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In vitro root induction - an improved system for production and elicitation of colchicine from *Gloriosa superba* L.

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Over exploitation of medicinally important plants makes their existence endangered and calls for conservation efforts. Micropropagation involving suspension culture is one such approach that plays vital role in production of various secondary metabolites. Colchicine is an important alkaloid used in the treatment of gout, rheumatism, liver and respiratory disorders, cancer, etc. Apart from *Colchicum autumnale*, the flame lily, *Gloriosa superba* L. (Liliaceae) is also known to contain colchicine along with other bioactive compounds *viz*. colchicoside, chelidonic acid, luteolin, etc. Here, in the present study, we focused on identification, isolation and quantification of colchicine from the *in vitro* root tubers of *G. superba*. Suspension culture and *in vitro* tubers were established in MS medium with different hormonal combinations. Phytochemicals were analyzed from *in vitro* tubers which were later compared to the methanol extract of *in vivo* root tubers of *G. superba*. The presence of high amount of colchicine in the methanol extract of root tuber and the callus was confirmed through HPLC. Both the *in vitro* tuber extract and callus indicated the presence of colchicine but in low quantity. Hence, production of colchicine was enhanced through elicitation using various biotic and abiotic elicitors in the suspension cultures. From the suspension culture, colchicine was identified, quantified and isolated using various chromatographic techniques. The result showed that maximum colchicine production was induced by chitosan which is a biotic elicitor and colchicine was estimated and quantified through HPLC, column chromatography, HPTLC, and TLC. The present study, thus confirmed that the suspension culture and *in vitro* root tubers of *Gloriosa superba* yield high amount of colchicine and effective utilization of elicited secondary metabolite production can help conservation of this endangered plant.

Keywords: Flame lily, Micropropagation, Suspension cultures