

High productivity of eicosapentaenoic acid and fucoxanthin by a marine diatom *Chaetoceros gracilis* in a semi-continuous culture

ABSTRACT

Significantly high eicosapentaenoic acid (EPA) and fucoxanthin contents with high production rate were achieved in semi continuous culture of marine diatom. Effects of dilution rate on the production of biomass and high value biocompounds such as EPA and fucoxanthin were evaluated in semi-continuous cultures of *Chaetoceros gracilis* under high light condition. Cellular dry weight increased at lower dilution rate and higher light intensity conditions, and cell size strongly affected EPA and fucoxanthin contents. The smaller microalgae cells showed significantly higher ($p < 0.05$) value of 17.1 mg g-dw⁻¹ fucoxanthin and 41.5% EPA content per total fatty acid compared to those observed in the larger cells. *Chaetoceros gracilis* can accumulate relatively higher EPA and fucoxanthin than those reported previously. In addition, maintenance of small cell size by supplying sufficient nutrients and light energy can be the key for the increase production of valuable biocompounds in *C. gracilis*.

Keyword: Microalgae production; Eicosapentaenoic acid; Fucoxanthin; *Chaetoceros gracilis*; Dilution rate