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Regenerative competence of pseudobulb explants of endangered Orchid genera: A study *in vitro*

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Tissue culture technique has added new dimensions to commercial exploitation of economically important plants. It is particularly useful in outbreeders like orchids which generate a great deal of heterozygosity in the progenies. Orchids represent a diverse group of geologically young plants, still in evolutionary flux. They have outsmarted their counterparts due to their long lasting flowers of myriad shapes, sizes and colors.

Morel (1960) demonstrated the possibilities of using apical meristems for micropropagating a variety of orchids. The technique is, however detrimental to the growth and development of mother plant, as it requires the sacrifice of the entire new growth or the only growing point. It is, thus desirable to develop an alternate and equally effective multiplication system by activating adventitious meristems in organs, whose excision does not endanger the survival of source plant. In order to meet this objective, regenerative competence of Pseudobulb explants is used for initiating *in vitro* cultures of endangered species *Coelogyne cristata* Lindl. (Orchidaceae), an important foliar herb. It grows luxuriantly along Himalayan ranges from Garhwal eastwards to Arunachal Pradesh (1700-2300m). The foliar extract is favourite of the herbalist for its bone healing properties (cf.Lawler, 1984).Besides this, its free fertility with related genera offers exiciting possibilities to progenate floriculturally significant hybrids.

The regeneration competence of the pseudobulbs seems to be markedly influenced by physiological age of the mother plant, position of donor and growth stimulus in the nutrient pool. Juvenility of the tissue emerged as the major factor since the response was more pronounced to the proximal segments due to the fact that the younger tissues with less rigid cell walls are physiologically & biochemically more active and shoe better morphogenetic potential in harmony to earlier reports (Vij and Pathak,1989; Basker and Bai, 2006; Sungkumlong and Deb, 2009).

The regeneration eluded the explants from well developed 1 yr old peudobulbs (>3cm long), whereas, meristematic activity could be selectively initiated in those from the freshly formed daughter pseudobulbs (<3cm long) depending upon their position in the source organ. The explants from central segments (PS_2), invariably turned brown and perished soon after inoculation, whereas, those from the proximal (PS_3) and distal (PS_1) responded to regeneration. The regenerative pathway and differentiation varied with quality and quantity of PGRs. In present studies, a treatment with KN (10 mg/l), promoted direct development of shoot primordial (Basker and Bai, 2006; Sungkumlong and Deb, 2009). An additional treatment with NAA and AC in KN treated cultures proved in effective but in BAP treated ones it favoured a switch in the regenerative pathway; the pathway was punctuated by Plb phase of development (Vij and Pathak, 1989; Basker and Bai, 2006). Among the different combinations tried in the present study, BAP (10mg/l) and NAA (5mg/l) were most effective for plantlet development. The synergistic effect of BAP & NAA is in compliance with earlier reports (Sunitibala and Kishor, 2009; Herrera et al., 1990; Basker and Bai, 2006).

Addition of Activated Charcoal (AC) in the initiation media proved beneficial in maintenance of cultures (Deb and Temjensangba, 2006; Sungkumlong and Deb, 2009).

Biography

Vishal Sharma completed his Ph.D. at the age of 27 years from Panjab University (Chandigarh). He has published more than 10 papers in reputed journals and is serving as an Associate Professor in Post Graduate Government College for Girls-11, Chandigarh (Panjab University).

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