



Characterization of natural occurrence of *Oenocarpus distichus* in the state of Maranhão, Brazil

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SUMMARY

In Maranhão State's Amazon, bacaba stands out as an important resource to local populations. It is employed in human and animal feeding, building houses, traditional medicine and manufacturer goods. The economically viable part of this species is the processed pulp known as bacaba, sold *in natura* or frozen. Considering the great potential of sustainable economic exploitation of native fruit trees, such as the bacaba, occurrence areas of natural populations of *O. distichus* in three municipalities of the Gurupi micro region and two of the Chapada das Mangabeiras were mapped in order to subsidize future researches regarding conservation and use of the germplasm. Bacaba populations were mapped in cities of the two microregions: 1) Gurupi where soils, in general, are of low natural fertility with predominance of dystrophic plinthudults and red-yellow dystrophic and plinthic soils and; 2) Chapada das Mangabeiras, where yellow dystrophic hapludox soils are found; and in the escarpments the litholic dystrophic neosoils are common. In these micro regions, bacaba populations are reduced to individuals found in backyards.

Key words: *Oenocarpus distichus*, Amazon, *in situ* conservation

INTRODUCTION

Bacaba trees are typical Amazon palm trees belonging to the genus *Oenocarpus*. The species *O. distichus* occurs in greater frequency in the East, dispersing from Pará to Maranhão State, also being found in Venezuela (Calvante, 1991; Henderson, 1995). It is present in the phytogeography domains of the Amazon and Cerrado (Brazilian Savana), encompassing the North, Mid-West and Northeast regions. It occurs also in the Amazon estuary, frequently in the *terra firme* forests and *capoeiras*, growing well in sandy soil devastated areas (Calvante, 1991).

In Maranhão State's Amazon, it stands out as an important resource for local populations, being employed in human and animal feeding, house construction, traditional medicine and manufacturer goods. The economically viable portion of this species is the fruit, whose processed pulp, known as bacaba is sold *in natura* or frozen. Fruit potential use is targeted to oil production for cuisine, canned food industry and related products. Qualitative and quantitative chemical analysis of fatty acids and the organoleptic properties present strong resemblance to olive oil, besides having great nutritional quality and high biological value proteins, 40% more than soy (Balick, 1986). Its oil is also used in the soap industry, gun lubrication, cosmetic and pharmaceutical (herbal medicine) industries. It is used by the native population as fuel for torches and candles and in cuisine to substitute sweet-oil (Lorenzi *et al.*, 1996).

Considering the great potential for sustainable economic exploration of the native fruit trees, such as the bacaba, occurrence areas of natural populations of *O. distichus* were mapped in the Gurupi and Chapada das Mangabeiras micro regions in order to subsidize new researches focused on conservation and use of the germplasm.



MATERIAL AND METHODS

The study was carried out in the Gurupi e Chapada das Mangabeiras micro regions in Maranhão State. Georeferencing was performed on the field with the use of global positioning system (GPS). Occurrence spots were visited and its geographic coordinates were recorded in the GPS. Georeferenced points were employed as “field truths” or references for associating spatial patterns in the satellite images. They were initially imported for SIG as information on land use, soils, vegetation, weather, drainage, road mesh and GPS spots relative to bacaba occurrence.

RESULTS AND DISCUSSION

Maranhão State has a territorial extension of 331.936,949 Km² and is situated in a transition area between North, Northeast and Mid-West regions; which, in part, explains its biodiversity. Its territory encompasses three great biomes: Amazon (34%), Cerrado (Brazilian savanna) (65%), and Caatinga (1%) (Ibge, 2017). According to IBGE, Maranhão is divided in five meso regions and twenty one geographic micro regions; among them Gurupi and Chapada das Mangabeiras are highlighted. The first micro region is located in the extreme northwest throughout the Gurupi river basin, the geopolitical limit between Pará and Maranhão. It is composed fourteen cities, such as Amapá do Maranhão, Governador Nunes Freire and Luís Domingues (Figure 1). Geomorphological characteristics correspond to the Northwestern Maranhão planed surface with residual elevations reaching 250m altitude. Soils are, in general, of low natural fertility, with a predomination of dystrophic plinthudults and red-yellow dystrophic and plinthic soils (DANTAS *et al.*, 2013). Predominating weather is humid Equatorial, with average pluviosity ranging between 1.600 a 2.200 mm, average temperature de 26°C e 27°C, with forest vegetation characteristic of Maranhão State’s Amazon. In some areas the great biological diversity owes to the dense ombrophilous forest, which is suffering deforestation (COSTA *et al.*, 2016).

Chapada das Mangabeiras micro region is located in Maranhão’s southeastern territory comprising eight cities, among them are Fortaleza dos Nogueiras and São Raimundo das Mangabeiras (Figure 2). Is considered an agricultural frontier, specifically in grain production, in which maze and soy stand out. Geomorphology of the area is characterized by a plateau surface, with altitudes ranging between 700 m and 800 m. On the top of the plateaus, yellow dystrophic hapludox soils are found; whereas in the escarpments the litholic dystrophic neosoils are more common (DANTAS *et al.*, 2013). Predominating weather is dry sub-humid with average temperatures of 28.8 °C and 28.6 °C and annual rainfall between 1.100 and 900 mm. Latitude and continentality of the area interfere directly in its climatic features.

O. distichus population in the mapped areas is greatly reduced due to the way that fruit bunches are retrieved, that is complete removal of the plant. This is a prejudicial process in the context of management and conservation of the *in situ* genetic resources. Natural populations still suffer other threats, such as hydroelectric plants, human population growth, real estate expansion, among other aspects that make *in situ* conservation difficult. However, there are individuals conserved in backyards or private land because are used in human consumption and as hunt attractive, which favors *on farm* and *in situ* conservation strategies (Cymerys, 2005).

CONCLUSION

Results of the bacaba population mapping will subsidize new researches, especially those focused on sampling, characterization, conservation and germplasm use.



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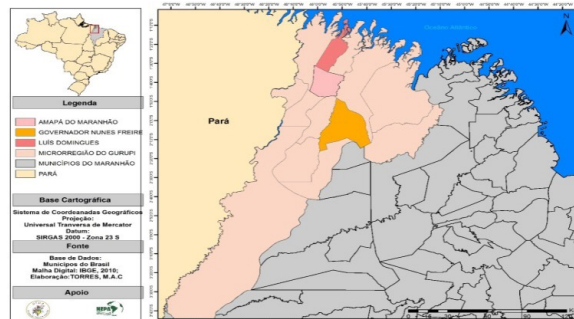


Figure 1: Gurupi micro region location

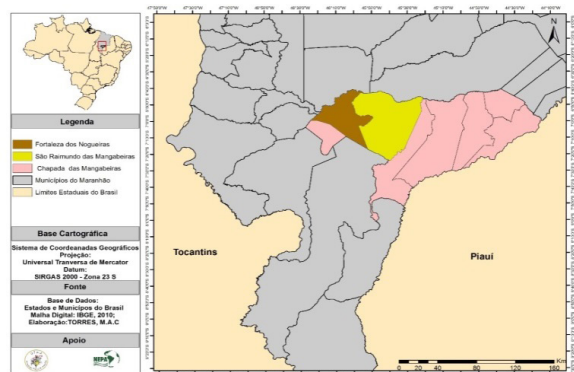


Figure 2 – Chapada das Mangabeiras micro region location