Molecular Characterization of Drought Tolerant Lines in Rice using Microsatellite Markers

P Venkata Ramana Rao, Swati Chandrika, K S N Prasad, M Gayathri, B N V S R Ravi Kumar, M Girija Rani, N Chamundeswari, P V Satyanarayana and Y Suryanarayana

Andhra Pradesh Rice Research Station & Regional Agricultural Research Station, Maruteru 534 122, W G Dist, A P, India

ABSTRACT

Drought is one of the major abiotic stresses in rainfed rice which causes low yields (0.7 to 1.5 t/ha). Drought being the most devastating environmental stress, continuous efforts are needed to improve the crop productivity under water-limiting conditions. Molecular characterization of the genotypes and study on extent of variability among the genotypes for complex traits like drought is essential to incorporate such genotypes in the breeding programme. The experimental material consisted of 44 advanced breeding lines developed at APRRI & RARS, Maruteru in the APNL Biotechnology project. These 44 advanced breeding lines were characterized using a set of 30 microsatellites or SSRs (simple sequence repeat) spanning all the 12 rice chromosomes. The total number of alleles detected in the study was 46 and out of these 46 alleles, 29 alleles (63%) were polymorphic. The number of alleles detected at a single locus ranged from 1-3 with an average of 1.5 alleles per locus. UPGMA analysis has grouped the 44 genotypes into nine clusters. Clusters I to V had single genotype each, while cluster VII had two genotypes. Cluster VIII and Cluster VI had three and four lines respectively. Of all the clusters, Cluster IX is the largest having 30 genotypes. The coefficient of similarities based on random data among genotypes ranged from 0.46 to 0.59 with an average similarity index of 0.53.

Key words : Characterization, Drought, Markers, Microsatellite, Rice.