

Complex mechanics of cellulose composites revealed

January 10 2023



From cellulose to composite materials. Credit: KhengLimGoh

An international team of researchers, led by Assistant Professor J

Naveen (VIT, India), has finally completed and published a comprehensive survey of the complex structure of the natural fibers embedded in and reinforcing polymer composite materials.

These natural fibers contain nanocellulose, which is one of the most important green materials because of its abundance, high aspect ratio, improved mechanical capabilities, renewability and biocompatibility.

The review mainly covers the effects of different properties of nanocellulose on the mechanical properties of nanocellulose-based multiscale composites, the classification of nanocellulose structures, extraction of nanocellulose, and mechanical properties of cellulose-based multiscale composites such as tensile, flexural and impact, followed by the applications of nanocellulose-based multiscale fiber reinforced polymer composites.

Importantly, the [survey](#) revealed that there is an increasingly strong demand in the industry for an efficient alternate material to man-made synthetic materials with superior mechanical properties. Nanocellulose-based multiscale composites can be an efficient alternative to meet the UN [sustainable development goals](#), such as SDG 12 on responsible consumption and production, without compromising performance.

The work has been published in *Polymer Composites*.

More information: Viswanath Ganapathy et al, Mechanical properties of cellulose-based multiscale composites: A review, *Polymer Composites* (2022). [DOI: 10.1002/pc.27175](https://doi.org/10.1002/pc.27175)

Provided by Newcastle University in Singapore

Citation: Complex mechanics of cellulose composites revealed (2023, January 10) retrieved 18 April 2024 from

<https://phys.org/news/2023-01-complex-mechanics-cellulose-composites-revealed.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.