

Influence of Different Types of Auxins and Cytokinins on *Dendrocalamus asper* Bamboo Growth in Liquid Media

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Structured Abstract

Background: *Dendrocalamus asper* bamboo plays a vital role in many economic sectors, including construction, food, handicrafts, and the paper and pulp industry, leading to a surge in demand for large-scale production of *D. asper*. In vitro technique can be used as an alternative to the traditional propagation method, which is lacking in various aspects, such as being time-consuming and requiring high labour costs. It is suitable to implement a tissue culture technique to balance the gap between demand and supply. This research aimed to increase the production of *D. asper* bamboo tissue culture using various auxins and cytokinins in liquid culture.

Methods: *Dendrocalamus asper* plantlets with approximately 5 cm in height and two shoots, were cultured in six different treatments of liquid Murashige and Skoog (MS) medium supplemented with 30 gL⁻¹ sucrose, and each with different synthetic plant hormones (IBA, NAA, BAP and kinetin) in the same concentration, 4.0 mgL⁻¹. The negative control was a treatment without plant hormones, while the positive control consisted of 4.0 mg L⁻¹ BAP and 0.5 mg L⁻¹ IBA, following Zani et al. (2024) to optimise *D. asper* growth. Subsequently, after 4 weeks, the effects of different auxins and cytokinins on the number of shoots, rooting and height of *D. asper* were determined.

Results: Based on cytokinin group, it was found that BAP was more effective than kinetin on the number of shoots of *D. asper*, whereas in the auxin group, IBA was more effective than NAA in promoting roots and height of *D. asper*. BAP at 4.0 mgL⁻¹ produced the highest number of shoots (14.67 ± 1.67) while IBA at 4.0 mgL⁻¹ produced the highest rooting (13.67 ± 0.88) and height (16.83 ± 1.09) of *D. asper*.

Conclusion: The role of cytokinin in promoting cell division and influencing plant growth and development is essential in tissue culture practices, while auxin is an essential factor for root growth in *D. asper*. It is recommended to test with other hormone types, such as naturally occurring hormones like IAA and zeatin, and to include acclimatisation for the next process in future studies.

Keywords: *Dendrocalamus asper*, tissue culture, auxin, cytokinin

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