Hyphesta

– Eat the Past, Feed the Future –

The Problem In Our World

400 million tonnes of everlasting plastic is produced each year on Earth, and over **20 million tonnes** is dumped into oceans and **370 million** is buried in landfills each year. Food sources, habitats and whole communities are affected due to these environmental damages.

Status Quo

Recently, there has been some research in the field of degrading plastics. One solution is to **biodegrade** the plastics with fungi. However, current mushrooms take **several months** to break down a **few grams** of plastic. This rate is still far from being commercially usable due to the slow processing times.

Genetically Modified Mushrooms that Eat Plastic and are Edible

How it Works

The primary decomposer of litter in many ecosystems is fungi since they are the best decomposers in nature.

- Fungi adhere to the surface of plastics and consume it for growth and reproduction.
- The hyphae penetrates the surface of the plastic and it releases 2 main enzymes — lipase and esterase.
- After 2 months, these mushrooms will be fully grown and ready to eat, with 90% of the plastic gone. The remaining 10% is a biodegradeable residue.

The Process

Oyster mushrooms are edible but they take longer to break down these plastics.

Our goal is to genetically engineer faster decomposing enzymes from *Aspergillus tubingensis* and increase their level in the oyster mushroom to speed up the process.

We can do this by integrating the potent esterase and lipase enzymes found in the aspergillus tubingensis, generated by the AFLA_006190 and AFLA_053930 genes, into the makeup of oyster mushrooms.

Thus resulting in an edible and faster plastic decomposing mushroom.

We are using Oyster Mushrooms as it is a commonly eaten mushroom and it is cost effective. By incorporating the stronger enzymes, we are creating a mushroom that is Nutrionally Healthy and Environmentally Friendly.

Our Vision

Sourcing plastic from recycling plants

Cutting up all the plastics into small (5-8cm) peices

Using mushrooms to breakdown the plastic

Harvesting and exporting the mushrooms

A cleaner planet with with more resources

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