

***Protocol for Creating a 'Leather' Biofilm incorporating Algae and Mycelium
(Adapted by Oliver Kellhammer), Part-time Lecturer in Sustainable Systems***

This protocol is adapted from the one developed by the Berlin-based Italian designer, Fara Peluso. Peluso in her work with the Institute of Biotechnology TU Berlin is interested in the process of 'lichenization', i.e. the melding of fungal and algal components into hybrid biomaterials, analogous to how lichens incorporate both algae and fungi into a single organism. For more information on Fara's work see here:

<http://artlaboratory-berlin.org/html/eng-event-MtF-Futurium.htm>

Video documentation of the artist demonstrating the protocol here:

<https://youtu.be/9asxB8I3frA>

NB: I have modified the recipe slightly by substituting dried (Chinese) shiitake mushrooms, ground to powder in an electric coffee grinder for the liquid-culture mycelium used by Peluso. This small change saves considerable time as students don't have to grow the mycelium from scratch.

The required ingredients are all easily obtained on either Amazon or at Asian markets. Agar agar is a common ingredient in East Asian cuisine and is derived from seaweed. Diatomite is an ocean sediment consisting of the remains of marine diatoms and is used in filtration and gardening applications.

Equipment required:

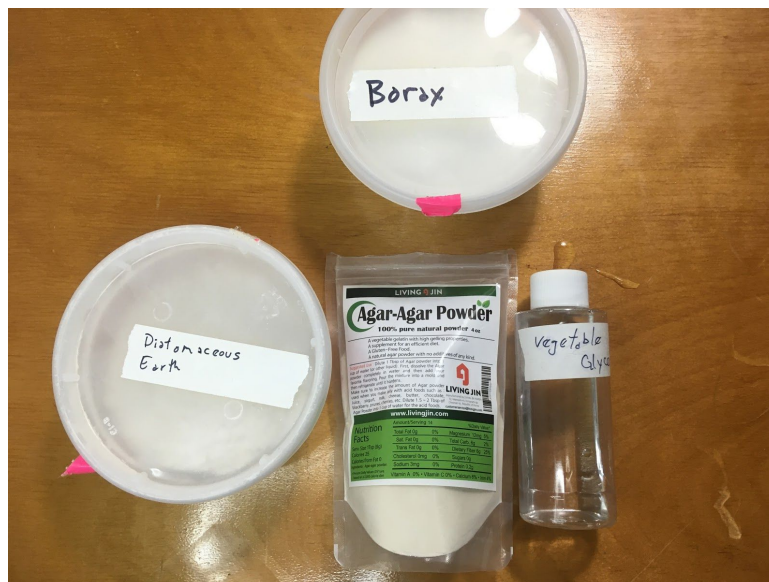
- 1) 15 litre translucent plastic storage box (43.9 x 28.9 cm approximately)
- 2) Knife and cutting board to chop up mushrooms
- 3) Electric coffee grinder
- 4) Small saucepan and access to a stove
- 5) Wire whisk or spoon for stirring
- 6) Digital Scale

Ingredients:

3 g diatomaceous earth (diatomite)
3 g powdered mushrooms (dried Shiitake are the cheapest but any dried variety will do)
3 g Agar Agar
10g Borax
22 ml Vegetable glycerin
150 ml Water (approximately, this depends on the type of mushroom used feel free to add more)

Protocol:

- In a small saucepan or pot bring 150 ml of water to a simmer.
- Add the diatomite, powdered mushrooms and agar agar, stirring rapidly.
- Add glycerin and borax while stirring and bring to a boil.
- Continue to stir and pour the well-mixed liquid into the plastic box tilting the box back and forth to evenly distribute the liquid across the bottom as it cools and thickens.
- When liquid has cooled and thickened, set the box aside for 2 or 3 days until the biofilm has dried.
- After it has dried, use a small knife to separate the biofilm from the edges of the container and peel off. The material will be quite rubbery.





(dried Shiitake mushrooms chopped) (ground Shiitake mushrooms in coffee grinder)



(RIGHT: freshly poured biofilm material) (LEFT: Cured biofilm - quite flexible!!)

That's it... Now use your creativity to fabricate something amazing!



(Image courtesy Fara Paluso)