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INVESTIGATING THE EFFICIENCY OF BIOLOGICAL TREATMENT PROCESS OF OIL POLLUTANTS USING SCENEDESMUS OBLIQUUS ALGAE: A CASE STUDY

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Abstract

Today, the expansion of oil field-associated industrial activities has led to the emergence of certain hazardous pollutions in the environment, particularly in aquatic ecosystems. To tackle this critical challenge, we conducted the present study to investigate the process of eliminating oil compounds and growing algae through various experiments in an artificial environment of petroleum sewage. In this regard, we employed cultivating *Scenedesmus obliqus* algae. In the current study, the highest growth rate of algae was reported to be significant in S2 treatment ($P < 0.01$). Moreover, the percentage of removal of all light petroleum hydrocarbons in S1 treatment was 100% on day 14 of cultivation ($P < 0.01$). Compared to light hydrocarbon compounds, eight heavy combinations with 99.33% in the concentration of 0.5 g / 100 ml, 87.66% in the initial concentration of 1.5 g/100 ml, and 77.66% at the initial concentration of 2.5 g / 100 ml of crude oil were eliminated with *S. obliquus* algae ($P < 0.05$). Ultimately, the experimental results revealed that in terms of the potential for nutrient removal, the cultivation of *S. obliquus* algae in wastewater, hydrocarbon compounds, water quality, and biomass production could be distinguished as some acceptable options to exploit in the biological treatment of contaminated aquatic environments.

Keywords: algae, biological purification, nutrient removal, oil wastewater, *Scenedesmus obliqus* algae

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