



BIOSORPTION OF OIL IN ARTIFICIAL WASTEWATER USING PORTUNUS PELAGICUS (BLUE CRAB) SHELLS

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ABSTRACT

This study aimed to explore the potential of *Portunus pelagicus* (blue crab) shells as a sustainable biosorbent for the removal of oil from artificial wastewater. The research was conducted at the Biology Laboratory of MHAM College. Chitosan was obtained through a series of chemical processes: demineralization, deproteinization, and deacetylation. Using a true experimental design with both control and treatment groups, artificial wastewater containing a 1:1 oil-to-water ratio was treated with varying dosages of chitosan (5g, 10g, 15g). Two biosorption techniques: mesh pouch and constant stirring, were applied. Gravimetric analysis was used to assess oil concentrations before and after treatment.

The findings revealed that the chitosan derived from *Portunus pelagicus* shells demonstrated an increasing biosorption capacity in artificial wastewater, as evidenced by a consistent rise in adsorption percentage with higher chitosan dosages. Specifically, the average oil adsorption was 19.24% at 5 grams, which increased to 46.23% at 10 grams and peaked at 58.09% at 15 grams. This upward trend confirms that the biosorption efficiency of *Portunus pelagicus*-based chitosan improves proportionally with dosage. These findings

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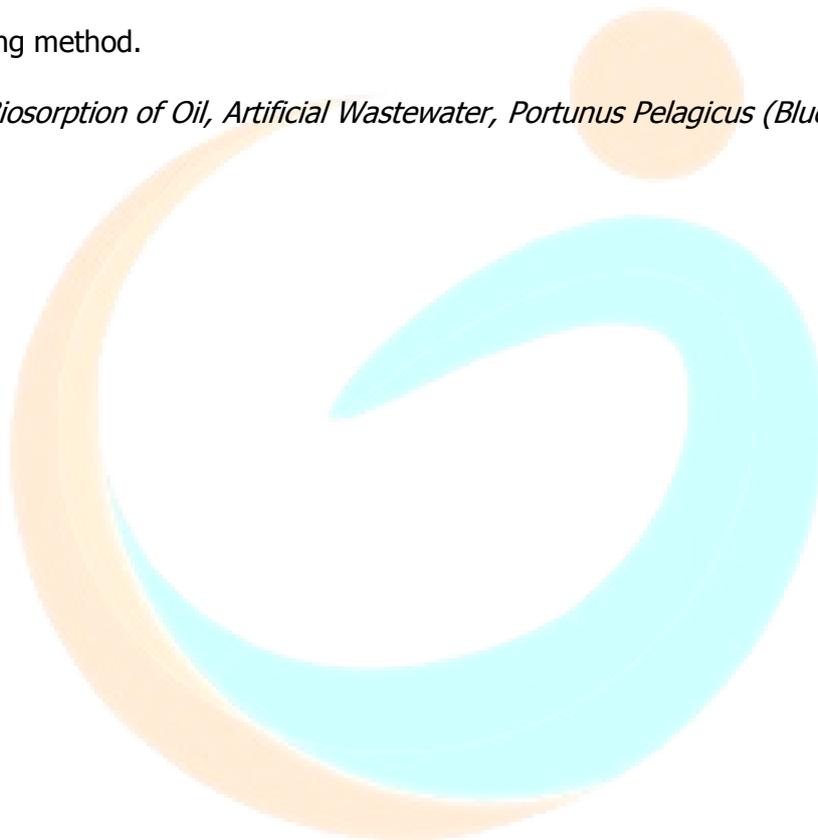
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support the hypothesis that increasing the amount of chitosan positively influences its capacity to remove oil from artificial wastewater.

In conclusion, the study found that chitosan derived from *Portunus pelagicus* shells demonstrates strong potential as a biosorbent for removing oil from artificial wastewater. Its biosorption efficiency increased with higher dosages and was further enhanced by the constant stirring method.

Keywords: *Biosorption of Oil, Artificial Wastewater, Portunus Pelagicus (Blue Crab) Shells*



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