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Projections for the production of enzymes of industrial interest by *Humphreya coffeata*

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Mushrooms have been widely studied for their production of extracellular enzymes with lignin-degrading ability. Enzymes are biological catalysts of great importance at cellular level, but also, they are of great interest at industrial level since they are key for certain reactions to occur, as they increase the rate of reactions without changing the equilibrium. Typically, enzymes are produced during fermentation processes of microorganism. However, low efficiencies and high costs are usually associated with their production. Therefore, bioprospecting for new microorganism for the production of enzymes is an important topic of research. In particular, the basidiomycete *Humphreya coffeata*, a native white-rot fungus found in Colombia, has not been largely explored for its ability to produce biologically active metabolites. Given the natural growth conditions of this fungus, it is likely that lignin-degradative enzymes are produced, such as: pectinases, amylases, laccases and cellulases. With this project, we aim at exploring the ability of *H. coffeata* to produce these four lignin-degradative enzymes under submerged fermentation conditions. First, the effect on fungal biomass and enzymatic production were assessed using two different flasks geometries and four different growth media, according to literature reports. Fungal biomass production was measured by dry weight, while enzymatic activity was determined using specific protocols depending on the kind of enzyme that wanted to be evaluated. In general, the enzymatic extract of each medium was added to a substrate solution, depending on the evaluated enzyme and either change in viscosity or absorbance values were recorded. The results of these evaluations showed that the geometry of the flask did not affect enzymatic production. On the other hand, greater enzymatic activities were found for pectinases and cellulases than for amylases and laccases. In fact, for the latter enzyme, we have not been able to determine the enzymatic activity under submerged fermentation; even after evaluating the addition of different waste/by-products of food industry to the culture media. However, we found that when adding ABTS-like inductor under solid fermentation conditions, some degradation occurred, suggesting that laccases were produced.

Speaker Biography

L Carmona Saldarriaga has completed her under graduation in Process Engineering from Universidad EAFIT, Medellin, Colombia. Currently, she is pursuing her Master's Degree in Engineering and Bioprocesses at the same institution. She enjoys doing research and has worked on several projects at the University, such as: establishing the working conditions for the production of a biopolymer from *Auerobasidium pullulans.* She received an award at COLAEIQ Conference in 2016. Other projects she has worked on are mainly related to other areas such as: biotechnology, materials and chemical processes. Currently, she is an Assistant Researcher for the company Cementos Argos S.A.S, at the Alternative Materials Department.

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