DEGRADATION

05.26.2023

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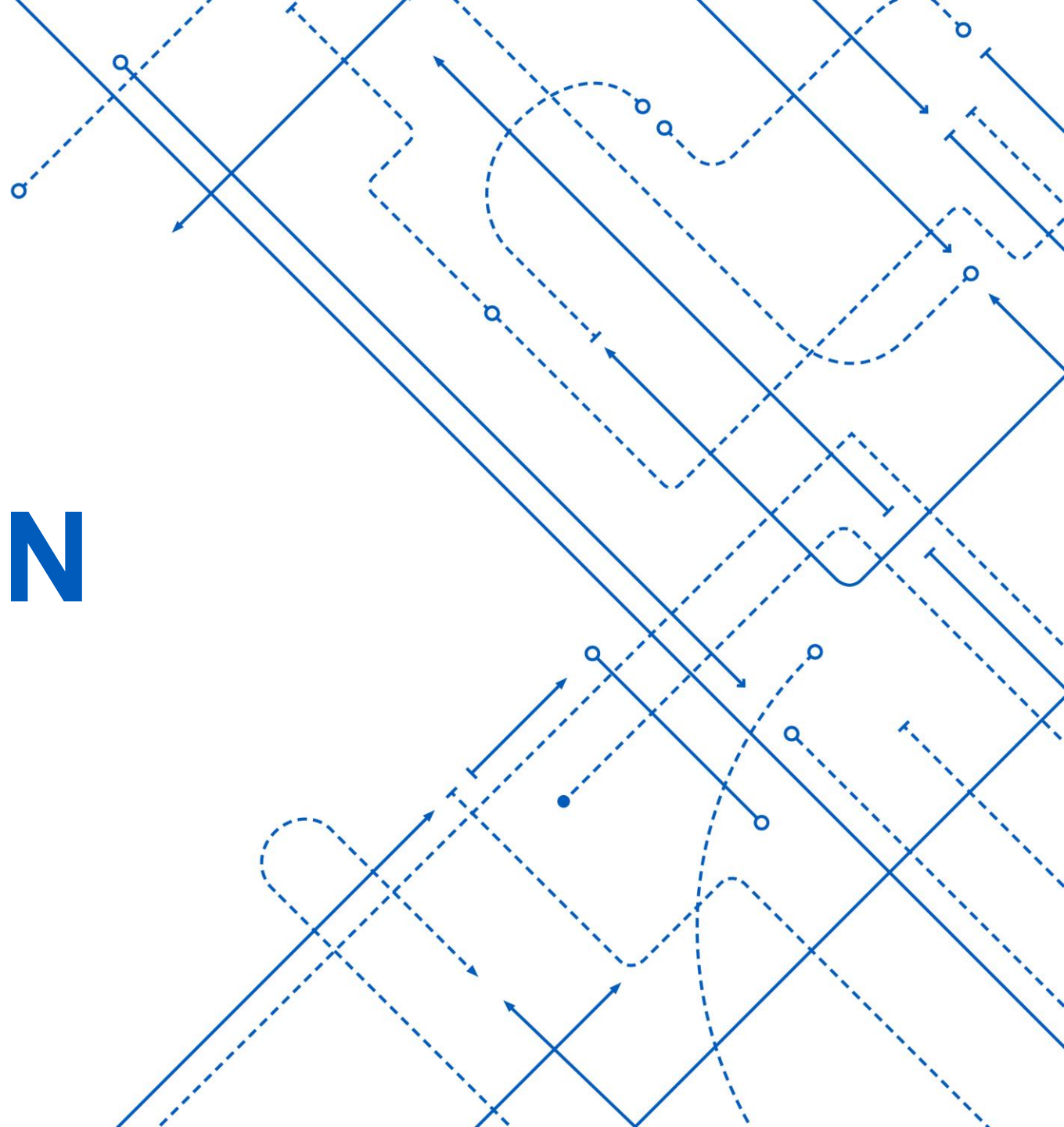

To explore mycelium degradation study in the soil

- Controlling parameters: Thickness of mycelium sheet, humidity
- Measurement: pH of the soil, temperature of the soil
- Thickness and mass will be checked to determine if mycelium degradation occurred.
- Check for holes, growth of biological matter

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Steps in soil experiments

Collect soil- Take a photo

Sieve soil mesh # 10- Take photos and video

Note: Remove organic matter after sieving

Weigh the soil, note in excel sheet

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Labeling and colour coding

Group name starting letter

N- Nalam - thin
P- Patseva- Thin
W-Wodo- Thick

K- Kordas

ick- Thick

20% - humidity **(RED)**

C- corner
S- side
Center

K- Kordas

ick- Thick

40% - humidity **(Blue)**

All experiments work on color code, so carefully note readings at the respective Ziploc code, excel code, and color code

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Steps in mycelium sheet collection experiments

