

# Strengthening of the existing scientific platform "LipPoISENS" (LPG) hosted by UMR IATE in Montpellier via an extension in Bangkok within the joint

## KU/CIRAD laboratory "Laboratory of Biochemistry and Technology of Natural Rubber" (LBTNR)

Using a multidisciplinary approach (associating genetics, biochemistry and archeology) our objectives are:

- to collect new native genetic resources from the south of the Amazon, related to the variety "Nacional" but with a larger diversity favorable to the creation of new aromatic varieties
- to characterize this plant material morphologically, genetically, biochemically and for sensorial traits, and confirm its relationship to the Nacional variety
- to better understand the present and past domestication of cocoa trees in order to better exploit its diversity, trying to find traces of the use of cacao in archaeological remains (ancient pottery dating from 3000 to 5000 years ago) by the analysis of ancient DNA.

## RESULTATS

obtained:

- New cacao genetic resources, currently disappearing, have been collected, propagated by grafting and cuttings, and preserved in germplasm collections for the improvement of aromatic cacao trees in Ecuador. Thus, 148 mother trees and 2,538 of their seedlings were established in the collections of INIAP and in the agricultural colleges of the Amazonian regions that were associated with the surveys. The analysis of these cacao trees shows their great variability and their genetic proximity to the Nacional variety and confirms our hypotheses placing the origin of the domestication of this variety in the south of the Ecuadorian Amazon. A participatory breeding project will be implemented to test and exploit this new genetic material.
- Ancient DNA analyzes provide direct access to past domestication by providing information on exploited diversity and heritage history. The analysis of ancient DNA made from ceramic residues found at an archaeological site (santa Ana La Florida) located in the prospecting area, complemented by analyzes of theobromine and starch grains, shows us a continued use of *T. cacao* by the Mayo Chinchipe people in ritual and domestic contexts dating back at least 5300 to 2100 years BP. Our results provide the first evidence for the use of *T. cacao* in the Americas and support the hypothesis that *T. cacao* was domesticated in South America at least 1,500 years before its transfer to Central America.

Zarillo et al., Nature ecology and Evolution, in press

## PERSPECTIVES

The perspectives are now to continue the collect, preservation and exploitation of the native cocoa trees of the Ecuadorian Amazon with the help of the local populations, and to continue the study of the past domestication of fine cacao varieties using paleogenomics.

**Responsable :**

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