Decolorization of Synthetic and Real Textile Wastewater by the Use of White-Rot Fungi

Author(s)

I. Nilsson, A. Möller, B. Mattiasson, M.S.T. Rubindamayugi, U. Welander

Abstract

Batch and continuous reactors inoculated with white-rot fungi were operated in order to study decolorization of textile dyes. Synthetic wastewater containing either Reactive Blue 4 (a blue anthraquinone dye) or Reactive Red 2 (a red azo dye) was used during the first part of the study while real wastewater from a textile industry in Tanzania was used in the later part. *Trametes versicolor* was shown to decolorize both Reactive Blue 4 and Reactive Red 2 if glucose was added as a carbon source. Reactive Blue 4 was also decolorized when the fungus was allowed to grow on birch wood discs in a continuous biological rotating contactor reactor. The absorbance at 595 nm, the wavelength at which the dye absorbs at a maximum, decreased by 70% during treatment. The initial dye concentration in the medium was 200 mg/l and the hydraulic retention time in the reactor 3 days. No glucose was added in this experiment. Changes of the absorbance in the UV range indicated that the aromatic structures of the dyes were altered. Real textile wastewater was decolorized by *Pleurotus flabellatus* growing on luffa sponge packed in a continuous reactor. The reactor was operated at a hydraulic retention time of 25 h. The absorbance at 584 nm, the wavelength at which the wastewater absorbed the most, decreased from 0.3 in the inlet to approximately 0.1 in the effluent from the reactor.

Keywords

Biological rotating contactor reactor;
Textile dyes;
Pleurotus flabellatus;
Trametes versicolor;
Reactive Blue 4;
Reactive Red 2