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Molecular Insights into the Genetic Integrity of Long-Term Micropropagated Clones Using Start Codon Targeted (SCoT) Markers: A Case Study with Ansellia africana, an Endangered, Medicinal Orchid

Authors : Paromik Bhattacharyya, Vijay Kumar, Johannes Van Staden

Abstract : Micropropagation is an important tool for the conservation of threatened and commercially important plant species of which orchids deserve special attention. Ansellia africana is one such medicinally important orchid species having much commercial significance. Thus, development of regeneration protocols for producing clonally stable regenerates using axillary buds is of much importance. However, for large-scale micropropagation to become not only successful but also acceptable by end-users, somaclonal variations occurring in the plantlets need to be eliminated. In the light of the various factors (genotype, ploidy level, in vitro culture age, explant and culture type, etc.) that may account for the somaclonal variations of divergent genetic changes at the cellular and molecular levels, genetic analysis of micropropagated plants using a multidisciplinary approach is of utmost importance. In the present study, the clonal integrity of the long term micropropagated A. africana plants were assessed using advanced molecular marker system i.e. Start Codon Targeted Polymorphism (SCoT). Our studies recorded a clonally stable regeneration protocol for A. africana with a very high degree of clonal fidelity amongst the regenerates. The results obtained from these molecular analyses could help in modifying the regeneration protocols for obtaining clonally stable true to type plantlets for sustainable commercial use.

Keywords : medicinal orchid micropropagation, start codon targeted polymorphism (SCoT),RAP), traditional African pharmacopoeia, genetic fidelity
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