Bio-based Packaging from Lotus Cellulose

Manoi, Theeraphat
Wongthongsiri, Kannikar
Sonprasom, Yutthasat
Thorarit, Rittikun

Foam and plastic packaging's for food are known to cause health and environmental problems from traditional foam and plastic packaging's. Lotus leaves have been used in old time food packing in many Asian Cuisines. Lotus is generally grown for its flowers. Its leaves are known to contain anti-bacterial property. This project aimed at utilizing the lotus stalks and leaves to produce material for environmental-friendly food packaging. Cellulose was extracted from lotus stalks by boiling in NaOH solutions at concentrations of 5%, 10%, and 15%. It was found that the cellulose obtained from boiling lotus stalks in a 10% NaOH solution was the least rigid while still maintaining optimal tensile and tear strength. Lotus leaf extract tested for anti-bacterial property was also prepared. After the cellulose was moulded as food containers, they were coated with mixture of corn flour, mung bean flour, TiO_2, and lotus leaf extract at a ratio of 6:6:1:2 which was found to yield best result in increasing the tensile and tear strength up to ten times higher than that of foam. The coating increase the durability of the container and food can be stored longer than 24 hours in its original condition without adding preservative.It is biodegradable, has a low production cost, and is resistant to acids, alkaline, oil, and water. This bio-based packaging is a potential environmental friendly product which can be further improved and used in long term storage and distance transport.

Awards Won:

Third Award of $1,000