

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

Rosário Veiga¹

¹ National Laboratory for Civil Engineering

Potential competing interests: No potential competing interests to declare.

Investigation of Mechanical Properties of Sisal Fiber and Sugar Palm Fiber Reinforced Hybrid Composites

Review

The article is about the adequacy of vegetable fibres as reinforcement of hybrid composites with a resin matrix, namely, to obtain appropriate mechanical characteristics, such as tensile strength, flexural strength, and impact strength, for several industrial applications.

The theme is interesting, and methods and materials seem well selected. However, there are several issues that must be corrected before acceptance for publication, which are detailed in the following comments:

Introduction

Page 3/15, first paragraph: "The hybrid composites were aged in seawater for 50, 150, and 300 days at temperatures ranging from 20 to 40 degrees Celsius." Why is the accelerated ageing done in seawater?

Page 3/15, second paragraph: "Common failure modes for the bast fiber-reinforced composite include fiber pull-out, fiber fracture, and matrix cracking, while delamination was reported as the major failure mode for the hybrid composite." This sentence is repeated in the text.

Page 3/15, last paragraph: "Patrick Ehilmoisili et al., [8], investigated the hybridization of microwave-treated plantain fibres with MWCNT". What is MWCNT? You should write in full text the first time an acronym is used.

Materials and Methods

Some information is provided concerning the fibers and their treatment, however, nothing is said about the resin. Please provide adequate information about the composite matrix.

There is some information about the treatments given to the fibres, but they are not detailed enough, and they are not justified: Why treatment with NaOH?

Page 9/15, Impact Test – "the specimens were notched". How were they notched, and what were the local and dimensions? Can you provide a photo of the test and the notched specimen? By the description, it is difficult to understand.

Page 10/15, first paragraph – “Five specimens from each fiber volume fraction with dimensions (152mm× 152mm × 5mm) (tensile samples) and (152mm× 152mm × 5mm) (flexural samples) were cut”, Are the two types of specimens (tensile and flexural) with the same dimensions? I don’t think so... and they are not in accordance with those defined in Figure 7. This must be clarified.

Results and discussion

Page 10/15, tensile strength – “The commonly used specimen for the tensile test is the flat bar type. “This is not in accordance with Figure 7, where the specimen represented is bone shaped.

Additionally, why do you describe the specimens in Results if they are already defined in Materials and Methods, which seems more correct?

“Sample-1, with 10% sisal and 20% sugar palm hybrid fibers, gives the least value of tensile strength of 50 N/mm², and the highest tensile strength of 76 N/mm² for sample 3, which contains 15 % of sisal and 15 % of sugar palm fiber. The Sample-2 hybrid composite shows 65 N/mm² of tensile strength, which contains 20 % sisal and 10 % sugar palm fiber.” These values are not in accordance with those referred to in the Abstract. Additionally, the value given in the Abstract for the best tensile strength is 6.67 N/mm² (for a sample that seems to be sample 2), which is much lower than all the values registered in Figure 8. This is most confusing.

In Figure 8, you could signalize the ultimate tensile strength and the rupture point.

Pages 12-13/15, Water absorption – “The specimens were submerged for 4 days. “Why didn’t you extend the text until constant mass, or until maximum absorption? As it is, it is difficult to make comparisons because clearly some of the specimens may go on absorbing more water. This could be the case for sample 2 and sample 3.

In the equation, you didn’t define the acronym Ww.

Concerning all the results, they are not justified, nor even discussed or compared with the literature. There is a simple comparison between the 3 compositions.

Conclusions

In the conclusions, the best results for each characteristic are not consistent with the values referred to in the Abstract, although they are in accordance with the values given in Results, in graphs, and tables.

Anyway, the values are not compared with the literature, nor otherwise discussed.