Biodiesel Production By Chara Vulgaris Isolated From Freshwater Of Basrah Province, Iraq

Haya Abd Shaker[1], Mariam Fawzi Al-Bidhani[2], Ahmed Abdburghal[3*]

Abstract

The negative impacts of burning fossil fuels on the environment and the rising crude oil costs have increased the interests in biofuel. The only renewable biofuel that is able to replace fuels made from petroleum is biodiesel produced from algae. The current study was conducted to assess the efficiency of green macroalgae, *Chara vulgaris* and the possibility of using it as a source of alternative energy production. Algae samples were collected from the freshwater environment in Basrah city. Algae were subjected to phenotypic diagnosis, then genetically identified based on ITS1 amplification. The sequences of the gene were identified and matched with the database in GenBank. The algae were identified as *Chara vulgaris* with an identity of 100%. The oil was extracted from algal biomass in two ways, at room temperature and in the soxhlet extraction device, yielding 0.09 and 0.163% oil, respectively The oil esterification process was carried out using two types of catalysts, basic and acidic catalysts. The result of the esterification process was analysed by GC/Ms, showing that fatty acid esters were the highest, while fatty acids and hydrocarbons were low. An assessment of the physical properties of the biodiesel produced was also carried out, proving to be non-carbon 0%, and of low sulphur and water content. These characteristics were compared to those of oil diesel.

Keywords: Biodiesel, *Chara vulgaris*, Macroalgae, Biofuel.

[1]University of Basrah, College of Science, Department of Biology, 61004, Iraq,
Email: hyashaker@gmail.com
[2]Marine Science Centre, University of Basrah ,61004 , Iraq, Mariam.hameed2005@yahoo.com
[3*]University of Basrah, College of Science, Department of Biology, 61004, Iraq,
Email: ahmed.burghal@uobasrah.edu.iq

***Corresponding Author**
*University of Basrah, College of Science, Department of Biology, 61004, Iraq,
Email: ahmed.burghal@uobasrah.edu.iq