

BIODECOLORIZATION OF METHYLENE BLUE USING BIOMASS OF *Cunninghamella echinulata* UCP 1297 AS ALTERNATIVE BIOSORBENT.

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**ABSTRACT:**

Nowadays, water pollution caused by dye contaminants has become a severe global issue and aroused tremendous attention, since it is estimated that more than 100 thousand types of commercial organic dyes have been produced. Meanwhile, huge amounts of dyes have been discharged into natural environment during the production process, which causes serious environmental problems. Hence, it is quite urgent to remove the dyestuffs from water, and several methods have been devoted to resolving this issue, including biosorption processes. In this context, this study aimed the decolorization of methylene blue using biomass of Mucoralean fungi *Cunninghamella echinulata* UCP 1297 as alternative biosorbent and comparing with mineral coal ash. For this, *C. echinulata* was initially 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. The biosorbent and waste industrial (lyophilised fungal biomass and mineral coal ash) were sieved to obtain particles of size less than 1.0 mm, which were used for decolorization of methylene blue from aqueous solution at concentration of 5 mg/L. Experiments were carried out for 24 h at 28°C, using a 2<sup>3</sup> full-factorial design (FFD) to evaluate the influence of agitation, pH, and amount of biosorbent. Discoloration was determined by measuring absorbance at 660 nm in UV-Visible spectrophotometer. According to the results, fungal biomass proved to be an excellent biosorbent of methylene blue, showing the highest percentage of removal (95.41%) in condition 8 of the FFD, with the maximum levels of the evaluated variables (200 rpm of agitation, pH 9 and 90 mg of biomass). Thus, 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, Agro-industrial residues, Biosorbent.

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