

Genetic divergence and heritability of 42 coloured upland rice genotypes (*Oryza sativa*) as revealed by microsatellites marker and agro-morphological traits

ABSTRACT

Coloured rice genotypes have greater nutritious value and consumer demand for these varieties is now greater than ever. The documentation of these genotypes is important for the improvement of the rice plant. In this study, 42 coloured rice genotypes were selected for determination of their genetic divergence using 25 simple sequence repeat (SSR) primers and 15 agro-morphological traits. Twenty-one out of the 25 SSR primers showed distinct, reproducible polymorphism. A dendrogram constructed using the SSR primers clustered the 42 coloured rice genotypes into 7 groups. Further, principle component analysis showed 75.28% of total variations were explained by the first—three components. All agro-morphological traits showed significant difference at the ($p < 0.05$) and ($p < 0.01$) levels. From the dendrogram constructed using the agro-morphological traits, all the genotypes were clustered into four distinct groups. Pearson's correlation coefficient showed that among the 15 agro-morphological traits, the yield contributing factor had positive correlation with the number of tillers, number of panicles, and panicle length. The heritability of the 15 traits ranged from 17.68 to 99.69%. Yield per plant and harvest index showed the highest value for both heritability and genetic advance. The information on the molecular and agro-morphological traits can be used in rice breeding programmes to improve nutritional value and produce higher yields.