

Recycling and Reuse Technology Transfer Center

Recycling and Reuse Technology Transfer Center



<http://www.rrttc.uni.edu>

Biodegradation of explosives by wood-rotting fungi
Annual Meeting of the Iowa Academy of Sciences: Clarke College

Publication: 1997 - 093

John Bumpus, Chemistry Department, University of Northern Iowa and Carl Johnston,
MycoTech

Student authors: C. Axtell, Chemistry Department, University of Northern Iowa

April 26, 1997.

Biodegradation of Explosives by Wood-Rotting Fungi. Catherine Axtell¹, Carl Johnston³ and John A. Bumpus^{1,2} Environmental Sciences Program¹ and Department of Chemistry² University of Northern Iowa, Cedar Falls, Iowa 50614 and Mycotech Corporation³ Butte, MT 59701

Several sites worldwide are contaminated with byproducts of the munitions industry. Bioremediation by fungi of soil, sediments and water contaminated by munitions waste is one method that is currently being evaluated for decontamination of such sites. It is known that *Phanerochaete chrysosporium*, a wood rotting fungus, is able to degrade substantial amounts of 2,4,6-trinitrotoluene (TNT) to carbon dioxide and this fungus shows some promise for use in remediation of contaminated sites. There are, however, many other species of wood rotting fungi and it is reasonable to expect that some may be as good or better than *P. chrysosporium* for this purpose. In the present study we have evaluated the biodegradative ability of F-600 a proprietary fungal strain developed by Mycotech Corporation. Our results demonstrate that F-600 mediates extensive biodegradation of TNT. Although very little TNT was degraded to carbon dioxide, mass balance analysis suggested that much of the TNT initially present was converted into biomass. Toxic metabolites, such as 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene did not accumulate and were present in only very small amounts. Evaluation of the ability of F-600 to enhance remediation of soil contaminated with munitions waste is currently under investigation at the Yorktown Naval Weapons Station (Yorktown, VA).

97-099

Axtell, C., C. Johnston and J.A. Bumpus (1997) Biodegradation of explosives by wood-rotting fungi. Annual Meeting of the Iowa Academy of Sciences, April 26, 1997, Clarke College.