

TITLE: PHYSICOCHEMICAL CHARACTERIZATION OF AMYLASE PRODUCED BY *Pleurotus pulmonarius*

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ABSTRACT:

Amylases are enzymes that catalyze the hydrolysis of the starch, this molecule is the main carbohydrate reserve source of plants. Due to their advantages, such as shorter production time, microbial amylases draw the attention of the enzyme market. These enzymes have great biotechnological potential in different industrial processes. Amylases are used in the production of syrups, sweeteners, flour, breweries, silage and food, animal feed, ethanol, pharmaceuticals, detergents, paper and textile industries. Thus, due to the wide field of application, the search for amylase enzymes with stable physicochemical characteristics is required. Therefore, the objective of the present work was to analyze the physicochemical characteristics of the amylase enzymes from *Pleurotus pulmonarius* obtained from the solid state fermentation using cocoa wastes. After analyse the interaction of pH and temperature using the artificial neural network (ANN) with pH 3 to 11 and temperatures from 20 °C to 80 °C, enzyme activity was quantified through the release of reducing sugars by the DNS method and it was observed that the optimum temperature and pH of the enzyme were 20 °C and pH 9, respectively, showing an activity of 120.17 U/gds. Analyzes of the effects of different ion salts and chemical reagents on enzyme activity were also performed at concentrations of 1mM and 5mM (Ca²⁺, Co²⁺, Mn²⁺, Mg²⁺, Zn²⁺, Na²⁺, Cu²⁺, Li²⁺, Ni²⁺, Al²⁺, EDTA, β-mercaptoethanol and sodium duodecyl sulfate(SDS)). The results obtained showed that amylase is stable in the presence of most ions and reagents tested, being positively influenced by Co²⁺, Ni²⁺, Li²⁺ and Zn²⁺, showing an increase of 30, 25, 18 and 15%, respectively at 1mM of the ions and negatively influenced by the presence of the reagents SDS (20%), EDTA (20%) and Na²⁺ ions (37%), at a concentration of 5mM. Therefore, the results show that the amylase produced by *P. pulmonarius* have optimal activity at lower temperatures, alkaline pH and are little influenced by reagents present in the medium, presenting a good potential for biotechnological application, especially in detergents industries.

Keywords: agro-industrial wastes, amylase, *Pleurotus pulmonarius*.

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