

RAPD Analysis in cowpea [*Vigna unguiculata* (L.) WALP]

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The present investigation was carried out with 18 germplasm of cowpea. Purified and isolated DNA was subjected to PCR based marker (RAPD) for assessment of genetic diversity. The quality of DNA was determined by calculating ratio between A260 and A280. The ratio between A260 and A280 was observed 1.41-2.01 which indicated a moderately good quality of plant DNA. The concentration of DNA ranged from 3.12mg/ml to 3.92 mg/ml in RAPD analysis. PCR (RAPD) involving 15 randomly selected decamer primers, of which only 9 primers gave good amplified product with template DNA. A total of 204 amplified fragments were formed by 9 primers. A total of 48 amplicon were obtained with 9 primers with an average of 3.2 bands per primer. Out of 48 scorable bands, all 48 bands were polymorphic and the level of polymorphism was 100 per cent. From RAPD profiling similarity matrix was obtained and similarity coefficient ranged between 0.00 - 0.47. The dendrogram clearly divided the 18 cultivars into 5 main clusters. Cluster I includes 13 genotypes of cow pea and cluster II includes only one cultivar. Cluster III includes 2 genotypes. Cluster IV and V includes 1 genotype each. On this basis of similarity matrix, dendrogram was constructed using UPGMA method.

Key words : RAPD analysis, Cowpea, Molecular marker

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INTRODUCTION

Cowpea [*Vigna unguiculata* (L.) Walp] a grainlegume is also referred as southern pea, black eye pea, crowder pea, lubia and frijole. It is a valuable crop because of its high protein content (23-29%) and nutritive value (Ehlers and Hall, 1997). Cowpea has ability to fix atmospheric nitrogen. Cowpea establishes symbiotic association with rhizobium body bacteria enabling it to fix atmospheric nitrogen. It is an important source of proteins for vegetarians or those who cannot afford protein rich foods like fish, meat and eggs. It has been referred to as poor man's meat. The proteins in cowpea seed are rich in essential amino acids such as lysine and tryptophan as compared to cereal grains. Young leaves, pods and peas of cowpea are rich in vitamins and minerals. It can also be used as green manure crop and livestock fodder. Cowpea can be intercropped with cereal crops like millet and sorghum. It is an annual autogamous crop. It belongs to family *Leguminoeaceae* with chromosome number $2n=22$.

Cowpea (*Vigna unguiculata* L.) is one of the important *Kharif* pulse crop grown in India. It is warm season crop, well adapted to many areas of the tropical

and subtropical zones. Cowpea is tolerant to heat and dry conditions, but is intolerant to frost. Drought resistance is one reason that cowpea is an important crop in many under developed parts of the world. The crop is sown from March to April and is harvested between June and July depending upon its end use. Incorporation of cowpea as a legume in crop sequences enriches soil fertility and provides a dense soil cover to check wind erosion and evaporation loss of soil water.

Molecular markers have been proved for valuable tools in the characterization and evaluation of genetic diversity within and between species and populations. Different markers might reveal different classes of variation (Powell *et al.*, 1996; Russell *et al.*, 1997). It is correlated with the genome fraction surveyed by each kind of marker, their distribution throughout the genome and the extent of the DNA target which is analyzed by each specific assay (Davila *et al.*, 1999).

RAPD markers are commonly used because they are quick and simple to obtain enabling genetic diversity analysis in several types of plant material such as natural populations, population in breeding programmes and germplasm collections (Ferreira and Grattupaglia,