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Genetic diversity of alfalfa breeding populations revealed by SSR markers

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Genetic diversity studies are important for the selection of parents with a greater combination capacity which, when crossed, increase the chances of obtaining superior genotypes. Thus, genetic diversity of 50 individual samples of five alfalfa populations selected from the breeding program of the Institute of Field and Vegetable Crops, Novi Sad, Serbia was characterized based on 27 polymorphic SSR loci. A total of 224 alleles were obtained with mean value of 8.77 alleles per population. Mean effective number of alleles ranged from 2.45 for population Ghareh to 2.66 for population Zuzana, while the mean observed heterozygosity ranged from 0.65 for population Ghareh to 0.73 for population Zuzana. Low levels of genetic differentiation among the populations of alfalfa were detected by Nei's $G_{st} = 0.079$. It is further confirmed by PCoA and Bayesian model-based clustering approach that could not reveal a clear separation between populations, although individuals from population RSI 20 were clearly differentiated to other populations. Analysis of molecular variance showed that 89.0% of the total genetic variability was attributed to variation among individuals within tested alfalfa populations, and only 11% was found between populations. The obtained results provided a better understanding of individual identities and relationships of alfalfa germplasm, and it could contribute to their more efficient utilization in breeding.

Biography

Ksenija Taški-Ajduković is employed in the Institute of Field and Vegetable Crops, Novi Sad, Serbia, as the Scientific Advisor. Her research is focused on the application of protein and DNA markers in breeding of field crops, plant genetic resources and plant protection. She has completed her PhD in 2005 at the Faculty of Biology, Belgrade. She is co-author of over 200 publications in international and national journals, conferences and book chapters. She is a member of the Variety Committee of the International Seed Testing Association (ISTA) and Editorial Boards of several peer-reviewed scientific journals.

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