Mycelium membrane weighs

↓

Label zip locks

↓

Thickness measurement

↓

Mass of mycelium sheet

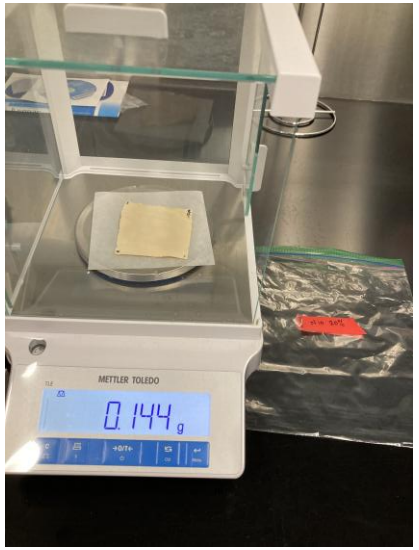
↓

Label corners of mycelium membrane

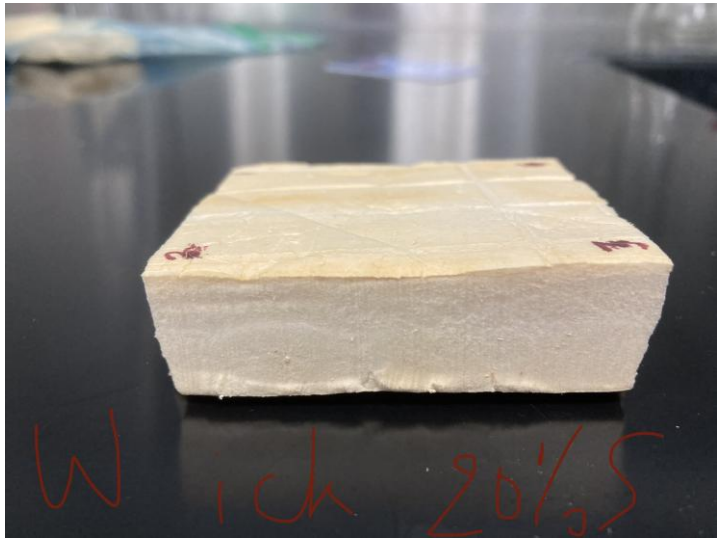
↓

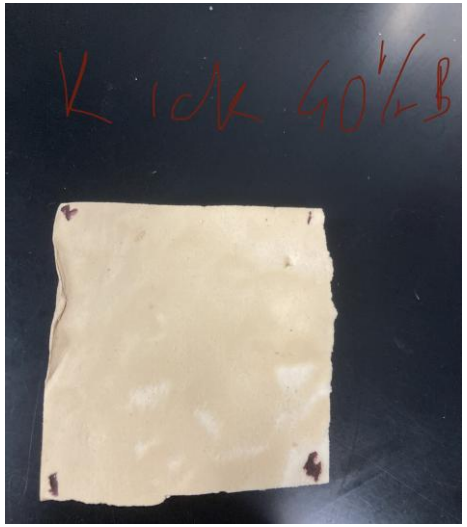
Take photos of the sides, corners, and center

Measure mass and thickness after shipping and after the experiment gets over



3 measurements at each corner, side and center for all sheets





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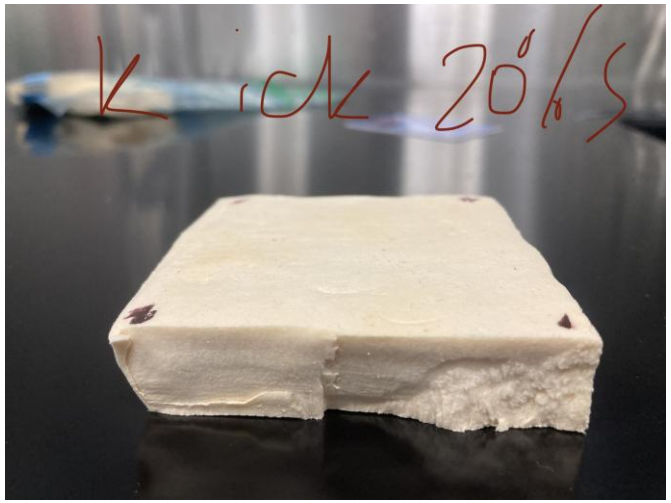
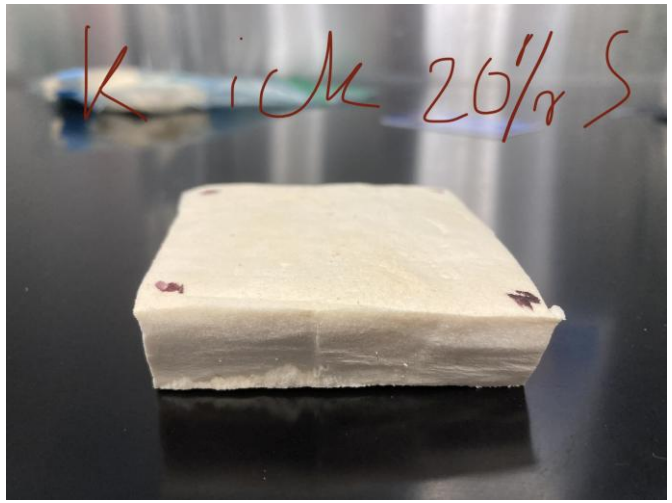
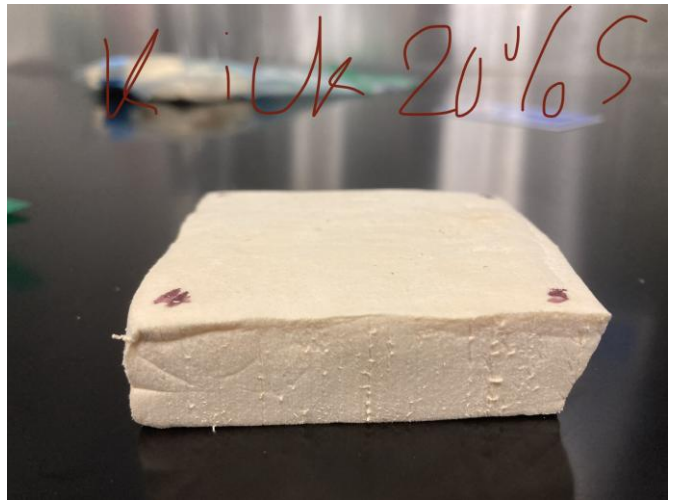
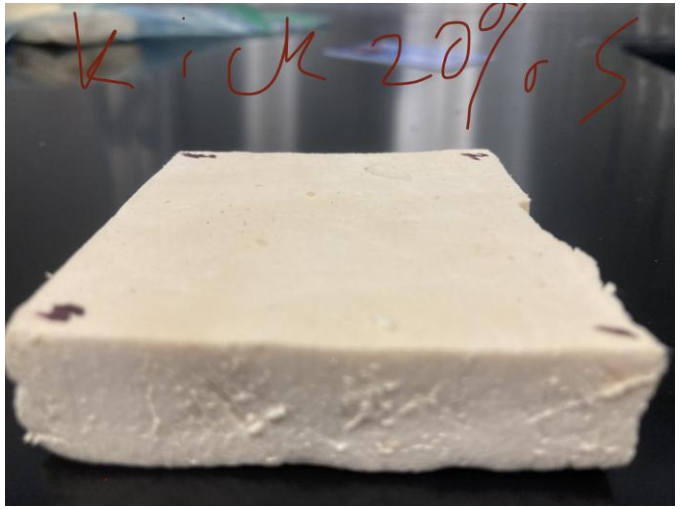
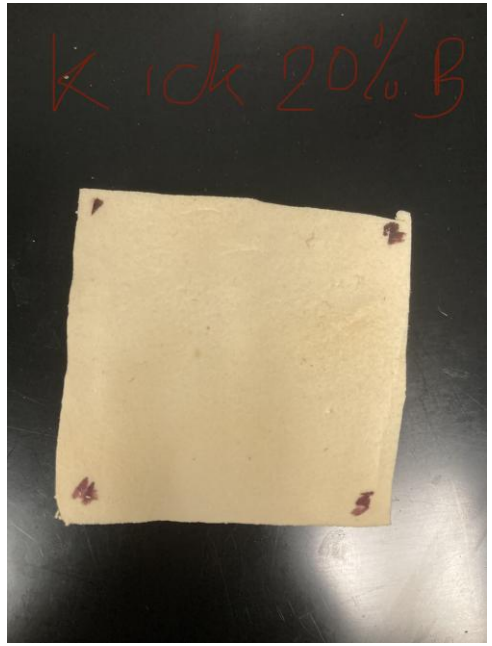
Thick membrane

