



## **Optimization of Growth and Lipid Production of the Chlorophyte Microalga *Chlorella Emersonii* as a Feedstock for Biodiesel Production**

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**Abstract :** *Chlorella emersonii* has been isolated and tested for its growth, pigment, protein and free amino acid contents. The growth of *chlorella emersonii* was found to be 3.2 times more in alternate illumination than in continuous light condition. Similarly, chlorophyll content was found as 2.50% (Chl-a) and 0.62% (Chl-b) in alternate light period and 1.65% (Chl-a) and 0.50% (Chl-b) in continuous illumination. The total protein content was found to correlates with growth and chlorophyll content. Carotenoid and free amino acid content was higher in continuous light period than in alternate light illumination. In the present study, based on the results, it is identified that the alternate dark and light period is more suitable for the growth of *Chlorella emersonii* than continuous light illumination. Hence, the present research work is focused on the biodiesel production from the *Chlorella emersonii*. In this study, soxhlet extraction had been used to extract the algal oil which contains high percentage of fatty acids. The extracted algal oil was characterized using GC-MS spectral data. Based on the spectral data, totally five fatty acids were identified using NIST GC-MS library. Further, the crude algal oil was converted into biodiesel using enzyme-catalyzed trans-esterification reaction.

**Keywords:** *Chlorella emersonii*; Isolation; Growth; Pigment; Carotenoid; Proteins; Amino acid; enzyme catalysed trans-esterification.

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