

## ABSTRACT

Direct regeneration was observed at BAP (2.5 mg/L), 2,4-D (0.5 mg/L), NAA (0.5 mg/L), IBA (0.5 mg/L) using shoot tip and node as explants. Combination of BAP + NAA (1.0 + 2.5 mg/L), BAP + 2,4-D (1.5 + 0.5 mg/L), BAP + KIN (1.0 + 1.0 mg/L), KIN + IAA (3.0+2.0 mg/L), BAP + IAA (2.0 + 0.2mg/L) also showed shoot formation. Maximum numbers of shoots ( $17.66\pm 0.33$ ) were attained on KIN + IAA (3.0+2.0 mg/L) from shoot tip and node. Callogenesis was done using leaf, node and root explants on BAP (2.5 mg/L), 2,4-D (1.0 mg/L), NAA (2.5 mg/L), BAP + NAA (1.0 + 2.5 mg/L), BAP + 2,4-D (1 + 2.5 mg/L). Callus with good texture i-e; green colour, granular were obtained on MS medium containing BAP (2.5 mg/L). For shoot morphogenesis, callus was sub cultured to shooting medium supplemented with BAP and 2, 4-D alone at 2.0 mg/L and 1.0 mg/L respectively. Combination of BAP + NAA (1.0 +1.5 mg/L) and BAP + IAA (0.2+0.5 mg/L) were also made. Maximum numbers of shoots ( $22.33\pm 0.33$ ) were attained on BAP+IAA (0.2+0.5 mg/L) from leaf derived callus. After shoot proliferation and elongation, shoots were transferred to rooting medium containing IBA (0.5 mg/L) with ( $10.66\pm 0.66$ ) number of roots. Hardening process was carried out.