

(200)

Optimizing Shoot Proliferation in *Musa acuminata* (Suwandel Banana) Via Short-Term Benzylaminopurine (Bap) Treatment for Efficient Micropropagation**Wishwakulathilaka, D.T., Botheju, W.S.M.****Plant Tissue Culture Research Centre, Department of Indigenous Medical Resources,
Gampaha Wikramarachchi University of Indigenous Medicine, Yakkala, Sri Lanka***shermila@gwu.ac.lk***Abstract**

The Suwandel banana (*Musa acuminata*, AAB group) is a unique traditional Sri Lankan cultivar, highly valued for its nutritional and aromatic qualities. Its conventional propagation leads to low rates of multiplication, vulnerability to diseases, and limits large-scale production. Micropropagation provides an efficient and reliable approach for the rapid multiplication and conservation of this valuable local banana variety. Therefore, the present study aims to evaluate the effects of BAP treatments on *in vitro* shoot multiplication of Suwandel banana. One-month-old *in-vitro* banana clumps (1 cm²) were used as explants and cultured on MS media series, supplemented with a constant 0.5 ppm of L-Ascorbic acid and varying concentrations of BAP (0,0.5,1.0,1.5,2.0,2.5 and, 3.0 ppm). After the first bud appeared, explants were transferred to MS medium with constant 1.0 ppm of Indole-3-Acetic Acid (IAA) and varying concentrations of BAP (0,1.0,2.0,3.0,4.0,5.0 and, 6.0 ppm). The experiment followed a completely randomized design with three replicates per treatment, and each replicate consisted of four explants. Data were analyzed using one-way ANOVA followed by Tukey's post-hoc test at a significance level of $p \leq 0.05$ in SPSS. Results showed that the first shoots emerged from the explant within three weeks on 1.5 ppm BAP initiation medium, and others took more than four weeks. After six weeks, shoot proliferation increased significantly with rising BAP concentrations, with 4 mg/L BAP producing the highest response. This treatment resulted in an average of 4.50 ± 0.8 buds per explant and a shoot height of 4.40 ± 0.75 cm, with a 100% survival rate, which was significantly higher compared to all other concentrations. These findings indicate that short-term BAP treatment is an effective strategy for rapid *in-vitro* shoot induction of Suwandel banana, which is essential for fast mass propagation. Further optimization of growth regulator regimes and acclimatization protocols is recommended to enhance plantlet quality, field establishment, and large-scale propagation efficiency.

Keywords: *Musa acuminata, Micropropagation, N6-benzylaminopurine, In-vitro culture, Plant growth regulators*