

Section: Bioengineering, Biotechnology and Bioinformatics

Poster presentation

GENETIC STRUCTURE AND CONSERVATION MEASURES FOR THE BALKAN SESSILE OAK (*QUERCUS DALECHAMPII* TEN.) IN THE DJERDAP NATIONAL PARK

Popović Vladan¹, Daničić Vanja², Jovanović Sanja¹, Lučić Aleksandar¹, Rakonjac Ljubinko¹, Ristić Danijela³

¹Institute of Forestry, Belgrade, Republic of Serbia

²University of Banja Luka, Faculty of Forestry, Banja Luka, Bosnia and Hercegovina

³Maize Research Institute, Zemun Polje, Belgrade, Republic of Serbia

The Balkan sessile oak (*Quercus dalechampii* Ten.) is a valuable native forest tree species that plays an important ecological and genetic role within mixed oak forests in across parts of southern and southeastern Europe. Despite its significance, the genetic resources of this taxon have not been sufficiently studied, which represents a major challenge for the development of effective conservation and sustainable forest management strategies. The aim of this research was to assess the current state of the genetic diversity and structure of Balkan sessile oak populations within the Djerdap National Park and to propose practical measures for their conservation. Molecular characterization of 27 genotypes was conducted using seven highly informative SSR (Simple Sequence Repeat) markers. DNA was extracted from fresh leaf tissue and analyzed following standardized PCR protocols. The results revealed a high degree of polymorphism across all loci (mean PIC = 0.899) and an overall expected heterozygosity (H_e) of 0.907, indicating a substantial level of genetic variability within the studied population. The presence of significant inbreeding coefficients ($F = 0.810$) and deviation from Hardy-Weinberg equilibrium suggest complex population dynamics and gene flow patterns. Cluster analysis confirmed moderate genetic differentiation and highlighted the importance of preserving intra-population variability. These findings emphasize the necessity of integrating both In situ and Ex situ conservation measures. Establishing conservation units, preserving natural regeneration stands, and developing seed banks are recommended to maintain the adaptive potential of these forest genetic resources. This will ensure the long-term sustainability and resilience of Balkan sessile oak forests in the face of ongoing environmental and climatic challenges.

Keywords: forest genetic resources; genetic diversity; conservation strategies; inbreeding; gene flow

Correspondence: vladanpop79@gmail.com