Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
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INORGANIC CARBON ACQUISITION BY *GRACILARIA EDULIS* AND ITS EFFECT ON GROWTH

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Abstract

The utilization of inorganic carbon by the red macroalgae, *Gracilaria edulis* (*G.edulis*) was investigated in this study. *G. edulis* were grown in brackish water aerated with varying concentration of carbon dioxide- 350 ppm (actual atmospheric carbon dioxide, CO2), 700 ppm and 1400 ppm CO2 gas. Higher growth rate was observed in culture medium aerated with 1400 ppm CO2 and the lowest growth rate was observed at actual atmospheric carbon concentration. Besides that, significant pH drift was observed in the culture medium with and without enriched carbon dioxide. In the control flask, the pH was higher with a mean of 8.65 ± 0.14, and it greatly differed with carbon dioxide enriched air that exhibited lower pH of a 0.8 unit difference. Photosynthetic rate increased with an increment of inorganic carbon concentration and the highest oxygen evolution were 45µmol g^{-1}FW h^{-1} and 35µmol g^{-1}FW h^{-1} at 1400 ppm and 350 ppm, respectively. Therefore, elevated concentration of CO_2 significantly decreased the pH of the medium, enhanced growth of macroalgae and evolved more O_2.

Key words: Carbon dioxide, *Gracilaria edulis*, growth, pH, photosynthesis

Received: November, 2013; Revised final: May, 2015; Accepted: May, 2015

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