Optimal Cultivation of Aeromonas veronii DYU-Too19 in Chitin Degradation

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ABSTRACT

Chitin, a polymeric carbohydrates, is widely distributed, and abundant just next to cellulose. When chitin is dedraded into N-acetyl-chitooligosaccharides that could have applications in the functional food and environmental protection. N-acetyl-chitooligosaccharides can be obtained by the chitinase method that is more favorable over the alkaline treatment. In this study, a strain, Aeromonas veronii DYU-Too 19, was isolated from Dacun Village in Changhua County. The aim of this study was to investigate an optimal condition for the production of reducing sugars by this strain. The effects of carbon and nitrogen sources on the production of reducing sugars, chitinase activity, and pH valus were first examined. The one-factor-at-a-time method was first used to investigate the effects of carbon and nitrogen sources on the production of reducing sugars. When β-chitin was the sole carbon source, higher amounts of reducing sugars were produced. Especially a highest production of reducing sugars (15.4 g/L) was obtained in a medium containing 4% β-chitin; Peptone seemed to be a better nitrogen source to produce reducing sugars, and 12.5 g/L of reducing sugars were obtained in a medium containing 0.5 g/L peptone. In addition, the response surface methodology was used to search for an optimal condition for culturing A. veronii DYU-Too 19. From the analysis of variance, both of the β-chitin and peptone concentrations were significant for the strain to produce reducing sugars ($p < 0.05$) and the optimal concentrations of β-chitin and peptone were 4.42% and 0.55 g/L, respectively. The predicted maximal production of reducing sugars was 20.52 g/L. In addition, comparison between the actual observation (20.24 g/L) at the optimal condition and the predicted response showed a close agreement. This indicates that the response surface model could well predict the reducing sugars production of A. veronii DYU-Too 19.

Keywords : Aeromonas veronii DYU-Too 19、Chitinase, Reducing sugars、Response surface methodology、Optimum condition

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