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Genetic determination of technological quality in *Triticum durum*

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Abstract

Background and Purpose: This paper presents the results of an investigation of gliadin alleles variability and their relationship to technological quality components in 21 durum wheat cultivars.

Material and Methods: Seeds of 21 durum cultivars were crashed and used for extraction of gliadins by 70% ethanols. At least 30 seeds were used for gliadin extraction. The composition of gliadin components was analyzed by acid polyacrylamide gel electrophoresis (pH=3.1). Electrophoregrams were used for identification of gliadin alleles. Technological quality of geneticaly divergent durum cultivars were evaluated by determination of wet gluten content and rheological (farinographic) dough properties.

Results and Conclusion: Polymorphysms of alleles at each locus was registered. At four gliadin loci 27 different alleles were determined by analysis of 21 durum cultivars. Each cultivar had different gliadin allele composition. Frequency of each allele was computed and varied in the ratio from 4.8% to 42.9%. Values of flour water absorption and gluten contents had on the level of B_1 and B_2 quality classes. Gliadin alleles at the *Gli-B1* locus showed the highest positive connection with gluten contents. High frequency of alleles was related with good gluten quality and water absorption of flour. Gliadins can be used as a marker for biological traits of wheat.

INTRODUCTION

Triticum durum is a tetraploid species with two diplod genomes AA and BB. Each of these genomes has 7 pairs of chromosomes (n=14 and 2n=28 chromosomes). Durum wheat is important for human food which is used for making pasta, bread, and related products are associated with medium to high protein contents and compositions. Many investigations have been focused on variability of storage proteins and their impact on technological quality parameters both in durum and bread wheat *(1, 2)*.

Storage proteins represent products of numerous alleles of *Gli* loci which are in *Triticum aestivum* wheat located at the short arm of 1A, 1B, 1D, 6A, 6B and 6D chromosomes *(3, 4)*. In durum wheat *Gli-A1* and *Gli-B1* loci are located at the short arm of 1. and *Gli-A2* and *Gli-B2* are located at the short arm of 6. homologous chromosomes *(5)*. For each locus multiple allelism were identified.

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