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GENOTYPING-BY-SEQUENCING HIGHLIGHTS GENETIC STRUCTURE AND PATTERNS OF GENETIC DIVERSITY IN A GLOBAL COLLECTION OF LENTIL (*LENS CULINARIS* (MEDIK.))

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Lentil (*Lens culinaris* Medik.) is one of the oldest domesticated crops and one of the most important grain legumes worldwide. Unfortunately, lentil genetic diversity available in *ex-situ* germplasm collections is largely unexplored, thus limiting the success of breeding efforts.

Within the framework of the project "LeGeReTe" (LEgume Genetic Resources as a tool for the development of innovative food TEchnological system), we assayed the molecular diversity of a global collection of lentil available at the Institute of Bioscience and BioResources (IBBR) of the Italian National Research Council.

Simultaneous marker discovery and call by genotyping-by-sequencing (GBS)yielded 4,760 high-quality SNP polymorphisms on a panel of 188 accessions. Analysis of genetic structure and relationships among accessions clearly indicated divergence between the Mediterranean and the Southern Asia gene pools, which were in turn different from Ethiopian germplasm. Patterns of genetic diversity were also identified within Mediterranean germplasm, reflecting geographical and/or phenotypic stratification.

Overall, this work provides useful information on lentil genetic diversity. Currently, we are characterizing the germplasm collection with respect to main morpho-agronomic and nutritional traits, aiming to the identification of superior genotypes under Mediterranean constraints, and in view to perform genome-wide association studies.