

EFFICIENCY OF DECOLORIZATION OF METHYLENE BLUE USING BIOMASS OF *Cunninghamella echinulata* UCP 1297 OBTAINED IN LOW-COST MEDIUM

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ABSTRACT:

Among industrial wastewaters, dye wastewater from textile and dyestuff industries is one of the most difficult to treat because of its synthetic origin and complex aromatic molecular structure of dyes. Different technologies may be used for decolorization of wastewater containing dyes. Among them, biological processes are the most promising because they seem to be environmentally safe. In this context, this study aimed the decolorization of methylene blue using biomass of Mucoralean fungi *Cunninghamella echinulata* UCP 1297 and comparing with sugarcane bagasse. For this, *C. echinulata* was previously cultivated in low-cost medium containing 1% corn steep liquor and 5% mature Pacovan banana (*Musa sapientum*) peel flour, at pH 6, 28°C and 150 rpm, during 96 h. Fungal biomass obtained after filtration and centrifugation of cultures was subjected to lyophilization. Sugarcane bagasse was thawed, oven dried at 70°C and ground in a blender. Both biosorbents were sieved to obtain particles of size less than 1.0 mm, which were used for decolorization of methylene blue solution at concentration of 5 mg/L. To investigate the effect of pH, three dye solutions was prepared by adjusting pH to 5, 7 or 9, using 1 M HCl or NaOH solution. Fifty milligrams of biosorbents were added to Erlenmeyers containing 100 mL of dye solutions and incubated for 48 h in shaker at 150 rpm and 28°C, under darkness. Aliquots of 2 mL were collected and centrifuged at 9000 rpm for 6 min at 0, 24 and 48 h. Experiments were performed in triplicate using, for each pH value, a control without addition of any biosorbent. Discoloration was determined by measuring absorbance at 660 nm in UV-Visible spectrophotometer. According to the results, fungal biomass showed higher ability to dye decolorization, with removal above of 80% in three pH values tested after 24 h of incubation, whereas for sugarcane bagasse the removal ranged from 47-77%. Higher removal at 24 h (90.69%) was showed by fungal biomass in pH 7. After 48 h the removal by biomass achieved 93.96%, whereas sugarcane bagasse reached 86.67%, both at pH 7. This study confirmed the suitability of fungal biomass for dye removal process and the cost-effectiveness of it uses due to inexpensive production using agro-industrial residues.

Keywords: dye removal, Mucoralean fungus, sugarcane bagasse.

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