PUROINDOLINES IN BREAD WHEAT NEAR-ISOGENIC-LINES (NILs) OF CV. ENESCO


*) C.R.A.-Istituto Sperimentale per la Cerealicoltura, Roma
**) C.R.A.-Istituto Sperimentale per la Cerealicoltura, S.Angelo Lodigiano (LO)
***) Conase, Conselice (Ra)

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Kernel hardness, an important technological trait influencing flour yield and quality of common wheat, is under the genetic control of Pina-D1 and Pinb-D1 loci coding for puroindoline a (Pin-a) and puroindoline b (Pin-b), respectively. Pin-a and Pin-b are the predominant component of friabilin, a group of polypeptides which occur in higher amounts on the surface of starch granules of soft wheats as compared to those from hard wheats.

The main common wheat cvs grown in Italy have been assigned to three different hardness classes (soft, medium hard and hard) according to their SKCS values. All cvs in each hardness class were found to show a normal distribution for the SKCS index, with the only exception of cv. Enesco, which presented a bimodal distribution. Further investigations carried out on spaced plants from certified seed of cv. Enesco demonstrated that plants were similar in phenotype and prolamin pattern, but different in puroindoline composition. Two biotypes were identified, i.e. soft textured Enesco 1 possessing alleles Pina-D1a and Pinb-D1a and hard-textured Enesco 2 possessing Pina-D1b and Pinb-D1a. The commercial cv. Enesco and its biotypes have been used in a field experiment carried out in Rome in 2006 and repeated in 2007 at S. Angelo Lodigiano (LO) in a plot trial with randomized blocks.

The tested genotypes were found to be similar for grain yield and agronomic related traits and significantly different for quality aspects such as flour yield, water absorption, starch damage, farinograph time peak and stability, alveograph W and P/L. Different end uses for each biotype are suggested according to their puroindoline composition.