

Kombucha SCOBY

 **Lee Kuan Yew**

ITE College East

Technology Award

Joshua Yeo Zhi Herng
(Group Leader)

Cyndi Tay Xin Lin

Choo Jean Yan Jeneil

Higher Nitec in Bio-Chemical Technology



Turning Tea Waste into Leather

Traditional leather and synthetic substitutes have major environmental drawbacks, including chemical pollution and microplastic waste.

To combat this, the team used Kombucha SCOBY, a by-product of tea fermentation, to create a sustainable leather-like material, enhanced with natural oils and food-grade dyes.

They also tested coffee grounds and sugar cane pulps as substrates, showing how food waste can be turned into useful materials.

Innovators' Inspiration

"Working on this project changed the way we see everyday materials. We realised that something usually thrown away, like excess SCOBY from kombucha fermentation, could be transformed into a useful and sustainable product. It taught us that innovation does not always mean creating something entirely new, but also in seeing new possibilities in what already exists and using science to give it a second life."

- Joshua Yeo Zhi Herng

What's So Special?

- The production process is environmentally friendly and does not involve harmful tanning chemicals typically used in leather manufacturing.
- Tests with mealworms suggest that the material can break down naturally, reducing long-term environmental impact and encouraging composting.
- The material is highly versatile, with its thickness, colour, and texture customisable during production, allowing it to be used in applications such as fashion accessories, upholstery, and packaging. Its high strength also makes it a sustainable alternative to plastic bags.
- The team developed a functional prototype in the form of a purse, lined with fabric for added durability and structure, which remained flexible and intact after four months.