



## **CULTIVATION OF MICROALGAE; *CHAETOCEROS CALCITRANS* FOR BIODIESEL PRODUCTION AS AFFECTED BY DIFFERENT NITRATE CONCENTRATIONS AND SALINITY LEVELS**

A.M. Gammanpila<sup>1</sup>, C.P. Rupasinghe<sup>2</sup> S. Subasinghe<sup>2</sup>

<sup>1</sup>Faculty of Graduate studies, University of Ruhuna, Sri Lanka

<sup>2</sup>Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka

[shanigam@yahoo.com](mailto:shanigam@yahoo.com)

Microalgae are considered as a promising biological material for the production of biodiesel. The key to economic algal biomass production for biodiesel is, optimization of the growth conditions. The aim of the present work was to study the effect of nitrate concentration and salinity level on growth and lipid production of marine diatom, *Chaetoceros calcitrans* cultured in an outdoor culture system, in view of its possible utilization as novel raw materials for biodiesel production. Guillard and Ryther's modified F/2 media was used as the culture media with different sodium nitrate concentrations such as, 0.0375 g/L, 0.075 g/L and 0.15 g/L. In the second experiment, *Chaetoceros calcitrans* was cultured in different salinity levels; 35 ppt, 30 ppt and 25 ppt. At the end of the 15 days growth period, cells were harvested by flocculation and dry weight and the percentage lipid content were estimated. Average dry matter yield and the % lipid contents were observed as 0.5 g/L with 6.5 % lipid, 0.6 g/L with 6.2 % lipid and 0.7 g/L with 6.0 % lipid in 0.0375 g/L, 0.075 g/L and 0.15 g/L nitrate concentrations respectively. Significantly lower average dry matter yield and significantly higher % lipid content was observed in the treatment with lowest nitrate concentration ( $p > 0.05$ ). Further, no significant effects on measured parameters were observed when *C. calcitrans* cultured in different salinity levels, which reveals its ability to grow in range of salinity (25 ppt to 35 ppt). Therefore, it is clear that *C. calcitrans* can be cultivated at low nitrate concentration (0.0375 g/L) and wide range of salinity levels (25 ppt to 35 ppt) to produce biodiesel.

**Keywords:** *Chaetoceros calcitrans*, nitrate, salinity level, dry weight, lipid yield