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Molecular characterization of elite finger millet (*Eleusine coracana* Gaertn.) accessions

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SUMMARY

RAPD primers are used to analyze the genetic diversity of an individual by using random primers. In this study eight finger millet genotypes resistance to neck and finger blast diseases were used and 14 random amplified polymorphic DNA (RAPD) markers were run, which has resulted in 71 different levels of amplified products with an average of 5.07 bands per primer. Out of 71 profile levels, 63 levels were polymorphic across eight finger millet accessions and eight levels were monomorphic. The markers detected significant polymorphism among genotypes and genotype specific markers were identified. Cluster analysis grouped the eight finger millet accessions into two major clusters. The Indian types were grouped with African type accessions in the study.

Key words : RAPD, Random amplified polymorphic, DNA, Finger millet

Finger millet (*Eleusine coracana* Gaertn.) is an important food crop in Africa and South Asia. It is a hardy crop that can be grown in diverse environments from almost at sea level in South India to high lands of Himalaya. It is believed that Uganda is the centre of origin and it was introduced to India probably over 3000 years ago (FAO, 1995). Finger millet is highly nutritious as its grains contain 65–75% carbohydrates, 5–8% protein, 15–20% dietary fiber and 2.5–3.5% minerals (Chetan and Malleshi, 2007).

The efficiency of selection based on phenotype assay may be reduced by environmental effects on the measured trait and by complex inheritance of multigenic traits. Many of the complications of phenotype based selection can be mitigated by direct selection for genotype using DNA markers that co segregate with genes of interest (Antoni *et al.*, 1991).There are many number of DNA markers for characterization among different crop species. The simplicity and applicability of the RAPD technique have captivated many scientists interests. Perhaps the main reason for the success of RAPD analysis is the gain of a large number of genetic markers that require small amounts of DNA without the requirement for cloning, sequencing or any other form of the molecular characterization of the genome of the species in question (Fevzi Bardakci, 2001)

AFLP requires a genomic DNA of high purity and having an advantage of small sequence variation can be detected (Blears *et al.*, 1998). In RFLP radioactive probe is used and have an advantage that they can be used to detect multiple alleles at a single locus (Antoni *et al.*, 1991). SNP is the polymorphism occurring between DNA samples with respect to single base. SNP primers are good for studying complex genetic traits and for understanding the genomic evolution (Tabassum and Lakhanpaul, 2006). RAPD markers offer many advantages such as higher frequency of polymorphism, rapidity, technical simplicity, use of fluorescence, requirement of only a few nano grams of DNA, no requirement of prior information of the DNA sequence and feasibility of automation (Subudhi and Huang, 1999). RAPD marker having an added advantage over microsatellite due to no requirement of prior sequence information.Eight accessions from the collections were selected based on resistant reaction to neck and finger blast diseases with higher grain yield and other quantitative traits of economic importance. Molecular characterization of these elite collections is necessary to initiate marker assisted selection programme. Different kinds of markers have been utilised to assess diversity. Random Amplified Polymorphic DNA (RAPD) is one such marker system used in finger millet to assess

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