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019- SCREENING AND SELECTION OF VARIABLES FOR OPTIMAL OBTAINING OF ENZYME INVERTASE FROM *Aspergillus niger* AND ANALYSIS OF ENZYMATIC ACTIVITY USING THE 3,5-DINITROSALYCIC ACID METHOD

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The enzyme Invertase, also known as β-D-Fructofuranosidase catalyzes the hydrolysis of sucrose producing a mixture of its two monomers glucose and fructose called invert sugar. This product, sweeter than sucrose, is mainly used in the food and pharmaceutical industry. It can be obtained using a chemical or enzymatic method, the enzymatic is much more efficient because undesirable products are not obtained. Invertase is produced by a wide variety of organisms that can use sucrose as a carbon source. It can be found in invertebrates, vertebrates, green algae, bacteria, vegetables and fungi. The genus *Aspergillus* has been shown to be a good producer of this enzyme. The aim of this work is to obtain the enzyme invertase at laboratory scale from the fungus *Aspergillus niger* and study the influence of experimental parameters that affect the production and purification process of this enzyme. We worked with *A. niger*, analyzed the enzymatic activity of invertase using 3,5-dinitrosalicylic acid. To determine the concentration of Invertase in the samples, a glucose calibration curve was performed and absorbance's of the samples were measured at 540nm. A high glucose concentration is indicative of high enzyme activity. A screening of different variables such as culture medium, time, pH and temperature was performed. A higher biomass was obtained working with Sabouraud dextrose liquid medium (SDLM) supplemented with sucrose (SDLM) than Sabouraud dextrose liquid medium (SDL) or Potato dextrose liquid medium (PDL) in all of the cases. The highest values of glucose concentration were 65.22 and 64.51 g/l corresponding to biomass obtained in SDLM supplemented with sucrose 20 g/l and 30 g/l respectively, and then suspending it in a 10 g/l sucrose solution before obtaining the enzymatic extract. The fungus was suspended in sucrose solution 10 g/l in order to increase the production of more enzyme Invertase in the presence of more substrate. These values were obtained working at pH 5, at a temperature of 28 °C.

020- BIOAUGMENTATION OF BIOMIXTURES WITH ACTINOBACTERIA FOR ATRAZINE REMOVAL: OPTIMIZATION OF INOCULUM CONCENTRATION

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Biopurification systems (BPS) or biobeds are bioprophylaxis systems to prevent pesticide point-source contamination, whose efficiency relies mainly on the pesticide removal capacity of the biomixture, the majority component of a BPS. The microbial metabolic abilities of the biomixture could be improved through bioaugmentation with microorganisms with specific degrading capacities, like actinobacteria. In this sense, *Streptomyces* sp. M7 is a previously selected actinobacterium with well-known pesticide-degrading abilities. The aim of this work was to optimize the concentration of *Streptomyces* sp. M7 (M7) inoculated in organic biomixtures for atrazine (ATZ) removal. For this purpose, the biomixtures B1 and B2 were formulated with soil, peat, and sugarcane bagasse and filter cake, respectively, inoculated with three concentrations of M7 (2, 4, and 8 g kg^{-1}), and contaminated with atrazine (50 mg kg^{-1}). The residual concentration of ATZ and different microbial groups were determined along a 28 d-assay. In general terms, at the end of the assay, an increasing trend was shown in the microbial developments of the different groups studied in both contaminated and bioaugmented biomixtures for the three concentrations of inoculum used. In B1, the microbial counts were significantly higher with 8 g kg^{-1} inoculum, with respect to lower inoculum concentrations: total heterotrophic microorganisms, total bacteria, fungi, and actinobacteria reached counts of 3.2 x 10^7; 2.7 x 10^7; 1.7 x 10^5, and 1.5 x 10^7 CFU g^{-1}, respectively. In B2, total heterotrophs, total bacteria, and actinobacteria were significantly higher for the 4 g kg^{-1} inoculum concentration, reaching 7.9 x 10^7; 1.1 x 10^8, and 5.9 x 10^7 CFU g^{-1}, respectively; fungal counts did not show significant differences. ATZ removal showed no significant differences in B1 and B2 between the three concentrations of M7 inoculum evaluated. The concentration of 2 g kg^{-1} of M7 was selected for further studies considering lower costs and optimum removal efficiency.