Degradation of chitin by indigenous Aeromonas hydrophila DYU-Too18

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ABSTRACT

The aim of this study was to investigate the effects of carbon and nitrogen sources on the reducing sugars, chitinase activity, and N-acetylchitooligosaccharides produced by the microbe-Aeromonas hydrophila DYU-Too18, a new species isolated to produce chitinase. The production of reducing sugars in a β-chitin medium was higher than that in an α-chitin medium. In addition, N-acetylchitotriose was produced by the microbe in a β-chitin medium. The highest production of reducing sugars, 1.42 g/L, was obtained when the medium contained 5% β-chitin. Using a mixture of yeast extract and peptone as the nitrogen source, the production of N-acetylchitotetraose was higher than those by using other nitrogen sources. When the concentration of yeast extract and peptone was 0.4 g/L, N-acetylchitotriose was the major product and reached 1.17 g/L. The crude enzyme, obtained from a culture of Aeromonas hydrophila DYU-Too18 in a medium of 5% α-chitin, and 0.4 g/L of yeast extract and peptone for 120 h, was purified and characterized. The purification procedure included precipitation by ammonium sulfate, dialysis, anion exchange chromatograph (DEAE-Sepharose CL-6B) and gel chromatograph (Sephacryl S-100). The specific activity of the purified chitinase was 3.66 U/mg, and the purified fold was 1.21. The optimal temperature for the chitinase was 40 ℃ and the optimal pH was 5.0. Metal ions such as Fe2+, Hg2+ and Zn2+ could inhibit the chitinase activity, especially Hg2+.

Keywords : Aeromonas hydrophila DYU-Too18、N-acetylchitotriose、purification、chitinase

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