

Pertumbuhan dan Kandungan Pigmen Fotosintetik *Euglena* sp. Pada Kultivasi Massal dengan Cekaman Garam $MgCl_2$ dan $CaCl_2$

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INTISARI

Mikroalga adalah kelompok mikroorganisme autotrof yang hidup di ekosistem laut, air tawar, dan tanah serta menghasilkan zat organik dalam proses fotosintesis. Dalam perkembangan terbaru, mikroalga berpotensi untuk menghasilkan berbagai macam senyawa seperti polisakarida, lipid, protein, karoten, pigmen, vitamin, sterol, enzim, antibiotik, hidrokarbon dan biofuel. Beberapa mikroalga dapat menghasilkan pigmen selain dari pigmen hijau yang dihasilkan dari proses fotosintesis. Penelitian ini dilakukan untuk mengetahui pengaruh salinitas menggunakan $MgCl_2$ dan $CaCl_2$ terhadap produksi massal pada kultur massal *Euglena* sp. Kadar pigmen dan jenis-jenis pigmen fotosintetik merupakan parameter utama yang diukur dalam penelitian ini. Kandungan pigmen pada *Euglena* sp. diukur dengan menggunakan spektrofotometer pada panjang gelombang 400-700 nm (Thermo Scientific GENESYS™ 10UV Scanning). Parameter tambahan yang diukur meliputi densitas sel, biomassa, lipid, salinitas, dan pH. Kultivasi *Euglena* sp. dilakukan secara massal dengan metode *open pond* pada Stasiun Penelitian Biologi UGM Karanggayam. Berdasarkan hasil penelitian selama 9 hari menunjukkan bahwa laju pertumbuhan spesifik, kandungan biomassa, dan lipid tertinggi terletak pada perlakuan $CaCl_2$ dengan nilai berturut-turut sebanyak $0,298 \pm 0,049$, $31,3 \pm 11,6$ ($g/mL \times 10^{-4}$), $37,03 \pm 18,07$ ($mg/mL \times 10^{-4}$). Hasil penelitian pada seluruh klorofil serta karotenoid dan turunannya juga memperoleh nilai tertinggi pada kultivasi dengan perlakuan $CaCl_2$.

Kata Kunci: *Euglena* sp., Kultur Masal, Pigmen, Salinitas

Mass Cultivation of *Euglena* sp. Growth and Photosynthetic Pigment Content under Salt Stress of $MgCl_2$ and $CaCl_2$

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ABSTRACT

Microalgae are a group of autotrophic microorganisms that live in marine, freshwater, and soil ecosystems and produce organic substances through photosynthesis. In recent developments, microalgae have the potential to produce various compounds such as polysaccharides, lipids, proteins, carotene, pigments, vitamins, sterols, enzymes, antibiotics, hydrocarbons, and biofuels. Some microalgae can produce pigments other than the green pigments produced from the photosynthesis process. This research was conducted to determine the effect of salinity using $MgCl_2$ and $CaCl_2$ on the mass production in the mass culture of *Euglena* sp. The pigment content and types of photosynthetic pigments were the main parameters measured in this study. The pigment content in *Euglena* sp. was measured using a spectrophotometer at a wavelength of 400-700 nm (Thermo Scientific GENESYS™ 10UV Scanning). Additional parameters measured included cell density, biomass, lipids, salinity, and pH. Cultivation of *Euglena* sp. was carried out on a large scale using the open pond method at the UGM Karanggayam Biological Research Station. The results of the 9-day study showed that the highest specific growth rate, biomass content, and lipid content were found in the $CaCl_2$ treatment, with values of 0.298 ± 0.049 , 31.3 ± 11.6 (g/mL $\times 10^{-4}$), and 37.03 ± 18.07 (mg/mL $\times 10^{-4}$), respectively. The study results on all chlorophyll as well as carotenoids and their derivatives also obtained the highest values in the cultivation with $CaCl_2$ treatment.

KEY WORDS: *Euglena* sp., Mass culture, Pigment, Salinity