

NOVEL METHOD FOR THE EXTRACTION OF CHITIN FROM MARINE SOURCES AS A POTENTIAL FUNCTIONAL FOOD INGREDIENT

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Chitin is a component of the outward cover of arthropods and crustaceans. The yearly production of chitin from marine sources is estimated to be 10^{11} tons (1). The existence of very reactive hydroxyl and amino groups in this polysaccharide offer a potential wide range of chitin derivatives. The current study examines the use of organic acids as an alternative to hydrochloric acid, which is the most common agent used in the demineralization of commercial chitin.

A preliminary screening was carried out using five different acids: hydrochloric, phosphoric, acetic, citric and lactic acid. The highest yield was obtained using citric and lactic acid. Optimization of extraction was investigated using acid concentration, temperature and time with selected acids. These factors; acid concentration (0.5-2M), time (2- 7h) and temperature (24-37°C), were used as independent variables. The second step in extraction which is deproteinization and this was carried out using either *Bacillus licheniformis* or pure protease (Sigma) as an environmentally friendly substitute for sodium hydroxide used in the commercial extraction.

Response surface methodology with central composite point (CCP) was applied to develop a model equation for the demineralization (Figure 1). Through this study it has been found that the efficiency of using organic acids (lactic or citric) for demineralisation and *Bacillus licheniformis* for deproteinisation of chitin from brown crabs was comparable to hydrochloric acid and sodium hydroxide, respectively. Furthermore it was found that treatment with 2M of citric acid for 2h at 24°C and 2.5M

for 4.5h at 30.5°C gave comparable results to commercial chitin.

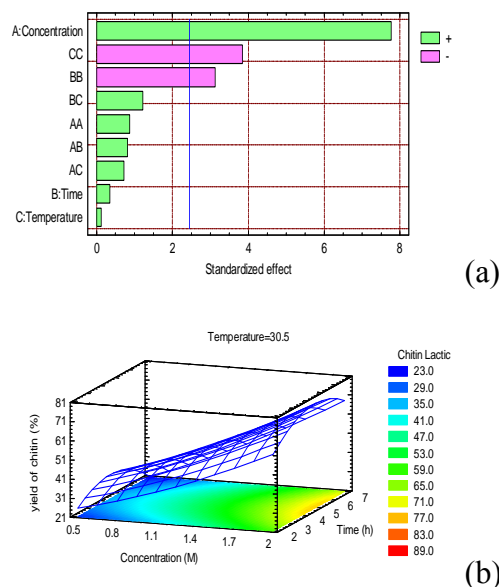


Fig.1: Standardized pareto chart (a) and response surface of chitin yield (b) using lactic acid for extraction.

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