TITLE: LIGNINOLYTIC ENZYMES PRODUCTION BY *Pleurotus sajor-caju* CULTIVATED IN PULP WASH AND FIXED IN *Luffa cylindrica*.

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ABSTRACT: Ligninolytic extracellular enzymes, laccase and manganese peroxidase, have high redox potential and are of industrial interest. These enzymes are produced by basidiomycete fungi such as *Pleurotus sajor-caju*, and their prospective applications cover sectors such as biorefinery, textiles, energy, bioremediation, cosmetology and dermatology. Notwithstanding the foregoing, its opening power is important for alternative sources of carbon for fermentation and enzyme production. In this scenario, lignocellulosic agroindustry wastes, such as washed-out Pulp washing machines, have a promising alternative for Lac and MnP biosynthesis, and a feasible approach to reduce costs and improve production. Lignocellulosic byproducts such as *Luffa cylindrica* can also be used as support for immobilization of fungal cells, reducing abiotic and biotic stress, and inducing enzymatic production. In the present study, *Pleurotus sajor-caju* was cultivated in Pulp wash and immobilized in *L. cylindrica* to evaluate the induction of activities of Lac and MnP enzymes. Samples were collected daily and analyzed by spectrophotometry. An increase in Lac activity (40.038,5 $U.L^{-1}$) was recorded during trophophase on the 12^{th} day and in MnP (22.696,6 $U.L^{-1}$) on the 10^{th} day of immobilization, with a final biomass However, when cultivated in a free form, the activities of Lac and MnP were lower (38.339,6 $U.L^{-1}$ and 16.106,12 $U.L^{-1}$ respectively) however they obtained a higher biomass (30,55 $g.L^{-1}$). The results showed that the presence of the support for immobilization of the fungus contributed to the increase of enzymatic activity. This fact can be justified by the use of the support as a substrate accessible for fungal growth, due to the presence of lignin and cellulose, in addition to providing greater stability to the microorganism, as well as cell longevity, by reducing its exposure to external factors inducing late laccase synthesis.

Keywords: Ligninolytic fungi, laccase, manganese peroxidase, Bioremediation.

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