

Production of β -fructofuranosidase by Fungus *Aspergillus niveus* under Solid-state Fermentation, Purification and Biochemical Characterization

Fernandes, M.L.P.¹; Alves, B.T.²; Jorge, J.A.³; Guimarães, L.H.S.⁴

¹Institute of Chemistry of Araraquara - UNESP

²Faculty of Philosophy, Sciences and Letters of Ribeirão Preto - USP

Introduction: β -D-fructofuranosidases (EC 3.2.1.26) are enzymes able to hydrolyze the β 1-2 bond of the sucrose molecule to produce an equimolar mixture of glucose and fructose known as invert sugar. In addition, some fructofuranosidases can be used to produce fructooligosaccharides (FOS). Then, these enzymes are applied in the food and beverage industries.

Objective: The goal was, investigate the production of fructofuranosidase by *Aspergillus niveus* under solid fermentation using cassava's peel as substrate, purifying and characterizing the extracellular enzyme. **Material and Methods:**

The microorganism was grown under SSF using cassava's peel with different mesh (10, 20, 25 and 30) humidified by tap water or different salt solutions, for 24-432h, at 30°C. After cultivation, the aqueous crude extract was loaded in DEAE-Cellulose chromatographic column followed by Sepharose CL-6B chromatographic column. The enzyme activity was determined according to Miller (1959) using DNS. One unit of enzyme activity was defined as de amount of enzyme necessary to produce 1 μ mol of glucose per minute at the assay conditions. The purified fraction was used for determination of optimum apparent pH and temperature of activity. Influence of different compounds on enzyme activity was also determined. **Results and Discussion:** The highest production (2.19 U/g substrate) of fructofuranosidase was obtained when the fungus was grown in 10 mesh cassava's peel using tap water as moisture agent at 1:1 (w/v) for 120 h. After the use of two chromatographic steps, the enzyme was purified 4.16-folds with recovery index of 5.49%. The enzyme showed optimal activity at pH 2.0 and 60°C. The fructofuranosidase activity was increased by Mn^{2+} (+59%) and it was not affected significantly by β -mercaptoethanol. **Conclusions:** The production of *A. niveus* fructofuranosidase can be conducted using a low-cost substrate and the enzyme presented acidic pH and high temperature of activity, interesting properties for its biotechnological application.

Keywords: β -D-fructofuranosidase, *Aspergillus niveus*, Solid-State Fermentation

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