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Effect of Salinity Concentrations on Growth Rate and Lipid Concentration in *Microcystis Sp.*, *Chlorococcum Sp.* and *Chaetoceros Sp.*

Asulabh K S, Supriya G and Ramachandra T V

Energy & Wetlands Research Group, Centre for Ecological Sciences,
Indian Institute of Science, Bangalore – 560 012, INDIA

E-mail: asulabha.mphil3@iiitmk.ac.in; supriya@ces.iisc.ernet.in; cestvr@ces.iisc.ernet.in
<http://ces.iisc.ernet.in/energy>

Biofuels from microalgae is a viable alternative for replacing the global demand for petro-diesel. The two important desirable characteristics considered in a species to be used for biodiesel production are high biomass and lipid production. It is noted that the increase in salinity can increase the lipid content of microalgae, but lowers the growth rate of a species. Therefore, the effect of salinity on the growth and lipid content of microalgal species have to be investigated. Salt stress is a major abiotic environmental factor that limits plant growth and productivity. The salinity stress and unfavorable light conditions are the main limiting factors of plant productivity both in aquatic and terrestrial, natural and anthropically modified environments. Microalgae differ in their adaptability to salinity and other stress conditions. The ability of cells to survive and flourish in saline environment under the influence of osmotic stress has received considerable attention. Under favorable and unlimited growth conditions microalgae produce primarily polar lipids (e.g. glycolipids and phospholipids), which enrich chloroplast and cellular membranes. However, under unfavorable growth conditions microalgae accumulate neutral lipids in lipid droplets located in the cytoplasm. The study focuses on the effect of salinity concentrations on the cell growth and lipid content of three microalgae viz., *Chlorococcum sp.*, *Microcystis sp.* (fresh water algae) and *Chaetoceros sp.* (marine alga), isolated and cultured in appropriate medium for a period of 7 days. The halotolerance of all the three algae were determined by growing them in three different salinity concentrations. All the three microalgae were able to tolerate the salinity levels and showed different growth patterns and lipid accumulation rates. The cell growth of all the three algae did not show a definite pattern. The total lipid content was found to be higher on the 5th day of culture experiment in case of *Chaetoceros sp.* (8.06 mg/ml at 35 ppt) and *Microcystis sp.* (8.4 mg/ml at 0.2 ppt) whereas, it was higher on 6th day for *Chlorococcum sp.* (6.6 mg/l at 0.2 ppt). The increase in lipid content at higher NaCl concentration may be due to adaptation under stress conditions, which help in accumulation of lipid content in cells.

Keywords: *Microalgae, NaCl, Lipid, Chlorococcum, Microcystis, Chaetoceros.*