

A Study on Mechanical and Physical Properties of Mycelium-Based Composite Derived from Thai Oyster Mushrooms for Green Building Materials and Bio-Degradable Packaging

Composite Materials & Lightweight Structures Group
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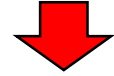
JFS Matchmaking Event
15.02.2024



First name: Pimpet
Last name: Sratong-on

Biography

2007 Enrolled in Automotive engineering (AE), TNI



2011

- Bachelor degree of AE, TNI
- Enrolled in Master of Engineering, TNI
- Lecturer, TNI



2013

- Candidate of MEXT scholarship (Research student) recommended by Tokyo Tech



2014

- Innovative & Engineered Materials (Master course), Tokyo Tech



2016

- Enrolled in Doctoral course in Tokyo Tech



2017

- Researcher, BCMaterials, Spain (1 Month, Tokyo Tech scholarship)



2019

- Doctoral degree, Tokyo Tech

Thai-Nichi Institute of Technology (TNI) since 2007

- Private university with supported by Japanese companies and Thailand-Japan Promotion Association (TPA)

- We have three main faculties

- Business Administration
- Information & Technology

- **Engineering**

 - Automotive

 - Computer

 - Industrial

 - Electrical

 - Robotics

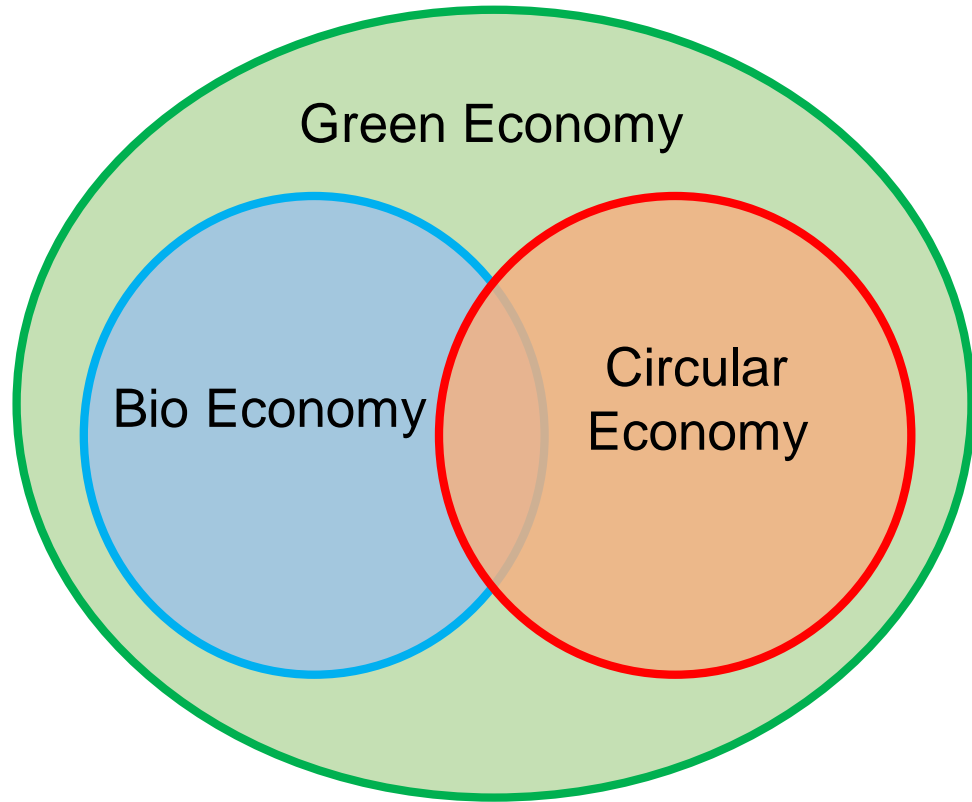


TNI



Our lab (since Jan. 2023)





