

AN ABSTRACT OF THE THESIS OF

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Title: Survey and Characterization of Almond (*Amygdalus spp.*) Germplasm in Lebanon

Despite its wide distribution range, almond germplasm is threatened by overgrazing, deforestation, and the replacement of traditional cultivars with improved varieties that have a narrow genetic base. The objective of this study was to survey the distribution of almond species in Lebanon and characterize the almond germplasm. The survey was conducted throughout Lebanon and collections were made from both wild and cultivated habitats. Ecogeographic surveys were conducted and morphological characterization of leaves and nuts was performed. In addition, the identified species were characterized using the RAPD technique. The results indicated that only three species (*Amygdalus communis*, *Amygdalus orientalis*, and *Amygdalus korschinskii*) out of six could be found in Lebanon. Several populations of *Amygdalus communis* were found at elevations ranging from 50 to 1100 m. In contrast only six populations of *A. orientalis* were found and those were limited to the North Eastern part of the country, while only three populations of *A. korschinskii* were found two of which were in Central Bekaa. The genetic diversity of the three species was high. In addition the morphological characterization revealed the presence of *A. communis* populations with desirable nut and kernel qualities. Leaf characters were consistently independent of nut characters, and the correlations between the characters varied with species. Principle component analysis revealed that nut weight, nut volume, nut width, kernel weight and kernel volume consistently had a higher contribution to total variation in both *A. communis* and *A. orientalis*. In contrast leaf traits consistently appeared in the second component. Molecular characterization of the three species revealed that *A. communis* and *A. korschinskii* were genetically closer to each other than either was to *A. orientalis* and therefore confirmed the classical morphological, based classification. A DNA fingerprint was also generated to characterise the three species.