

## **Influence of Photobioreactor on Cultivation of *Tetraselmis* Sp. under Various Colors and Light Intensities for Biodiesel Production**

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### **Abstract**

In microalgae cultivation, artificial light sources have impactful influences on their growth pattern. The biomass production rate, lipid and pigment accumulation, fatty acid profile is observed in microalgae under various color of lights. Artificial lighting will enhance not just production but also the costs related with microalgae cultivation. Therefore, microalgae *Tetraselmis sp.* was cultivated in 20 L photobioreactor under different color (Blue= 490 nm, Green= 560 nm, Red= 635 nm) with different light intensities (120, 240 and 480  $\mu\text{mol photon m}^{-2}\text{s}^{-1}$ ) at  $24\pm 2^\circ\text{C}$  for 15 days to determine the specific light absorption rate. The highest biomass 42.34 mg/L and lipid  $35\pm 2\%$  was obtained under blue light with 240  $\mu\text{mol photon m}^{-2}\text{s}^{-1}$  light intensity as compared to other lights. Palmitic acid and Stearic acids were dominant fatty acids which found from the lipid analysis. The observation proves that there is a compelling association between light colors, intensity, and the growth of microalgae.

**Keywords:** Biodiesel; Light intensity; Photobioreactor; Lipid; Photosynthesis.