CLAUDIA'S SUCCESSFUL RECIPES

SUBSTRATES USED :

1. Oak sawdust
2. Barley straw
3. Charcoal

To the first recipe it was added blue oyster while in the second, golden reishi mushroom. In combination with water, they proved to be a good environment for the growth of mycelium.

BIO CERAMIC VESSEL

Manufactured with no chemicals and with limited firing.

Main sources are local wild clay, mycelium and bio waste material.

Hand built using coiling technique throughout. No interface between the material and the maker.

Clay and waste act as substrates for the mycelium to grow.

In the final piece, the mycelium will act as colour and texture, mimicking the glaze effect.

Images are illustrative from Biomatters studio using 3D printing.

Recipe for a bio ceramic vessel

RECIPE 01 - OAK, APPLE SAWDUST, SEAWEED & BLUE OYSTER

I decided to base my experimental enquiry on the bonding capabilities of Mycelium with Seaweed sourced from my hometown of Swansea, and its ability to form material which can be used within domestic and the packaging/ insulation industry. Our early results were highly promising and a succesful recipe and process example can be found on the recipe sheet attached.

MYCELIUM AS INSULATION

We in the UK are facing a house insulation crisis. Criticism of the goverments current Great British insulation scheme which aim to insulate 300,000 homes a year over the next three years, have raised concerns on the plans ability to reach the 19m Homes that need better insulation. With the UK having one of the oldest and least efficient housing stock in europe and cold, damp homes proving to be a real health risk to the uk population and contributing to strain on the national health service. Not to even mention the severally inflated costs of the energy market We must find a more effctive and environmmentally conscious ways of targetting these issues with potential solutions. Mycelium bonded material has the real potential to providing innovative and more enviromentally sustainable solution to home insulation.

Unlike current, standard foam insulation which is made using harmful chemicals which are [illegible] people and the environement. Mycelium bonded biosubstrate material is completely biodegradable, environmentally friendly and actually outperforms the standard products [illegible] mycelium acts as a natural binding cohesive, binding [illegible] making it difficult to break. Its [illegible] fire, mold and water resistant making it a viable solution material for [illegible]

BENEFICIAL PROPERTIES

- Biodegradable and compostable at end of life
- Fire, mold and water resistant
- Carbon Negative
- Non- toxic and can be produced from readily available materials and agricultural byproducts

HOME INSULATION KIT

Recipe Sheet

This recipe has and can be adapted for larger volumes.
The quantity makes 1m2 sheet of material.
Note
Inoculation time will vary with scale and quantities.

What you will need:

BIOsubstrates -
375g Oak Sawdust
250g Apple Sawdust
375g Seaweed Powder*
(*dehydrated & blended)
2L Distilled Water
Blue Oyster Liquid Culture

Apparatus -

A large tray container, Isopropyl alcohol, nitrile gloves, Digital scales, Autoclaving machine, incubator, oven, Kitchen foil, Baking tray, industrial blender.

TOP TIPS

Use washed up Seaweed so that you are not disturbing any living biodiveristy in the area.
You **Must** completely dehydrate and blitz the seaweed into a fine powder.
Any moisture will affect the growing and could cause the mixture to go mouldy.
Oak & Apple Sawdust can be substituted for Beech or Barley
straw- all worked well in other experiments

INSTRUCTIONS

1. Dehydrate the Sourced Seaweed on a foil lined baking tray until crispy and all moisture is removed
2. Blitz the dried Seaweed using the blender into a fine powder.
3. Weigh out your raw substrates in the required quantity using a digital scale in an autoclaving bag
4. Agitate (mix) the subetrate mixture to ensure it is well mixed and combined
3. Sterilise your bag of substrate through Autoclaving and allow the mixture to cool
4. Add the Blue Oyster culture into the sterilised substrate and mix well to encourage inoculation
5. Transfer the mixture into your container/ mould and compact by hand to ensure strength in bonding
6. Incubate the mixture in an incubator at 26-27oc for 2-3 weeks monitoring its growth
7. Allow to fully colonise over 2 weeks
8. Deactivate at 150°C for 30 - 45minutes

Recipe for home insulation

Stan's Recipe for a Mycelium Chair

Pine Needles + Crushed Chalk + Powdered Oyster Shell + Beech Sawdust + Golden Reishi

