

# Review of: "Investigation of Mechanical Properties of Sisal Fiber and Sugar Palm Fiber Reinforced Hybrid Composites"

Carlos Toshiyuki Hiranobe<sup>1</sup>

<sup>1</sup> Universidade Estadual Paulista

**Potential competing interests:** No potential competing interests to declare.

The work represents another contribution in the field of composite materials. It is a research study that employs a resin matrix, using a mixture of fibers as a filler to obtain a hybrid composite. The authors conduct mechanical tests, such as tensile strength, Izod, and impact, in addition to water absorption analysis. However, the authors could broaden the tests by examining the structural and thermal properties of the new composite.

I suggest that the authors review the following points:

1. In the introduction of the following paragraph: "In recent days, composite materials ..... the hybrid fiber-reinforced composite is designed to improve thermal and mechanical properties." A bibliographic reference should be included.
2. In the introduction of the following paragraph: "The focus on natural fibers is increased as ... an elaborate literature survey has been carried out." A bibliographic reference should be included.
3. In the introduction of the following paragraph: "Common failure modes for the bast fiber-reinforced composite ... while delamination was reported as the major failure mode for the hybrid composite." A bibliographic reference should be included.
4. In the Materials and Methods section, there is a lack of mention regarding the specifications of the epoxy resin used in the study.
5. In the Materials and Methods, why was the ratio of 70% resin and 30% hybrid fibers chosen? Why did the authors not work with reference composites (70% resin + 30% sisal fiber and 70% resin + 30% sugar palm fiber)?
6. In the Materials and Methods, I suggest conducting, in addition to the analyzed mechanical properties, an analysis of the composites' hardness, abrasion resistance, and scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDX) of both the fibers and the new composite. This is particularly useful in materials studies for the identification and quantification of the sample's chemical composition.
7. In the Materials and Methods, I suggest conducting additional tests on the thermal properties of the composites, such as thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC), which are essential techniques for studying the thermal properties of composites. TGA evaluates thermal stability and decomposition of components, while DSC examines thermal transitions, such as melting and crystallization. These techniques identify incompatibilities between components, assist in optimizing manufacturing processes, and ensure quality control by monitoring consistency and variations in thermal properties over time. In composites, TGA and DSC analyses provide crucial insights for the development and application of these materials.

8. After the analysis of the results, what would be the application of the new hybrid composite?
9. In the bibliographic references, although they come from recognized and current journals, the use of only 10 references for this article is quite limited. Furthermore, I suggest including the Digital Object Identifier (DOI) code for each reference.