

Feasibility of Using a Fungal Bioreactor in Treating Industrial Wastewater (an abstract)
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Phanerochaete chrysosporium, a species of the white rot fungus (WRF), has gained exposure in recent years due to its unique biodegradation capabilities. It is capable of degrading a variety of organic pollutants including chlorophenols, nitrotoluenes, and polycyclic aromatic hydrocarbons. The white rot fungi have a unique extracellular enzyme system which is used to degrade lignin, the structural polymer of wood. This system has been shown to mineralize a wide range of recalcitrant environmental compounds. WRF produces lignin peroxidases and other extracellular enzymes which have extensive biodegradation properties. The wastewater to be used came from an industrial factory in which soy flour is produced. It contains a high amount of Total Kjeldahl Nitrogen, on average about 300 PPM, and a high Chemical Oxygen Demand, about 4000 PPM. Traditionally these contaminants have been resistant to normal bacterial wastewater treatment schemes. In this study, a white rot fungus, "*Phanerochaete chrysosporium*", was grown in a bioreactor and used to evaluate the effectiveness of treating the industrial soy processing plant's wastewater in order to reduce the TKN and the complex organic compounds. The specific objectives were: 1. To evaluate the hydrodynamic parameters of the laboratory scale bioreactor in order to define the hydraulic retention time (HRT) and bioreactor type 2. To evaluate the ability of *Phanerochaete chrysosporium*, (WRF), using a fungal bioreactor, to degrade industrial wastewater containing high concentrations of Total Kjeldahl Nitrogen (TKN) and complex organic compounds.