



Genipa americana L.

Taxonomy and nomenclature

Family: Rubiaceae

Synonyms: *Gardenia genipa* Sw., *Genipa americana* var. *caruto* (Kunth) K. Schum., *G. americana* var. *caruto* fo. *grandifolia* Chodat & Hassl., *G. barbata* Presl, *G. caruto* Kunth, *G. codonocalyx* Standl., *G. cymosa* Spruce, *G. exelsa* K. Krause, *G. grandifolia* Pers., *G. humilis* Vell., *G. nervosa* Spruce, *G. oblongifolia* Ruiz & Pav., *G. pubescens* DC., *G. spruceana* Steyerl., *G. venosa* Standl.

Vernacular/common names: jagua, juito, genipa (Sp.); genipap, marmalade box (Eng.); confiture de singe (Fr.).

Distribution and habitat

Widely distributed throughout the humid tropical and parts of subtropical Americas from Mexico to Argentina and the Caribbean. In most places it is restricted to the lowlands. It may have originated in the Amazon where it grows naturally.

It is found especially in the 'várzeas' the part of the Amazon forest which lies next to rivers and is flooded annually for several months but also extends into the open forest/savannah transition zone. It is common in secondary forests on sites abandoned by shifting agriculture. Although reasonably represented in these vegetation types, its presence is rather scattered except where planted. It prefers areas with annual rainfall of 1200-4000 mm, mean annual temperature of 18-28°C. It tolerates dry periods of up to 6 months but is sensitive to temperatures near zero.

Uses

The species is mainly grown for its fruit that is popular as a source of beverages. The pulp from mature fruits is cooked with sugar to produce a syrup used for various beverages and deserts. As an edible fruit it is rated low. In pre-Colombian times a dark blue body paint was made from the green fruits. This was a very common use and probably the reason for the wide distribution of the species.

The wood is of good quality, with fine grain and easy to work. It is used for cabinets, carvings, light construction, firewood and many other minor uses. It is not very durable nor is it termite resistant. Other uses include a wide range of medicine and it is also popular as an ornamental.

Botanical description

Small to medium-sized tree, 8-20 m tall, occasionally up to 30 m, with diameter of 30-80 cm; trunk usually straight, with thick, smooth bark; crown is dense and the lower branches more or less horizontal.

Leaves 10-35 cm long, opposite, simple, clustered at the end of the branches. For each pair of leaves there are two stipules that, when they fall off, leave very distinct scars. Flowers bisexual, small, yellow-white, borne in terminal inflorescences.

Fruit and seed description

Fruit: a large, rounded berry, 9-15 cm long, 7-9 cm wide, weighing 200-400 g, crowned at the top by the persistent calyx; skin is thin and leathery; mesocarp (pulp) soft, yellow-brown, 1-2 cm thick; the central cavity contains the up to 300 seeds that are enclosed in membranes arranged in rows around a central core.

Seed: the seeds are hard, flat and dark brown, 10-12 mm long and covered with the fibrous inner mesocarp. There are typically 10.000 seeds per kg.



Photo from: The CTFS guide to tree species of the Panama Canal watershed

Flowering and fruiting habit

In most of Amazonia the trees flower in May to September and fruits September to April. It takes up to one year for the fruits to mature. The flowers are mostly pollinated by bees and fruits are dispersed either by water or by animals that feed on the soft pulp surrounding the seeds.

Harvest

The fruits fall to the ground when they are mature. Because of the soft mesocarp that protects them they do not bruise and can be collected from the ground. Collection directly from the tree is also possible, the fruits are collected when the colour changes to a greenish grey. A tree of 15 to 20 years can produce 400-600 fruits.

Processing and handling

The freshly harvested fruits are packed in bags that allow ventilation and protection from direct sunlight. At the processing site the fruits are soaked in water and macerated in order to remove the pulp.

The extracted seeds are spread out on mesh wire and left to dry in the shade in a well-ventilated place. Because of the high moisture content of the fresh seeds, it is important that they are dried in the shade, at least until the moisture content is below some 15%.

Storage and viability

At the time of harvest, the seeds have a moisture content of almost 50% (this value is for seeds extracted without using water).

Storage behaviour is orthodox and the seed should be dried down to below 10% moisture content and stored in airtight containers, preferably at 5°C. However, some trials have shown that even at 15°C storage temperature, properly dried seed can store for one year without losing viability. At ambient temperature (~25°C) viability will normally be lost after two months.

There can be large differences between seedlots from different provenances and in some instances drying below 10-20% moisture content has killed the seeds. Also, the response to storage at temperatures below zero can vary depending on provenance and maybe seed quality.

Dormancy and pretreatment

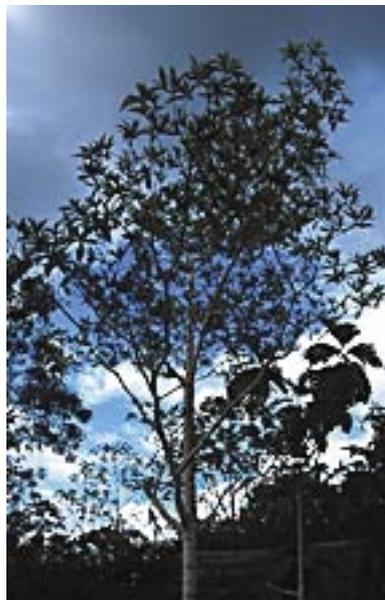
The seed is not dormant and pretreatment is not necessary. Soaking the seeds in running water for 1-2 days will accelerate germination.

Sowing and germination

Germination is epigeal (cotyledons emerge above ground). If the seed is of good quality and have been properly handled, germination will begin after 1-2 weeks and be complete after 1 month. Germination is normally high, between 65 and 100%. If sown in seedbeds, seedlings are ready for pricking out 20 days after germination.

Initial growth is slow, it takes about one year to attain transplanting size of 20-40 cm. Because of drought sensitivity the best way of establishment is to use containerised seedlings. Vegetative propagation by cuttings is also possible and grafting is used for varieties with superior fruit quality.

For fruit production, spacing of 10x15 m is normally recommended, 3x3 m for timber production. Temporary crops such as cassava or cotton can be interplanted to provide shade for the young trees and income for the farmer. The trees begin to set fruits when they are about 6 years old.



Tree habit. Photo: Rainforest Conservation Fund.

Selected readings

CTFS. *The CTFS guide to tree species of the Panama Canal watershed.* Centre For Tropical Forest Science, Panama

FAO 1986. *Fruit and fruit-bearing forest species. 3: Examples from Latin America.* FAO Forestry Paper 44/3. FAO, Rome.

Morton, J. 1987. *Genipap.* In: *Fruits of warm climates.* Miami, FL.

Salomão, A.N. 2000. *Genipa americana.* The project on handling and storage of recalcitrant and intermediate tropical forest tree seeds. Newsletter no 7. DFSC/IPGRI.

THIS NOTE WAS PRODUCED IN COLLABORATION WITH EMPRESA BRASILEIRA DE PESQUISA AGROPECUÁRIA (EMBRAPA), BRAZIL AND CENTRO AGRONÓMICO TROPICAL DE INVESTIGACIÓN Y ENSEÑANZA (CATIE), COSTA RICA

Authors: Dorthe Jøker, DFSC, Antonieta Nassif Salomao, Cenargen and William Vasquez, CATIE

Danida Forest Seed Centre
Krogerupvej 21
DK-3050 Humlebaek
Denmark

Phone: +45-49190500
Fax: +45-49160258
Email: dfsc@sns.dk
Website: www.dfsc.dk