Poster Abstract - F.03

CHARACTERIZATION OF EXPRESSED AND UNEXPRESSED Y-TYPE GENES IN DIPLOID AND POLYPLOID WHEAT

F. SESTILI, C. MATTEI, R. D'OVIDIO, D. LAFIANDRA

Department of Agrobiology and Agrochemistry, University of Tuscia, Via San Camillo de Lellis, snc, 01100 Viterbo, Italy - lafiandr@unitus.it

glutenin, wheat, y-type, gene silencing, quality

Glutenins represent the most important group of seed storage proteins present in hexaploid bread wheat (genomic formula AABBDD) due to their role in determining dough properties; in particular they are associated with the dough visco-elastic properties, which are the critical factors of bread-making quality. They are polymeric structure that, when treated with reducing agents, give rise to high (HMW) and low (LMW) molecular weight subunits. HMW glutenin subunits are encoded by two linked genes per genome present at the *Glu-1* loci, on the short arm of the homoeologous group 1 chromosome and designated as x- and y-types. HMW glutenin genes of cultivated wheat are not all expressed; in particular, the Ay subunit is always absent in bread and durum wheats (AABB), while is present in cultivated and diploid wild species *T. monococcum* ssp *monococcum*, *T. monococcum* ssp *boeoticum* and *T. urartu*, all with genomic formula AA.

In this work, we report, for the first time, the characterization of an expressed *Ay* gene both at the DNA and protein level, in order to detect further differences between different species and establish relationships with the silent *1Ay* genes present in polyploid wheats. The entire coding region of the *HMW* gene was amplified by PCR on genomic DNA of *T. urartu* using two specific primers. Deduced amino acid sequence was aligned with the amino acid sequences of the *Ay* silent gene from bread wheat cultivar Cheyenne and orthologous y-type genes associated at the B and D genomes of *Triticum aestivum*. These comparisons showed that the *1Ay* expressed gene from *T. urartu* possessed a similar structure as the previously reported silent *1Ay* gene from common wheat. This included the absence of a cysteine residue in the repetitive central domain, near the C-terminal part, differently from what observed for the By and Dy subunits. Implications for breadmaking properties are discussed.