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Molecular characterization of rice (*Oryza sativa* L.) germplasm using SSR marker

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Molecular marker technologies can assist conventional breeding efforts and are valuable tools for analysis of genetics relatedness and the identifications and selection of desirable genotypes for crossing as well as for germplasm conservation in gene banks. The objectives of the present investigation were to evaluate genetic divergence, molecular characterization of 30 rice genotypes using twenty SSR markers and to evaluate the efficiency of SSR markers. Among the used 20 primers, only 15 primers amplified well and revealed polymorphic bands, whereas, remaining 5 primers showed no reaction in PCR amplification. The allele length for these 15 primers varied from 100 to 500 bp. Total of 20 alleles were detected in 30 rice genotypes and number of alleles per locus ranged from 1 to 3 with an average of 1.93 per locus. The highest number of alleles (3.0) was detected in the locus RM1, RM2-, RM26 and the lowest number of alleles (1.0) was detected from RM22, RM 138, RM182 and RM 189. The PIC (Polymorphism Information Content) values for different SSR loci across the 30 rice genotypes ranged from 0.066 (RM138 and RM 182) to 0.9 (RM31) with an average of 0.605. The PIC values indicate that RM31 might be the best marker for diversity analysis. Resolving power of the microsatellite markers used ranging from 1.6332 (RM20) to 4.3664 (RM26) with an average of 2.4686. Jaccard's similarity coefficient revealed that Punjab Basmati 3 and Vallabh Basmati 24 were ascertained to be the genetically divergent from the other genotypes. The similarity coefficient values indicated, a wide genetic base of 30 genotypes used in the experiment. The resolving power and PIC value of primers shows that they are highly polymorphic and informative. The result derived from the analysis of genetic diversity at DNA level could be used for designing effective breeding programs aiming to broaden the genetic basis of commercially grown varieties.

Biography

Pooran Chand has expertise in teaching and development of wheat and rice varieties with reference to heat and drought tolerant through conventional and non-conventional methods. He is currently teaching Postgraduate and PhD courses on Principles of Quantitative Genetics and Advanced Biometrical and Quantitative Genetics. He has published more than 50 research papers in different reputed research journals and is associated with the development and releasing of 14 varieties in different crops well adopted by the farmers.

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