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Decolorization of the mixed dyes by immobilized white-rot fungi

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Wastewater from the textile industry is one of the most problematic to treat due to its color, high chemical oxygen demand (COD), biochemical oxygen demand (BOD), suspended solids, turbidity and toxic compounds. The chemical composition of the textile effluents has changed rapidly due to a shift in the consumer preferences, the most significant of these being the popularity of cotton fabrics and bright colors leading to greater usage of synthetic reactive dyes and azo dyes. By far the single class of micro-organisms most efficient in breaking down synthetic dyes is the white-rot fungi. These fungi constitute a diverse eco-physiological group comprising mostly basidiomycetous and to a lesser extent litter-decomposing fungi capable of extensive aerobic lignin depolymerization and mineralization. The mechanism of fungal decolorization mainly involves two aspects, biodegradation and biosorption. The biodegradation capability of fungi is due to their extracellular, non-specific and non-selective enzyme system. In our experience, white rot fungus *M. esculenta* was immobilized on to three different support materials (polyurethane, kaolin, cellulose). Bio-decolorization of mixed dyes was investigated and the data were compared for all immobilized cells. Polyurethane was selected as immobilization support material for the best dye removal (dye concentration: 10 mgL^{-1} and 97,78%) in agitated system. At the end of the bio-decolorization, samples (10 mgL-1) were analyzed by FT-IR and UV spectrum to identify any possible metabolites. When the obtained data were examined, no metabolites were found. As a result, immobilized *M. esculanta* on to polyurethane could be used for the wastewater bioremediation.

Biography

Bugra Dayi has completed his degree and is currently a Master's student in the Department of Chemistry, Biochemistry subdivision at Pamukkale University. He works on Environmental Biotechnology, Waste water bioremediation and Dye removal.

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