

GENOTYPING A COLLECTION OF ITALIAN AND EXOTIC TEMPERATE RICE GERMPLASM

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The study of the genetic diversity and populations structure may represent a powerful tool for breeding programmes of crop plants. The association between the visual observation (phenotyping) in the field and the modern bio-molecular analyses carried out by means of genomic markers (genotyping) can be used for the identification of new alleles for elite characters.

The genomic relationship among a collection of 224 rice genotypes was investigated using the microsatellites molecular markers: these are codominant, easy to analyze and allow a high automation and repeatability of the analyses.

A panel of 24 SSR molecular markers was chosen to investigate the rice collection and the genetic distances were analyzed: a phylogenetic tree describing the genetic structure of the collection was created. The correlation genotype-phenotype reveals the existence of distinct phylogenetic groups that were recognisable for their origin and agronomic traits, thus allowing the identification of well-defined groups of cultivars with specific characters.

Moreover, the use of molecular markers are of major interest in the varietal identification in view of traceability, certification of DOP and IGP labelled product etc. and the identification of a given variety classified into a class with a brand name, is allowed. DNA-based analysis with the development of variety-specific molecular markers allows a rapid identification of a product and its attribution to a defined variety within a specific group. We have developed a set of molecular markers (SSR) that can be used as tool for varietal identification, suitable for use directly on grain and on rice-derived products. Fingerprinting analyses were validated on leaf-derived DNA and on flour-derived DNA in commercial varieties, and the developed markers will be exploited as a powerful tool for genetic traceability of the Italian rice.

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