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# Diversity of polyphenoloxidase isozyme in cashew (*Anacardium occidentale* L.) cultivars using PAGE method

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## ABSTRACT

The experiments were conducted at Department of Horticulture, Dr. B.S.Konkan Krishi Vidyapeeth, Dapoli, and Molecular Biology Laboratory Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola to estimate the genetic diversity of cashew hybrids and their parents using polyphenoloxidase isozyme marker.Electrophoretic pattern of 8 hybrids and their parents of cashew genotype were analysis by PAGE. The polyphenoloxidase activity carried out on PAGE, peak density and relative front (Rf) value were evaluated in the Gel Docunmentation system. Polyphenoloxidase activicity of PAGE exhibited total 23 bands. The peak density observed was found in the range of 94.70 to 131.50. The range of Rf value was found 0.146 to 0.277. The polyphenoloxidase activity was not much more polymorphic to differrentiate cashew genotype and activity were only at anodal side.Dendrogram constructed base on UPGMA dice coefficient exhibited major three clusters on the basis of polyphenoloxidase activity in cashew hybrid and it's parents.

**Key words :** Polyphenoloxidase activity, Cashew diversity

Cashew (*Anacardium occidentale* L.) is one of the most important dollar earning crops among the major horticultural and plantation crops of our country.Though,it is export oriented premier crop in Indian commerce, first among the horticultural commodities, however, this crop was neglected and was treated as a forest tree for aforestration and wasteland development. Cashewnut originally belonging to South Eastern Brazil and introduced in the first half of the sixteenth century by the Portuguese first in Goa and Malbara hill and then, it spreads slowly to other parts of the country. Presently, cashew cultivations is confined mostly in coastal regions of Kerela, Karnataka, Goa and Maharashtra in the west coast and Andhra Pradesh, Tamil Nadu, Orissa and West Bengal (Mandal, 2000). Further improvement programme, as well as for the introduction of new variety, needs proper identification. The morphological differences in this crop are not sufficient to establish variety description suitable for plant breeding. Like other crops, the research efforts in cashew are mainly directed towards enhancing the yield potential and improving the production technology.Greatest impact of enzymes has been based on the development in the area of modern biology. Extensive studies in the field of enzymology have ushered in the modern era of molecular biology, genetic engineering and biotechnology. Isolation, cloning, characterization and manipulation of genes, creation of transgenic plant or animal utilization of molecular markers for crop improvement, fingerprinting of an organism or an individual at the molecular level etc. can not be envisaged without the help of enzyme at one stage or the other. Changes in coding base sequence will result in corresponding replacement in the amino acids and thus in the primary structure of proteins and enzymes. In the presence of electric field and while passing through a semiporous gel medium, these differences cause dissimilar forms of a protein / enzyme (Markert and Moller, 1959). Isozymes are considered to be particularly useful for this purpose as the expression of isozyme loci is co-dominant which not only allow the detection of the true hybrid but also identifies the contaminating parental seed or any other off type. Since many of the isoenzymes are expressed in seeds/ seedlings these are found very useful for genetic purity testing (Dadlani and Varier, 1993).

## MATERIALS AND METHODS

The experiments were conducted at Department of Horticulture,Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli, RFRS, Vengurla and in collabration with Biotechnology Centre, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during 2005-2006. Eight hybrids and their parents have been used which were developed at RFRS Vengurla, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli (M.S.) as shown in Table 1.

Polyacrylamid Gel Electrophoresis method was followed for the seperation of total seed protein enzyme for the identification of cultivar with a pocedure described by Dadlani and Varier (1993). Sample extraction medium used was 2 x treatment buffer 0.125 m Tris cl, 20%