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Callus induction and regeneration for moscatilin yield in Dendrobium ovatum, a threatened medicinal orchid

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Traditional herbal drugs are of high demand owing to their minimal after-action-responses unlike synthetic forms. Many of these herbs are listed endangered and are scarcely subjected to conservational measures while others remain underexploited. One such plant family which is less explored for medicinal uses is the rare species encompassing Orchidaceae as identified by IUCN. Micropropagation of these orchids is very crucial for the sustenance of the species. Many revised plant tissue culture trials are in practice to elicit bio-chemicals of therapeutic potential which remains quite challenging. Callus induction and regeneration establish ploidy changes, which sometimes help in natural product enrichment. Our study is focused on phytochemical screening of moscatilin in callus and regenerating callus systems. Identification and quantification was performed by RP-HPLC and Mass Spectrometry. 'Moscatilin', a bibenzyl compound (stilbene) has been recently reported for its pharmaceutical purposes due to its anti-mutagenic and anti-cancer properties. We have compared the yield of moscatilin from respective wild plant populations, axenic seedlings, callus systems and callus-regenerated plants to identify and characterize optimum moscatilin production. Highest moscatilin yield from wild plant populations, *in vitro* micropropagated systems and callus systems was found to be 107.12 µg per gm, 65.24 µg/gm and 89.27 µg/gm dry weights, respectively, of plant extract (~1.3 fold increase than the normal *in vitro* systems). We also demonstrate the effect of elicitors (methyl jasmonate and yeast extract) on further enhancement of moscatilin in callus systems. This study is an attempt to design a protocol to augment the medicinal stilbene (moscatilin) without the destruction of natural populations in the wild and to find the rate limiting factors involved in bio-production of moscatilin.

Biography

Ipsita Pujari has completed BSc in Zoology (2007) from Gangadhar Meher (Autonomous) College (Sambalpur University), India and both MSc in Biomedical Genetics (2009) and MTech in Biotechnology (2012) from VIT University, Vellore, Tamil Nadu. Currently she is pursuing her PhD in Department of Plant Sciences under School of Life Sciences at Manipal University, Manipal. She has one publication in the *Journal of Pharmacy Research* to her credit.

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