

GROWTH KINETICS OF FOUR FRESH WATER ISOLATED MICROALGAE FOR OPTIMAL BIOMASS AND LIPID PRODUCTION USING RESPONSE SURFACE METHODOLOGY

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ABSTRACT

*Microalgae require a wide range of chemical and physical factors for their growth, proliferation, and differentiation. These factors affect the morphology, physiology and metabolic activities of the organism. Therefore, in the present investigation, lipid producing microalgae were isolated and identified, abiotic growth factors such as different autotropic media, pH, nutrients, and media optimization studies were carried out to obtain highest biomass and lipid from microalgae which have the potential for effective biodiesel production. Growth studies were carried out of the isolated algal strains, the optimum temperature for all the experiments was kept at 25 ± 1 °C and light intensity of 1.2 ± 0.2 klux was maintained. Four strains with highest percentage wise Biomass : Lipid ratio were considered for studies, these strains are *Chlorella vulgaris* AS-3, *Chlorella pyrenoidosa* AS-6, *Scenedesmus dimorphus* AS-13, all 3 strains were isolated from unkal lake and *Scenedesmus quadricauda* AS-18 was isolated from Rayanaal lake. Out of the four isolated strains *Chlorella vulgaris* (AS-3) showed a significant increase in lipid content by 3 %. The organism was found to grow well in the optimized BG-11 media with the pH of 6.5 and culture age of 6 weeks and concentration of sodium nitrate, FAC, potassium bicarbonate and magnesium sulphate of 2, 0.24, 0.3 and 0.8 g/L respectively. The data obtained by the by the above growth studies can be used for mass culturing of the organism in invivo conditions in open ponds and furthers studies can be done using different media compositions. Hence, AS-3 was found to be an ideal candidate for biodiesel production and further characterization of the microalgae was carried out.*

KEYWORDS: Biomass, Lipid, Microalgae, Optimisation, *Chlorella Vulgaris* AS-3

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