Proceedings of the LXVI SIGA Annual Congress Bari, 5/8 September, 2023 ISBN: **978-88-944843-4-2**

Poster Communication Abstract – 1.18

SNP GENOTYPING TO EXPLORE GENETIC DIVERSITY: THE CASE OF MONTENEGRIN DURUM WHEAT LANDRACES

VELIMIROVIĆ V.*, JOVOVIĆ Z.*, PEROVIĆ D.**, LEHNERT H.***, MIKIĆ S.****, MANDIĆ D.*****, PRŽULJ N.*****, MANGINI G.******, FINETTI-SIALER M.****** *) Biotechnical Faculty Podgorica, University of Montenegro, Mihaila Lalića 15, 81000 Podgorica, Montenegro **) Federal Research Centre for Cultivated Plants, Institute for Resistance Research and Stress Tolerance, Julius Kuehn-Institute, Erwin-Baur-Strasse 27, 06484 Quedlinburg, Germany ***) Federal Research Centre for Cultivated Plants, Institute for Biosafety in Plant Biotechnology, Julius Kuehn-Institute, Erwin-Baur-Strasse 27, 06484 Quedlinburg, Germany ****) Institute of Field and Vegetable Crops, Maksima Gorkog 30, 21101 Novi Sad, Serbia *****) Agricultural Institute of Republika Srpska, Knjaza Miloša 17, 78000 Banja Luka, Republika Srpska, Bosnia and Herzegovina ******) Faculty of Agriculture, University of Banjaluka, Bulevar vojvode P. Bojovića 1a, 78000 Banja Luka, Republika Srpska, Bosnia and Herzegovina ******) Institute of Biosciences and Bioresources, National Research Council (IBBR-CNR), Via Amendola 165/A, 70126 Bari, Italy

durum wheat landraces, Rogosija, genetic diversity, SNP array

Landraces of durum wheat (Triticum turgidum subsp. durum), were the main cereals of Montenegro until the mid-20th century, where they were Rogosija. After the Second World War, collectively recognized as the introduction high-yielding common wheat cultivars threatened of the survival of Rogosija landraces, that were almost extinct in farmers' fields. Starting from 1955, sampling of durum wheat accessions in Montenegrin regions allowed the conservation of a Rogosija durum collection in the Montenegro Plant Gene Bank. This assortment represents an unexplored durum wheat germplasm that can be analyzed for the identification of valuable alleles, useful to increase the wheat crop adaptability to climate change. Aims of this study were: i) to estimate the genetic diversity and

population structure of the Rogosija collection using SNP markers; *ii*) to investigate correlation between genetic clusters and the Montenegro ecogeographic conditions. The collection was analyzed with a high-throughput genotyping system based on the 25K Illumina SNP wheat array. A total of 6,915 high-quality SNPs were retained and mapped on the durum genome. Principal components and phylogenetic analyses discriminated two different genetic durum clusters. Analysis of molecular variance revealed that 16% of the total variation was due to differences among the genetic clusters, the remaining variance occurred within clusters. whereas To estimate whether the genetic clusters detected are related to Montenegrin ecogeographic regions, the durum accessions were geo-referenced and evaluated according to ecological data of the collecting sites. Interestingly, one genetic cluster included samples located around Lake Skadar, while the second genetic cluster comprised accession sampled in the Montenegrin littoral coast. This result suggests that the Rogosija durum collection stored in the Montenegro Plant Gene Bank enclosed two Rogosija durum populations, evolved in two different eco-geographic micro-areas.