Plastic Decomposing Mushrooms

Colburn, Lukas (School: Grants High School)
Tortalita, Ryan (School: Grants High School)

The researchers conducted experiments using Pestalotiopsis microspora and Pleurotus pulmonarius creating a non-toxic biodegradable process for decomposing plastic. P. microspora is a fungus native to the Amazon Rainforest, it grows best at 20-24 oC at 90% humidity. Pleurotus pulmonarius is part of the Oyster genus, native to subtropical forests of U.S. and Europe. It grows under the same conditions as Pestalotiopsis microspora. 2 CC of spores in media were injected onto the agar mold, plastic circular pieces were placed on Aspen wood substrate. Researchers hypothesized spores would germinate and thrive using plastic as an additional nutrient. The Null hypothesis proposed that spores would not grow on plastic and mass of plastic would remain the same as at the start of experiment. The alternate hypothesis was proven correct over a 3-weeks the culture grew engulfing the mold, attaching hyphae to edges of plastic. Later observations revealed perforations in plastic decomposing, dissolving the plastic while showing loss of mass from ~ (27-50%) depending on the type of plastic and the species of mushroom with PE being decomposed most. The cultures P. microspora and P. pulmonarius grew and thrived using plastic as a source of nutrients, fungus attached to both types of plastic in both species of mushrooms. One sample of (P. microspora PE Jar 1) mushroom was able to decompose 65.7% of the plastic with an average decomposition of 50% of the plastic by (P. microspora in both PE Jars 1 & 2).

Awards Won: