Title: 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.

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I. Abstract Body

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 µmol photons $m^{-2}s^{-1}$) 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 µmol photons $m^{-2}s^{-1}$ for 20 days. Once algae reached the stationary phase, the maximum biomass productivity ($367.82\pm4.26 mgL^{-1}d^{-1}$) was found in culture illuminated with 200 µmol photons $m^{-2}s^{-1}$, while the highest lipid content (59.18±1.62%) and lipid productivity ($126.72\pm3.27 mgL^{-1}d^{-1}$) were achieved in culture illuminated with 400 µmol photons $m^{-2}s^{-1}$. The properties of biodiesel obtained from *C. oleofaciens* cultured fewer than 50 µmol photons $m^{-2}s^{-1}$ 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 µmol photons $m^{-2}s^{-1}$ light intensity.

II. Images:





III. Biography of Author and Co-Author

Marzie is PhD candidate at 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.
Erfan passed Computer Engineering Course several years ago and has gotten such different international certificates as Cisco and Microsoft. He also has some ISI papers in Computer Science. He works as a programmer in such various languages as JAVA, C#, R and Python and hired for data processing purposes at FANAP Company, Tehran, Iran.

IV. Research Interest

Marzie has general interests in natural resources and aquaculture especially algae organization. As a result, her PhD dissertation has focused on alga-culture conditions and techniques to produce optimized biofuels. She is especially concerned about that algal biofuel has lots of challenges to be solved. Therefore, she is started Interdisciplinary studies with Erfan in computer science and data processing to enhance accuracies and accelerate her studies.

V. Presenting Author and Co-Author details



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