THE OPTIMIZE CONDITION EXTRACTION AND CHARACTERISTIC OF CHITOSAN FROM *LITOPENAEUS VANNAMEI* SHELL WASTE

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ABSTRACT

This research aims to study the optimize condition extracted of chitosan from *Litopenaeus vannamei* shell waste and characterize the chitosan quality of *Litopenaeus vannamei* shell waste. Chitosan extract from *Litopenaeus Vannamei* shell waste was carried out using NaOH and HCl solutions were used for deproteination demineralization and deacetylation. The results show that parameters of yield, solubility, viscosity, fat binding capacity, %DD, color, moisture, protein and ash. The best results in this study were obtain from the best condition extraction of chitosan using by 60% NaOH but the highest yield from the condition extraction of chitosan using by 45% NaOH.

INTRODUCTION

Litopenaeus Vannamei is a popular shrimp for cooking and frozen food by eliminating the head and bark. Cause of waste from shrimp shells increased.The residue of shrimp shells extracted into chitin. Chitin is a polysaccharide carbohydrate found in shrimp shells, crabs, insects and cell walls of microorganisms such as fungus (Merk Index, 1996). The general structure of chitin can not be dissolved so has been modified is chitosan. Chitosan is a derivative of chitin that can dissolve in acids and alkalis (Hayes et al., 1977). This research was conducted to determine the concentration of sodium hydroxide using chitosan extract and to the benefits with your body

METHODS

Shrimp shells Crushed with blender

Heat in hot air oven at 60°C in 1 hour

DEPROTEINATION

Soaked in 5% NaOH

Water bath 80°C in 1 hour

Heat in hot air oven 60°C in 2 hours

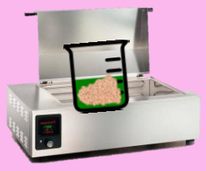
Samples removed protein

Chitin

Samples removed protein

DEMINERALIZATION

Soaked in 1% HCl



Water bath 80°C in 1 hour

Chitosan

Chitin

DEACETYLATION

Soaked in 45% 50% and 60% NaOH

Water bath 80°C in 1 hour

Washed and filtrated with suction until neutral pH

RESULTS & DISCUSSION

Table 1. Showed Yield , %DD, Solubility of commercial chitosan and chitosan was extracted.

Sample of Chitosan	Yield (g)	%DD	Solubility (%)
Commercial Chitosan	≥200	≥ 60	≥70
Chitosan 45% NaOH	145.24	70.5	35.22
Chitosan 50% NaOH	141.00	72.3	51.46
Chitosan 60% NaOH	138.93	75.8	59.65

