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Testing the Potential of Using Fungi to Convert Human Waste into Protein

Alex Zapata, Elizabeth Phillippi, Blair Mitchell, Jon Schoer, Michael Watters

Departmental Affiliation: Chemistry and Biology
College of Arts and Sciences

We report on the results of a pilot experiment designed to test the potential of filamentous fungi (mold) to reduce solid waste (feces) while converting it into a consumable, high protein food product. Feces represent an untapped resource. Filamentous fungi are natural decomposers with the ability to use this resource. Many filamentous fungi are safe to eat. We examined growth in order to determine the conditions which maximized the rate of conversion of solid waste into fungal biomass. For this pilot, we compared the effect of different lengths of incubation, different methods of aeration, and different available surface area. The initial study resulted in rates of conversion as high as 75% (3.75g of mold produced from 5g of solid waste). Fungal growth also appeared to reduce odor. Although initially proposed as a mechanism to deal with waste and food storage issues on long-term space missions, this project holds the potential to benefit waste processing in diverse situations including large livestock confinement operations and sewage treatment facilities. This work was supported by a grant from the Indiana Space Grant Consortium (INSGC).

Information about the Authors:

Alex is a senior pursuing a major in biology as well as minors in chemistry and philosophy. He began his research under Dr. Watters in the fall of 2010 studying the effects of oxidants and reductants on the branching density in *Neurospora crassa*. After graduation, he hopes to pursue an MD/PhD in soft tissue engineering. Elizabeth Phillippi is a sophomore chemistry and biology double major from Green Bay, Wisconsin. She enjoys researching, reading, and playing her violin. She hopes to one day attend graduate school and research algae-based biofuels. Blair is a senior pursuing a bachelor's degree in biology with a minor in chemistry. This is her first research project with Valparaiso faculty. Following graduation, she plans to attend medical school, seeking a dual MD/MPh degree with a special interest in women's health.

Faculty Sponsor: Dr. Jon Schoer, Dr. Michael Watters

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