IN VITRO PROTOCOL FOR RAPID MULTIPLICATION OF CARNATION

K.E. Chandima[1], S.M.M.R. Mawalagedera[1], A.G.C. Babu[2] and W.A.P. Weerakkody[3]

[1]*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura*

[2]*Tissue Culture Unit, Agriculture Research and Development Centre, Sita Eliya*

[3] *Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Peradeniya*

The influence of growth regulators, explants and their interactions on induction of callus and *in vitro* shoot and root generation from callus was studied in carnation (*Dianthus caryophyllus* L.). The leaf, petal, flower bud and internode explants were surface sterilized by using 20% Chlorox (5.25% NaOCl) and 70% Ethyl Alcohol and cultured on Murashige and Skoog (MS) medium. All experiments were conducted in a Completely Randomized Design. Parametric data and arcsine transformed non parametric data were subjected to analysis of variance (ANOVA) and means were separated by Tukey's test, and the significance of treatment effect were defined at $p<0.05$. The highest callus induction was observed with 2 mg L^{-1} 2, 4-dichlorophenoxy acetic acid (2, 4-D) and 1 mg L^{-1} of benzylaminopurine (BAP). Out of the four explants, petal and flower bud could differentiate calli for shoot regeneration. The highest callus greening rate was shown by flower bud with 2 mg L^{-1} of 2, 4-D and 0.5 mg L^{-1} of BAP in callus induction medium and also 1 mg L^{-1} of BAP and 0.5 mg L^{-1} of NAA in shoot induction medium. Further, flower bud explants resulted the highest number of shoots per callus when provided with 2 mg L^{-1} 2,4-D and 0.5 mg L^{-1} BAP in callus induction medium, and 1 mg L^{-1} BAP and 0.5 mg L^{-1} 1-napthaleneacetic acid (NAA) in shoot induction medium. The tallest shoots were obtained from petal explants. Significant differences were observed in calli producing shoots and number of shoots per callus in the explants (petals and flower buds) and interaction of explants and callus induction media, and interaction of explants and callus induction media and shoot induction media. The shoots were inoculated into MS medium supplemented with 0.5 mg L^{-1} NAA and growth regulator-free MS medium for rooting. Plantlets were hardened and 72% of the *in vitro* plantlets survived after four weeks in pots in greenhouse.

Keywords: Calli, *Dianthus caryophyllus*, Roots, Shoots