Analysis of Chemical

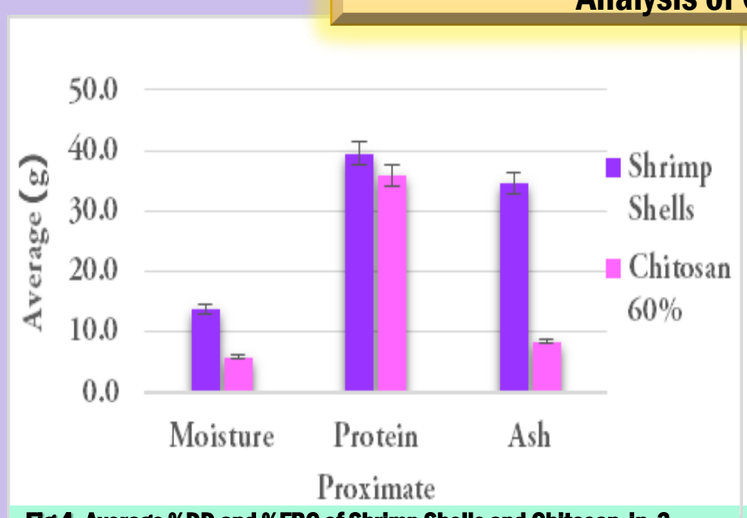


Fig 4. Average %DD and %FBC of Shrimp Shells and Chitosan In 3 conditions

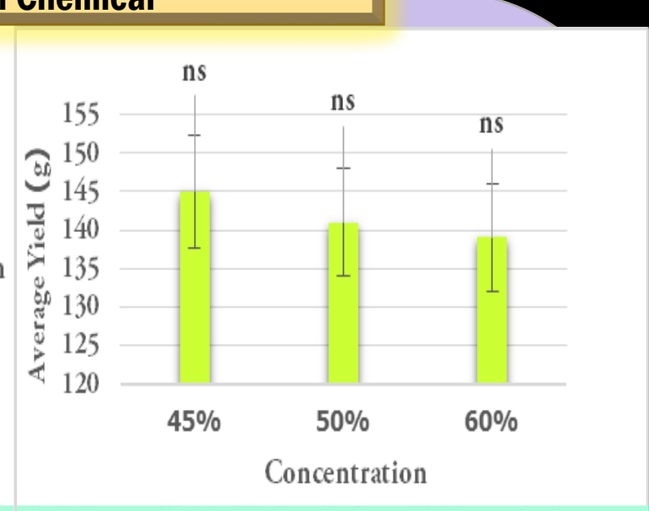


Fig 5. Average Yield of Shrimp Shells and Chitosan In 3 conditions

Analysis of Physical

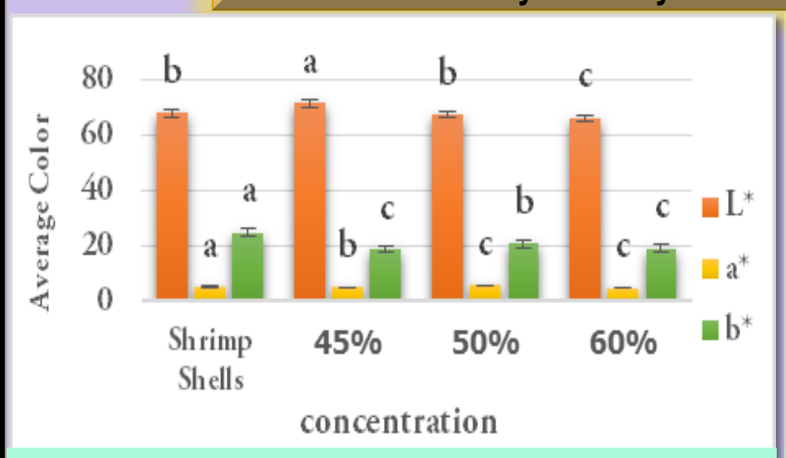


Fig 1. Average color of Shrimp Shells and Chitosan In 3 conditions

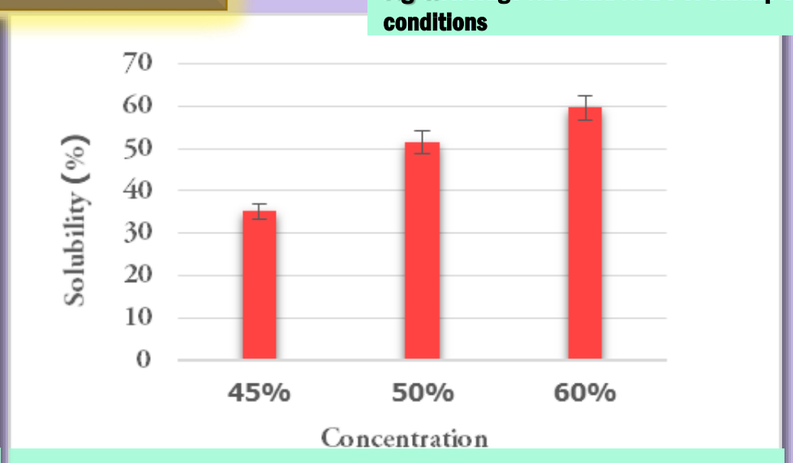


Fig 2. Solubility of Shrimp Shells and Chitosan In 3 conditions

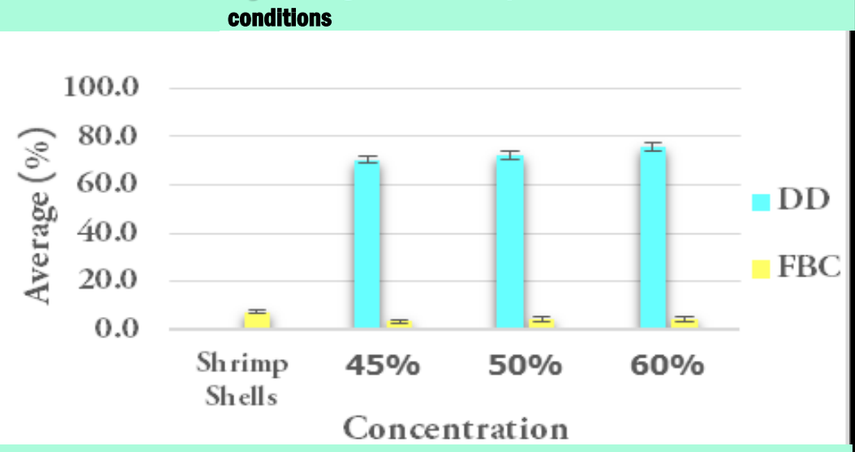


Fig 3. Average Proximate of Shrimp Shells and Chitosan In 60% NaOH

- Chitosan in concentration of 60% NaOH have high %DD . As a effect , increased solubility and other high values follow , because it is pure and good quality.
- The results do not show the viscosity because It can not be measured in concentrations of 45% and 50% NaOH, Because the particles are not soluble in acetic acid , but Chitosan in a concentration of 60% NaOH measured due to it can be soluble in acetic acid.

CONCLUSIONS

The best condition extraction of chitosan using by 60% NaOH in deacetylation step. It applied with body human. but highest yield from the condition extraction of chitosan using by 45% NaOH. It was low quality.

REFFERENCES

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