

## **In vitro responses of plant growth factors on growth, yield, phenolics content and antioxidant activities of *Clinacanthus nutans* (Sabah snake grass)**

### ABSTRACT

*Clinacanthus nutans*, commonly known as Sabah snake grass, is one of the more important medicinal plants in Malaysia's herbal industry. *C. nutans* has gained the attention of medical practitioners due to its wide range of bioactive compounds responsible for various biological activities, such as anti-cancer, anti-venom and anti-viral activities. Due to its high pharmacological properties, the species has been overexploited to meet the demands of the pharmaceutical industry. The present study was conducted to establish a suitable in vitro culture procedure for the mass propagation of *C. nutans*. Murashige and Skoog (MS) basal medium, supplemented with different types of cytokinins, auxins, basal medium strength and sucrose concentrations, were tested. Based on the results, a full-strength MS basal medium supplemented with 12  $\mu\text{M}$  6-benzylaminopurine (BAP) and 30 g/L sucrose was recorded as the best outcome for all the parameters measured including the regeneration percentage, number of shoots, length of shoots, number of leaves and fresh weight of leaves. In the analysis of the phenolics content and antioxidant activities, tissue-cultured leaf extracts assayed at 100 °C exhibited the highest phenolic content and antioxidant activities. The propagation of *C. nutans* via a plant tissue culture technique was recorded to be able to produce high phenolic contents as well as exhibit high antioxidant activities.

**Keyword:** *Clinacanthus nutans*; Cytokinin; Auxin; Basal medium strength; Sucrose concentration; Antioxidant