OPTIMIZATION OF LIQUID AND SOLID MEDIA COMPOSITION FOR SOMATIC EMBRYOGENESIS OF TEA

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Tea propagation by single-leaf bud cuttings has limited applications for rapid supply of planting materials from new elite cultivars. An alternative method for rapid multiplication by cell and tissue culture technique was introduced in tea, however, not well utilized locally. The present study was therefore conducted to establish a viable protocol for direct somatic embryogenesis of tea [*Camellia sinensis* (L.) O. Kuntze]. Somatic embryos were induced in two explant types (mature cotyledons and *ex-vitro* nodal cuttings) of TRI 2024 and TRI 2043 cultivars. Cotyledons were inoculated in solid and liquid media with following growth regulator combinations (i) 2 mg/L BAP + 3 mg/L NAA and (ii) 3 mg/L BAP + 0.1 mg/L NAA with the full strength Murashige and Skoog (MS) medium and (iii) 2 mg/L BAP with half strenght MS medium.Whereas, *ex-vitro* nodals explants were inoculated in following combination of growth regulators; (i) 0.5 mg/L BAP + 3 mg/LGA_3 + 0.1 mg/L IBA, (ii) 0.5 mg/L BAP+ 3 mg/L GA_3 + 0.1 mg/L IBA + 8.6 Ag $NO_3$and (iii) 1 mg/L BAP + 4 mg/L NAA. The results revealed that the significantly highest number ($P<0.01$) of somatic embryos were recovered in cotyledons of TRI 2043, cultured in liquid medium after ten weeks with 3 mg/L BAP + 0.1 mg/L NAA growth regulator combination. Six weeks after inoculation, good quality somatic embryos were observed around the cut surfaces of nodal explants in solid medium supplemented with 0.5 mg/L BAP + 3 mg/LGA_3 + 0.1 mg/l IBA. Subsequently somatic embryos derived from cotyledons were transferred to the embryo regeneration medium.Embryo regeneration was observed under solid and liquid MS media with three different growth regulator combinations, (i) 0.1 NAA + 3 mg/L BAP (ii) 0.1 mg/L Kinetin + 0.1 mg/L ABA (iii) NH_4NO_3 and hormone free medium. Different stages of embryo regeneration were clearly observed in liquid medium with 0.1 mg/L Kinetin + 0.1 mg/L ABA. Results revealed that, somatic embryo induction and regeneration of cotyledon explants was higher in liquid medium irrespectively cultivar used. This information could be useful in developing a mass propagation protocol for tea.

Keywords: Embryo regeneration, Somatic embryogenesis, Somatic embryos