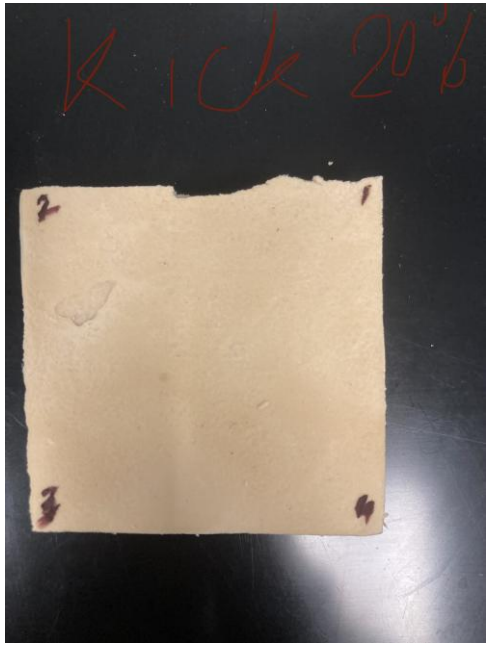












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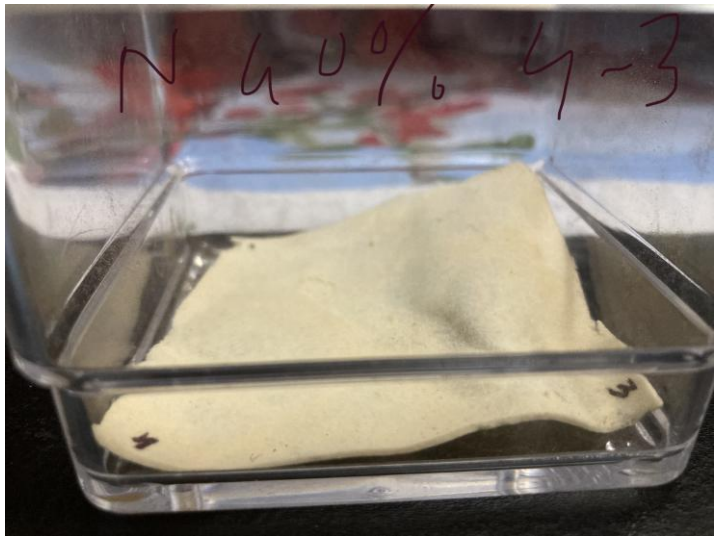
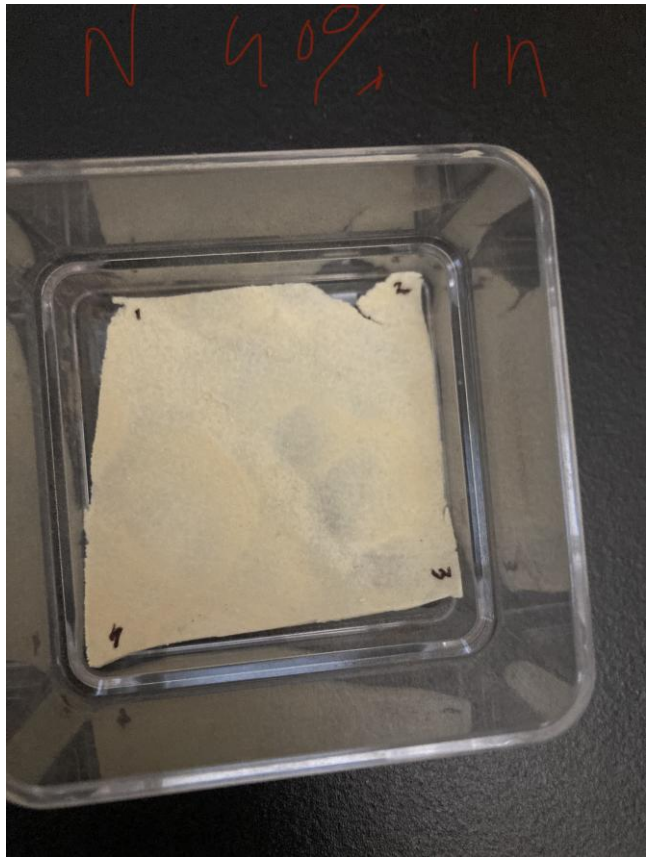
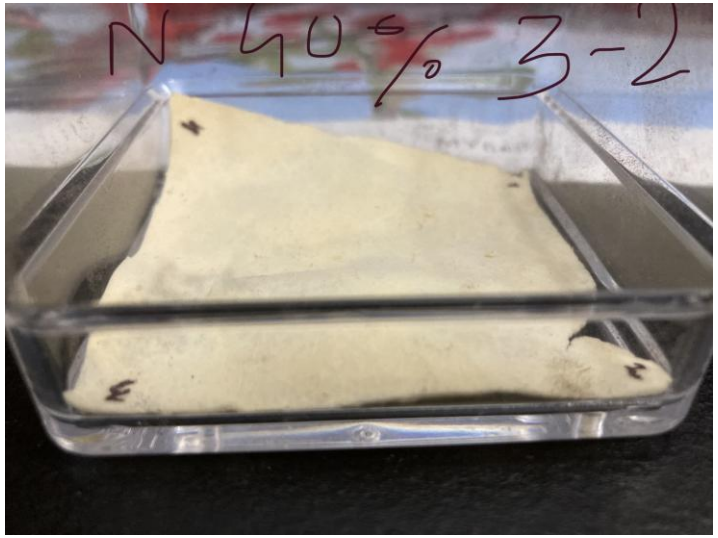
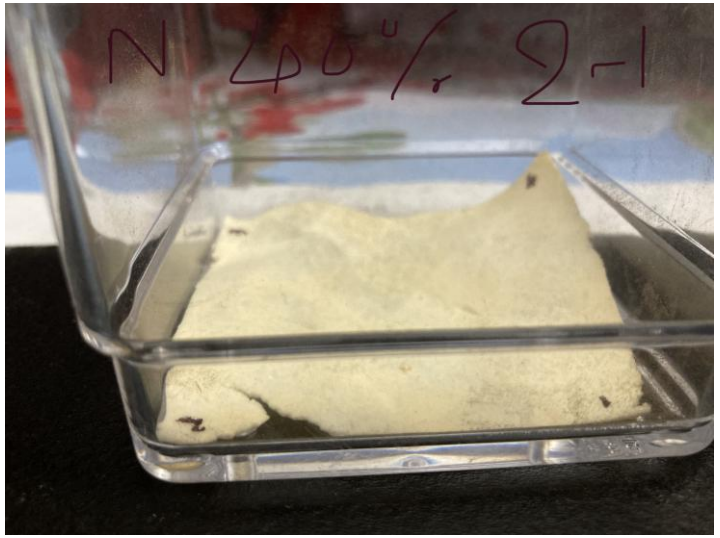
Thin membrane









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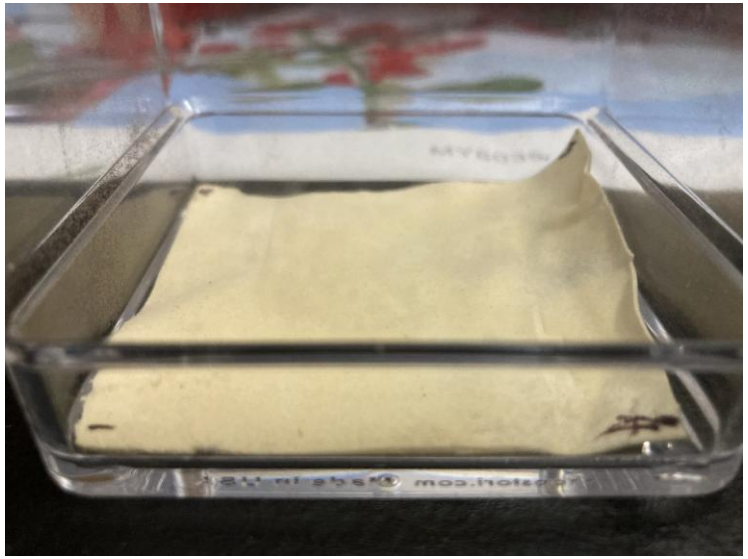
Tray arrangement

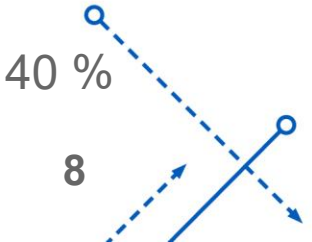


Place the mycelium carefully to avoid dirt going below the mycelium in the tray

Arrange all sheets in an oriented manner according to the labeling, following the numbering on mycelium – 1-2, 2-3, 3-4. 4-1, take images in a similar manner every day

20 %

40 %



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Tray arrangement

If you are not home for a few days, keep the trash bag on the tray arrangement to maintain the humidity

Record Temperature, pH and maintain the humidity for each tray

20 %

40 %

Wait till equilibration of humidity is attained for the first experiment.

Analysis

- Photos
- Weight
- Thickness
- Image J to determine the area covered by the mycelium membrane to see if it is degrading
- Timelapse of all the images to check if they overlap/ degrade.

Other groups can send the images to Dr. Nalam's group for post-imaging analysis.

