Assessment of somaclonal variation and morphogenic potential in different explants for *in-vitro* propagation of Chrysanthemum (*Chrysanthemum morifolium* L)

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Abstract

Chrysanthemum (*Chrysanthemum morifolium)* is one of the most important flower spp. in commercial floriculture. Tissue culture is a useful propagation tool for mass production of planting material and for induction of new genotypes via somaclonal variation.

In this study, an attempt is made to perfect tissue culture protocol for micro propagation of Chrysanthemum cv. Tension and to assess somaclonal variation and morphogenic potential in different explants. The procedure involved two phases as direct organogenesis and indirect organogenesis. Under direct organogenesis aseptic culture of shoot tips was followed by rapid shoot multiplication, rooting and finally hardening and establishment of plantlets in soil. All stages were arranged in Completely Randomized Design with 10 replications. The agar-solidified MS medium supplemented with 0.2 mg/l BAP was given highest shoot multiplication rate (11.7 shoots/explant). Maximum *in vitro* rooting (13.2 roots/plant) was achieved with MS containing 1mg/l IBA with 0.5g/l charcoal. Plants acclimatized successfully in greenhouse environment with survival rate of 80%.

Under indirect organogenesis explants of leaf, shoot tip and stem segments were cultured aseptically and followed by callus initiation, shoot regeneration and up to establishment of plantlets in soil. Although highest callus formation was observed with immature leaves in MS medium supplemented with 0.3mg/l 2, 4-D, highest regeneration capacity was observed in callus derived from shoot tips and stem segments in the same medium. Significantly higher rate of proliferation (4plants/explant) was achieved, in MS medium supplemented with 0.5mg/l BAP and 0.5mg/l NAA. Somaclonal variation was assessed through phenotypic makers on chrysanthemum leaves pertaining to morphological variations which record 8% variation as compared to mother plant. Variation in flowers couldn't be investigated as the period of study was not sufficient to reach the blooming stage of chrysanthemum plants raised from tissue

culture technology. In-vitro rooted plantlets were successfully established in medium containing top soil cattle manure ands sand at a ratio of 1:1:1 with 85% survival rate. Hence valuable cultivars such as Tension can be easily propagated *in vitro* using shoot tip and stem explants as they exist higher *in- vitro* morphogenic potential.

Keywords: Chrysanthemum, Variety tension, In-vitro propagation, Somaclonal variation, Morphogenic potential