

Genetic Variability and Morphological Characterization of the Local Cannabis “Beldia” from Northern Morocco

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Abstract

Our study explores the biodiversity of the local Moroccan cannabis population, Beldia. A detailed morphological characterization of Beldia was conducted, providing insights into plant height, general growth habits, and the description of the stem, root system, leaves, male and female flowers, fruits, seeds, as well as the presence and distribution of trichomes. Furthermore, a genetic analysis of Beldia was carried out using simple sequence repeat (SSR) markers on samples collected from four regions in northern Morocco. The genetic diversity and population structure were investigated using GenAlEx 6.5 software and STRUCTURE v2.3.4 software, respectively. The results revealed that Beldia ecotype had a great genetic diversity as indicated by several genetic diversity indices, highlighting its value as a reservoir of alleles for breeding new cultivars with desirable traits. Moreover, the population structure and Mantel test results demonstrated the absence of isolation-by-distance. The geographical distance between regions did not influence the observed genetic differences, suggesting that Beldia seeds were frequently exchanged among farmers across these areas. This conclusion is of great interest in germplasm management and conservation, as all Beldia individuals from the four regions could be grouped into one genetic group, which can be protected as a single evolutionary unit, reducing conservation costs. Our findings contribute to a deeper understanding of the ecological and genetic landscape of Moroccan cannabis, aiding in the efficient management of its genetic variability and the preservation of Beldia's unique genetic identity and purity.

Keywords

Cannabis sativa L., Moroccan Ecotype, Morphological Characterization, Genetic Diversity, SSR Markers