

Identification of Fungal Contamination in Tissue Culture of *Dendrocalamus asper* using Morphological and Biochemical Approaches

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Structured Abstract

Background: *Dendrocalamus asper* is a giant bamboo species valued for its commercial and ecological significance. Tissue culture has been proven as an effective method to enhance propagation, but fungal contamination remains a major limiting factor, causing culture failure. Fungal contaminants may originate from explants, tools, air, or laboratory practices. In bamboo, large intracellular gaps and vessel voids at the cut ends allow contaminants to persist deep within the tissue, even after sterilisation. Identifying these fungal contaminants is crucial for improving micropropagation success rates. This study focuses on observing and identifying fungal contaminants in *D. asper* tissue cultures using morphological and biochemical analysis.

Methods: Contaminated nodal segment samples were collected from *D. asper* tissue cultures at the UiTM Shah Alam Plant Tissue Culture Laboratory. Eight fungal samples (DA1-F1 to DA8-F8) were isolated and cultured on Potato Dextrose Agar (PDA). Morphological features were observed macroscopically and microscopically using Lactophenol Cotton Blue staining. Biochemical tests included amylase activity on starch agar and urease activity using urea broth. The fungi were identified tentatively at the genus level through literature comparison.

Results: Five distinct fungal genera were identified: *Penicillium* spp., *Cladosporium* spp., *Rhizoctonia* sp., *Chrysosporium* sp., and *Trichoderma* sp. *Penicillium* spp. showed the highest frequency, occurring in 3 out of 8 samples. All isolates exhibited distinct morphological characteristics under light microscopy. Biochemical tests revealed that most isolates showed positive amylase activity, while urease activity varied among genera. Likely contamination sources included airborne spores, insufficient sterilisation, and the presence of endophytes within *D. asper* explants.

Conclusion: This study successfully identified fungal contaminants in *D. asper* tissue cultures, highlighting the need for stricter contamination control and improved sterilisation protocols. The findings provide a foundation for future contamination prevention strategies and demonstrate the importance of combining morphological and biochemical methods for fungal identification in plant micropropagation.

Keywords: *Dendrocalamus asper*, fungal contamination, tissue culture, biochemical test, morphological identification

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