Degradation of Bioplastics from Biomass Sources Used as an Alternative for Plastic Products

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Plant starch products that are compostable often take six months to decompose but end up in landfills before this process is complete. These artificial environments do not allow for further decomposition making these products environmentally damaging. This research's purpose was to determine whether Aspergillus oryzae can accelerate the decomposition rate of plant starch plastic products. I put three samples each in two bins, one control with only compost and one experimental with an added sample of Aspergillus oryzae and allowed them to compost for 6 weeks. The bins were put in a room-temperature area and were mixed and watered twice a week. By comparing the change in mass of each sample before and after, I was able to determine that the samples decomposed at a numerically greater rate in the experimental group. The mean change in mass of the control group was 2.400 and the mean of the experimental group was 5.067, showing a large difference in mass change and rate of decomposition between the groups. With a 95% confidence interval and a two-tailed p-value of 0.0258 derived from a t-value of 3.4587 and four degrees of freedom, the test was proven to be statistically significant. Therefore, I accept the hypothesis stating an quicker rate of decomposition of plant starch products with Aspergillus oryzae. This study demonstrates that Aspergillus oryzae accelerates the decomposition of plant starch-based alternative plastics.

Awards Won:

NC State College of Engineering: Award to attend NC State Engineering Summer Camp