

Lonchocarpus longistylus Pittier

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FABACEAE (BEAN FAMILY)

No synonyms

Balché, bal-ché, palo gusano, saayab, sakiab, xbal-che'

Lonchocarpus longistylus is native to America. The species grows from southeastern Mexico, particularly in the Yucatan Peninsula and Chiapas, south to the region of Peten in Guatemala, forming part of the semideciduous tropical forests. It grows in association with *Brosimum alicastrum* Sw., *Bursera simaruba*, *Vitex gaumeri* Greenm., *Lysiloma bahamensis* Benth., and *Caesalpinia guameri* Greenm., among others (Martínez 1987, Rzedowski 1978).

Lonchocarpus longistylus is an evergreen or deciduous tree, depending on the availability of water. It can reach up to 18 m in height and 20 to 25 cm d.b.h. The trunk is straight and short, and the large, spreading crown is made up of thin, rising branches with dense foliage. The leaves are composite, imparipinnate, and have 15 oblong or ovate leaflets, 3.5 to 8.5 cm long. In the Yucatan Peninsula, the tree grows in calcareous soils with outcropping rocks, forming part of the tropical forest. The regions where the tree is found have an average annual temperature of 26 °C with a maximum temperature of 36.7 °C and a minimum temperature of 14.9 °C. The maximum temperatures correspond to the months of April and May, the minimum temperatures to the months of December and January. Average annual precipitation is approximately 1288 mm, ranging between 900 and 1800 mm.

Since pre-Hispanic times, the bark of *L. longistylus* and other species of this genus has been used to prepare an alcoholic beverage with psychotropic properties, known as balché. The bark is soaked in sugary water or water with honey. Once fermented, it is drunk during religious festivities. The bark contains a toxic alkaloid called rotenone, which has insecticidal properties. The tea obtained from the infusion of the leaves is used in traditional medicine to treat coughs and to clean infected wounds. *Lonchocarpus longistylus* is planted as an

ornamental in streets, parks, and gardens (Mendieta and del Amo 1981, Miranda 1975, Standley 1930).

Lonchocarpus longistylus blooms during September and October and fruits abundantly the following April through June. The flowers are papilionaceous, purple-violet in color, and arranged in racemes. The fruits are oblong and flattened legumes, indehiscent, and light brown in color when ripe. Each fruit contains one or two seeds (Martínez 1987, Standley 1930). Seeds are reniform, laterally flattened, 12 to 14.5 mm long, 6.8 to 7.0 m wide, and 4.5 to 6.0 mm thick. The seed coat is dark reddish-brown to dark brown, smooth, opaque, and coriaceous.

The ripe brown fruits are collected from the tree using poles with metal hooks or from the ground. The fruits are fragile and the extraction of seeds is done by grinding the fruits by hand. Impurities are removed using sieves or with a vertical column blower. Seeds average 3,943 per kg. Seeds remain viable for approximately 6 months when stored under ambient conditions (24 to 30 °C). With longer storage, their viability quickly diminishes (Vega and others 1981).

Under humid conditions the fresh seeds germinate at 65 percent without pretreatment. A heterogeneous sample of seeds germinated approximately 10 days after sowing (Vega and others 1981).

ADDITIONAL INFORMATION

The hilum is lateral, oblong or elliptic, surrounded by funicular remnants and a darker areola, and has a split. The micropyle is puntiform and very close to the radicular lobe. The lens is opposite to the micropyle, oblong, and dark. The dark yellow embryo has a curved axis and is asymmetrical. The two cotyledons are plano-convex in cross section, pulpy, and oily. The plumule is slightly developed. The radicle is curved and elongated.

Lonchocarpus rugosus Benth.

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FABACEAE (BEAN FAMILY)

No synonyms

Arripin, black cabbage bark, canansin, canasin, catzin, chaperno, chapulaltapa, masicarán, masicarón, matabuy, and matachalpul (Lagos 1977, Witsberger and others 1982)

Lonchocarpus rugosus is native to southern Mexico and Central America. Other *Lonchocarpus* species reported in El Salvador are *L. atropurpureus* Benth., *L. minimiflorus* Donn. Smith, *L. peninsularis* (Donn. Smith) Pittier, *L. phaseolifolius* Benth., and *L. salvadorensis* Pittier (Berendsohn 1989, Witsberger and others 1982).

Lonchocarpus rugosus is a slow-growing, medium-sized tree that may reach 15 m in height. The tree with its broad and dense crown may reach maturity when it is only 2 m tall. *Lonchocarpus rugosus* grows from sea level to 1400 m and is adapted to dry conditions. In El Salvador, it is found only on dry and steep sites, especially in hot, subtropical, humid forests (Witsberger and others 1982).

Lonchocarpus rugosus produces high quality wood used in construction and wooden wagons (Witsberger and others 1982). In Guatemala, a purple dye used to color fabrics is obtained from the bark. This species grows slowly but its round and dense crown could be useful in silvopastoral systems, parks, or other urban areas.

Lonchocarpus rugosus blooms in June and July. The purple-reddish flowers measure 1.1 to 1.3 cm in racemes 7 to 13 cm long, and the fruits are flat legumes or pods 5 to 14 cm long with one to three seeds (Witsberger and others 1982). The indehiscent pods mature from October through December and are very abundant in full-grown trees.

Pods are collected by hand directly from the tree. Seeds from pods collected from the ground are usually infected by weevils. Seeds are extracted by hand and average 6,000 per kg. Seeds kept dry at 5 °C are viable for at least 3 years.

Pregermination treatments may be necessary for fast germination. Only 17 percent of nonscarified 6-month-old seeds germinated 30 days after planting, while more than 30 percent of fresh nonscarified seeds germinated within 10 to 15 days (Navarrete-Tindall and Aragón, unpublished data). Placing seeds in boiling water for 1 to 5 seconds did not improve germination and seeds exposed for 10 to 15 seconds died. Germination was higher in loam soils than in sand, perlite, and fine red basalt. Future research should investigate other scarification treatments including use of lower water temperatures.

In nursery production, one seed is planted in a polyethylene bag containing soil with 10 to 15 percent organic matter. Seedlings vary in growth; 5-month-old seedlings from a single tree reached 8 to 40 cm in height after outplanting at 3 months. The longest leaves were 32 cm and had 9 to 13 leaflets (Navarrete-Tindall and Van Sambeek, unpublished data). Outplanting 6-month- to 1-year-old seedlings should occur during the rainy season. Mechanical weed control is required during the first two years.

ADDITIONAL INFORMATION

Nodulation was observed recently in 3-month-old *L. rugosus* seedlings (Navarrete Tindall and Van Sambeek, unpublished data) suggesting that like other *Lonchocarpus* species the tree is a nitrogen fixer (Allen and Allen 1981). Additional research will determine nitrogen fixation efficiency of the rhizobial bacteria symbiotic to the species.

