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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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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*