Post-processing of images in PowerPoint

- Click on the Image
- Remove the **background** (to remove unnecessary things)
- Picture Format: **Corrections:** 40 % Bright, 20 % contrast (for uniformity)
- *Left-click format picture:*
- **Sharpness:** (100 % to observe all features)
- **Brightness:** 58 % or more (to see a clear image)

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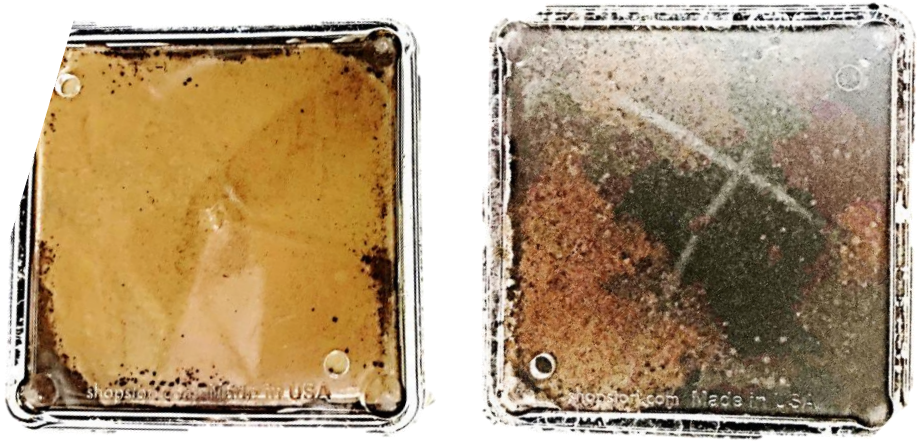
Images on first and the last day

19th May

16th June

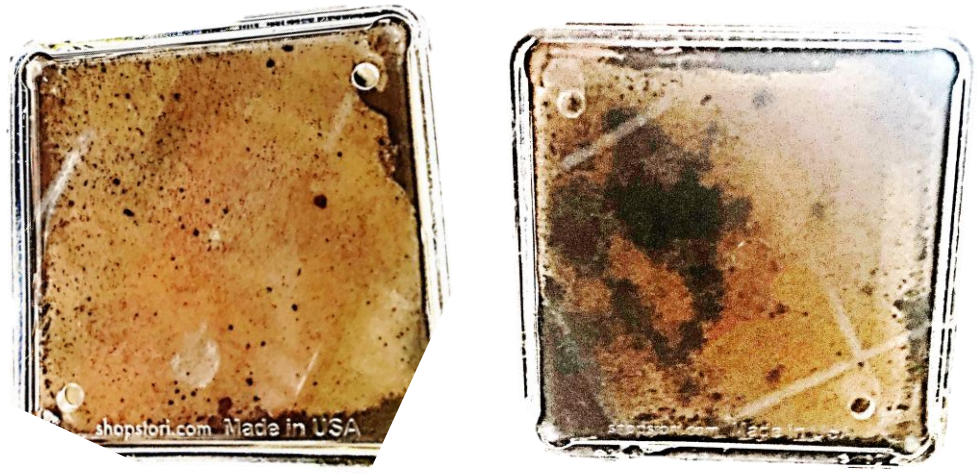
20 %



19th May

16th June

40 %



29 days to degrade mycelium

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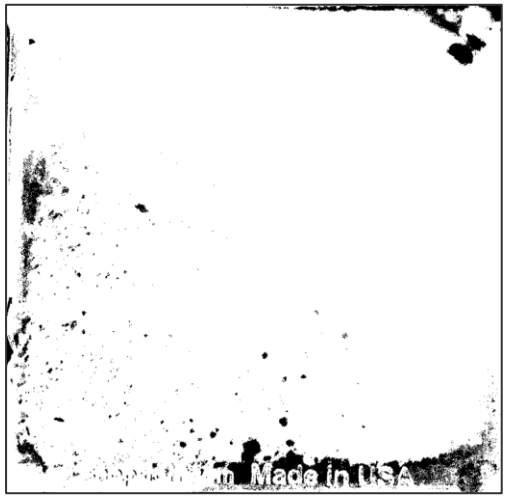
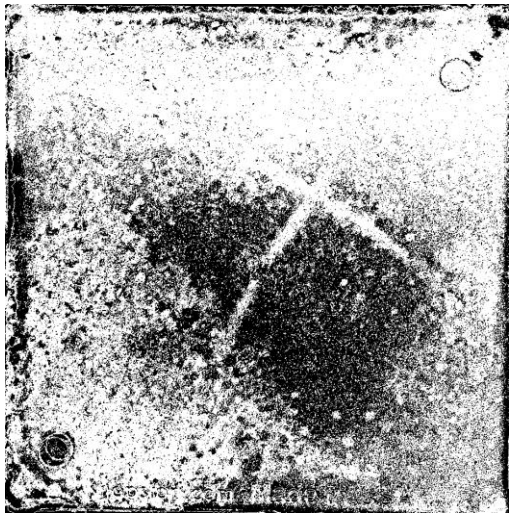
Area % degraded analyzed through Image J

