TITLE: DEGRADATION OF TEXTILES DYES BY *Phanerochaete chrysosporium* UNDER SUBMERGED SYSTEM

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ABSTRACT:

The textile industry segment can be considered as one of the most polluting industrial sectors in the world, generating a high volume of wastewaters which are often discarded without the proper treatment. Particular concern should be given to the dye released into the environment, not only by its evident colorful aspect, but also by its toxicity, complexity and difficulty of degradation. Bioremediation processes have been highlighted by their advantages as low cost, non-use of toxic agents and ease conduction. The use of lignin-degrading basidiomycete fungi, in turn, presents itself as a promising technique in industrial and environmental applications. Thus, this study aimed to evaluate the biodegradation potential of *Phanerochaete chrysosporium* to decolorize different textile dyes under submerged fermentation. Two dyes were tested individually in this process: Olive T Coll and Biomax Black RB, at the concentration of 50 ppm. The fungal strain was grown on culture plates pre-filled with Potato Dextrose Agar (PDA) and incubated at 28°C for 12 days. Following incubation, two mycelial agar plugs were cut and transferred to Erlenmeyer flasks (in triplicates) containing a liquid Potato Dextrose medium enriched with trace elements solution and the respective textile dye. Non-inoculated culture medium was used as control. The flasks were incubated in the dark at 28°C and 180 rpm for 10 days. Aliquots were removed at determined time intervals (3, 5, 7 and 10 days) and centrifuged. The supernatant was used to determine dye degradation by spectrophotometric analyses and it was expressed as relative percentage taking the non-inoculated control as 100%. Biomass was also determined at the end of the experiment as dry weight after drying the samples at 60°C for 48 hours. The results obtained for Olive T Coll were 13% after 3 days, 66% after 5 days, 72% after 7 days and 75% after 10 days. On the other hand, the results obtained for Biomax Black RB were 28% after 3 days, 66% after 5 days, 96% after 7 days and 97% after 10 days. It was also possible to notice a high growth of biomass (0,31g) that indicates the disappearance of dye color may be due to biodegradation of chromophore in dye molecule because of extracellular enzyme production by fungi along with absorption and adsorption by the cells. So, the performance of *P. chrysosporium* in the decolorization of textile dyes reinforces its potential for environmental decontamination.

Keywords: bioremediation, filamentous fungi, *Phanerochaete chrysosporium,* textile dyes

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