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ASSESSMENT OF GENETIC SIMILARITY AMONG EMBRYO CULTURED *CAMELLIA SINENSIS* L. (TEA) PLANTS USING MORPHOLOGICAL AND RAPD MARKERS

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Owing to the long-term nature of conventional tea cultivar development programme, Tea Research Institute of Sri Lanka has perfected an embryo culture protocol for hybrid seeds and successfully integrated it to accelerate the release of new tea cultivars. Unless the resultant regenerants are genetically similar and phenotypically uniform, they cannot be used in the breeding programmes. This study was aimed to assess the genetic similarity of embryo cultured tea plants using morphological and RAPD markers. Three embryo cultured plant progenies generated from controlled hybridization between TRI 2025 × PK 2, TRI 3013 × DT 95 and TRI 3013 × C. s*asanqua* were assessed with 28 standard morphological descriptors and six RAPD markers. Results of both quantitative and qualitative morphological analysis indicated that only one and two individuals from the cross combinations of TRI 2025 × PK2 and TRI 3013 × DT 95, respectively were not phenotypically similar to other individuals of those progenies. All the other individuals of both progenies were showing insignificant morphological variations indicating genetic similarity among them. Also, all the individuals of progeny TRI 3013 × C. s*asanqua* exhibited genetic similarity confirming their usefulness in future breeding programmes. Qualitative morphological traits *viz* apex habit, texture of upper surface, young leaf colour, undulation of margin, leaf venation, bud pubescence density, leaf blade attitude, leaf angle, leaf apex, leaf pose, leaf margin, leaf size and quantitative morphological traits *viz* leaf blade width, leaf blade length, length of margin, internodal length, leaf serrations, serrations per unit length were identified as most discriminative morphological descriptors. Furthermore, morphological traits of young leaf colour and pubescence density of bud could be used in early nursery stages to assess genetic fidelity of regenerants. Two RAPD primers OPD 10 and OPB 08 produced 6, 11 and 10 clear and unambiguous bands from progenies of TRI 2025 × PK 2, TRI 3013 × DT 95 and TRI 3013 × *C. sasanqua*, respectively after subjecting for cluster analysis. Molecular analysis of TRI 3013 × PK2 progeny facilitated identification of three deviating individuals, whereas resultant dendrograms of other two progenies were different from morphological analysis. This study confirms that a combination of morphological and molecular markers can be effectively used to assess genetic similarity of embryo cultured plants in order to adopt tissue culture techniques in conventional tea breeding programmes.