20 % Humidity Day 2



Area % : 96.05 %

20 % Humidity Day 27



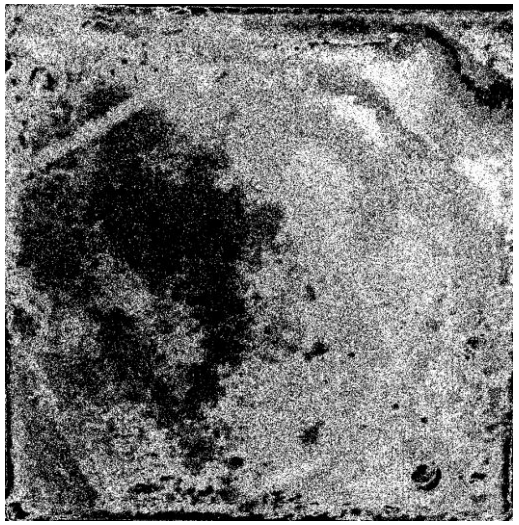
Area % : 69.05 %

Change in Area % : 27 %

40 % Humidity Day 3

Area % : 90 %

40 % Humidity Day 21



Area % : 63.17 %

Change in Area % : 26.83 %

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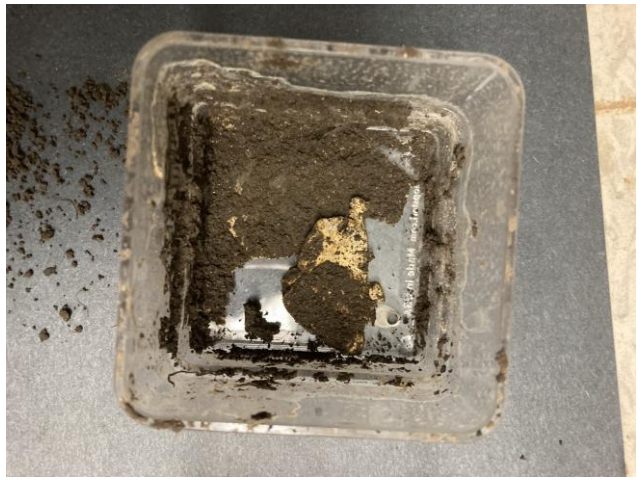
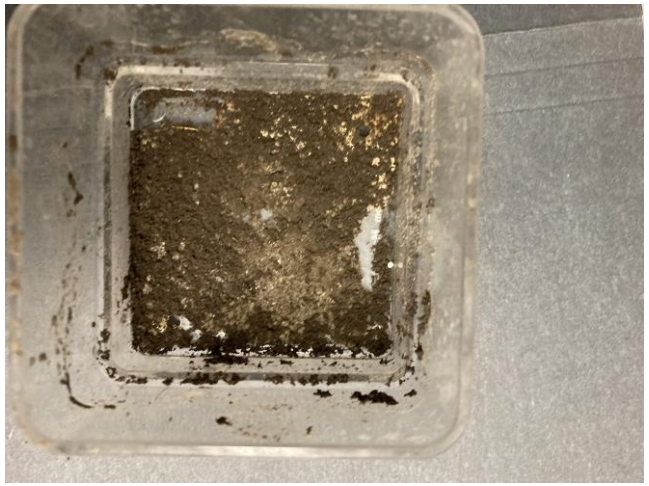
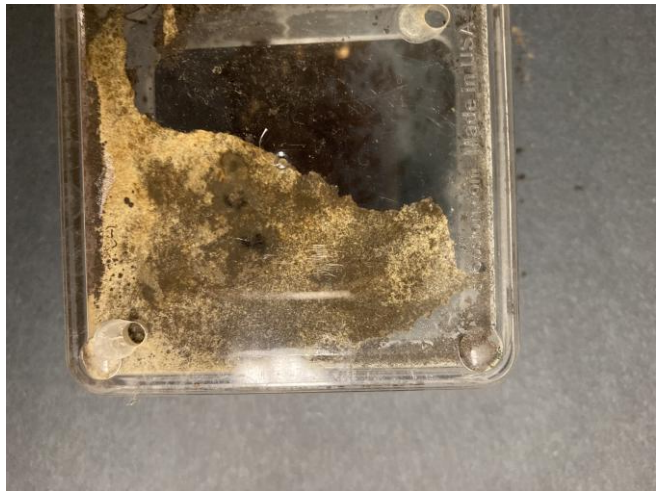
Images of mycelium taken out of soil

20 % After 5 days: dried soil



40 %



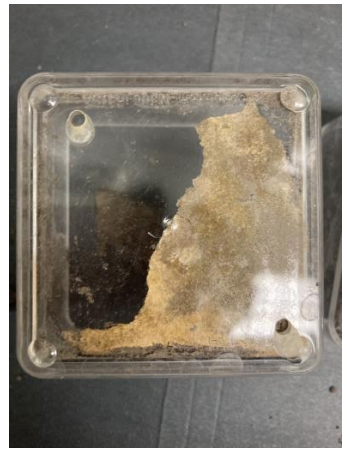


Mycelium was broken during removal from the soil. Let the soil dry for more days. Also remove very carefully as it's extremely sensitive, also it is stuck after the experiments to the tray.

No biological growth is observed.

After 7 days

20 %



40 %

The soil is completely dried

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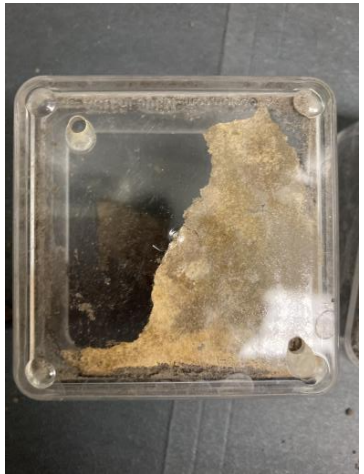
Images of mycelium taken out of soil

20 %



Mycelium has the property to stick to the soil and the plastic tray, the soil is completely dried, but mycelium will remain attached to it. Due to the thin membrane, it is difficult to take it out of the tray, it has a very high sticking property to the tray

40 %

Attempts made to tap the tray, peel the mycelium by a sharp object, but it breaks

