**Estimation of optimum specific light intensity per cell on a high-cell-density continuous culture of Chlorella zofingiensis not limited by nutrients or CO2**


ABSTRACT

To determine the optimum light intensity per cell required for rapid growth regardless of cell density, continuous cultures of the microalga Chlorella zofingiensis were grown with a sufficient supply of nutrients and CO2 and were subjected to different light intensities in the range of 75ï 1000 ε E mī 2 sī 1. The cell density of culture increased over time for all light conditions except for the early stage of the high light condition of 1000 ε E mī 2 sī 1. The light intensity per cell required for the high specific growth rate of 0.5 dayī 1 was determined to be 28ï 45 ε E g-dsī 1 sī 1. The specific growth rate was significantly correlated to light intensity ($y = 0.721 \times x/(66.98 + x)$, $r2 = 0.85$, $p < 0.05$). A high specific growth rate was maintained over a range of light intensities (250ï 1000 ε E mī 2 sī 1). This range of light intensities suggested that effective production of C. zofingiensis can be maintained outdoors under strong light by using the optimum specific light intensity.



**Keyword:** Biomass production of microalgae; Chlorella zofingiensis; High-cell-density culture; Nutrient and CO2 supply; Optimum light condition