Bio Economy: Eco-friendly materials

Circular Economy: Efficient utilization of resources

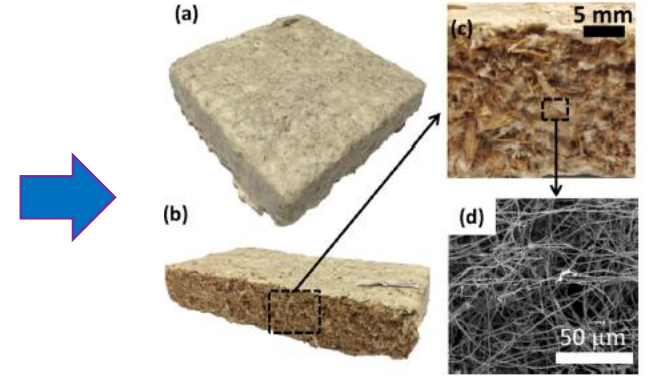
Green Economy: Low carbon

Fungi of mushroom
"Mycelium"



M.R. Islam et al. *Sci. Rep.* (2017)

MBC



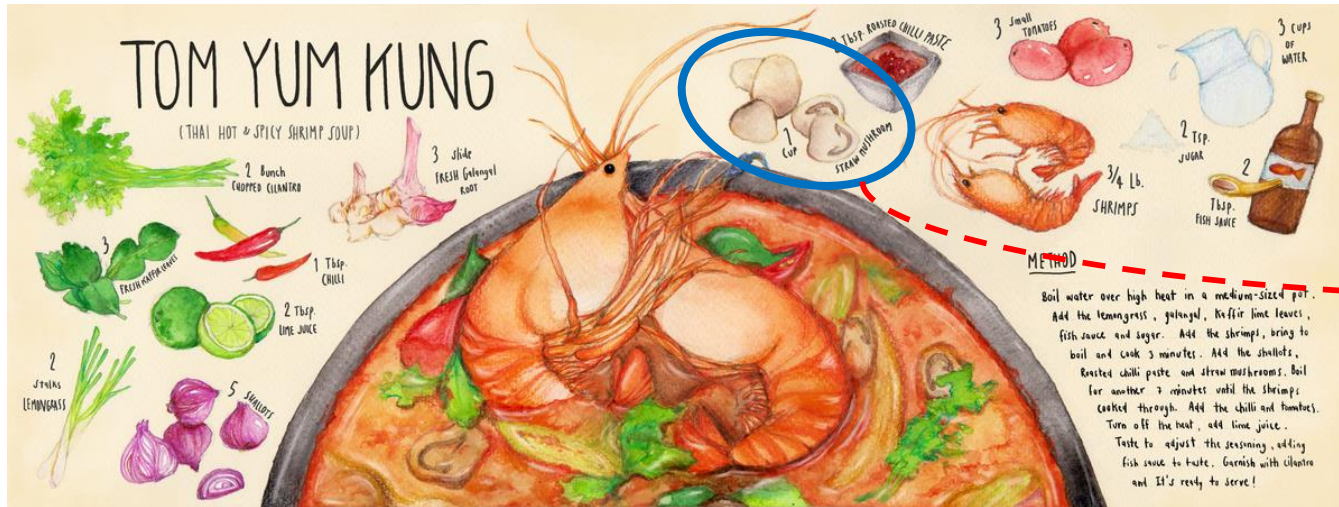
M.R. Islam et al. *J. Mater. Sci.* (2018)

Mycelium grows on agro-wasted materials

- Upcycling agricultural wastes
- Low carbon emission in entire life time

MBC comes from nature and decomposes in nature





Mushroom is the main ingredient in Tom Yum Kung!

