

ABSTRACT

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OPTIMUM CONDITION FOR N-ACETYL-GLUCOSAMINE PRODUCTION FROM TIGER SHRIMP (*Penaeus monodon*) SHELL USING EXTRACELLULAR CRUDE CHITINASE ENZYME FROM *Mucor circinelloides*

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(xvii + 49 pages: 3 tables, 19 figures, and 13 appendices)

N-Acetyl-glucosamine can be derived from chitin in shrimp shell waste, and can be used in the treatment for osteoarthritis, knee pain and back pain. This research was conducted to determine the optimum condition (pH, temperature, substrate concentration and fermentation period) for N-acetyl-glucosamine production using extracellular crude chitinase enzyme from *Mucor circinelloides*. Optimum chitinase activity was determined by determining the optimum pH (3, 4, 5, 6, 7, 8 and 9) and optimum temperature was determined by varying from 30, 40, 50, 60, 70 and 80°C at optimum pH. The second stage were done by varying the substrate concentration (0.5, 1, 1.5 and 2%) and fermentation period (2, 4, 6, 24h). Result showed the optimum pH was 8 with enzyme activity 4.38 ± 0.06 U/mL, for optimum temperature was 50°C with enzyme activity 5.42 ± 0.06 U/mL. The fermentation condition was optimum with 1.5% of substrate concentration and 2 hours of fermentation. The concentration of N-acetyl-glucosamine produced from the fermentation was $2,195.83 \pm 15.14$ ppm.

Keywords: Chitin, chitinase enzyme, *Mucor circinelloides*, N-acetyl-glucosamine, tiger shrimp shell.

References: 55 (1996-2018)