FUNGAI

AI-Guided Mycelium Moulding and Performance Testing for Sustainable Construction Applications

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Date: 16/01/2025
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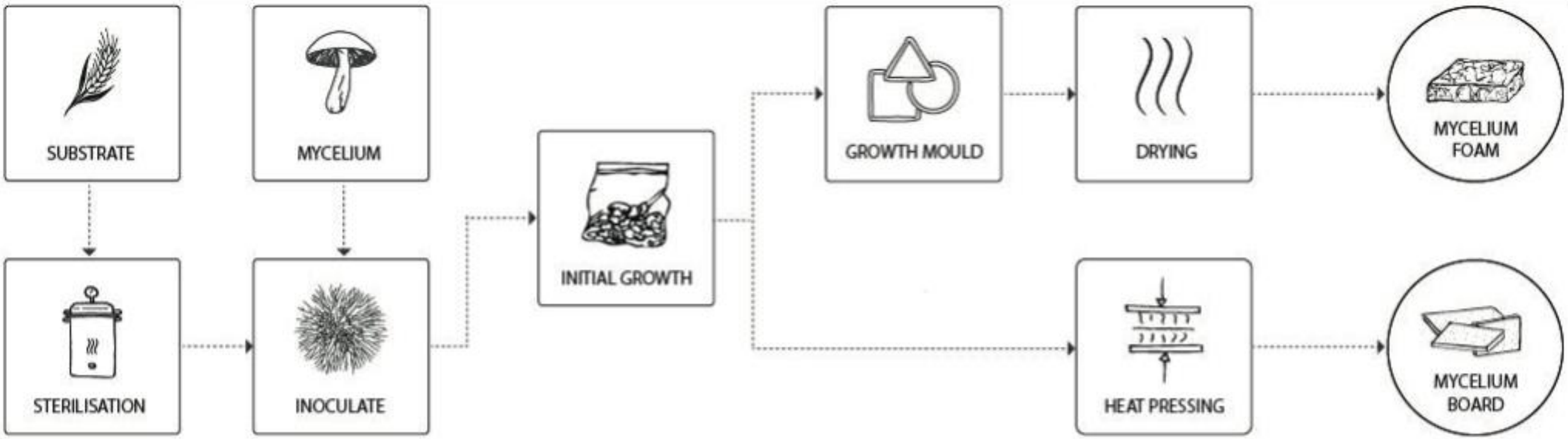
Introduction



The construction industry heavily relies on non-renewable resources, causing significant environmental harm. Mycelium bio-composites present a sustainable, biodegradable alternative. However, scaling production with consistent quality remains challenging. The FungAI project integrates AI to optimize growth monitoring, reduce variability, and enhance material performance for construction.

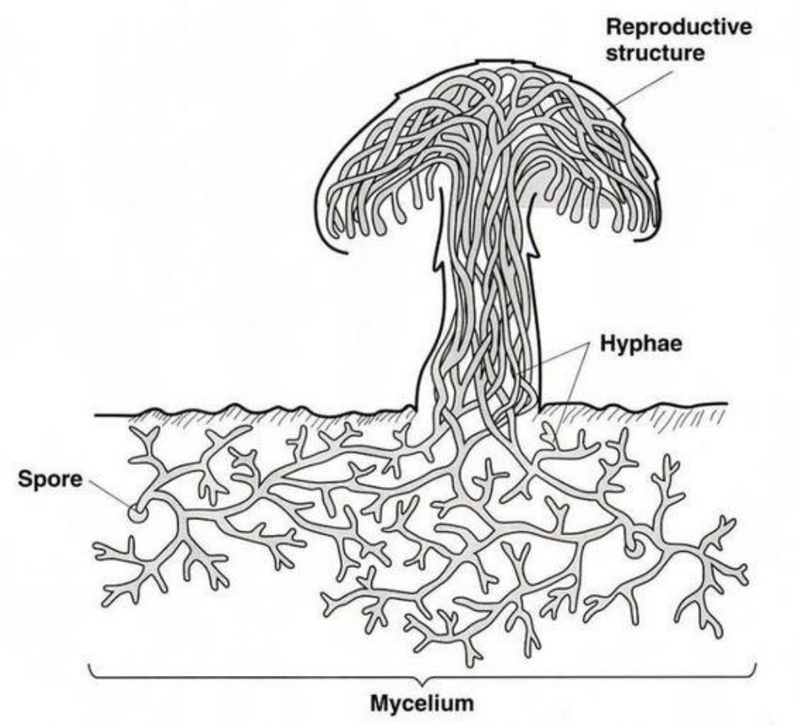


Figure 1: Mushroom Growth – IAAC BLOG

Methods

Figure 2: Liquid inoculum and mycelium moulding

Sterilized malt extract broth (121°C, 25 minutes) was blended with colonized Ganoderma resinaceum petri dishes to create a liquid inoculum.
The inoculum was evenly mixed with sterilized rapeseed straw substrate.

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Substrate was transferred into sterilized 10x10 cm molds and covered with perforated foil.
Samples incubated at 30°C were inspected daily for contamination and growth.

High-resolution images captured top and bottom views of samples.
Metadata (dimensions, incubation days) was cataloged for AI training.

Compression Testing: Samples compressed to 1.5 cm to determine maximum strength via real-time pressure graphs.

Moisture Absorption: Samples placed on tape platforms above water in sealed containers for 24-48 hours, then weighed to assess water retention.

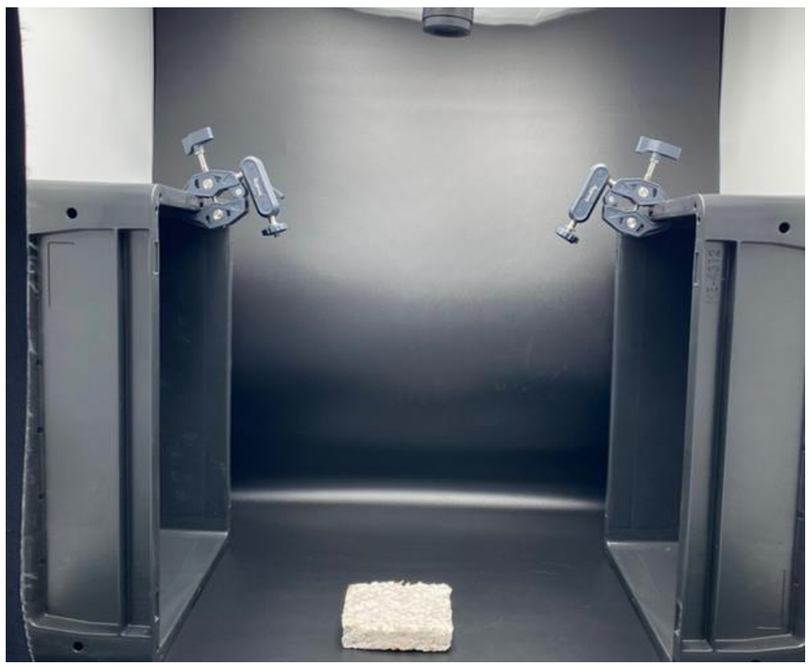

Figure 3: Photographic Set-Up

Conclusion

The FungAI project showcased AI's potential to revolutionize mycelium production, improving scalability and quality control. This innovation paves the way for incorporating sustainable materials into construction.

Recommendation

- Expand datasets for better AI precision.
- Enhance sterilization to minimize contamination.
- Automate imaging for efficient data collection.

References

https://www.researchgate.net
https://www.mnext.n
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