Myrciaria dubia (H.B.K.) McVaugh.

Myrtaceae

LOCAL NAMES
English (guavaberry,bayberry fruit,rumberry)

BOTANIC DESCRIPTION
Camu-camu is a shrub or small tree, 4-8 m tall, without a detectable trunk, heavily branched from ground level, although each secondary branch has few tertiary branches.

Leaves large, evergreen, opposite, leaf blade lanceolate to elliptic, 3-5 cm long by 1-2 cm wide, entire, feathery, glabrous, petioled; the petiole is 3-6 mm long by 1 mm in diameter.

Flowers auxiliary, with 1-12 subsessile flowers, arranged in pairs. The calyx is globular to sub-globular, with 4 ovoid lobes, glabrous; the corolla has 4 waxy white petals that alternate with the ovoid sepals, with a sweet smelling aroma.

Fruit spherical, light orange or reddish-purple to purplish-black with a yellow pulp becoming light beige when dry, about the size of a large grape, approximately 2-3 cm in diameter with a 10 mm or shorter peduncle. The pulp is acidic, edible, with an agreeable flavor. It contains 1-4 elliptical, flattened seeds, covered with short white fibers.

Bark on the secondary branches brownish-bronze and on tertiary branches greenish-brown to greenish gray. The bark is smooth and peels naturally.

BIOLOGY
Trees begin to bear fruit after about 4-6 years. In the wild, most plants flower after attaining 2 cm in stem girth, with flowers appearing throughout the crown. The plant phenology is influenced by the rainy season, with flowering at the end of the dry season and fruiting during the rainiest part of the humid season. In a good year, with abundant rainfall, camu-camu may flower during most of the year on the uplands. In Peru, flowering starts at the beginning of the flood season, usually in July, extending to September, with fruiting from September to December. On the dry uplands in central Amazônia, flowering occurs in September to December and fruiting from December to April.

ECOLOGY
Camu-camu is found throughout the Amazon rainforest, mainly on banks of rivers, in swampy or flooded areas, where the lower part of the plant is often submerged. It survives best in hot, humid tropical climates and in the subtropics, surviving temperatures down to just above freezing. It grows mostly on alluvial soils with a clay-silt texture of pH 5-6.

BIOPHYSICAL LIMITS
Altitude: 130-200 m
Temperature: Mean annual temperatures of 20-30°C, surviving temperatures to 0ºC and requires full sun.
Rainfall: Annual rainfall of 1500-3000 mm, an annual relative humidity of 78-82%
Soil type: It favors soft, alluvial soils with a clay-silt texture of pH 5-6 of seasonally flooded areas.

DOCUMENTED SPECIES DISTRIBUTION

Native: Brazil, Colombia, Peru, Venezuela
Exotic:

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: The fruit was not widely eaten by the indigenous people, due to its sour, acidic taste, but in recent years become popular in Iquitos, Peru, where it is made into drinks and flavoring for ice creams, sweets or mixed with other fruits for fruit punch. Use in jams, jellies, wines, liquors and pie fillings have been reported. Fruit has the highest recorded amount of natural vitamin C known on the planet. While oranges provide 500-4000 ppm vitamin C, or ascorbic acid, camu-camu provides up to 500,000 ppm, or about 2 grams of vitamin C per 100 grams of fruit. Compared to oranges, camu-camu provides thirty times more vitamin C, ten times more iron, three times more niacin, twice as much riboflavin, and 50% more phosphorus. Camu-camu is also a significant source of potassium, providing 711 mg per kg of fruit. It also has a full complement of minerals and amino acids that can aid in the absorption of vitamin C. Alpha-pinene and d-limonene (compounds known as terpenes) predominate as the volatile compounds in this fruit. Processed powder from the fruit pulp is beginning to be sold in the west as a health food in loose powder or capsule form. Camu camu fruit pulp is exported from Peru, with most of it going to Japan.

Medicine: Camu-camu has never been documented as a traditional herbal remedy for any condition in the Amazon region, but it is known to have astringent, antioxidant, anti-inflammatory and emollient properties. However, there are a few herbal supplement companies in the United States marketing camu-camu extracts in powders and pills and alluding to claims of its benefits-from curing viral infections and colds/flu and cold sores and autoimmune disorders to even weight loss but there is no research to back up these claims. Traditionally, native medicine practioners and herbalists have recommended camu-camu for strengthening the immune system; improving symptoms of herpes infections, including mouth blisters, genital blisters, shingles blisters and other viral infections; promoting energy and vitality of people with chronic immune dysfunction; strengthening the nervous system; supporting healthy levels of white blood cell formation; detoxifying the body, especially the liver; promoting health of upper respiratory organs, including lungs, sinuses, nasal passages; and promoting a healthy heart and circulatory system.

In Brazil, camu-camu is being promoted as a product that untangles and strengthens hair, and protects it from external damage, adding to its shine and vitality. It is being used in a new line of cosmetics specially recommended for damaged and dull hair that include shampoos, conditioners, hair masques, hair renewal that add body and shine to hair.

Fuel: camu-camu is a convenient source of firewood when dead.

SERVICES
The growing popularity of this wild rainforest fruit is contributing to the sustainable development of the Amazon River basin and helping the forest dwellers to maintain their traditional way of life.

Other services: Until recently, camu camu was used almost exclusively in Peru as fish bait. Fish, such as the large Colossoma macropomum ("gamitana", "tambaqui") feed on the fruits, and they have disappeared from places where camu camu fruit is no longer available to them.

TREE MANAGEMENT
Management of the large monocultural stands of camu-camu in western Amazônia, appears promising. Ideal monoculture densities are still subject to research with a recommended spacing of either 2x3 m or 3x3 m, and can be interplanted with cowpea, squash, manioc, and other annual crops or be inter-planted with other flood-resistant tree species. Tighter spacing is common, but this strictly limits intercropping options.

Harvesting is labor intensive, as the ripe fruit is picked from the shrub. In cultivation harvesting should be done two or three times per week and the fruit sent to market immediately. Even under intensive harvesting, the stands recruit enough juveniles to maintain themselves indefinitely. Population and horticultural management techniques require research. Ideal densities could further increase yields and pruning might also enhance yields.

GERMPLASM MANAGEMENT
Seeds must be gotten from healthy plants of high production and with fruits of good size. Soon after extraction, the seeds should be washed and be sown immediately. However, if the seeds are to be stored it is recommendable that after the extraction, they be dried to the shade for 24 hours. After that, the seeds must be dusted with a fungicide and then sealed in double plastic bags, kept at 20ºC or ambient temperature. In this way seeds can be stored for up to 6 months, with little loss in the germination rate.

The available information, however is not detailed enough to define procedures capable of extending the period of conservation of these seeds.

PESTS AND DISEASES
Camu camu is tolerant or resistant to pests and disease. In the floodplain, especially during peak flood period, no pests and diseases can attack it when most of the plant is under water and all required nutrients are supplied by the river or swamp. This further enhances its resistance and tolerance.

FURTHER READNG

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SUGGESTED CITATION

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