

MOLECULAR TECHNIQUES FOR THE FINGERPRINTING OF DURUM WHEAT VARIETIES

SCIACCA F., RUSSO M.P., PALUMBO M.

CRA-ACM - Centro di Ricerca per l'Agrumicoltura e le Colture Mediterranee, Corso Savoia 190, 95024 Acireale (Italy)

Durum wheat, fingerprinting, fAFLP, SSR-microsatellite, RAPD

The use of biotechnologies has provided additional tools to monitor and trace the cereal chain, through DNA analysis. The aim of the study was to compare three molecular techniques: fAFLP (*Amplified Fragment Length Polymorphism* in fluorescence), SSR (*Simple Sequence Repeat*) and RAPD (*Random Amplified Polymorphic DNA*).

The use of fAFLP technique shows some advantages in the identification of diagnostic or specific markers. Although these markers are generally dominants, the AFLP analysis does not require previous knowledge of the DNA sequence, generates reproducible fingerprinting profiles and allows the amplification of a high number of DNA fragments per reaction, enabling the detection of specific amplified fragments. The AFLP fragments are usually scored as presence or absence of bands among a set of genotypes. The technique was developed for application to durum wheat and resulted effective to identify low levels of genetic variability and to discriminate between genetically similar genotypes.

The SSR technique is "single-locus type" and co-dominant markers distinguish homozygous from heterozygous loci, respectively represented by only one band or two bands. In this study, 13 microsatellites were selected and the discrimination ability was evaluated by checking their efficiency in distinguishing among 20 accessions of durum wheat. The RAPD analysis involves the use of a single decamer primer with random sequence and the number of polymorphisms obtained for each primer varied from 6 to 12. This technique is very effective for homogeneity test and can be usefully adopted to check for contamination, especially in the seed industry.

The three methods considered can be useful to protect the authenticity and traceability of the cultivars in the cereal chain.