

LIGHT INTENSITY IMPACTS ON THE PROSPECTIVE NITROGEN-FIXING CYANOBACTERIUM *ANABAENA* SP. ISOLATE

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ABSTRACT

Anabaena sp. is a filamentous photosynthetic cyanobacterium which has potential as a source of organic matter and nitrogen fixation ability. Accordingly, the present investigation emphasizes the effect of light intensity on biomass accumulation and nitrogenase activity measured as acetylene reducing activity (ARA) of *Anabaena* sp. isolate. Three light intensities (50, 100 and 150 $\mu\text{mol s}^{-2} \text{m}^{-1}$) provided by white fluorescent lamps providing continuous illumination were used for cultivation of *Anabaena* sp. isolate. Increasing light intensity significantly correlated with increased growth of *Anabaena* sp. where the maximum biomass accumulation of 760 mg/l was achieved at 150 $\mu\text{mol s}^{-2} \text{m}^{-1}$. For nitrogenase activity, our results indicated that increasing light intensity positively correlated with increasing acetylene reducing activity (ARA) but this increase was limited up to a certain level of light intensity after which this activity could be declined. The highest rate of ARA of 52.47 $\mu\text{moles C}_2\text{H}_4\text{mg}^{-1}$ algal dry weight hr^{-1} was recorded at 100 $\mu\text{mol s}^{-2} \text{m}^{-1}$ compared to a lower value obtained at 150 $\mu\text{mol s}^{-2} \text{m}^{-1}$. Consequently, it can be concluded that light intensity was found to be an effective method in increasing biomass accumulation and nitrogen fixation of *Anabaena* sp. culture.

KEYWORDS: *Anabaena* sp., Light Intensity, Growth, Nitrogen Fixation, Nitrogenase