Amazon wild cocoa collect

Collection of wild cocoa genetic resources related to aromatic chocolate quantities in the Ecuadorian Amazon

ABSTRACT

Flavor is among the main criterion of quality for chocolate manufacturers and is the basis to classify the cocoa product in 2 classes: the fine flavor cocoa and the bulk cocoa. Ecuador is among the main producer of fine flavor cocoa provided by its traditionnal and aromatic variety called “Nacional”. However, this variety was crossed with other introduced non aromatic genotypes, and the aroma progressively diluted. Recent works allowed to identify representants of the ancestral Nacional variety, cultivated at least 500 years ago in the pacific coast, and to localise its probable origin of domestication in the south part of Amazonia of Ecuador. The objective of this project was to collect native semi cultivated or wild genotypes from this region to enrich the genetic resources related to the Nacional variety to improve the aroma and productivity of the present Nacional variety.
The focused areas to be prospected were located in the territories of the Shuar communities (Jivaro), and, in concertation with the ministery of environment of Ecuador, contacts with these comunities were first established to be able to penetrate these territories, and to associate the Shuar communities to these prospections.
The expedition was organised during 4 weeks and during a period favourable to collect mature pods in the trees.
The progression in the forest has been done by foot , by road or by navigation on the rivers using canoe.
With the help of the Shuar communities, 82 very old mother trees, native of the region, were collected. Each tree was characterised for their geo-localisation (GPS coordonates), their morphological traits, and sampled with pods and/or budwood for further propagation. Leaves were also collected for genetic molecular analysis of diversity, and fermented seeds were prepared on 15 genotypes producing enough pods to characterise the aromatic potential of these new accessions.
the collected material was brought back to the station after eight days, allowing to save rapidly and conserve the collected material in good condition.
The multiplication of this material was made in 2 INIAP stations: one located at Pichilingue (altitude 60m), the main cocoa INIAP station, and the other in Domono (Macas) in an Amazonian region (altitude 800m). The multiplication was very successfull as only one genotype was lost between the 2 stations. In addition to grafting of budwood for each accessions, seedlings (30 when possible) were sown for 39 accessions.
Microsatellite markers were used to analyse the diversity of collected material. A large diversity was revealed in this material, and the close relationship of this material with the Nacional variety was confirmed.
Biochemical analyses of volatil compounds, and particularly linalol displayed also a variable amount of linalool among accessions, with some of them 3 times higher than the traditional Nacional variety.

Keywords : Plant, Genomics, Consuimer, Genetic ressources, Sensoriel analysis, Cacao

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Project leader : Claire Lanaud
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PERSPECTIVES

This collect represents a real rescue of the native trees from this region. Indeed, the forest is progressively diseappearing, due to the bovine farming, or to the cultivation of other crops, and the cocoa genetic resources are diseappering simultaneously. The diversity revealed by the genetic and biochemical analyses show the interest of this material to improve the aromatic varieties for Ecuador. This prospection will be continued by the exploration of the south part of the Zamora Chinchipe province, not yet explored until now.