BIODECOLORATION OF AMARANTH DYE BY *Agaricus bisporus* AND *Trametes* sp

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Azo dyes are the largest class of synthetic dyes used in the food industries. Amaranth is a mono-azo-substituted naphthalenic red dye having one hydroxyl and three sulfonic functional groups. It has been banned in the United States by the Food and Drug Administration as a suspected carcinogen, although it is still legal in some countries, including Brazil. Many synthetic dyes present in industrial wastewaters are resistant to degradation by conventional treatments. White rot fungi are ligninolytic organisms capable of degrading a wide array of pollutants, including dyes, using a highly non-specific enzymatic process. The decolorization of amaranth by white rot fungi was examined in solid and submerged cultures. Initially, a plate screening assay was used to evaluate mycelial growth and amaranth decolorization (50 and 100 mg/liter) by *Trametes* sp, *Pleurotus ostreatus,* LMB-CF1, and *Agaricus bisporus*. Aqueous solutions of the dye were mixed with agar (1.5% w/v) or potato dextrose agar (PDA) and sterilized for 15 min at 121°C. Inoculum was grown on PDA and incubated at 28°C during 7 days. One mycelial agar plug was placed at the center of the medium, being incubated at 28°C. The best results were obtained with *Agaricus* and *Trametes*, which totally decolorized amaranth in all conditions. The highest growth rate and biomass production for both fungi were obtained in medium with amaranth 50 mg/liter and PDA: 0,42 (±0.02) mm/h and 0.33 (±0.03) mm/h for *Agaricus* and *Trametes*, respectively. Liquid experiments were conducted with these fungi, in Erlenmeyer flasks (250 ml) containing 50 ml of the medium (2% of malt extract and amaranth 100 mg/liter, sterilized for 15 min at 121°C). Each flask was inoculated with a suspension of cells, prepared by harvesting 7 days mycelia cultivated on PDA. The initial cell number in each flask was $5.9x10^5$ UFC/ml and $4.3x10^3$ UFC/ml for *Agaricus* and *Trametes*, respectively. Controls consisting of uninoculated flasks were also prepared. Flasks were incubated for 7 days at 28˚C in an orbital shaker at 100 rpm. Samples were analyzed for dry biomass, pH, decolorization and ligninolytic enzyme activities (laccase, manganese peroxidase and lignin peroxidase). The pH of medium remained constant (6.0). *Agaricus* removed 91% amaranth from culture medium and *Trametes* 90%. Enzimatic activities were not detected in culture media of both fungi, suggesting that biosorption in fungal biomass and other enzymes could possibly be involved in the decolorization.

Key-words: Amaranth dye, azo-dye biodegradation, white-rot fungi.