UDC 575.17:575.113.2:633.34

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APPLICATION OF NEW MOLECULAR MARKERS FOR DETECTING OF GLIADIN LOCI POLIMORPHISM OF *TRITICUM DURUM* DESF.

Durum wheat is an important raw material in the food processing industry and the main ingredient in the production of pasta. It is mainly grown in the Mediterranean basin (Italy, Turkey, Algeria and Spain, providing 50% of the world's production).

Usually durum wheat cultivars with extraordinary frost tolerance have unsatisfactory yield and quality. Breeding winter –type cultivars of durum wheat with

frost tolerance and quality on a level of classical quality spring durum varieties and yield is challenging, but not impossible. Flour breadmaking/ pastamaking quality is determined by properties of gluten complex consisting of monomeric gliadins and polymeric glutenins proteins.

Gliadins and glutenins demonstrate high polymorphism and are very important for selection durum wheat especially of winter type cultivars selection, growing in Ukraine. Due to the complexity identification allelic variants of gliadins in durum wheat there is a need for DNA-markers. Therefore, the aim of study was to analyze polymorphism of *Gli-A1* and *Gli-B1* loci of modern Ukrainian winter durum wheat cultivars using a DNA-marker system developed on common wheat.

Eighteen durum wheat cultivars developed by Plant Breeding and Genetics Institute – National Center of Seed and Cultivar Investigations were analyzed by PCR with allele-specific primers to *Gli-A1* and *Gli-B1* loci, developed by Zhang et al (2003). Gliadin protein specters characteristics were revealed by storage proteins electrophoresis in acid PAGE method. Bioinformatic analysis and PCR *in silico* were used for analyzing possibility of applying of primers developed for bread wheat for durum wheat.

By using PCR with allele-specific primers to *Gli-A1* locus *Gli-A1.2* allele was detected in all cultivars studied. For six cultivars two alleles *Gli-A1.1* and *Gli-A1.2* alleles revealed in each grain analyzed. We assume these cultivars could have two copies of amplified in PCR sequence, that was shown by bioinformatic analysis.

Using PCR with allele-specific primers to *Gli-B1* locus developed by Zhang, we revealed two diferent by length amplification fragments of *Gli-B1.1* allele: 376 bp and 379 bp. Also five different by length amplification fragments were detected for *Gli-B1.2* alele: 397 bp, 400 bp, 403 bp, 409 bp, 424 bp.

DNA-marker system for gliadins developed on common wheat (Popovych et al., 2020) is applicable for durum wheat. Most alleles detected in the study are common for *T. durum* and *T. aestivum* species. Allele frequencies revealed for durum wheat significantly differ from allele frequencies of bread wheat collections studied before.

References

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