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The Genetic and Morphological Diversity of Nance (*Byrsonima crassifolia*) in Yucatán, Mexico

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Abstract

To assure future food security, the conservation of agrobiodiversity is a key aspect. It is important to preserve the interspecific diversity as well as the intraspecific diversity.

In many areas worldwide plant agrobiodiversity is conserved in home gardens. A great variety of neglected and underutilised species can be found there. The promotion of these species matters as they can contribute to food security, improved nutrition, improved income of rural poor, and agroecosystem stability.

Here, the diversity of the tropical fruit tree Nance (*Byrsonima crassifolia*) was investigated in Yucatán, Mexico. Nance is a typical representative of an underutilised and neglected species. The multipurpose tree occurs in Central and South America. Although broadly distributed and still frequently found in Mexican home gardens, it is only relevant for local markets.

Being a plant with future potential and so far not intensively investigated, it is interesting to evaluate the morphological and genetic diversity of Nance in detail. In total 213 trees were investigated, of which 16 could be assigned to be wild.

This study is divided into three parts: A questionnaire about the local use of Nance, morphological observations based on leaf characteristics and genetic diversity descriptions, analysed with microsatellite markers. With the developed questionnaire the knowledge and management about Nance of the locals was captured. Results indicated knowledge erosions about the utilisation of the multipurpose plant.

Nance showed a great leaf morphological diversity. The observed and expected heterozygosity for the genetic diversity was calculated with $H_o=0.3380$ and $H_e=0.4319$. Comparative results of cultivated Nance individuals and wild savannah stands, did not show clear signs of clustering, but indicate a process of Nance towards domestication.

Comparing genetics, morphology and vegetation, evidence points out two subgroups of Nance, divided by a vegetation change and differences in leaf size.

Keywords: Agrobiodiversity, *Byrsonima crassifolia*, interspecific diversity, intraspecific diversity, morphological diversity, neglected and underutilised species