



## DI 08 Effects of various sucrose concentrations and other additives on growth and development of adventitious buds of Purple coneflower (*Echinacea purpurea* L)

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In this experiment we focused on 4 different concentrations of sucrose (2%, 3%, and 4%) on the MS basal medium for the shoot and root development of purple coneflower. Shoots (1 cm) regenerated *in vitro* from petiole segments were used as explants. Anova (DMRT) test showed there were significant effects of various sucrose concentrations and other additives on growth and development of adventitious buds of Purple coneflower at  $p < 0.05$  level. Best sucrose concentration for shoot growth and root production appeared in 3% sucrose concentration, compared to other two concentrations. Significantly highest mass production in whole plant and roots; 1.69 g and 0.61 g, respectively was obtained on MS basal media supplemented with 3% sucrose concentration. A better growth of shoots than in other sucrose concentrations and morphologically normal and identical shoot and root systems were also observed in this sucrose concentration. Higher concentrations (4%) inhibited the mass production. The presence of nitrogenous additives lactobumin hydrolysis, peptone and yeast to the medium reduced the proliferation rate of shoots. Shoot multiplication occurred in all concentrations tested of coconut water; however 2% provided a higher shoot regeneration frequency (2.58 buds per explants). Shoot organogenesis was not variable and dependent on the supplemented broader range of copper sulphate and formed green regenerated buds with the same morphological appearance. Investigation of shoot induction combined with silver nitrate showed negative effect when increasing the concentrations. Greenish well growing nodular callus was observed on the medium supplemented with BA and proline at higher concentrations such as 450 mg/L and 1000 mg/L (16.7 buds per callus). These newly established protocols in organogenesis of *E. purpurea* plants have high applicable values for genetic improvements of the crop.

**Keywords:** purple cone flower (*Echinacea purpurea*), sucrose, MS basal medium, plant tissue culture