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Determination of Phylogenetic Relationships among Isoetes Species Using Random Primers

Yogendra K. TRIPATHI¹, Priyatansh GURHA², D. GHOSH³, R.V. KUMAR⁴,
Ved PRAKASH⁴

¹Department of Genetics, Barkatullah University, Bhopal - INDIA

²Department of Molecular Biology, University of Illinois, Illinois - USA

³Department of Genetics and Plant Breeding, Calcutta University, Kolkata - INDIA

⁴National Research Center for Agroforestry, Jhansi - INDIA

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[Authors](#)



bot@tubitak.gov.tr

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Abstract: Isoetes L. is an ancient, primitive genus of lycopsids. The genus occupies a unique position in plant evolution as the closest relatives of tree lycopods. The morphological characters, namely leaf size, comb, and sporophyll size, are used diagnostically to help in the identification of the Isoetes species. Thus, species identification of Isoetes is always problematic and the knowledge on the genetic relationship of Isoetes species is also limited. Therefore, in order to find a suitable method for species identification and estimation of genetic relationship among different species of Isoetes, a Random Amplified Polymorphic DNA (RAPD) technique based on Polymerase Chain Reaction (PCR) was used for the described purpose. Out of 150 decamer primers tested, 58 produced good amplification products. A total of 4442 amplification products were scored and only 3479 bands (78.11%) were found to be polymorphic, with sizes ranging from 200 to 5500 bp. Unweighted pair group method using arithmetic average cluster analysis revealed a clear genetic difference among Isoetes species. The scientific data presented in this study suggest that RAPD-PCR could be a valuable tool for identification and estimation of genetic relationship among species of Isoetes L.

Key Words: Isoetes species, RAPD fingerprint, identification, genetic relationship

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