OPTIMIZATION OF THE PRODUCTION OF AN EXTRACELLULAR *CRYPTOCOCCUS FLAVUS* α-AMYLASE USING RESPONSE SURFACE METHODOLOGY

Trindade, MJF[1] , Nogueira, LM[1] , Gonçalves, AAM[1], Godoi, RR[1] , Ribeiro, PAF[1], Dias, DS[1] , Oliveira, LF[2], Gonçalves, DB[3] , Galdino AS[1]

[1]Microbial Biotechnology Laboratory, Divinopolis, Universidade Federal de São João Del Rei, Minas Gerais, Brazil.
[2]Engineering Laboratory Processes and Technology, Divinopolis, Universidade Federal de São João Del Rei, Minas Gerais, Brazil.
[3]Biotechnological Processes and Macromolecules Purification Laboratory, Universidade Federal de São João del Rei, Minas Gerais, Brazil.

INTRODUCTION: The α-amylase (EC3.2.1.1), a major starch processing enzyme, has great biotechnological importance and wide field of industrial applications, such as: starch liquefaction for obtaining high glucose syrups, breweries, paper industry, textile, and others. However, the high costs involved in production of this enzyme is an obstacle to their effective use as biocatalysts. **OBJECTIVE:** The main goal of this work was to optimize the production of *Cryptococcus flavus* alpha amylase Using the Response Surface Methodology. **MATERIAL AND METHODS:** Response Surface Methodology has studied the effects of starch concentration, peptone, yeast extract and ammonium sulphate $(NH_4)_2SO_4$ on the enzyme activity. The central composite design (DCCR) determinated the optimal concentrations of starch and $(NH_4)_2SO_4$ for which obtains higher amylolytic activity. The extracellularprotein expression profile was evaluated by SDS PAGE analysis and zymogram assay. **RESULTS AND DISCUSSION** The highest enzymatic activity (18.201 U / ml) was obtained after 120 h of culture. Within the conditions evaluated in this study, 26.601 (g / L) $(NH_4)_2SO_4$ and 39.174 (g / L) starch, were predicted by the model as great concentrations in which maximizes amylolytic activity. amylase activity was detected as a clear band in dark background in presence of starch iodine with an approximate molecular weight of 62 kDa. **CONCLUSION:** Taken together, the results suggests the great potential for industrial application of α-amylase from *C. flavus*, since it is possible to produce in cheap culture medium . We thanks the Universidade Federal de São João Del Rei – Campus Centro Oeste, Divinópolis, MG for providing all the material, equipment and facilities to carry out the project.

Keywords: α-amylase, *Cryptococcus flavus*, Response Surface Methodology.