Optimization of a Somatic Embryogenesis protocol from Nodal cuttings and Leaf explants of Tea (*Camellia sinensis* (L) O. Kuntze)

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ABSTRACT

Tea is the main agricultural foreign exchange earner in Sri Lanka. Tea is commonly propagated by vegetative cuttings, the mostly adopted practice commercially in Sri Lanka, thus unable to fulfill the annual planting material requirements. Somatic embryogenesis is considered as a rapid mass propagation method in woody perennials; however in tea, potential has not been explored yet. Objectives of the study were to identify optimum growth regulator combinations for producing embryogenic calli from nodal cuttings and leaves of tea and identify optimum conditions for somatic embryo induction from leaf calli. Sterilized field-grown explants *viz* stem cuttings and leaf segments of TRI 2025, TRI 2043 and leaf calli of TRI 2043 were established on solid MS media with different plant growth regulator combinations under aseptic conditions. The highest callusing of nodal cuttings was observed in MS medium contained 0.11 mg L^{-1} TDZ, 0.1 mg L^{-1} IBA, 3 mg L^{-1} GA_3, 8.6 mg L^{-1} $AgNO_3$ for TRI 2025 while MS media contained 0.11 mg L^{-1} TDZ, 0.1 mg L^{-1} IBA, 3 mg L^{-1} GA_3 was reported as the best for TRI2043. Highest callus induction from leaves was observed in MS medium contained 0.11 mg L^{-1} TDZ+ 1.86 mg L^{-1} NAA for TRI 2025 and MS medium contained 0.0044 mg L^{-1} TDZ+ 0.1 mg L^{-1} IBA, 3 mg L^{-1} GA_3 for TRI 2043. Meanwhile results showed that early signs of somatic embryo induction in solid MS medium containing 0.044 mg L^{-1} TDZ, 0.1 mg L^{-1} IBA and 3 mg L^{-1} GA_3 for leaf callus of TRI 2043. Among two cultivars, TRI 2025 showed high response for callus initiation with higher callus mass in both nodal and leaf explants than TRI 2043. Identified combinations can be used to obtain embryogenic calli from nodal cuttings and leaf explants and results provide a foundation for developing a somatic embryogenesis protocol for tea.

Key words: Tea, Explant, Somatic embryogenesis, embryonic callus