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Title: Genetic Diversity and Conservation of the Wild Olive Tree (Olea europaea subsp. europaea var. sylvestris) in northern Algeria by the Molecular Approach

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Abstract

The protection of the genetic resources of the olive tree becomes fundamental not only for the cultivated olive tree but also in its wild form. Wild olive (Olea europaea subsp. europaea var. sylvestris) represents a valuable genetic resource on the one hand, for the breeding programs of cultivated olive and on the other hand, for the conservation of biological diversity in natural environments. In this study, a large number of wild olives (174) were collected along an altitudinal gradient climatic from Western to East Algeria. Sixteen SSRs markers were selected. Several readings and verifications of microsatellite data before establishing the genetic database. The polymorphic results of 16 SSRs were evaluated through the values of the genetic diversity indices. The total number of alleles equal to 173, the largest number of alleles equal to 22 detected with DCA 16 followed by UDO 43 and UDO 28. The best discriminating power values are recorded with DCA04 followed by DCA 16 and UDO43. The best PIC values are obtained with DCA16, UDO43 and UDO28. Distribution of state-shared identity alleles (IBS) between genotypes were determined by 22.088 unbound nucleotide polymorphisms. Genetic relationships have been demonstrated through PCA. Genetic structure by the Bayesian group revealed K=2, the first genetic pool (Gp1) includes 78 genotypes collected in the northwest of the country. Second genetic pool (Gp2) contains 86 genotypes mainly collected in Northeast Algeria. For K= 3, Gp2 revealed Gp2.1 of the northeast coast genotypes and Gp2.2 includes the genotypes of the interior mountainous regions. AMOVA revealed most of the molecular variance within the population (85%) and only 12 and 3% respectively, between groups and within groups. Indeed, the geographical origin and the type of climate are the main factors determining the population structure of the local oleaster. Samples from an area characterized by higher temperatures and low precipitation are a good source of genes for tolerance to harsh climatic conditions, thus becoming crucial in addressing future challenges posed by climate change. A deeper understanding of the genetic basis of resistance in the genetic material of the wild olive tree could improve the performance of cultivars through the implementation of olive breeding programs.

Biography

Wahiba Falek is from National Superior School of Biotechnology, Constantine 3 University, Algeria her research interests are Wild olive, Diversity, Genetics, microsatellites, Structures and also participated in many international conferences around the world.