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In-vitro establishment of embryo, juvenile and field-grown shoot tip and axillary bud cultures of cinnamon (_Cinnamomum verum_ Presl.)

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Cinnamon (*Cinnamomum verum* Presl.) is an economically important spice crop among the minor export crops. With the increasing demand for high quality cinnamon products, establishment of homogeneous plantations is a vital requirement. Application of clonal micropropagation technique would be a potential facilitator for implementing this task. *In-vitro* clonal propagation in cinnamon has not been reported, probably due to difficulties in culture initiation. Excessive browning and systemic contaminants are the major problems in culture initiation. Therefore, this research was undertaken with the objective to determine the pre- and post- surface sterilization precautionary steps required, with the known surface-sterilization agents, for successful *in-vitro* establishment of explants of different maturity stages.

Embryos with ½ portion of cotyledon isolated from matured seeds, shoot tips and axillary buds collected from one-year old seedlings and from four-year old bushes were used as initial explants. The seedlings and the bushes under protected environment were treated with systemic fungicide (Folicur EW 250®) and insecticide (Rogrow 40 EC®) at weekly intervals. At the time of sample collection, the explants were directly dipped in 100 mg/L ascorbic acid solution. In selecting a suitable surface sterilization procedure, 15% NaOCl, 0.1% and 0.2% $HgCl_2$ with a range of exposure times were tested (5 – 20 min). The surface disinfected explants were dissected while submerging in a filter sterilized 100 mg/L ascorbic acid solution. Half strength MS basal medium supplemented with 1.0 mg/L BAP + 0.5 mg/L IBA +200 mg/L PVP was used for culture initiation. All cultures were kept at 23±2 °C and given total dark condition for first 3 days and then, transferred to 12 h photoperiod light regime (1220 lux). It was observed that the embryo with ½ portion of cotyledon had better growth performance compared to the entirely isolated embryonic axis after 2 months of incubation period (>55% and 10%, respectively). 15% NaOCl with 20 min. exposure time was the optimum sterilization treatment for isolated embryos (26% browning, 5% contamination). The pre- and post- sterilization precautionary steps taken for minimizing browning and contaminations influenced greatly on successful establishment of juvenile and mature shoot tip and axillary bud cultures *i.e.*, 20% contamination and 42% browning of juvenile and 28.5% and 57% of mature cultures, respectively. Therefore, in addition to treatment with usual surface sterilization agents, certain pre- and post- surface sterilization precautionary steps have to be applied for successful *in vitro* establishment of cinnamon explants.

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