

**THE EFFICIENCY OF GROWTH MEDIUM BIOCONVERSION INTO BANANA
(*MUSA ACUMINATA*, AA) PLANTLET BIOMASS IN TEMPORARY IMMERSION
SYSTEM (TIS) RITA[®] BIOREACTOR WITH DIFFERENT IMMERSION PERIODS**

HANS INDRA PRAMANA¹, RIZKITA RACHMI ESYANTI² & AHMAD FAIZAL³

^{2,3}Plant Science and Biotechnology Research Group, School of Life Sciences and Technology, Institute of Technology Bandung, Ganeca, Bandung, Indonesia

^{1,2,3}Undergraduate Program in Bioengineering, School of Life Sciences and Technology, Institute of Technology Bandung, Winaya Mukti, Jatinangor, Indonesia

ABSTRACT

A temporary immersion system (TIS) was developed as an alternative solution to produce large quantity of banana (*Musa acuminata*, AA) plantlet in relatively short period, i.e. by using RITA[®] (Recipient for Automated Temporary Immersion System). In this study, we evaluated the effect of immersion period of medium on growth and development of banana somatic embryo as well as the medium bioconversion into production of shoot biomass. Somatic embryos of *M. acuminata* were grown in full strength MS medium supplemented with 2 ppm BAP (benzylaminopurine). RITA[®] bioreactors were set up with two different immersion periods, 1 min and 15 min, scheduled every 6 h and incubated for 21 days. The result indicated that immersion period affected embryo's germination and growth rate (μ). Fifteen-minutes immersion showed greater percentage of germination ($93.44 \pm 0.59\%$), growth rate (0.042 ± 0.001 g/day), and productivity (0.025 g. L_{medium}^{-1} . hari⁻¹) compared to that immersed for 1 min ($81.49 \pm 0.34\%$, 0.037 ± 0.001 g/day, and 0.019 g. L_{medium}^{-1} . hari⁻¹ respectively). Additionally, the pattern of sucrose, mineral, and inorganic compounds consumption followed the growth of cell biomass for both systems. In conclusion, RITA[®] system with longer immersion period supports better efficiency of medium bioconversion.

KEYWORDS: *Musa Acuminata* (AA), TIS RITA[®], Immersion Period, Growth Rate, Medium Bioconversion, Somatic Embryo