

## Using Genetic Algorithm to predict the suitable light intensity for best influence on lipid characteristics and fatty acid profile of freshwater Microalgae for biodiesel production

1Marzie Rayati, Erfan Arzhmand 2

1Islamic Azad University, Iran

2FANAP Company, Iran

The present study was purposed to predict the suitable light intensity on the lipid Accumulation properties of a freshwater microalga *Chlorococcum Oleofaciens* KF584224.1 to get the highest lipid content. Based on some previous studies and gathered data for light intensity, by using Genetic Algorithm via R programming language, we predicted that if we cultivate the body of these microalgae species at two different light intensities (200 and 400  $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) then we will get the highest lipid content at highest probability. In continuation, the microalga was isolated from a freshwater body and cultivated at five different light intensities of 50, 100, 200, 400, and 800  $\mu\text{mol photons m}^{-2}\text{s}^{-1}$

for 20 days. Once algae reached the stationary phase, the maximum biomass productivity ( $367.82 \pm 4.26 \text{ mg L}^{-1} \text{ d}^{-1}$ ) was found in culture illuminated with 200  $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ , while the highest lipid content ( $59.18 \pm 1.62\%$ ) and lipid productivity ( $126.72 \pm 3.27 \text{ mg L}^{-1} \text{ d}^{-1}$ ) were achieved in culture illuminated with 400  $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ . The properties of biodiesel obtained from *C. oleofaciens* cultured fewer than 50  $\mu\text{mol photons m}^{-2}\text{s}^{-1}$  met the specifications provided by the international biodiesel standards (European EN 14214 and US ASTM D6751), higher light illumination improved the biodiesel quality which makes *C. oleofaciens* as a potential feedstock for biodiesel production especially under 400  $\mu\text{mol photons m}^{-2}\text{s}^{-1}$  light intensity.

### Biography:

Marzie is PhD candidate at science and research branch of Islamic Azad University in reproduction and culture of aquatic. She is hiring as an expert at Organization of Agriculture, Tehran, Iran. Also, she works as a consultant member at Agricultural and Natural Resources Engineering Organization, Tehran, Iran.

[13th International Conference on Biofuels & Bioenergy; February 19-20, 2020; Dubai, UAE](#)

Citation: Rayati M (2020); Using Genetic Algorithm to predict the suitable light intensity for best influence on lipid characteristics and fatty acid profile of freshwater Microalgae for biodiesel production, Biofuel 2020, February 18-19, 2020; Dubai, UAE