ABSTRACT

Bioremediation Potential of the White Rot Fungus, *Phanerochaete chrysosporium*, on Solid Wood Chips Augmented with Sweet Whey

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The recent oil spill disaster in the Gulf of Mexico highlights the need for safe and effective strategies to clean up sites contaminated with petroleum hydrocarbons. In a society dependent on fossil fuels, contamination of soil and ground water is a pervasive problem across the landscape. Remediation with aggressive treatment chemicals carries a risk to environmental and human health. A biological option is the use of white rot fungi, such as *Phanerochaete chrysosporium*, long recognized for their ability to co-metabolize a variety of organic pollutants, most notably the highly toxic polyaromatic hydrocarbons, which are poorly handled by bacteria. *Phanerochaete chrysosporium* has been extensively studied in the laboratory and successfully adapted to field applications. However, broader adoption requires improvement in consistency and cost effectiveness of using fungi for bioremediation. Sweet whey, formulated as MycoMax™, an enhancer for fungal biopesticides, significantly improves the effectiveness of fungi used for management of hemlock woolly adelgid, an invasive insect decimating eastern hemlock forests. The ability of sweet whey to enhance colonization by *P. chrysosporium* on wood chips and its subsequent release of enzymes active in hydrocarbon breakdown was investigated. Wood chips are added to contaminated soil to enhance natural bioremediation through aeration and by providing a substrate for microbial activity. Directing ecological functions by enhancing microbial populations with a low cost, super inoculum gives added value to the wood chips and other organic substrates used in bioremediation processes.