

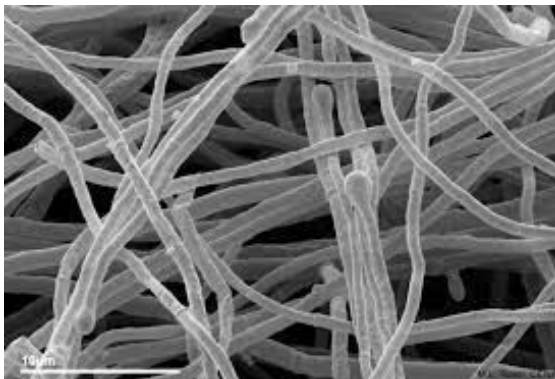
Grow Architectural Models with Mushrooms

This document was originally produced by Mo Langmuir, working with Ignite! on a project growing mycelium with young people at The Ridge Youth and Play Centre, Bestwood, in early 2019. The project was supported by the I Will Fund and more information about the project can be found at www.ignitefutures.org.uk/iwill.

Mushrooms are actually the reproductive system of the organism mycelium, so technically this project is about growing mycelium into an architectural model.

Since mycelium grows by consuming carbon rich materials like wood chips, straw, cotton, etc, the shape that it will grow into can be organized by stuffing a formwork with mycelium food.

This is what mycelium looks like under a microscope...



Model Ingredients:

- Substrate (mycelium food); sawdust or straw
- Small and big myco-bags (or sterilised plastic bags with a few prick-poked holes)
- Reishi mushroom spawn (available online)
- Board to build on
- Wooden building blocks
- Sterilising spray
- Water
- Gloves

Step 1: Sterilize Your Substrate

Put your substrate into a small myco-bag and add enough water to make all of it damp but not too wet. Sterilise in a pressure cooker for 1 hour. Once the mycobags have cooled properly (this can take a few hours and is the most likely stage for the experiment to fail – if the substrate is still too hot and kills the spawn).

Step 2: Inoculate the Substrate with Mycelium

Wash your hands thoroughly or put on sterile gloves and clean all work surfaces and implements with sterilising spray. Break up your mycelium Reishi spawn block into small pieces. Mix these pieces in with your chopped straw or sawdust. You are looking for about 20% spawn to 80% substrate. Massage the bag to try and distribute them evenly throughout the mix. Allow the mycelium to grow for approximately 1-2 weeks (this limits the risk of contamination when you put mycelium onto your model, as the mycelium has grown and can out-compete other bacteria/fungi!)

Step 3: Design Your Formwork



Preferably you want materials like plastic, plexiglass, 3D prints, etc. The mycelium will grow into, or begin to consume organic materials such as wood, so if you use wood make sure you cover it with plastic or wrap in sellotape first.

Step 4: Pack the Substrate



Pack the substrate and mycelium around the form. The tighter it's packed, the smoother the final product will be. Mycelium takes on whatever form and surface you present it with, so packing the substrate against smooth materials such as plexiglass or plastic will result in a smooth finish.

Step 5: Seal It Up



Mycelium consumes oxygen and expels carbon dioxide, just like us! Myco-bags come with a filter strip that allows gas exchange, but does not allow bacteria to get in. If you don't have a large myco-bag, use a sterile rubble sack or plastic bag with a few tiny holes punched in.

Spray a small amount of water into the bag before putting your model inside, but be careful not to add too much. Store the model in a dark place (ideally around 20-23 degrees).

Step 6: Let It Grow

The mycelium growth should cover the model after 1-2 weeks. If you let it grow too long it will eventually fruit mushrooms. If you start to see green or black spots, your substrate has become contaminated with bacteria and should be composted.

Step 7: Remove Form



Once the model looks sufficiently covered in a white mat, you don't need to worry about contamination and can just cut open the plastic bag to remove the form. Because the mycelium is moist it is still pretty fragile, so remove the form very carefully.

Step 8: Bake Your Model



Preheat your oven to 95 degrees celsius and bake your model for one hour. This will effectively kill the mycelium and prevent any further growth. It will also dry out your model and create a sturdy final product.



Add some models and vegetation to make your model look more realistic.

...What else could you grow?

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