MOLECULAR MARKERS FOR MOLECULAR ASSISTED BREEDING AND VARIETAL IDENTIFICATION IN ITALIAN RICE


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Fingerprinting methods are a major requirement to track high-quality varieties and protect brand names for the consumer choices. The Italian legislation establishes groupings of varieties and the corresponding trade name for the rice product derived from each group. A trade name must correspond to a single variety of the group within the same package; mixtures among varieties of the same group are not allowed. In the case of specialty rice, such as Carnaroli (for its peculiar quality), Vialone Nano (EU label for Protected Geographical Indication.), and Gange (fragrant rice), the varieties deserve a premium price which is significantly higher than common quality rice in domestic and international market, and packages of milled product must contain the specific variety only. We have developed and validated (ISO9001:2008) a methodology (RICE-ID) based upon a panel of molecular markers as a powerful tool for genetic identification and traceability of Italian rice varieties, applicable not only to non-processed, but also to processed commercial products (e.g. flours). The RICE-ID method enables the unequivocal identification of specific rice genotypes. A dedicated software (RICLASS) was developed to automatically collect and analyze the DNA profiles generated by the DNA fingerprint analysis. The RICE-ID methodology is widely applicable to the analytical tracking of a specific variety during processing of rice-derived food products and to varietal protection and traceability.

Sets of DNA markers were also developed and validated for specific quality traits (e.g. aroma, amylose content). The use of these DNA markers allow the selection of genetic materials of interest to accelerate ongoing breeding programs at national level.

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