Title: A rapid screening of significative variables in the production of proteases and amylases by submerged fermentation of *Geomyces pannorum* S2B

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Abstract:
Inductive enzymes synthesis can be modulated by inductor presence that is commonly derived from substrate. The demand in industrial processes has stimulated biocatalysts production thereby several strategies are used to reduce process costs, as statistical modeling tools and reducing the use of synthetic media. Proteases and amylases belong to a group of hydrolase-like enzymes which catalysis hydrolysis reactions of covalent bonds. This work aimed to study the modeling and interaction of parameters on synergistic production of proteases and amylases by fermentation of agro-industrial waste, by *Geomyces pannorum* S2B isolated in the Antarctic continent. It was employed an experimental design Plackett-Burman using 11 independent variables, being enzymatic activity the dependent variable adopted. Statistical analysis was performed using the program Statistica 8.0. The fermentative process was run for 96h at 120 rpm in orbital shaker. Crude enzymatic extract was submitted to analytical determinations using its specific substrates: azocasein (proteases) and corn starch (amylases). Total protein determination was tested with bicioninic acid using serum bovine albumin as standard. Wheat bran, tryptone and NaCl was the variables statistically significative ($p < 0.05$) with negative effects on proteases production, while yeast and Cl_2Ca had positive effects on protease production, showing enzymatic variation of 0 to 53.25 U mL^{-1} and the model adjustment was measured by the coefficient of determination (R^2) which had a value of *0.999*. However, the evaluation of parameters interaction on amylases secretion did not show significance, even with the production of that enzyme. The model adjustment was measured by the coefficient of determination (R^2) which had a value of *0.945*. In summary, the employing of experimental designs on production of biocatalysts by microbial fermentation has economically attractive features to the industry sector. Thus, *G. pannorum* S2B was shown as a promising tool on proteases and amylases secretion; hydrolytic enzymes with several applications on food, pharmaceutical and detergent industry.

Key-words: statistical modeling, hydrolases, filamentous fungus