

Highly Efficient in Vitro Regeneration of *Swertia chirayita* (Roxb. ex Fleming) Karsten: A Critically Endangered Medicinal Plant

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Abstract : Highly efficient in vitro regeneration system has been developed for *Swertia chirayita* (Roxb. ex Fleming) H. Karst, a high prized traditional medicinal plant to treat numerous ailments such as liver disorders, malaria and diabetes and are reported to have a wide spectrum of pharmacological properties. Its medicinal usage is well-documented in Indian pharmaceutical codex, the British and the American pharmacopeias, and in different traditional medicine such as the Ayurveda, Unani and Siddha medical systems. Nodal explants were cultured on MS medium supplemented with various phytohormones for multiple shoot induction. The nodal segments failed to respond in growth regulator free medium. All the concentrations of BAP, Kin and TDZ facilitated shoot bud break and multiple shoot induction. Among the various cytokinins tested, BAP was found to be more effective with respect to initiation and subsequent development of shoots. Of the various concentrations BAP tested, BAP at 4.0 mg/L showed the higher average number of shoot regeneration (10.80 shoots per explant). Kin at 4 mg/L and TDZ at 4 mg/L induced 5.70 and 04.5+0 shoots per explant, respectively. Further increase in concentration did not favour an increase in the number of shoots. However, these shoots failed to elongate further. Hence, addition of GA₃ (1 mg/L) was added to the above medium. This treatment resulted in the elongation of shoots (2.50 cm) and a further increase in the number of microshoots (34.20 shoots/explant). Roots were also induced in the same medium containing BAP (4 mg/L) + GA₃ (1 mg/L) + NAA (0.5 mg/L). In vitro derived plantlets with well-developed roots were transferred to the potting media containing garden soil: sand: vermicompost (2:1:1). Plantlets were covered with a polyethylene bag and irrigated with water. The pots were maintained at 25 ± 2°C, and then the polyethylene cover was gradually loosened, thus dropping the humidity (65-70%). This procedure subsequently resulted in in vitro hardening of the plantlet.

Keywords : micropropagation, nodal explant, plant growth regulators, *Swertia chirayita*

Conference Title : ICPTCDB 2019 : International Conference on Plant Tissue Culture, Development and Biotechnology

Conference Location : Dubai, United Arab Emirates

Conference Dates : December 19-20, 2019