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“Filling gaps and removing traps
for sustainable resource management”

Genetic Diversity and Differentiation of *Olea europaea* subsp. *cuspidata* in the Hajar Mountains, Sultanate of Oman

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Abstract

Olea europaea subsp. *cuspidata* (Wall. & G. Don) Cif. (wild olive) is one of the six subspecies considered important for domestication purposes of olive as it bears favourable physiological and morphological traits. The distribution of wild olive stretches from South Africa over the Middle East and the Mediterranean region to China mainly at mid to high altitudes with reliable precipitation. Wild olive populations are considered isolated outposts of a formerly large and more or less connected *Olea europaea* population. Nowadays, wild olive populations are poorly connected, situated in fragile habitats, and hence more prone to additional stresses. These stresses include erratic weather extremes and anthropogenic influences such as illegal logging and livestock keeping activities that may result into further fragmentation of stands, shifts of demography, increased clonal growth, and lead to directional genetic change. Wild olive also grows in the Hajar Mountains, Sultanate of Oman, a habitat subjected to many anthropogenic disturbances. Therefore, the present condition of wild olive in the Hajar Mountains was studied to predict the future stability of this population. To this end a total of 362 individuals was inventoried and a subset of 188 individuals were genetically analysed at 12 microsatellite markers. Dendrological measures indicated disturbances mainly due to human activities. Height and crown area of individuals averaged 3.7 m (range: 0.2 to 12 m) and 14 m (range: 1 to 18 m), respectively. The stand conditional index was mainly 50%. The identified genetic variation within the sampled areas was moderate (observed and expected heterozygosity: 0.58 to 0.55 and 0.64 to 0.62, respectively) with the absence of clones. Though significant genetic differentiation was found, there was no evidence of population sub-structure suggesting effective pollen and long-distance seed dispersal. Changes in gene flow patterns may be reflected in the next (seedling) generation. Further studies are necessary to detect any changes in the future and to develop sustainable conservation strategies for this species.

Keywords: EST-markers, genetic diversity, microsatellites, spatial genetic structure, wild olive