

Combined effects of light intensity and carbon dioxide concentration on photoautotrophic growth of *Haematococcus pluvialis*

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Increased concentration of carbon dioxide in the atmosphere is considered to be one of main causes of global warming problem. Therefore, various attempts have been conducted for reducing and storing carbon dioxide. In this study, we used a microalga *Haematococcus pluvialis* to reuse carbon dioxide. This strain have been taken a great attention due to hyper-accumulation of high level of astaxanthin (up to 4%) which is a high-value carotenoid (US\$ 2500 kg⁻¹). A potent producer of astaxanthin, *H. pluvialis* has distinctive life cycle, which is associated with a morphological transformation from green vegetative cells stage to thick walled red cells stage. To use this alga for reuse carbon dioxide some important factors (e.g., CO₂ concentration, light intensity) affecting algal growth should be investigated. In this work the combined effects of CO₂ concentration and light intensity were studied. At 5%(v/v) of CO₂ concentration, the maximum specific growth rate was obtained without inhibition by high light intensity up to 180 $\mu\text{E m}^{-2} \text{s}^{-1}$. However, when the light intensity was lower than 50 $\mu\text{E m}^{-2} \text{s}^{-1}$, the growth rate at 0.035%(v/v) was higher than that at 5% (v/v).