

Genetic variability for high molecular weight glutenins in Spanish bread wheat landraces

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The allelic variation in high molecular weight glutenins (HMW-Gs) has been reported to account for up to 60% of the variation in bread making quality. In modern cultivars, the HMW-GS allelic variability is not very large and the cultivars used for high quality wheat breeding are very similar in their HMW glutenin composition. Wheat landraces have a higher allelic variability and could be very useful for broadening the currently narrow genetic basis in breeding programs.

In this work, the allelic variation of HMW-Gs has been analyzed in a collection of 189 Spanish wheat (*Triticum aestivum* ssp. *vulgare* L.) landraces provided by the Plant Genetic Resources Centre. A set of 28 reference cultivars was also included in the analysis. Combining standard electrophoresis techniques (SDS-PAGE) and PCR analysis, we identified five different alleles at the *Glu-A1* locus, being the most frequent the *b* allele (2* subunit). In the *Glu-B1* locus, fifteen different subunits combinations were found, the 20x+20y combination, which corresponds to the *e* allele, was identified in half the accessions. Nine different alleles were identified in the *Glu-D1* locus, where the *a* allele (2+12 subunits) was the most represented. New allelic variation was found for the three loci analysed in the set of landraces. This variation is higher than the obtained in previous studies with landraces, and suggests a high degree of genetic variability in this collection. Afterwards, we tried to link the variability observed for HMW-Gs with the overall genetic diversity of the collection, previously assessed by DArT-seq. Interestingly, accessions with the same *Glu-B1* alleles were grouped together in a Principal Coordinates Analysis based on genetic data.

The complete description of the HMW glutenin composition of all the landraces analyzed besides further functional quality analyses may favour the use of these valuable materials in wheat breeding programs.