Oxidoreductases Enzymes From Filamentous Fungi

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Introduction: Lignin is the major structural component of plants and the most abundant form of aromatic carbon in the biosphere. Its rigid structure is a limiting factor in the degradation of plant biomass. Oxidoreductases are a family of enzymes widely distributed in nature which catalyse the oxidation of a variety of substrates (mainly aromatic compounds and metals) reducing the oxygen molecule into water. In nature fungi express extracellular hydrolytic and oxidative enzymes that are needed to degrade all the wood polymers. The objective of this study was to select filamentous fungi multicooper oxidases and peroxidases producers, aiming enzyme purification and biotechnological applications. **Material and Methods:** Four strains of a total of 75 fungi were selected due their abiliy to decolorize ABTS, DMP, DMPPDA and Guaiacol. The strains were cultured at 30 °C, for 30 days in minimum media with sugarcane bagasse and enzyme activity to lignin peroxidase, Mn-peroxidase and laccase was measured spectrophotometrically in 310 nm, 465 nm, 420 nm, respectively, in reaction with substrate veratryl alcohol, guaiacol and ABTS respectively. **Results and Discussion:** Enzymatic activity was observed depending on color intensity of reaction product: green halo with ABTS oxidation, brown halo with guaiacol, pink halo for DMPPDA and yellow halo with DMP. *Aurantiopileus voucher*, *Phanerochaetes chrysosporum* and 2 strains that are still identified have showed MCO's activity against one or more substrates. Enzyme assays with lacase, mn-Peroxidase and lignin peroxidase in *Aurantiopileus voucher* have showed maximum activity of 14,4 U/L, 1,18 U/L and 10,75 U/L respectively. We are also studing the effect of cooper on enzyme production. Our results show an increase in Lacase activity by 33,17 U/L. **Conclusions:** filamentous fungi can be a good source of oxidoreductases. The media composition may affect the enzyme production levels. More research is needed about the gene expression and physiological regulation factors involved in the expression of these enzymes.

Key words: Lignin; Oxidases; Enzyme; Fungus.

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