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**DEVELOPMENT OF FUNCTIONAL MARKERS ASSOCIATED WITH PHENOTYPIC  
TRAITS FOR IDENTIFICATION OF RICE VARIETIES**

*Document prepared by experts from Uruguay*

**Summary**

In order to guarantee the identity and genetic purity of varieties an effective variety identification system is required. Currently, a varietal description is established by the distinctness, uniformity and stability ("DUS") tests ("DUS"). The DUS test examines a set of morphological and physiological characteristics during different cycles and phenological stages of the crop, in a costly process in terms of infrastructure, human resources and time. There is no consensus at UPOV regarding the use of anonymous molecular markers to register varieties. However, the use of molecular markers associated with descriptive phenotypic characteristics has been considered useful. In this research, eleven genic and genomic SSRs and one allele-specific marker, selected within QTLs associated with descriptive characteristics, have been tested for 22 varieties of rice. Nine of these markers were polymorphic, and a total of 41 alleles were determined, with an average of 4.1 allele per locus and a mean PIC of 0.45. The allele-specific marker *BADEX7-5* was effective for discriminating accurately the non-aromatic from the aromatic varieties. A high percentage of accurate classifications were obtained for pubescence traits (100%) using SSR *GL311*, seed shape using *GMGS3-1* (95%) and *GMGS3-2* (80%), amylose content (84.2%) with the SSR *RM190* and subspecies (89.5%) using the SSR *RM215*. *MRG4709*, *GENHdl* and *RM10252* did not discriminate for pigmentation, flowering time and maturity characteristics, respectively. The set of polymorphic markers used correctly discriminated 90.9% of the varieties evaluated. These markers may be included in a matrix for genetic identification of rice varieties. The results show the potential of selected markers within genes and QTLs associated with

characteristics of descriptive interest, as a complementary tool for the phenotypic description of rice varieties.

**Keywords:** *Oryza sativa*, SSR mining, molecular characterization

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