

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TREE MANAGEMENT

The trees are not a profitable source of balsam until about the 15th year. Under proper management, trees yield gum for 30-40 years. Gum harvesting begins on 20-30 year old trees with minimum diameters of 12-15 cm. Twenty year old trees yield about 3 kg of gum per year. Wild populations are the major sources of Peru and tolu balsam. Gum harvesting is drastic and may cause serious tree injury or deaths.

GERMPLASM MANAGEMENT

The presence of high levels of coumarin in the cotyledons and embryonic axis seems to have no effect on the germination of this species, but it seems to act as an allelopathic factor. There are about 1 700 seeds/kg.

PESTS AND DISEASES

Both varieties of *M. balsamum* are attacked by a number of fungi: *Meliola xylosmae*, *Myiocopron pereirae*, *Peckia pereirae*, *Phylosticta myroxyl*, *Phomopsis* sp. and *Tabutia xylosmae*.

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FURTHER READING

Allen ON, Allen EK. 1981. The Leguminosae. A source book of characteristics, uses and nodulation. Macmillan, London.

Duke JA. 1981. *Caesalpinia spinosa*. In: Handbook of Legumes of World Economic Importance. Plenum Press, New York. Pp. 32-33.

NFTA. 1995. Myroxylon: balsam and much more. NFTA 95-03. Waimanalo.

SUGGESTED CITATION

Orwa C, A Mutua, Kindt R, Jamnadass R, S Anthony. 2009 Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)