Biochemical Characterization of some Marine Biomaterials: Unlocking the Potential of Shrimp Shells, and Fish Scales for Sustainable Applications

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ABSTRACT

One of the main issues the Sea food sector is dealing with is the disposal of bio waste. Although fish scales, prawn shells, and crab shells have obvious potential and a thorough biochemical investigation of these biomaterials is necessary to fully utilize their potential. The purpose of this study was to examine the biochemical of shrimp shell and fish scale waste in relation to the amount of chitin that can recovered from these bio wastes for various byproducts.

Keywords: Sea Food, Shrimp Shell, Fish Scale, Byproducts

INTRODUCTION

Crustacean shell waste disposal is one of the biggest problems facing the food industry. According to Knorr (1991), the yearly production of crustacean shell waste from harvest that occurs globally is estimated to be 1.44 million metric tons. A small portion of the trash is composted or used as feed (Chakravarty et al., 2018). While there is clear potential for fish scales, prawn shells, and crab shells, a comprehensive biochemical analysis of these biomaterials is required to fully realize their potential. Together with chitin, the two primary constituents of crustacean shells are minerals, primarily calcium carbonate, and proteins. Approximately 90% of the shell's dry weight is made up of these three closely related components (Anh et al., 2011).

OBJECTIVE

This study was design to analyze the biochemical composition of fish scale and shrimp shell waste with reference to amount of chitin extracted from various byproducts of these bio waste.

MATERIALS AND METHODS

The waste materials were collected from the Karachi fish harbour and following techniques were used to estimate the major biochemical components namely proteins, carbohydrates, and lipids: The Bradford Method (Bradford, 1976) was used to analyze proteins; Dubuis, (1956)'s approach was used to calculate carbohydrates; and Folch et al., (1957) protocol was used to estimate lipids.

RESULT

Proximate composition analysis revealed interesting insights into the constitutional content of Fish scale and Shrimp shells. Protein content exhibited notable variation across the size variability of shrimp shells Carbohydrate content also fluctuated and the percentage of lipid content showed significant differences in between fish scales and Shrimp shells, with the highest lipid content observed in scales. The chitin material was also extracted from these two bio waste materials.

CONCLUSION

This work provides the complete biochemical analysis to better understand the composition of these two marine biomaterials: fish scales and prawn shells. It also considers how these materials might be used to make sustainable biomaterials. As part of this research effort, important constituents like chitin, proteins, minerals, and lipids are isolated and measured with the aim of making noteworthy contributions to the field of sustainable biomaterials.

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