

Evaluation of Genetic Fidelity and Phytochemical Profiling of Micropropagated Plants of *Cephalantheropsis obcordata*: An Endangered Medicinal Orchid

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Abstract : The main objective of the present study was to optimize and develop an efficient protocol for in vitro propagation of a medicinally important orchid *Cephalantheropsis obcordata* (Lindl.) Ormerod along with genetic stability analysis of regenerated plants. This plant has been traditionally used in Chinese folk medicine and the decoction of whole plant is known to possess anticancer activity. Nodal segments used as explants were inoculated on Murashige and Skoog (MS) medium supplemented with various concentrations of isopentenyl adenine (2iP). The rooted plants were successfully acclimatized in the greenhouse with 100% survival rate. Inter-simple sequence repeats (ISSR) markers were used to assess the genetic fidelity of in vitro raised plants and the mother plant. It was revealed that monomorphic bands showing the absence of polymorphism in all in vitro raised plantlets analyzed, confirming the genetic uniformity among the regenerants. Phytochemical analysis was done to compare the antioxidant activities and HPLC fingerprinting assay of 80% aqueous ethanol extract of the leaves and stem of in vitro and in vivo grown *C. obcordata*. The extracts of the plants were examined for their antioxidant activities by using free radical 1, 1-diphenyl-2-picryl hydrazyl (DPPH) scavenging method, 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging ability, reducing power capacity, estimation of total phenolic content, flavonoid content and flavonol content. A simplified method for the detection of ascorbic acid, phenolic acids and flavonoids content was also developed by using reversed phase high-performance liquid chromatography (HPLC). This is the first report on the micropropagation, genetic integrity study and quantitative phytochemical analysis of in vitro regenerated plants of *C. obcordata*.

Keywords : *Cephalantheropsis obcordata*, genetic fidelity, ISSR markers, HPLC

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