

## PENGARUH STARVASI NITROGEN TERHADAP PERTUMBUHAN, PRODUKSI LIPID, DAN PROFIL ASAM LEMAK *Euglena* sp. PADA KULTIVASI SEMI-MASSAL

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### INTISARI

Mikroalga merupakan salah satu organisme yang dapat menghasilkan lipid, sehingga sering di kultur dalam jumlah massal. Sebelum dikultivasi secara massal, *Euglena* sp. perlu beradaptasi lewat kultivasi semi-massal dengan kondisi, perubahan lingkungan, atau kontaminan. Salah satu upaya yang dilakukan untuk mendapatkan hasil lipid yang optimal, perlu dilakukan perlakuan starvasi nitrogen. Penelitian ini bertujuan mengetahui pengaruh starvasi nitrogen terhadap laju pertumbuhan dan biomassa, kandungan lipid, serta profil asam lemak *Euglena* sp. dengan kultivasi semi-massal. Starter mikroalga *Euglena* sp. Stok isolat *Euglena* sp. dikultivasi ke dalam kolam 50 L sebanyak 3 buah dengan Medium Cramers-Myers yang memiliki kandungan Nitrogen ((NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>) masing-masing 500 mg/L dan 250 mg/L, serta Nitrogen ((NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>) 1000 mg/L sebagai kontrol. Namun rendahnya konsentrasi nitrogen juga meningkatkan produktivitas lipid. Lipid yang dihasilkan pada perlakuan konsentrasi nitrogen 500 mg/L dan 250 mg/L masing-masing sebesar 0,011±0,0014 mg/mL dan 0,009±0,0009 mg/mL, lebih tinggi daripada perlakuan 1000 mg/L yang sebesar 0,005±0,0014 mg/mL. Rendahnya konsentrasi Nitrogen pada 250 mg/L, menyebabkan kandungan SFA tertinggi mencapai 40,76% dan rendahnya kandungan PUFA 20,11%. Semakin rendah konsentrasi nitrogen yang diberikan maka akan semakin menurunkan laju pertumbuhan, produksi biomassa, protein, pigmen, dan karbohidrat dari *Euglena* sp.

Kata Kunci : *Euglena* sp, FAME, Kultivasi semi massal, Lipid, Starvasi Nitrogen.

## THE EFFECT OF NITROGEN STARVATION ON GROWTH, LIPID PRODUCTION, AND FATTY ACID PROFILE of *Euglena* sp. ON SEMI-MASS CULTIVATION

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### ABSTRACT

Microalgae are among the organisms that are capable of producing lipids, and as a result, they are frequently cultivated on a large scale. Prior to mass cultivation, it is necessary to adapt the *Euglena* sp. through semi-mass cultivation to a variety of conditions, environmental changes, and contaminants. One strategy employed to achieve the greatest possible lipid yield is the implementation of a nitrogen starvation treatment. The objective of this study is to ascertain the impact of nitrogen starvation on the growth rate and biomass, lipid content, and fatty acid profile of *Euglena* sp. through semi-mass cultivation. *Euglena* sp. microalgae starter stock isolates were cultivated in three 50-L ponds with Cramers-Myers Medium containing 500 mg/L and 250 mg/L nitrogen (ammonium sulfate), respectively, and 1,000 mg/L nitrogen (ammonium sulfate) as a control. However, the low nitrogen concentration also increased lipid productivity. The lipid productivity observed in the 500 mg/L and 250 mg/L nitrogen concentration treatments was  $0.011 \pm 0.0014$  mg/mL and  $0.009 \pm 0.0009$  mg/mL, respectively, higher than that observed in the 1000 mg/L treatment, which was  $0.005 \pm 0.0014$  mg/mL. The low concentration of nitrogen at 250 mg/L resulted in the highest SFA content reaching 40.76% and a low PUFA content of 20.11%. As the nitrogen concentration decreased, the growth rate, biomass production, protein, pigments, and carbohydrates of *Euglena* sp. also decreased.

Keywords: *Euglena* sp, FAME, Semi-mass cultivation, Lipids, Nitrogen Starvation.