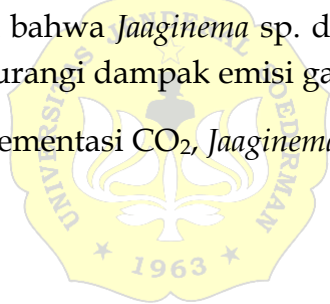


ABSTRAK

Peningkatan konsentrasi CO₂ di lingkungan telah menjadi penyebab utama pemanasan global. Mikroalga memiliki potensi untuk mengurangi kadar dan dampak dari peningkatan CO₂ di lingkungan dengan kemampuan fiksasi CO₂. Penelitian ini bertujuan untuk mengetahui pengaruh suplementasi gas CO₂ terhadap pertumbuhan dan biomassa mikroalga laut *Jaaginema* sp. Dalam penelitian ini, mikroalga *Jaaginema* sp. dikultur pada media *Seawater-Batam* SWBT selama 8 hari dengan perbedaan suplementasi gas CO₂ yaitu 0 mL sebagai kontrol, 10 mL, dan 20 mL. Laju pertumbuhan spesifik *Jaaginema* sp. tertinggi adalah ($0,1280 \pm 0,0154$ /hari), produktivitas biomassa ($0,1312 \pm 0,0025$ mg/mL/hari), dan laju fiksasi CO₂ ($0,2401 \pm 0,00464$ mg/mL/hari) pada konsentrasi CO₂ 10 mL. Selain itu, *Jaaginema* sp. menunjukkan peningkatan kandungan karbohidrat, protein, dan lipid pada konsentrasi CO₂ 10 mL, mencapai nilai tertinggi yaitu 30,5%, 27,9%, dan 23%. Uji ANOVA menunjukkan bahwa suplementasi CO₂ berpengaruh signifikan terhadap produksi biomassa dan kandungan metabolit primer mikroalga pada taraf uji signifikansi ($\alpha = 0.01$). Secara umum, viabilitas yang baik dari *Jaaginema* sp. terbentuk pada 10 mL CO₂. Penelitian ini menunjukkan bahwa *Jaaginema* sp. dapat menjadi alternatif agen biofiksasi yang dapat mengurangi dampak emisi gas CO₂ secara langsung.

Kata kunci: mikroalga, suplementasi CO₂, *Jaaginema* sp., fiksasi



ABSTRACT

Increased of CO₂ concentration in the environment have become a major cause of global warming. Microalgae have the potential to reduce the levels and impacts of elevated CO₂ in the environment with their CO₂ fixation ability. This study aims to determine the effect of CO₂ supplementation on the growth and biomass productivity of *Jaaginema* sp. In this study, *Jaaginema* sp. was grown under different CO₂ concentrations (0 mL as control, 10 mL, and 20 mL) using Seawater-Batam (SWBT) media for 8 days. The highest specific growth of *Jaaginema* sp. was (0.1280 ± 0.0154 /day), productivity biomass was (0.1312 ± 0.0025 mg/mL/day), and CO₂ fixation rate was (0.2401 ± 0.00464 mg/mL/day) at 10 mL CO₂ concentration. Additionally, *Jaaginema* sp. showed an increase in carbohydrate, protein and lipid content at 10 mL CO₂ concentration, reaching the highest value of 30,5%, 27,9%, and 23%. ANOVA test showed that CO₂ supplementation had a significant effect on biomass production and primary metabolite content of microalgae at the test level significance ($\alpha = 0.01$). In general, good viability of *Jaaginema* sp. was established at 10 mL CO₂. Furthermore, this research showed that *Jaaginema* sp. could be an alternative biofixation agent to reduce the impact of CO₂ emissions.

Key words: microalgae, *Jaaginema* sp., fixation, supplementation

