

Manilkara zapota

(L.) van Royen

Sapotaceae

LOCAL NAMES

Creole (sapoti); English (chickle gum, common naseberry, sapodilla, chicle tree, naseberry); Filipino (chico); French (sapotilleir, sapotillier commun, sapotille); German (Breiapfelbaum, Sapodilla, Kaugummibaum); Hindi (chiku); Indonesian (sawo londo, ciku, sawo manila); Javanese (sawo londo); Khmer (lomut); Lao (Sino-Tibetan) (lamud); Malay (ciku, chiku); Portuguese (sapota, sapoti); Spanish (níspero, chicozapote, sapotillo); Thai (lamut, lamut-farang); Vietnamese (hông xiêm, xabôchê, tâm lu'c)

BOTANIC DESCRIPTION

The sapodilla is a large, evergreen, forest tree more than 30 m in height and with a diameter up to 1.5 m; under cultivation it varies between 9 and 15 m, depending on location, and generally does not exceed 50 cm in diameter. It produces a dense crown and a characteristic branching system (sympodial), in which the young branches are arranged horizontally. Bole cylindrical and long, especially in forest-grown individuals; bark dark brown and deeply fissured, forming small rectangular pieces. The tree has an extensive root system.

Leaves spirally arranged and clustered at the shoot tips, simple, elliptic or oblong, apex obtuse to shortly acuminate; coriaceous, shining, glabrous when mature. Secondary veins make a wide angle with the midrib.

Flowers greenish, solitary, cyathiform or campanulate, with a brown pubescent peduncle; 6 sepals, 6 corolla lobes.

Fruit an ovoid to globular berry with a rough brown skin, containing 1-12 shining, brown or black seeds (frequently 5), surrounded by a brownish, sweet, juicy, scented flesh.

'Manilkara' is a common name for a member of the genus in Malabar. The common name 'sapodilla', by which the fruit is known, is taken from the Spanish 'zapotillo' meaning 'small zapote'.

BIOLOGY

No specific information on pollination has been found, but honeybees collect nectar from the flowers and may contribute to the pollination. Flowers are bisexual; the stigma extends beyond the corolla. The tree flowers and fruits throughout the year; fruit take about 4 months to mature. Seedlings may take 5-8 years to bear fruit, while grafted varieties take only 2-3 years from planting out.



(Manuel Bertomeu)



Chicle extraction from trees in Mexico
(Anthony Simons)



Fruit (Trade winds fruit)

ECOLOGY

M. zapota is a species of the lowland rainforest. Trees grow well in a wide range of climatic conditions from wet tropics to dry cool subtropical areas. But they prefer a moist hot climate similar to that found at medium to low elevations in tropical areas, such as in coastal regions. Fruiting is not adversely affected by heavy rainfall, but high temperatures (42-43 deg. C) are harmful. Trees prefer full sunshine and are fairly hardy and resistant to wind damage when mature. Young trees are frost tender and may be killed at freezing point or below, whereas mature trees can withstand short periods of temperatures of about -3 deg. C.

BIOPHYSICAL LIMITS

Altitude: 0-2000 m, Mean annual rainfall: 1250-2500 mm

Soil type: Soils can be well-drained, slightly alkaline, medium-textured loams; however, *M. zapota* will tolerate a wide range of soil types from drier sands through to heavy clays with marginal drainage.

DOCUMENTED SPECIES DISTRIBUTION

Native: Brazil, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Venezuela

Exotic: Antigua and Barbuda, Argentina, Australia, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brunei, Cambodia, Cayman Islands, Chile, Colombia, Dominica, Ecuador, French Guiana, Grenada, Guyana, India, Indonesia, Israel, Jamaica, Laos, Malaysia, Montserrat, Myanmar, Paraguay, Peru, Philippines, Singapore, St Lucia, St Vincent and the Grenadines, Surinam, Thailand, Trinidad and Tobago, United States of America, Uruguay, Vietnam, Virgin Islands (US)



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.

PRODUCTS

Food: *M. zapota* is mainly cultivated for its fruit, which is highly prized and considered one of the best in Central America. It is eaten raw or made into jam, preferably when slightly overripe, and in Cuba and Brazil it is often made into a sherbet. The fruit keeps for about 6 weeks in a refrigerator at around 0 deg. C. The juice may be boiled into syrup or fermented into vinegar.

Apiculture: Honeybees are known to collect nectar from the flowers.

Timber: The valuable wood is homogenous, deep red in colour, very hard, strong, tough, dense, resistant and durable. It is suitable for heavy construction, furniture, joinery and tool handles.

Latex or rubber: Wild and cultivated trees in America are tapped for their milky latex, which coagulates into chicle, the principal constituent of chewing gum before the advent of synthetics. In recent years, synthetic substitutes have been replacing chicle, so the trees are mainly grown for their fruit. The gum is also used in transmission belts, dental surgery, and as a substitute for gutta percha, a coagulum of the latex of *Palaquium* spp., also in the Sapotaceae family, which had many applications in industry before the advent of plastics.

Tannin or dyestuff: Tannin from the bark is used to tan ship sails and fishing tackle.

Poison: Seeds contain hydrocyanic acid and should be removed before eating the fruit.

Medicine: A leaf decoction is taken for fever, haemorrhage, wounds and ulcers; for neuralgia, leaf with tallow is applied as a compress on the temples. Seeds are antipyretic, and when ground with water they act as a diuretic. The plant is a source of sapotin, a glucoside used in medicine as a febrifuge. In Indonesia, the flowers are used as one of the ingredients of a powder that is rubbed on the body of a woman after childbirth. In Cambodia, tannin from the bark is used to cure diarrhoea and fever.

SERVICES

Ornamental: *M. zapota* is widely cultivated as an ornamental.

TREE MANAGEMENT

Trees are spaced 7-12 m apart, depending on the growth habit of the cultivar. They require irrigation during the dry season for the 1st 3-4 years, after which they are able to withstand drought. If necessary, young plants should be staked. Response to fertilizer is good, and 3-4 small applications a year of a nitrogen-containing fertilizer are beneficial. Pruning to shape the young trees is practised for the 1st 5 or 6 years. Planting a strong windbreak is also advised to protect against prevailing winds.

GERMPLASM MANAGEMENT

Seed storage behaviour is intermediate; viability can be maintained for 24 months in air-dry storage at 5 deg. C.

PESTS AND DISEASES

In some regions, larvae of Trypetidae fruit flies are serious pests, as they infest the ripe fruit and render it unfit for consumption. *Ceratitis capitata*, the Mediterranean fruit fly, and *Anastrepha ludens*, the Mexican fruit fly, are 2 of the most troublesome species. Rhyparida beetles may damage new leaves, and banana spotting bugs damage fruit, causing split lesions.

Symptoms of fruit rot transmitted by *Phytophthora palmivora* are especially clear on lower fruits of the tree. Rusts *Scopella sapotae* and *Uredo sapotae* attack the leaves in the native range of the tree. A leaf spot (*Septoria* spp.) has been observed to cause defoliation of trees in Florida.

FURTHER READNG

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SUGGESTED CITATION

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