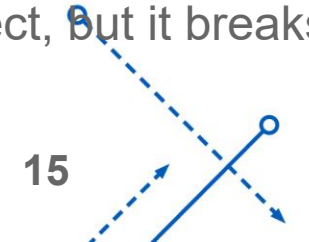


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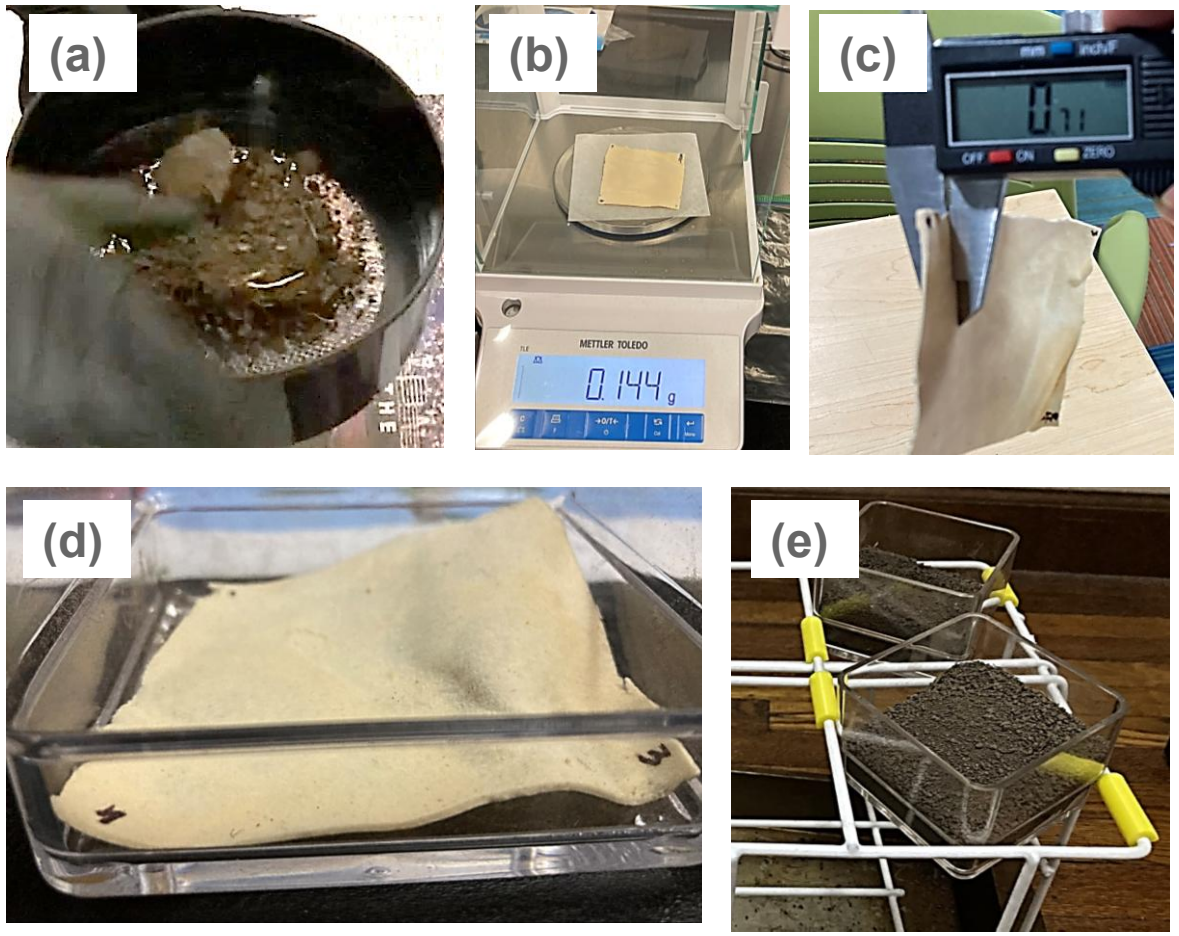
Figure 1 in manuscript



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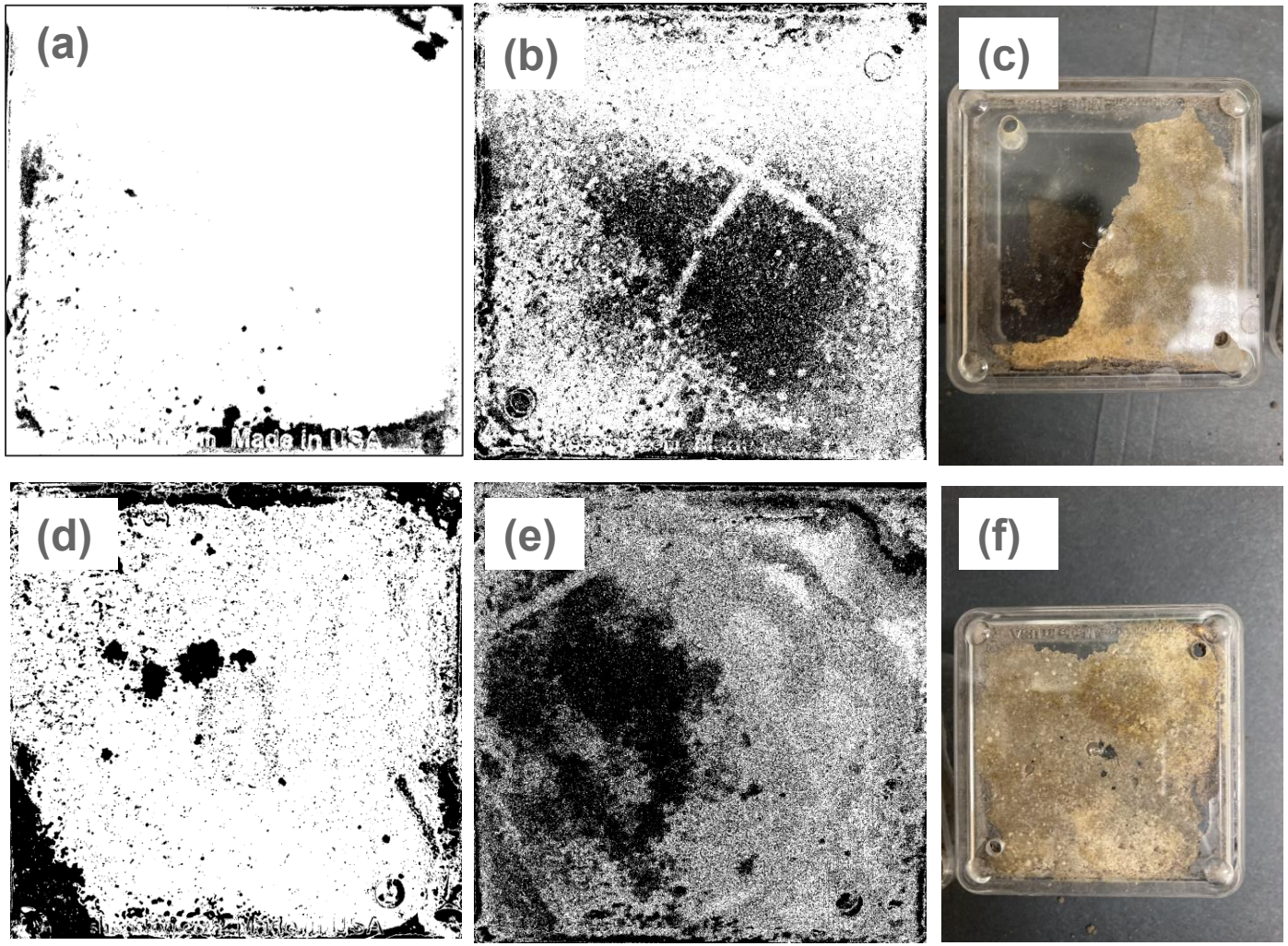
Degradation 20%



