

Researchers:

DR. HUSNUL AZAN TAJARUDIN
Dr. Muaz Mohd Zaini Makhatar
Professor Dr. Rokiah Hashim

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▶ **TRADE SECRET (TS/IO/2019/050)**



Figure C.1 : Control in rubber wood decay test by white rot fungus, *P. chrysosporium*

NON TOXIC NATURAL WOOD PRESERVATIVES: A NOVEL WASTE DERIVATIVE

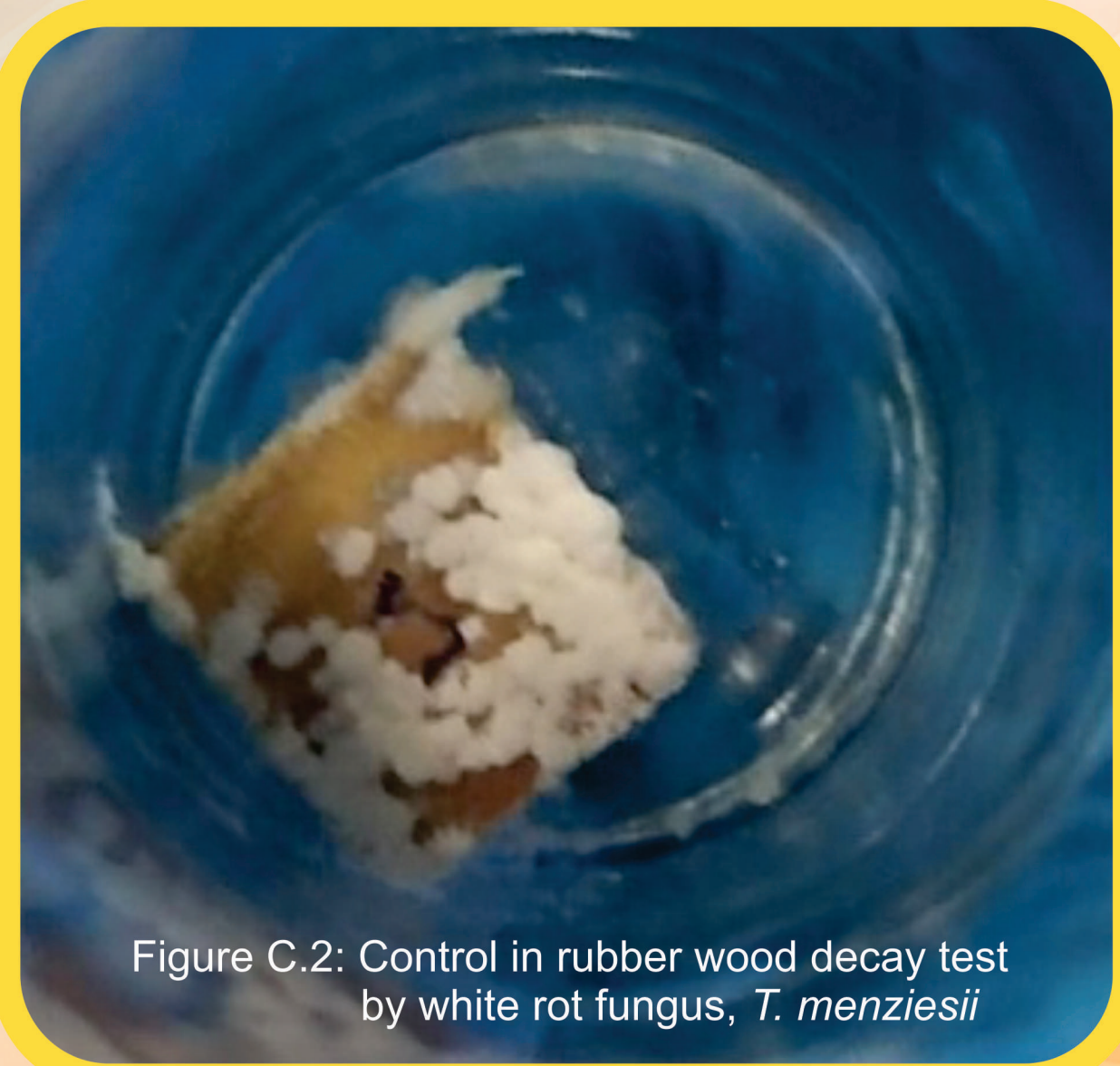


Figure C.2: Control in rubber wood decay test by white rot fungus, *T. menziesii*



