

# The Cocoa (*Theobroma cacao* L) native in Mexico

## Abstract

With the objective of publicizing the conditions where native cocoas are still found in Mexico and the characteristics of these, this document exposes the morphological diversity of native cocoas found in Mexico and that are currently conserved in the INIFAP.

**Keywords:** cocoa, diversity, conservation

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**Avendaño-Arrazate CH, Martínez-Bolaños M, Mendoza-López A**

Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP)-Campo Experimental Rosario Izapa, México

**Correspondence:** Avendaño-Arrazate CH, Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP)-Campo Experimental Rosario Izapa, Carretera Tapachula-Cacahoatán, Tuxtla chico, Chiapas, CP 30870, México, Email [avandano.carlos@inifap.gob.mx](mailto:avandano.carlos@inifap.gob.mx)

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## Introduction

Cocoa (*Theobroma cacao* L.) shares the genus with 21 other species.<sup>1</sup> Most of the species are distributed exclusively in South America and some reach Central America. *T. cacao* L. and *T. bicolor* Humb. & Bonpl. (locally is known as “Pataxte”) are the only species that are distributed to the southeast of Mexico. Cocoa was so important to the Mayan culture that it was used as a currency, so drinking chocolate represented a luxury only for the elites.<sup>2</sup> Cocoa is a crop of great economic importance, being cultivated by more than 2million producers in more than 50 countries. In Mexico it is cultivated mainly in the states of the southeast, Chiapas, Tabasco, Oaxaca and Guerrero;<sup>3</sup> the area established with cocoa is 61,397 ha with a nationwide production of 28,006 tons for the year 2015; an average yield per hectare of 470kg and a production value of \$1,034,792,000.<sup>4</sup>

Worldwide, three genetic types of cocoa are recognized: the Criollo that has a white cotyledon and is poorly cultivated because it is very susceptible to diseases; the Forastero, from the Amazon region; and the Trinitario, a hybrid of the Forastero and the Criollo.<sup>5</sup> The genetic group Forastero presents cotyledon of purple color due to anthocyanins, it is also the most resistant to diseases and the most cultivated worldwide.<sup>6</sup> In Mexico, the predominant varieties are Trinitario, Criollo native and Forastero.<sup>3</sup> Their aromatic quality and the aromatic descriptors are on function of the variety of cocoa, its origin and the days of fermentation.<sup>7</sup>

## Discussion

In Mexico, efforts are made to collect, conserve and use native cocoas, with the aim of identifying and conserving the greatest diversity by different methods (live and cryopreservation) and their use in genetic improvement programs, to obtain varieties of cocoa with quality and tolerance to diseases, which the market of high

specialty is demanding. In this regard, in Mexico has found an important diversity of native cocoas that are distinguished in addition to the different shapes, colors and sizes of the fruits, shapes, sizes of almonds and the white color of cotyledons (60 to 100% inland of the fruits) (Figure 1). They are distinguished by being in riverside areas, streams, areas with high humidity (>90%) or areas of intermittent runoff, totally isolated only, or small compact populations without spatial arrangement (hardly exceed ten individuals). Individuals formed from seed are erect growth trees, diameter less than 25cm, height greater than 12m, and continuous orthotropic growth flows, have above four flows (possibly in search of light), high pubescence in branches, small leaves, thin secondary and tertiary stems, in some cases where there is high relative humidity, lichens and ferns in stems are seen (makes propagation difficult). The buds have light green and red colors, which is a function of the color of the immature fruit, in both conditions there are seeds with clear tones that range from the color close to white to cream (Yucatán and Chiapas).

In the same sense, in the search for new aromas, compounds and flavors that may provide important elements for the cocoa derivatives industry, coupled with the search for biological control agents that are interacting with cocoa in these natural environments, found individuals in which environmental, morphological and genetic aspects are combined that separate them from the rest of the cultivated cocoas and are located as native cocoas, that is to say, cocoas that have been conserved for years in totally isolated environments of commercial populations and have characteristics of hardness in the form of the fruit and arrangement of the seeds. It is important to mention that this type of cocoa is part of forest complexes of natural areas under protection and conservation in Chiapas (Lacandona jungle), Yucatán (Cenotes) and Oaxaca (Mountain)<sup>3</sup>. It shows the close interaction with flora and fauna typical of each place that repeatedly illustrates the meaning it had for the Mayan and Aztec culture “as a sacred tree” or “tree of life.”



**Figure 1** Diversity of fruits and seeds of cocoa native to Mexico.

## Conclusion

The native cocoa of Mexico has many qualities (tolerance to water stress, yield, quality, aroma and growth) that have been discovered and others that have yet to be determined that may be useful for future generations, since few producers know them. . Therefore, the main challenges and perspectives of native cocoa, is to conserve, propagate and promote the use of diversity in a sustainable manner and that producers are empowered and able to live to cultivate, as well as Outsiders, Trinitarios, Criollos and Native cocoa. Mexico.

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## Conflict of interest

Authors declare that there is no conflict of interest.

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