

Genetic Comparisons of Landrace Rice Accessions by Morphological and RAPDs Techniques

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ABSTRACT

Morphological and molecular characterization of ninety-six landrace rice (*Oryza sativa* L.) accessions including six checks collected from four regions (North-West, North, West and Central-West) of Cote d'Ivoire were assessed using 14 agrobottanical traits and 10 Randomly Amplified DNA Polymorphisms (RAPDs) primers, respectively. Accessions were evaluated in a field experiment in an augmented experimental design with three replicates. The aim of the research was to study variations and to select lines that could be used as potential parents in future breeding programs. A principal components plot and a dendrogram based on distance between genotype cluster groups for mean values of the morphological variables were used to group the accessions. Genetic relatedness among accessions based on RAPD molecular marker was also presented in form of a dendrogram generated by clustering analysis using the Unweighted Pair Group Method with Arithmetic mean (UPGMA). The relative effectiveness of the RAPD markers compared to botanical descriptors in assessing diversity among the accessions was investigated. Clustering analysis technique using NTSYS classified the 96 landrace accessions into 8 morphological groups whereas PCA re-ordered the accessions into three broad groups that had within cluster similarities and inter-cluster differences in morphological variations. Reaction products (bands) of the RAPD analysis were highly polymorphic, more discriminatory and informative as they were able to differentiate more pairs of accessions than the botanical descriptors. Apart from checks, highest grain yield (2316 g/plot) was observed for accessions 46 (DNN 184) with an average of 12 filled tillers, plant height of 136 cm and medium maturity date of 136 days. It was observed that number of total and filled tillers per se was not a function of yield but rather, these traits were significantly associated with plant height and maturity date. Although, landrace rice accessions in Côte d'Ivoire is associated with relatively narrow genetic base, positive heterosis could be promoted if any of the Gagnoa (GGA) accessions from Central West of the country is used in a future hybridization program with Danane (DNN) accessions from west because of genetic distance between members of the two groups.