TITLE: SIMULTANEOUS PRODUCTION OF LIGNINOLYTIC ENZYMES AND FUNGAL BIOMASS OF *Pleurotus sajor-caju* BY SUBMERGED FERMENTATION IN PULP WASH MEDIUM

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ABSTRACT:

The ligninolytic enzymes laccase (lac) and manganese peroxidase (MnP) are part of the white rot fungi basidiomycete enzymatic complex, particularly those of the genus *Pleurotus sp*., and stand out for their ability to degrade a diverse range of xenobiotics and recalcitrant organic pollutants. In addition, they are widely used in various industrial areas, such as in the food/waste, tannery, textile, cosmetics, pharmaceuticals and pesticides industries. The high efficiency of these enzymes is related to the nonspecific and oxidative system, in which they present high redox potential in the direct transformation of the pollutant compounds during the fermentation process. However, it is necessary to use alternative substrates in order to induce the production of these oxidoreductase enzymes. In this sense, the agroindustrial lignocellulosic by-products, specifically the pulp wash residue, appear as an excellent sustainable alternative to act directly in the processes that can maximize the enzymes production, just as minimize costs and generate fewer toxic residues. Thus, the purpose of this work was to evaluate the production of ligninolytic enzymes and mycelial biomass from the mycoremediation of the *Pleurotus sajor-caju* fungus, using the orange juice pulp wash from the food industry as the growth substrate. The experiments were conducted during 12 days of submerged fermentation (SmF) in an orbital shaker at 28 ^{o}C and 180 rpm. The fungi were grown in pulp wash medium with pH corrected to 5.5. The samples were analyzed by spectrophotometry for enzymatic activity and gravimetry for mycelial biomass. The production of ligninolytic enzymes was observed, and the highest lac activity was obtained on the 8th fermentation day (26.1170,72 UI/L) and between the 8th and 10th day for the MnP (ranging from 6.340-7.750 UI/L). Concomitantly, the mycelial biomass obtained high concentration (20.78 g/L) on the 12th day of growth. Therefore, it should be mentioned that, under favorable conditions, the orange pulp wash residue has been shown to be a potential source in the production of these ligninolytic enzymes, just as to increase the fungal biomass, once due to chemostatic induction by organic carbon sources provided by the residue, causes the hyphae branching and elongation and consequently the greater synthesis of these enzymes. Thus, the high activity of the enzymes presents potential for the biotechnological processes' development, besides allowing the treatment of high added value residue from easily available renewable inputs in Brazil.

KEYWORDS: Ligninolytic enzymes, Mycoremediation, *Pleurotus sajor-caju*, Pulp wash.

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