Figure C.3: Control in rubber wood decay test by white rot fungi



Figure C.4: Control in rubber wood decay test by brown rot fungi

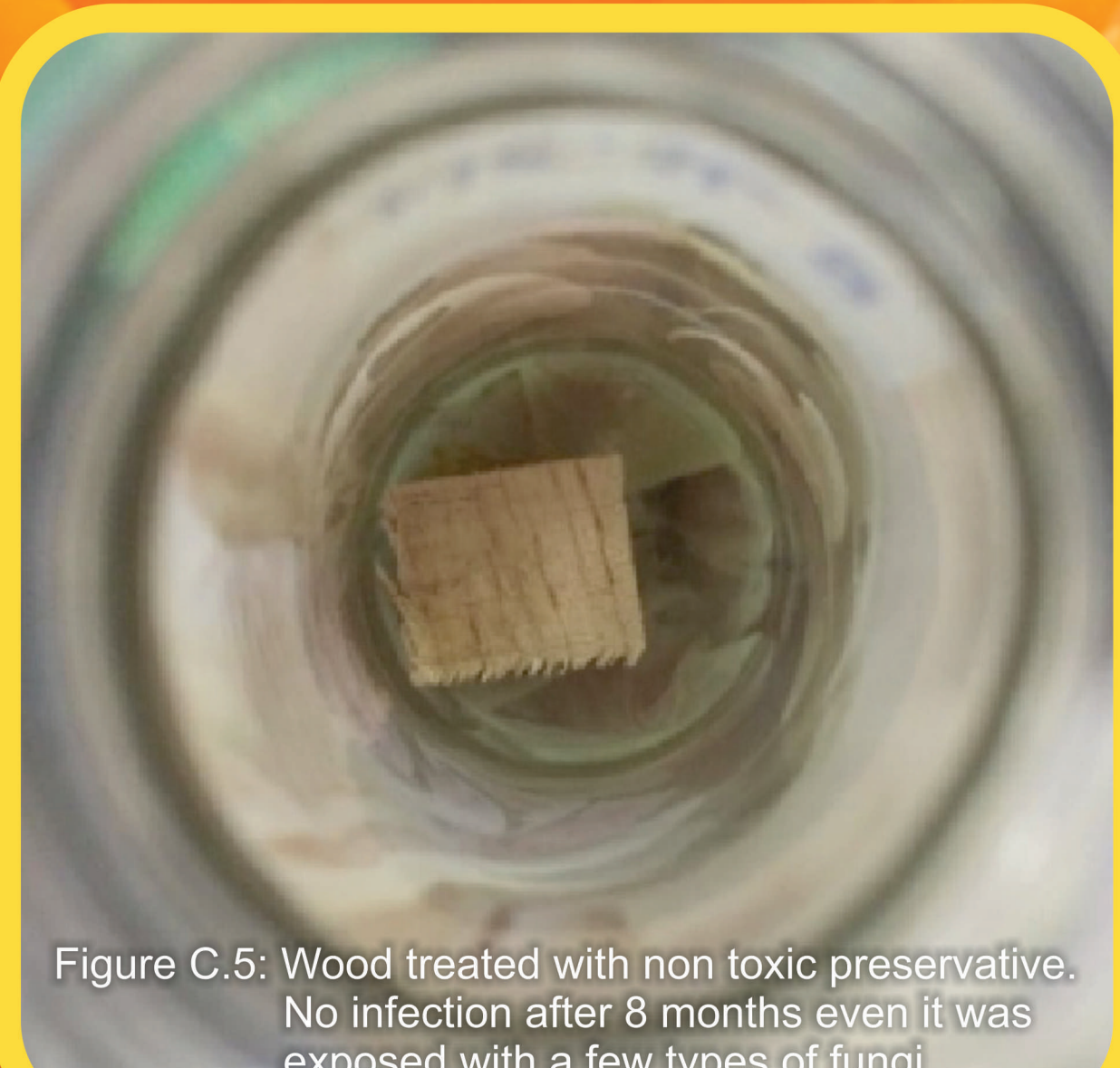


Figure C.5: Wood treated with non toxic preservative. No infection after 8 months even it was exposed with a few types of fungi

Introduction and Problem statement

- Wood industry needs preservative to protect and increase quality of their products.
- Most wood preservatives in the current market are toxic to human, animal and environment. A few countries have banned those preservatives and they replace oil to protect the wood. However, oil is expensive and just protect the surface area.
- Most preservatives can lead to a decrease in the strength of the wood.
- Most wood preservatives are expensive and are derived from petrochemical and mining industry, and hence, it is unsustainable.

Novelty & Inventiveness

- A process to produce useful chemicals from leachate via biological process.
- A method to extract useful chemicals from fermented leachate.
- A technique and method to convert useful chemicals to act as a preservative to natural wood.

Applicability

- Replace harmful preservative to treat fresh wood
- To treat furniture which is infected by fungus and this preservative is non-toxic to human/animal/environment and is sustainable.

Product/Technology Readiness

- TRL 5
- R&D- 100% completed
- Up scaling-100% completed
- Ongoing commercialization effort with industry/partner to the product.

Research Achievement

- 6 journal papers have been published (ISI and Scopus)
- 2 published books (Springer and USM publisher)
- Talent Development : 4 MSc students
- Grant - 1 FRGS grant (RM 79K-2014), 1 PRGS (RM 135K-2015), 1 RUI (RM 145K-2015) and 1 DIA (RM 26K-2019)

Intellectual Property

- Patent filing: A process for the production of acetic acid and butyric acid (PI 2015704214)
- Copyright: Separation Acetic and Butyric Acid by Activated Carbon (October 2018)
- Trade secret: Process of convert acetic and butyric acid to become wood preservative.

Commercialization Potential

- Opteraz Sdn Bhd

Level of Impact

- In line with Sustainable Development Goal (SDG)'s policy - SDG 6 Clean water and SDG 12 Responsible consumption and production
 - *This project is beneficial to the community because it reduces the exposure of community with carcinogenic material.
 - * This project is beneficial to the country because it reduces the pollution in the environment and it has potential to support the economy.

Presentation and Other Strength

- Most preservative will reduce (5%-15%) strength and structure of wood. However this preservative will increase strength and structure of wood by almost 5-15%.
- This preservative is not harmful to human, animal and environment.
- Derive from leachate - price is cheaper than current preservative in the market.

Contact Person:

DR. HUSNUL AZAN TAJARUDIN

School of Industrial Technology, Main Campus
Universiti Sains Malaysia, Penang, MALAYSIA

Tel: +604-653 6194 Fax: +604-653 6375 E-mail: azan@usm.my