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Biomass enhancement of stevia rebaudiana bertoni shoot culture in temporary immersion system (TIS) RITA® bioreactor optimized in two different immersion periods (Conference Paper) (Open Access)

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Abstract

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Stevia plant contains steviol glycosides, which are estimated to be 300 times sweeter than sucrose. However, conventional (in vivo) propagation of Stevia rebaudiana in Indonesia was not effective due to poor results. Therefore, an alternative method to propagate stevia plants is needed. One of them is by using in vitro method. Multiplication with a large quantity of stevia biomass in a relatively short period can be conducted by using TIS RITA® (Recipient for Automated Temporary Immersion System). This study aimed to evaluate the effect of the immersion period of the medium on growth and the medium bioconversion into the production of shoot biomass . The bioreactors were set up with 15 min and 30 min immersions periods, scheduled every 6 h, and incubated for 21 d. The result indicated that the immersion period affected the biomass and growth rate (μ). Amount of 30 min immersion showed a greater percentage of shoot multiplication, higher biomass , percentage of leaf growth, growth rate, and productivity compared to 15 min immersion . The pattern of sucrose, mineral, and inorganic compounds consumption followed the growth of plant biomass for both systems. In conclusion, 30 min immersion gave a greater efficiency medium bioconversion to plant biomass compared with 15 min immersion .

SciVal Topic Prominence

Topic: Stevioside | Stevia Rebaudiana | Rebaudioside A

Prominence percentile: 95.327

Author keywords

Diabetes prevention | Micropropagation | Natural sweetener | Sweetener plant | Tissue culture

Indexed keywords

Engineering controlled terms: Agriculture | Bioconversion | Bioreactors | Ecology | Growth rate | Inorganic compounds | Sugar (sucrose) | Sugar substitutes

Engineering uncontrolled terms: Immersion periods | Shoot cultures | Shoot multiplication | Short periods | Stevia rebaudiana | Stevia rebaudiana bertoni | Steviol glycosides | Temporary immersion systems

Engineering main heading: Biomass

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