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Czech J. Genet. Plant Breed.

Vyhnánek T., Havel L.:

Genetic variability for coloured caryopses in common wheat varieties determined by microsatellite markers

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Products made from wheat are the most important components of the human diet, and could also become a source of functional foods and feed ingredients, e.g. minerals, vitamins and/or phytochemicals. The caryopses of certain wheat genotypes contain antioxidants, i.e. anthocyanins or carotenoids, which cause purple, blue or yellow coloration. The first step before the introduction of these traits into individual wheat cultivars is the characterization of relationships and the possibility of new gene combinations. In this study, relationships among 24

genotypes with different types of caryopsis colour were investigated by means of microsatellite markers. Using 44 SSR (Simple Sequence Repeat) markers it was possible to detect a total of 184 alleles; on average, approximately 4 alleles were detected at a microsatellite locus. Using a set of 5 SSR markers (*Xgwm636*, *Xbarc077*, *Xwmc262*, *Xgwm397* and *Xwmc219*) with PIC (polymorphic information content) values higher than 0.70, it was possible to differentiate among all the genotypes analysed. A dendrogram was created on the basis of all SSR markers, and showed that the genotypes were divided into two groups. Three, and one genotype with purple and blue caryopsis, respectively, belonged to one cluster, while the remaining twenty formed the second, greater cluster, which was subdivided into 2 sub-clusters: one of them involved genotypes with blue caryopses, and the other those with yellow and red caryopses. The genotype of tall wheatgrass (*Thinopyrum ponticum*), as a possible donor of genes responsible for blue caryopses, was also classified. These results can be used in wheat breeding programmes aimed at the

selection of functional foodstuffs.

Keywords:

aleurone layer; endosperm; grain; pericarp; SSR markers; *Triticum aestivum*; *Thinopyrum ponticum*

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