STUDIES ON IMMOBILIZATION TECHNIQUES FOR DEXTRANASE ENZYME AND ITS APPLICATION IN FOOD INDUSTRY

By

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دراسات على طرق تحميل إنزيم الدكسترانيز وتطبيقاته فى التصنيع الغذائى

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2012

5. SUMMARY

The presence of *Leuconostoc mesenteroides* and *Leuconostoc* species in sugarcane juice in sugar factories causes loss of sucrose and formation of dextran (polysaccharide) which interferes in sugar manufacturing process in addition to the loss of sucrose. The problems caused, the loss of sucrose, increase in viscosity of process syrups, and poor recovery of sucrose due to inhibition of crystallization.

Many microorganisms produced dextranase such as yeast, bacterial, and fungal strains which are capable to remove the dextran. The present study was carried out to evaluate the production, extraction and purification of dextranase from some microbial strains and studying the characteristics of chosen enzyme. The immobilization techniques by different supports, the stability and characterization of the immobilized dextranase and its application in sugarcane along with its economic costs were also studied.

The obtained results are summarized as:

1. Microbial Production of Dextranase:

1. Six microbial strains *Penicillium funiculosum NRRL-6014*; *Penicillium aculeatum* NRRL-896; *Bacillus subtilis* M-15; *Leconostoc dextranicus* B-512 FM; *Saccharomyces cerevisiae* YSF-5 and *Lipomyces starky* ATCC-12659 were used to produce dextranase (α-I,6-glucan 6-glucano-hydrolase, EC 3.2.1.11) on basal medium contained dextran. The dextranase produced from fungal strain (*P. aculeatum*) showed the highest activity after 7 days incubation period (101250.00 units/100ml) compared to the other fungal strain (*P. funiculosum* NRRL-6014) or the five microbial strains i.e. *Bacillus subtilis* M-15; *Leconostoc dextranicus* B-512 FM; *Saccharomyces cerevisiae* YSF-5 and *Lipomyces starky* ATCC-12659 being 2985.03, 27591.49, 1078.18 and 744.61 units/100 ml, after 10, 7, 4 and 10 days, respectively.

Approval Sheet

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