

PRODUCTION OF SYNTHETIC SEEDS OF *Acacia* HYBRID & *Endospermum diadenum* FOR CONSERVATION OF ELITE PLANTING MATERIALS

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ABSTRACT

Synthetic seeds were produced from shoot tips and axillary buds from *in-vitro* *Acacia* hybrid and *Endospermum diadenum*. In the present study, various concentrations of sodium alginate solutions and calcium chloride solutions were tested in order to optimize the size, shape and texture of alginate synthetic seeds or beads for the bud-sprouting. The explants were encapsulated with 2-5% sodium alginate (w/v) in the MS free of calcium salt solution solvent. Explants in the alginate solutions were pipetted individually dropwise into 25-100mM CaCl₂.2H₂O prepared in liquid MS medium containing the same adjuncts as in the sodium alginate solution and exposed for at least 30 minutes to polymerize. The beads were recovered by decanting the CaCl₂ 2H₂O and blotted dry on filter paper. The recovery and plantlet regeneration were tested by culturing them on the basal MS culture media with several BAP concentrations (0.5, 1.5 & 2.5mg/l) at 25°C under 16-hr photoperiod and total darkness. Rounded beads were observed by the encapsulation with alginate 3% and exposed to 75mM and 100mM CaCl₂.2H₂O combinations. They were also observed by the encapsulation with alginate 4% and 5%; and exposed to any CaCl₂.2H₂O combinations. Both *Acacia* hybrid and *E. diadenum* synthetic seeds showed 100% germination rate in any BAP concentration when cultured in light where the germinations took about 5-8 days to complete. While in the total darkness, both species showed lower germination rate (26.7-100%) and had taken longer durations to complete (7-23 days). The germinated *E. diadenum* synthetic seeds manage to elongate the shoots in the dark, unlike the *Acacia* hybrids. The low germination rates were caused by the failure of some synthetic seeds to germinate. However, some germinated *Acacia* hybrid synthetic seeds were dead eventually. It was also observed that the young *E. diadenum* shoots survive better in the dark compared to the *Acacia* hybrids. When exposed to light after the third week, the young *E. diadenum* shoots showed better regeneration to become a complete plantlet. Therefore, synthetic seeds production has the possibility as an alternative planting material meant for forestry sector in the future especially for the highly demanded species.

Keyword: *Acacia* hybrid, *Endospermum diadenum*; synthetic seeds, encapsulation, alternative planting material