

Optimasi Konsentrasi NAA (*Naphthalene Acetic Acid*) Dan BAP (*Benzyl Amino Purine*) Terhadap Pertumbuhan Planlet Pisang Cavendish (*Musa acuminata L.*) Secara *In Vitro*

(Optimization of NAA (Naphthalene Acetate) and BAP (Benzyl Amino Purine) Concentrations on the Growth of Cavendish Banana (Musa acuminata L.) Plantlets in Vitro

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ABSTRACT

Cavendish banana (Musa acuminata L.) is a tropical fruit with high economic value and substantial global market demand due to its relatively uniform fruit quality. However, conventional propagation methods through suckers have various limitations, such as the small number of seedlings produced, the relatively long propagation time, low seedling uniformity, and a high risk of disease transmission. This condition makes it difficult to obtain large quantities of seedlings, making tissue culture techniques an important alternative for producing uniform, healthy, and pathogen-free plantlets. The success of in vitro culture is largely determined by the composition of plant growth regulators, particularly the balance between auxin and cytokinin. NAA plays a role in stimulating root formation and cell elongation, while BAP functions to encourage cell division and shoot formation and proliferation. However, to date, the most appropriate concentrations of NAA and BAP to support the growth of Cavendish banana plantlets remain unknown. This study aimed to determine the effect of various concentration levels of NAA and BAP and their interactions on the growth of Cavendish banana seedlings in vitro. The study was conducted from June to September 2025 using a factorial Completely Randomized Design (CRD) involving two treatment factors, namely NAA (0.5; 1.0; and 1.5 ppm) and BAP (3; 4; and 5 ppm), each replicated three times. Observation parameters included the time of first root emergence, the number of shoots at the 6th and 12th weeks after inoculation, shoot height, and the number of leaves. The data obtained were analyzed using ANOVA, followed by DMRT at the 5% level. The results showed that NAA treatment significantly affected root initiation, shoot number, and leaf number, while BAP significantly affected shoot number and shoot height. The interaction between NAA and BAP had a very significant effect on shoot formation and significantly affected root initiation and leaf number. The combination of 1 ppm NAA and 5 ppm BAP treatment was the most effective in increasing leaf number, with an average of 6.1 leaves per plantlet. These findings confirm that the right balance of NAA and BAP concentrations plays an important role in increasing root formation, shoot proliferation, and leaf development in Cavendish banana plantlets in in vitro culture.

Keywords: *Cavendish banana, in vitro culture, NAA, BAP, plantlet growth*