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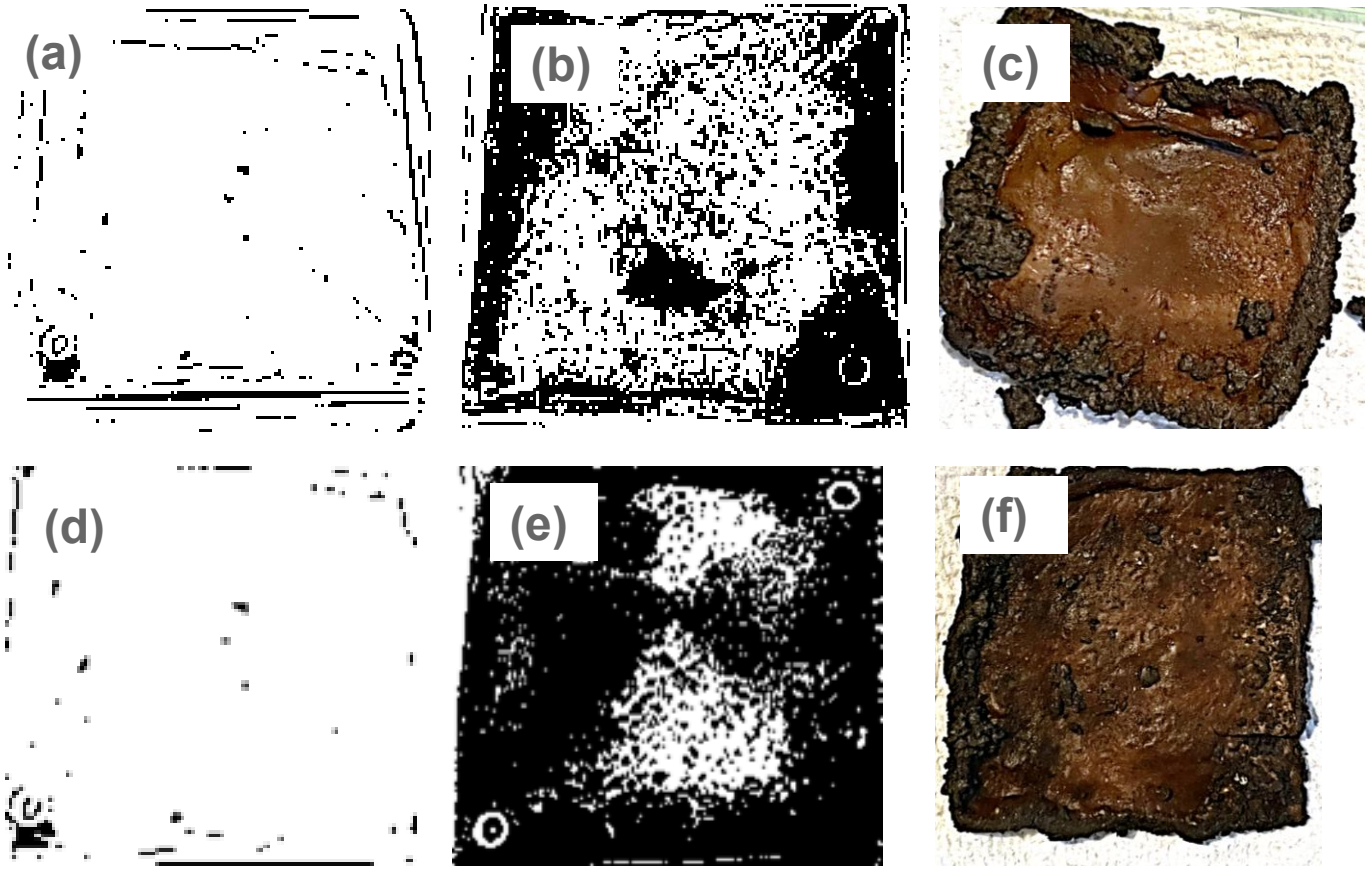
Degradation 40%



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16900

11827