In vitro regeneration of Pomegranate cv. Bhagwa through axillary and adventitious bud proliferation

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Pomegranate (*Punica granatum L.*) is one of the oldest known fruit crops of the tropics and subtropics. It is regenerated through tissue culture directly by axillary bud or by callus mediated adventitious bud proliferation. But both the methods have pros and cons. The choice of the method specifically depends upon purpose, quality, economy, potency, and duration of the protocol. Keeping these facts in view, the present studies were carried out to optimize the protocol for rapid and efficient *in vitro* regeneration of Pomegranate cv. Baghwa. In axillary bud proliferation different explants, duration of mercuric chloride treatment, antioxidants and growth regulators were tried for improvising aseptic culture establishment. Among the various treatments, surface sterilization of double nodal explants containing IIIrd + IVth nodes with $HgCl_2$ 0.10 % for 3 minutes resulted in significantly better aseptic culture establishment (55 % aseptic culture, 15 % each bacterial contamination, fungal contamination and phytotoxicity) onto MS medium containing BAP 1 mg/l + $AgNO_3$ 1 mg/l + activated charcoal 2000 mg/l. Superior shoot proliferation (5 number of shoots/explants, 4.97 cm length of shoot and 18.23 number of leaves/shoot) was found onto the MS medium containing ancymidol 0.02 mg/l + $AgNO_3$ 1 mg/l + activated charcoal 500 mg/l. Among the various media combination, effective rooting (22 number of days taken for rooting, 48 % rooting, 4.30 cm length of roots and 5.50 number of roots/shoot) was observed on half strength MS medium supplemented with IBA 2 mg/l +$AgNO_3$ 1 mg/l + activated charcoal 200 mg/l. Callus was induced with exogenous application of plant growth regulators for adventitious bud proliferation. The nodal segment was found superior for induction of callus (++++: Very good) when cultured on MS basal medium consisting of BAP 5 mg/l + NAA0.4 mg/l. Early shoot initiation (17.06 days), a greater number of shoots per explant (8.13) and maximum shoot length (7.32 cm) was noticed when proliferated calli were cultured on MS basal medium containing BAP 2 mg/l + NAA 0.1mg/l + GA3 0.5 mg/l. Early *in vitro* root initiation (20.25 days), highest per cent rooting (72.50) and maximum number of roots per plantlet (3.95) were recorded on full strength MS medium supplemented with IBA 3 mg/l.

Speaker Biography

Prabhuling Guranna has completed his PhD in Horticulture with specialization in banana plant tissue culture in 2011 from University of Agricultural Sciences, Bangalore, India. He participated in post graduate course on "Adapting to Climate Change: Biotechnology in Agriculture in a World of Global Environmental Changes" from 2.05.2011to 30.06.2011 at Rehovot, Israel. Presently he is working as Associate Professor of plant biotechnology at University of Horticultural Sciences, Bagalkot, India. He has over 35 research publications that have been cited over 12 times, his RG score is 9.11 and H-index is 2 and has been serving as an editorial board member of reputed Journals viz., Research Journal of Biotechnology and European Journal of Medicinal Plants. He is MASHAV alumni, life member of International Society of Biotechnology, Karnataka Horticultural Society and Association for the Improvement in Production and Utilization of Banana. He received first best oral presentation award at National Conference on Production of Quality Seeds and Planting Material – Health Management in Horticultural Crops in 2010.

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