ABSTRACT

In vitro grown seedlings of chickpea (*Cicer arietinum* L.) were used as source of explant. Seed germination conditions were optimized in growth room and it was observed that petri plates with 5 seeds containing 15 ml distilled water showed 100% germination. A simple, rapid and effective recurring regeneration system in chickpea was achieved using different explants *viz.*, cotyledonary nodal region, nodal region, shoot tip and embryonic axis with single cotyledon. Direct and indirect regeneration was observed using different concentrations and combinations of growth regulators such as TDZ, BAP, NAA, IBA alone, TDZ + IAA, BAP + NAA, BAP + IAA + Kn, BAP + 2,4D, BAP + IBA. Cotyledonary nodal explants showed best callus induction on MS + 2.0 mg/L BAP + 2.0 mg/L NAA. The MS medium supplemented with 0.5 mg/L NAA and 2.0 mg/L BAP showed maximum shoot bud formation with 3.0 numbers of shoots per callus. Direct shoot regeneration was best observed with cotyledonary nodal explants on MS medium supplemented with 0.2 mg/L TDZ with maximum number of shoots per explants i.e. 22 but shoots were stunted. Maximum shoot length of 3.7 cm of regenerated shoots was observed using embryonic axis explant with single cotyledon, on MS medium supplemented with 2.0 mg/L BAP. BAP (2.0 mg/L) alone was found to be best for elongation (5.0 cm) of regenerated shoots. Half strength MS medium containing 0.1 mg/L NAA showed better root formation as compared to IBA. The well-grown plantlets were transferred to pots containing soil mixture for hardening at growth room conditions, the conditions were then shifted gradually towards field conditions.