

ABSTRACT

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DETERMINATION OF OPTIMUM CONDITIONS FOR PRODUCTION OF GLUCOSAMINE FROM SHRIMP SHELLS BY SOLID-STATE FERMENTATION USING *Trichoderma virens*

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Chitin is a biodegradable polysaccharide found naturally in shrimp shells and can be derived into glucosamine, which has a wide range of use, especially in the therapeutic field to treat joint damage. N-acetylglucosamine (NAG), one of the forms of glucosamine, can be produced by fermentation of chitin using chitinolytic microorganisms, such as mold or bacteria. Chitinase production by *Trichoderma virens* has been studied however the NAG production has not been directly evaluated. This research was conducted to determine the optimum conditions (temperature, pH, and fermentation time) for NAG production by solid-state fermentation of chitin from *Penaeus monodon* waste using *Trichoderma virens*. Shrimp shells were sun-dried, demineralized with HCl, and deproteinized with NaOH to produce isolated chitin. Determination of optimum temperature was first performed by solid-state fermentation of the isolated chitin at varying incubation temperatures of 25°C, 30°C, 35°C, with a controlled pH of media at 6 for 4 days. The second stage research used varying pH at 4.0, 5.0, 6.0 and 7.0, and different fermentation times for 4, 6 and 8 days. In the first stage research, the highest NAG concentration, around an average of $14,905.00 \pm 735.527$ mg/L, was produced at a temperature of 30°C. The highest NAG production in the second stage research was achieved from fermentation at pH 4.0 for 8 days, resulting in an average total NAG concentration of $23,413.33 \pm 201.039$ mg/ml.

Keyword: Glucosamine, *Trichoderma virens*, chitin, shrimp shells, solid-state fermentation

Reference: 72 (1999-2017)