Polymorphism analysis in some Algerian Opuntia species using morphological and phenological UPOV descriptors

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Description:
Background: In the present study, we have investigated the morphological variation in a set of five Opuntia species from the Algerian steppes using 49 UPOV descriptors. Questions: Which of the 49 descriptors that can be used as powerful estimators of the phenotypic diversity within Opuntia species? How is the morphological diversity patterned in Algerian Opuntia? Species study/ Mathematical model: Opuntia ficus-indica, Opuntia amycleae, Opuntia streptacantha, Opuntia engelmannii, Opuntia robusta. Principal Components Analysis (PCA) and Hierarchical Cluster Analysis were used. Study site: Four counties were studied located in the Algerian steppes. The present research was carried out during 2014. Methods: 49 descriptors adopted by the International Union for the Protection of New Varieties of Plants (UPOV) were employed in the present research, where cladode, flower and fruit traits were used to determine the overall degree of polymorphism among 5 Opuntia species. Results: Principal Component Analysis and Hierarchical Cluster Analysis indicated a consistent differentiation between all studied species. The relative magnitude of the first two PCA eigenvectors showed that 8 descriptors out of 49 were identified as the most important descriptors for the classification of the species. The dendrogram performed on the calculated Euclidean distances between all species pairs allowed the identification of 3 groups, unlike the PCA that identified 4 groups. The species Opuntia ficus-indica and Opuntia amycleae were identified as very close morphologically. Conclusions: The present outcome represents a paramount step towards the …