5th World Conference on Sustainability, Energy and Environment

Prague, Czech Republic 18 – 20 September 2025

An Analysis Of The Cell Fission Rate Of Scenedesmus Obliquus Under Different Light Frequencies.

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ABSTRACT

Microalgae have been extensively studied for their environmental and industrial applications. Here Scenedesmus obliquus is studied due to its stand-out benefits such as capable of producing high-quality biolipids, high efficiency on CO_2 absorption during photosynthesis and so on. It is known that various ambiance conditions may have impacts on the algae's population growth. In this study measurement was implemented on counting the number of Scenedesmus obliquus cells multiple times each day under different light frequencies over a period of time. The number of cells versus time is then plotted from the acquired data points. Formulating a theoretical equation that determines the rate of generation requires multiple parameters and is complicated. However, in this paper a straightforward equation with two parameters to estimate the corresponding time factors on cell division is introduced. The two parameters t_0 and D indicate the cell cycle duration, and the average fission rate, respectively. Employing data fitting techniques, sets of (t_0, D) values are thus derived for different light frequencies. Our results show that red light at 620 nm with t_0 = 11, and D = 1.15 is optimal for generating Scenedesmus obliquus.

Keywords: biomass; cell density; microalgae; multiple fission; renewable energy