

SUMMARY

Integration of new populations for the Genetic Improvement Program of manzano chili (*Capsicum pubescens* Ruiz & Pav.) in Las Montañas region of Veracruz State, Mexico

The study of morphological diversity provides knowledge about the performance and physiological development of a species, crop or variety, and it is a source of information for decision-making for planning conservation and genetic improvement actions. In this regard, there is a morphological diagnosis and reservoir of manzano pepper populations (*Capsicum pubescens* Ruiz & Pavón) from Las Montañas region, in the center of Veracruz State, México, so expanding and incorporating new materials or populations morphologically evaluated contributes to improve the diversity of the genetic base for the genetic improvement program of this crop. The objective of the present study was to determine the patterns of morphological diversity of *C. pubescens* fruits collected in different localities of the Center, Center-North, and North of the state of Veracruz, and to evaluate their incorporation into the management and genetic improvement program of the crop. The study consisted of two steps: 1) delimitation of the North, Center-North and Center zones of Veracruz State, to identify sites with collections and locate new locations to be collected, for which an analysis of the potential distribution was developed with the MaxEnt® software; and 2) morphological characterization of the fruit by zone using the SNICS Technic Guide and the IPGRI descriptors. Results were evaluated with an analysis of variance (ANOVA), an analysis of principal components (APC) and a conglomerate analysis. Forty-eight new accessions of *C. pubescens* from the North, Center-North, and Center were collected, with which a potential distribution model was generated (high fit: AUCmean= 0.990), which identified potential areas in the states of Veracruz, Puebla, Oaxaca, Hidalgo, and to a lesser extent in Chiapas, Durango and Guerrero. The ANOVA showed significant differences ($p \leq 0.05$) in all the fruit variables evaluated, as a result of the morphological diversity in the accessions. The PCA explained more than 70.1% of the total variation. The cluster analysis allowed grouping the collections into three large groups: group I: Central mountainous region, group II: Central-northern region, and group III: Northern region of the state of Veracruz. High interpopulation variability was found, that was integrated into the genetic improvement program. In addition, with the model, new potential areas were identified in the state of Veracruz that meet favorable edaphoclimatic conditions where the crop can be established, this represents an opportunity for additional economic benefits for the agricultural population.

Key words: Morphological characterization, MaxEnt, fruit, potential distribution.