
Use of Operacional Cycles and Different Substrates in the Production of Succinoglycan by Agrobacterium Radiobacter Nbrc 12665 Cells Free and Immobilized in Loofa Sponge

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Resumo

Succinoglycan is a soluble exopolysaccharide synthesized by bacteria, composed of glucose monomers, galactose and succinic acid, connected by β -linkages. It is a thickening agent with broad potential application in the food, pharmaceutical and chemical industries. The objective of this research was to evaluate the production operational cycles of succinoglycan obtained from Agrobacterium radiobacter NBRC 12665 free and immobilized in loofa sponge (*Luffa cylindrica*), using the substrates lactose and sugar cane molasses. To produce succinoglycan, the microorganism was inoculated onto pre inoculum (g/L): sucrose (20), yeast extract (5) and peptone (5). After 72 h incubation, cells were transferred to production medium in erlenmeyer flasks containing 100 ml of medium varying the carbon source (g/L): lactose or sugar cane molasses (7.5) KH_2PO_4 (1), MgSO_4 (0.25), $(\text{NH}_4)_2\text{HPO}_4$ (1), trace elements solution (10 mL), pH 7.0. The solution of trace elements in 100 mL of 0.1N HCl contained: $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (0.5 g), $\text{MnSO}_4 \cdot \text{H}_2\text{O}$ (0.2), ZnCl_2 (0.1), $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ (0.1). The incubation in the production medium occurred for 8 days at 30 °C and 180 rpm. The operational cycles were evaluated based on 8-day cycles. At the end of each cycle, the free cells and loofa sponge containing immobilized cells were transferred to a new production medium. The

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succinoglycan production by free and immobilized cells using lactose were 7.0 g/L and 9.3 g/L, and using sugar cane molasses were 12.0 g/L and 14.0 g/L, respectively. In conducting of operational cycles using immobilized cells and substrate lactose occurred only 23% reduction in production succinoglycan the first to the last cycle, and free cells was reduced by 50%. When the sugar cane molasses and immobilized cells were used, there was a reduction in the production of succinoglycan 41% of the first cycle to the last. With this substrate was achieved higher production of succinoglycan in the last cycle (8.3 g/L). This study showed that the immobilization on loofa sponge is promising for succinoglycan, and can be made from the operational cycles of 8 days. The use of agro-industrial waste, as sugar cane molasses, can be used as a carbon source low cost.

Palavras-Chave: Agrobacterium radiobacter, succinoglycan, immobilization, loofa sponge, operational cycles

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