ABSTRACT

In vitro grown seedlings of *Jatropha curcas* were used as source of explant. Seed germination conditions were optimized in growth room and it was observed that glass jars with 3 seeds containing 10 ml distilled water showed 100% germination. A simple, efficient and cost effective protocol has been developed for high frequency regeneration using cotyledonary nodal region of *J. curcas*. Direct and indirect regeneration was observed using different concentrations and combinations of growth regulators. Callus cultures were initiated from cotyledonary leaf, cotyledonary nodal region, hypocotyl and root explants on MS basal medium supplemented with different concentrations of 2,4-D, BAP and NAA alone and in combination. 2,4-D (0.5 mg L^{-1}) was found to be effective in induction of callus in only hypocotyl explants. Excellent growth of callus was obtained in medium supplemented with BAP (2.0 mg L^{-1}) along with NAA (2.0 mg L^{-1}) in all explants. The MS medium supplemented with 0.5 mgL^{-1} IBA and 1.5 mg L^{-1} BAP showed maximum shoot induction i.e. 4.0 per hypocotyl generated callus while cotyledonary leaf explants showed regeneration with 0.5 mgL^{-1} IBA and 1.0 mg L^{-1} BAP, generating 3.0 shoots per callus. Direct shoot regeneration was induced on cotyledonary nodal region using MS medium containing 1.5 mg L^{-1} BAP in combination with 0.5 mg L^{-1} Kn and a maximum of ten shoots were formed within 6 weeks of culture incubation. Incorporation of 0.25 mg L^{-1} IAA to the medium containing 1.5 mg L^{-1} BAP+ 0.5 mg L^{-1} Kn enhanced the number of shoot induction i.e. 11 per cotyledonary nodal region explants. Approximately three fold (3.6 cm) increase in shoot length was observed within 4 weeks on MS medium supplemented with 0.5 mg L^{-1} GA_3. Rooting of shoots was best achieved i.e. 70% on half-strength MS medium supplemented with 0.1 mg L^{-1} IBA. The well-grown *in vitro* regenerated plantlets were transferred to earthen pots containing soil mixture and maintained for hardening at growth room conditions, the conditions were then shifted gradually towards field conditions. This system may be helpful for promoting genetic improvement studies in *J. curcas*.