

Enhancement of Cynobacteria Growth in Serial Configuration Photobioreactor by Photon Flux Density Alteration

Dianursanti, author

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Abstrak

*There are many researches to solve the effects of global warming caused by great amount of CO₂ in the air. One of the effective alternatives to reduce this gas in atmosphere is by using micro alga *Spirulina platensis* due to its ability of CO₂ fixation and the very useful biomass that it produced. *Spirulina platensis* contains high protein and can cure diseases such as cancer and cholesterol reduction. In considering of these benefits, this research focused on increasing the biomass production of *Spirulina platensis* by alteration of light illumination during microbial growth. The cultivation holds in a series of photo-bioreactors at 29°C and 1 atm where each of photo-bioreactor has volume of 500 ml., using Conwy medium as nutrition. 3% CO₂ is the carbon source for the cultivation with superficial velocity 1.2 m/h. Phillips Halogen lamp 20W/12V/50Hz is the source for illumination. The cultivation using constant intensity of light illumination was also be done as a control. Cultivation of *Spirulina platensis* with alteration illumination method successfully increased the biomass production 55.1 % higher than constant intensity of light illumination. The energy of producing biomass in alteration of light illumination method lower than continuous intensity illumination which was only 21.6 % than constant intensity of light illumination. Kinetic studies of this microbial growth at alteration of light illumination also concluded that specific growth rate and bicarbonate concentration as essential compound followed Ierusalemky kinetic model equation.*