Indian oyster mushroom is ready in the whole year in Thailand

Mushroom species in Thailand (Tropical countries) are abundant

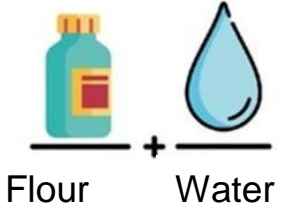
Fabrication process in our lab



Substrate Preparation

- Agro-waste
- Sawdust
- Coffee grounds
- Rice husk

Additives



Mycelium



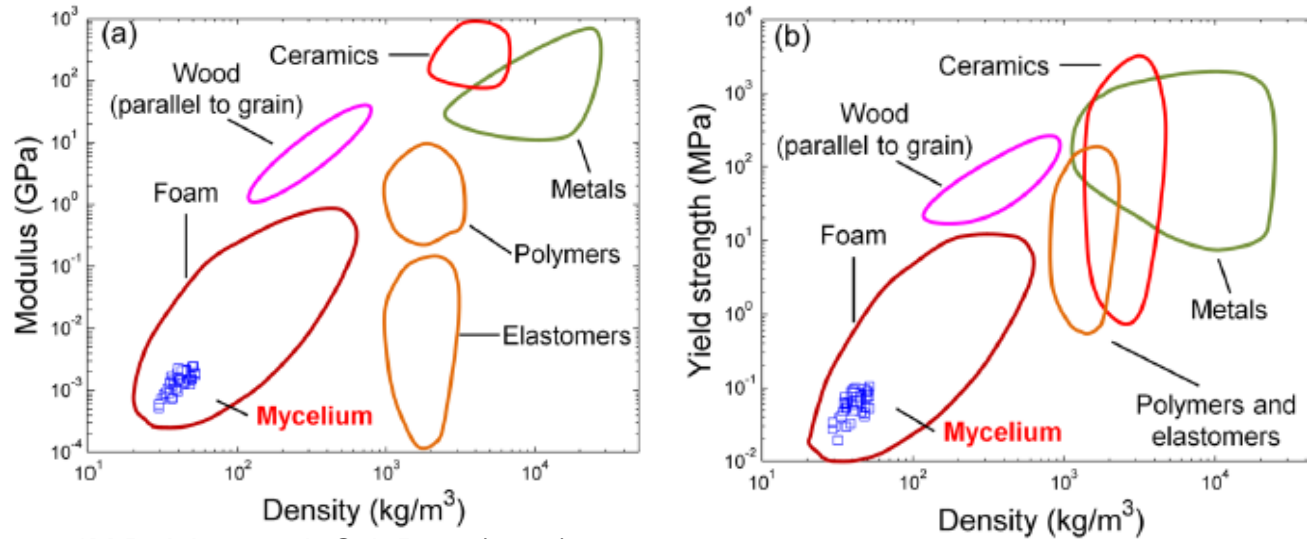
Final MBC from our lab

Indian/Thai Oyster

King Oyster

Our MBC is under mechanical, physical properties tests

Mechanical properties*



*M.R. Islam et al. *Sci. Rep.*, (2017)

Potential applications

- MBC can be used as biodegradable foam

Pain point

- MBC strength is in few MPa
- How it can be made in mass production scale

Idea

- Change substrate



- Add natural binder



Gum Arabic

Food waste?
Eggshell
Shrimp shell

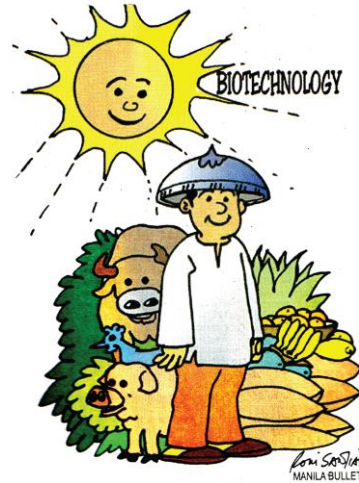
- Using 3D Printer



Come and Join with us!!!

If you are in the field of....

- Chemical Engineering
- Architecture
- Biotechnology
- Mechanical Engineering
- Related fields



What do you get?

- Opportunity to try to grow the numerous mushroom species in Thailand and develop as MBC
- More agricultural waste in Thailand
- Explore Thailand!!

We can share....

- An idea to develop MBC in the large scale
- More digital technology to produce MBC using green technologies
- Design MBC for construction materials



We are welcome the partners who are interested in growing MBC!!! (*email: pimpet@tni.ac.th*)