

PCR ANALYSIS OF X- AND Y-TYPE GENES PRESENT AT *GLU-1* LOCI IN OLD DURUM WHEAT CULTIVARS

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High molecular weight glutenin subunits (HMW-GS) have been extensively investigated because of their impact on quality of wheat gluten and dough elasticity. In durum wheat they are encoded by genes at two complex loci (*Glu-A1* and *Glu-B1*) present on the long arms of the chromosomes of the homeologous group 1. Each locus consists of two tightly linked genes one encoding a subunit of higher, and the other of lower molecular weight, designated as x- a y-type respectively. Despite the fact that durum wheat possess four HMW-GS genes, the number of expressed subunits ranges from one to three because of gene silencing processes. The y-type gene at the *Glu-A1* locus is always silent in cultivated wheat, while the x-type at the same locus is expressed only in some cultivars. The identification of “quality-associated” glutenin subunits that can be incorporated into durum wheat, has led to wider studies on allelic variation at each of the encoding loci which has been shown to have different effects on technological performance of durum semolina.

In order to identify sources of novel genes and to study changes occurred in encoded proteins, the HMW-GS present in durum wheat cultivars grown in Italy seventy years ago, have been analysed by biochemical and molecular techniques. HMW-GS alleles encoded at two glutenin loci have been identify, from a set of old durum wheat cultivars and commercial varieties recently released, by sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE). At the *Glu-A1* and *Glu-B1* loci, one and six alleles have been observed respectively. Comparison of glutenin alleles among old cultivars and modern commercial varieties confirmed the presence of allelic pairs associated to poor quality score. Genes corresponding to these subunits were amplified by polymerase chain reaction (PCR) using specific primers. DNA fragments corresponding to x- and y-type genes associated to the A and B genomes were detected in all accessions including those without expressed x- and y-type subunits. The presence in the y-type genes associated to A genome of the particular 8-kb transposon-like insertion, usually present in unexpressed y-type genes at the *Glu-A1* locus in Chinese Spring, has been also shown confirming previous results obtained in wild and cultivated tetraploid wheat.