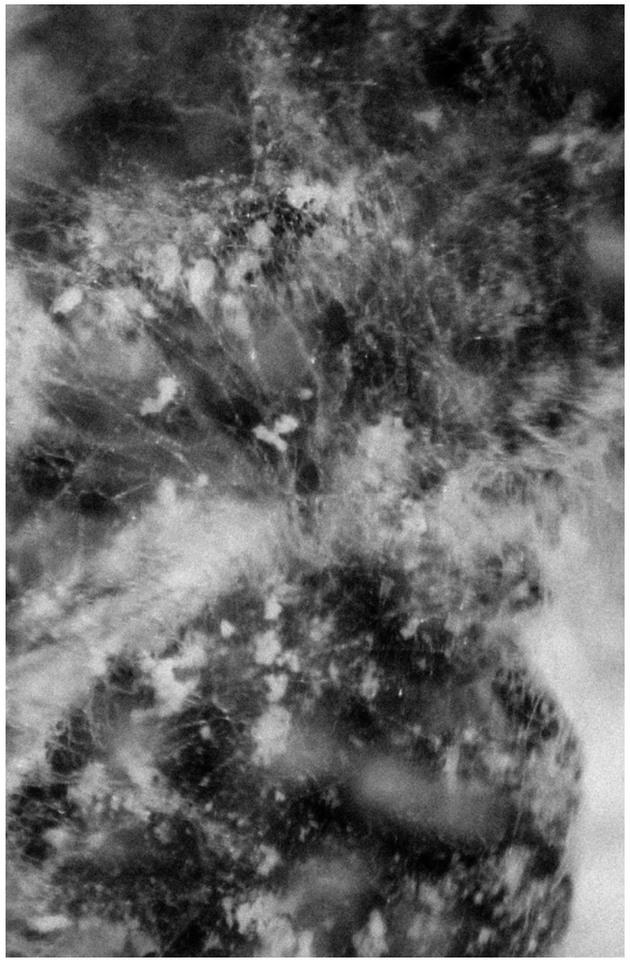
Pine needles	50%
Chalk	10%
Oyster Shell	15%
Beech Sawdust	25%
Golden Reishi	Culture (liquid)

Up to three quarters of timber used in the furniture and wood processing industries is discarded in the form of sawdust and wood chips.

If a tree was felled for timber in the past, we used all of the available material - but with mass production, the knowledge, awareness and process has been lost. Pine needles account for 30% of the tree's overall mass - a part of the tree commonly unused.

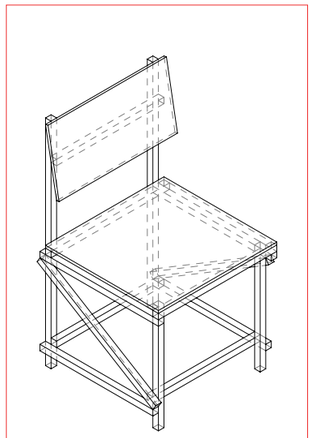
This proposal for a chair aims to question current standards of material use in the furniture design industry by repurposing waste sawdust, as well as pine needles that would otherwise go to waste.

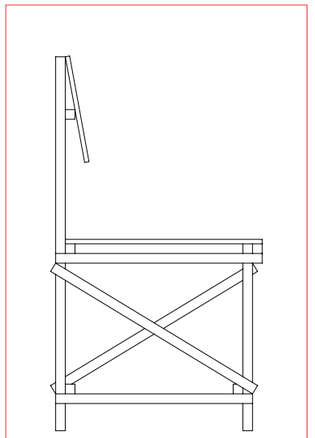
For this recipe, I have taken chalk and oyster shell from the landscape near my home, as well as waste beech sawdust from the wood workshop, and ground needles rescued from Pine trees discarded on the street after Christmas.

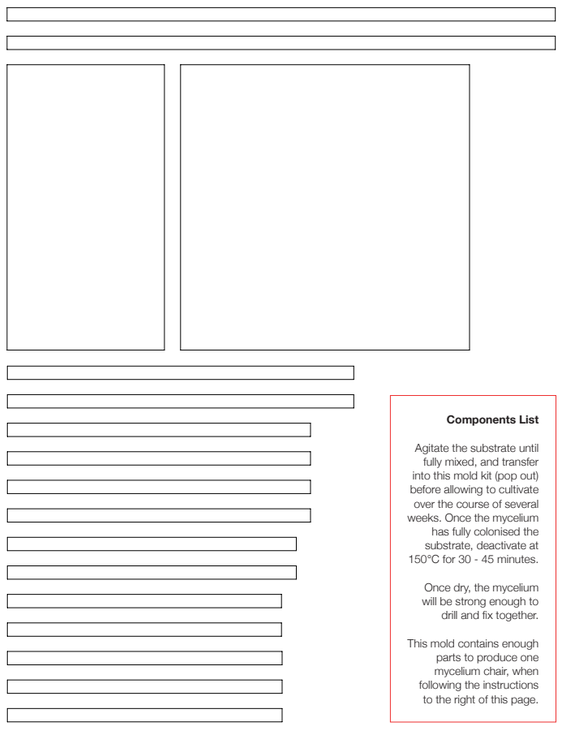


Stan's Recipe for a Mycelium Chair

Kit







Components List

Agitate the substrate until fully mixed, and transfer into this mold kit (pop out) before allowing to cultivate over the course of several weeks. Once the mycelium has fully colonised the substrate, deactivate at 150°C for 30 - 45 minutes.

