

## Study of Mycelium Bricks

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### ABSTRACT

The main purpose of the study is to improve the developing material to utilise the power of the nature and is in agreement with its conditions. The utilization of the living design to diminish or invalidate the natural expenses of the structure materials. In the current scenario there is a lot of need of a construction material that is cheap and environment friendly. For this purpose, mycelium bricks are best choice because they are grown, not made. The method use to make the brick is collecting material for growth of mycelium, growing, filling in molds, drying in appropriate conditions, and killing its bacteria in an oven. Mycelium based materials are usually composites, to increase the flexibility by using the selective materials in it. The aim is to produce mycelium material that could be used as insulation. The scope of the mycelium bricks, it gives good compressive strength, varies greatly on its constituents. Future work is planned to improve the thermal performance and increase water resistance of the mycelium bricks by applying oiling and painting.

**Keywords :** Mycelium Bricks, Thermal Performance.

### I. INTRODUCTION

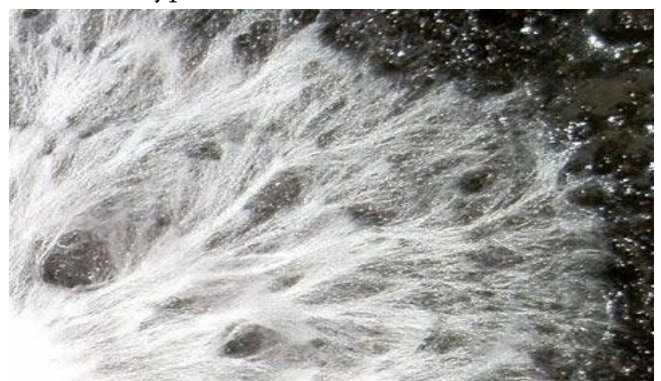
The standard brick had used for building purpose for thousands of years. Bricks were used since 7000 BC. They were discovered in southern Turkey at the site of an ancient settlement around the city of Jericho.

Brick gives more stability to the structure. Besides comfort, a building made of brick also has some advantages such as easy to install. Like advantages there are some disadvantages of standard bricks like standard bricks causes too much pollution at the time of hardening. Hence to save our environment, now a days many researchers are doing work on the mycelium bricks which is one of the environment friendly bricks. Mycelium is a fast growing organism and one of its primary use is to decompose organic compounds. Petroleum products and some pesticides are organic molecules as they are built on a carbon structure, so they can be a potential carbon source for

mycelium. As part of study, will continue with the potential of this material to make a big difference to the material world.

#### MYCELIUM:

Mycelium is the vegetative part of a fungus or fungus like bacterial colony consisting of a mass of branching thread like hyphae.



**Figure 1.** Mycelium

Because of having an active property they can be used in many different areas. The current study is about researching and testing the different substrates and mesh like materials to make mycelium. Here we are using mushroom with a large base (king oyster mushroom) which grow fastly.



**Figure 2.** king oyster mushroom

#### **Need of mycelium brick:**

In the current scenario there is a lot of need of a construction material that is cheap and environment friendly for this purpose mycelium bricks are the best choice because they are grown not made besides of making bricks mycelium can be used in many different thing it can be used to be grow structure frame to replace concrete. Also it can be used to make chairs tables all can be grow from mycelium. It can replace thermocol. And there is many usage of this technique in the future. It is very vast topic to research.

#### **Disadvantages:**

- Indoor growing mushrooms.
- Laden with other microbes
- Sterilization
- Long waiting time for mycelium to be colonized.

## **II. REVIEW**

- **Mycelium as a construction material:**



**Figure 3.** mycelium bricks

#### **1. Sebastian Cox and Ninrla Lvanova :**

A British furniture designer Sebastian Cox has teamed up with researcher Ninela Lvanova to investigate the potential of mushroom mycelium in contemporary interior design. He wanted to use this fungal material to create more everyday products. Their series 'mycelium' includes a range of stools and lights series is presented at Somerset house as a part of the London design festival which was held on Sept 2017.

#### **2. Danielle Trafe(2015):**

Has developed the mushroom table lamp, mushroom flower pots, mushroom hemi pendant are all made of mushroom mycelium.

#### **3. Surf Organics-(2015):**

Has developed the surf boards using the mushroom materials.

#### **4. Celine park(2015):**

In place of needles the filter made from fungus can be used in pipes. This is the new technique developed Celine in his study. To inhale the vaccine in place of injecting them in the body these pipes are used. She has observed that the fungi can be used as filter as it observes more viruses in it.

#### **5. Lou Corpuz-bosshart(2014):**

He developed pavement block using mushroom mycelium. He mixed the mushroom mycelium in the sterilized sawdust for two weeks after it he sent it to green house of university of British Columbia from where the mix is chipped in wood chipper and packed in the mould and left for 5

days after which the blocks were taken out and dried.

**6. David Benjamin(2014):**

He has developed HI-FI tower soars of 40 feet into the air using mushroom and biodegradable materials it is designed in New York City the HI-FI is built from 10000 living bricks.

**7. Philip Ross(2014):**

Has developed the leather like structure from the mushroom myco in his own company testing the mushroom as a construction material which is made from the same material to make wooden like black. He has developed small samples of mycelium bricks using mycelium & agricultural waste which is growing in his lab.

**8. Eben Bayer(2015):**

Has developed mushroom material to provide a natural alternative to traditional plastics & synthetics packaging. Their company evocative has also made the packing of the dell laptop which is also made from mycelium which is replacing standard thermocol packing.



**Figure 4.** Agricultural waste, Mycelium bag.

Collecting material for growth of mycelium



Growing mycelium



Filling the mould



Drying the product



Killing the bacteria in oven

**Figure 5.** Step by Step Processes

### III. PROCEDURE

1. Sterilize the substrate i.e., the agricultural waste in this case.
2. Take a plastic bag.
3. Add a sterilize agricultural waste and formalin and Fungicide
4. mAdd 2 – 3 Mushrooms seeds in it.
5. Pack the plastic bag and place in a dark place for 3 – 7 days.
6. After 3 – 7 days the Mycelium will start growing.
7. After growth of Mycelium take a brick mould.
8. Add the mix in the brick mould.
9. Pack the mould with Cellophane sheet to make it air tight.
10. Leave the mould in the dark place for 3 – 5 days.

After 5 days the Mycelium should grown.

### IV. CONCLUSION

- This paper presents the brief review on mycelium bricks using the root part of mushroom.
- Mycelium composition, utilizes the biological growth rather than expensive energy intensive manufacturing process.
- It constitutes substrate, additives that strongly influence material properties including compressive strength, flexibility and electrical conductivity.
- Temperature and substrate humidity are some of the environmental condition that mostly contribute to the development of the final material.

- Current application of mycelium bricks are restricted to temporary structures.
- eg: - HY-FI tower (12 m).
- But in near future, mycelium brick holds the possibility of being integrally involved in the construction process of building since it is an ecofriendly material.

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