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ASSESSMENT OF GENETIC DIVERSITY AND RELATIONSHIP AMONG DIFFERENT BAMBOO SPECIES REVEALED BY MOLECULAR MARKERS

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ABSTRACT: Thirty-two accessions belonging to eight different bamboo species viz., *D. asper, B. vulgaris, D. longispathus, B. balcooa, B. vulgaris, B. tulda, B. bambos* and *D. strictus* collected from various states of the country and grown in germplasm bank of Tropical Forest Research Institute, Jabalpur were investigated using 10 Inter Simple Sequence Repeats (ISSR) markers. The average numbers of band per marker was observed to be 12.6. Average gene diversity per marker showed moderate level i.e. 0.36. Average discriminating power exhibited by ISSR markers was considerably higher (0.83). Furthermore, average expected heterozygosity and mean heterozygosity revealed by the employed markers was 0.45 and 0.46, respectively. UPGMA hierarchical clustering analysis revealed three clusters. B. *vulgaris* var. yellow and *B. vulgaris* var. green clustered in one group, *D. asper, D. strictus, B. balcooa, B. tulda* and *B. bambos* in second cluster and *D. longispathus* in separate one. We conclude that ISSR markers are efficient for diversity assessment studies.

Keywords: *Clusters, genetic diversity, ISSR markers, UPGMA*

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INTRODUCTION

Bamboos are evergreen perennial flowering plants in the subfamily Bambusoideae (Kigomo 1988) of the grass family Poaceae. Bamboos comprise approximately 1290 species, which are naturally distributed all over the world (Hamzah *et al*., 2016). For bamboos, major species richness is found in Asia-pacific followed by South America, whereas the least number of species is found in Africa (Bystriakova *et al*., 2003). Most bamboo species are native to warm and moist tropical and warm temperate climates. However, many species are found in diverse climates, ranging from hot tropical regions to cool mountainous regions and highland cloud forests. India is the second richest country in bamboo genetic resources following China (Bystriakova *et al*., 2003).

Overexploitation and genetic erosion of bamboo species have made it necessary not only for the collection and conservation of its germplasm (Thomas *et al*., 1988; Loh *et al*., 2000) but also to classify and characterize them (Bahadur 1979). Characterization of germplasm is an important link between the conservation and utilization of germplasm therefore, Identification and classification is necessary for collection and conservation of germplasm (Bahadur 1979; Soderstorm and Calderon 1979). Characterization of bamboos has so far been done based on morphological characters, yet the classification is not reliable since these are often influenced by ecological factors (Das *et al*., 2007).

During past few years, there has been growing concern about the loss of diversity of plant species especially in forest ecosystem. Consequently, it has created awareness among conservation biologist for a thorough study of genetic diversity with the aim to plan for suitable strategy towards conservation with sustainable utilization and development. During last few decades, there has been indiscriminate exploitation of this species resulting into sharp decline in the natural populations.