Once dry, the mycelium will be strong enough to drill and fix together.

This mold contains enough parts to produce one mycelium chair, when following the instructions to the right of this page.

Step 1
Start with assembling the sides. Front and back legs (A & B) flat. Fix horizontals C & D in place. Top c 440 mm from bottom end a. Top d 104 mm from bottom end a. Fix together with screws. Pre-drill a hole through the wood to prevent it from splitting. Fix diagonal in position (E) as on drawing.

Step 2
Cut wood for front and back horizontals. Fix the front and back horizontals in position with screws: top F 116 mm from top of A. G and H on top. 1 on top of D, 80 mm from front of D. J behind A, above D.

Step 3
Cut wood for front and back diagonals. Make sure the frame is standing straight on a flat surface. Fix front and back diagonals to frame.

Step 4
Cut wood for seat and backrest and screw seat and back to frame.

Step 5
To get the right seat angle, cut 17 mm from bottom of back legs (a).

A
BACK LEGS - 2
847 X 22 X 22

B
FRONT LEGS - 2
460 X 22 X 22

C
TOP HORIZONTAL SIDE - 2
470 X 22 X 22

D
LOWER HORIZONTAL SIDE - 2
455 X 22 X 22

E
SIDE DIAGONAL - 2
540 X 22 X 22

F
BACK DIAGONAL - 2
440 X 22 X 22

G
BACK HORIZONAL - 1
380 X 22 × 22

H
FRONT HORIZONTAL -1
380 X 22 X 22

J
SEAT
450 X 380 X 12

K
BACK
250 X 380 X 12

Wenqin's Recipe

Cherry sawdust+ Seaweed+ Charcoal

Cherry sawdust 20g

Seaweed 20g

Charcoal 5g

Mycelium Painting

Pure natural materials replace industrial pigments —— more environmentally friendly

Step:

1 Sterilize and powder the ingredients.

2 Put in a petri dish and grow mycelium.

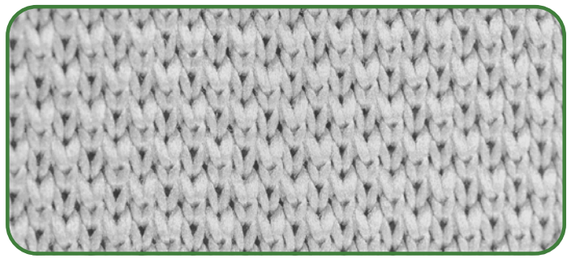
3 Dye mycelium with natural pigment spray paint.

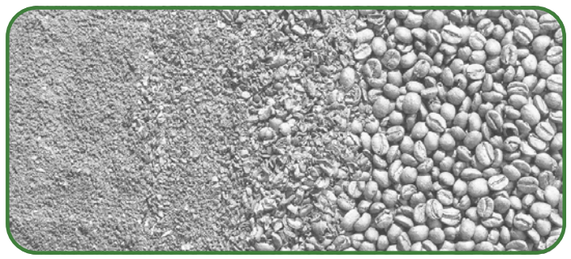
4Used in painting instead of paint.

Recipe for Painting

RECIPE FOUR

WOOL - COFFEE GROUNDS - BLUE OYSTER





These specific ingredients were selected after many iterations of compatibility. The coffee grounds provide the required nutrients for the mycelium of the Blue Oyster mushroom to grow sufficiently and the wool provides an aerated structure for the hyphae to attach onto. Both the coffee grounds and the wool should be autoclaved before use to ensure that no bacteria threatens the life of the mycelium as it grows onto this substrate. It is important to keep the working area clean and make sure that you sanitise your hands and any equipment before working with the materials. The preparation process should take no more than four hours and the growing time will be approximately three weeks depending on the size of the project.

KNITTING MYCELIUM

Interestingly, the well known skill of knitting can be utilised within architecture as a structural component when combined with mycelium bonding. The interlocking mechanisms of basic knitting and pearling offers the malleability to shape the knitted piece into complex curved doming structures or rounded columns. This is then solidified by growing the mycelium along the porous material. Prototyping this is also an easy and exciting exercise. Along the right-hand-side of this page gives an explanation of a simple 'knit one' process. This is the best technique to create the structure, however, once you become accustomed to this, feel free to experiment with other knitting patterns. To secure your structure in preparation for mycelium growth, an exostructure is required to hold it in place, along with mechanisms to bolt it down to a base. Simple pins can be used in prototyping.