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

Thanh Mai Nguyen Tran[1]

1 Changwon National University

Potential competing interests: No potential competing interests to declare.

Abstract

Topic Clarity: The abstract clearly outlines the objective, methodology, and key findings of the study. It establishes the context of using natural fibers as reinforcements in polymer matrix composites and the focus on sisal and sugar palm fibers.

Key Findings: The highlights of different mechanical properties based on the composition of sisal and sugar palm fibers are well-summarized.

Possible Improvement: A brief mention of why specific ratios were chosen for the fiber combinations might provide better insight into the experimental design.

Questions:

How does the performance of sisal and sugar palm fiber composites compare with traditional synthetic fiber composites in terms of cost and environmental impact?

Introduction

Relevance: The introduction effectively sets the stage by discussing the importance and applications of fiber-reinforced composites in various industries.

Literature Review: The literature survey is comprehensive, covering various aspects of natural fiber composites. However, the connection between these studies and the current research objectives could be more explicitly stated.

Clarity: While informative, the introduction is somewhat lengthy. A more concise presentation focusing on key points relevant to sisal and sugar palm fibers would enhance readability.

Questions:

What specific properties of sisal and sugar palm fibers make them suitable for high-performance goods like sports equipment?

Are there any limitations or challenges in using these natural fibers in such applications?

Materials and Methods

Experimental Design: The description of the composite preparation is detailed, providing a clear understanding of the process.

Chemical Treatment: The paper mentions NaOH treatment of fibers but lacks a detailed explanation of its impact on fiber properties. A deeper discussion here would be beneficial.

Questions:

Could different methods of fiber treatment or composite fabrication significantly alter the results?

How does the proportion of sisal and sugar palm fibers in the composites influence their overall properties?

Results and Discussion

Data Presentation: The results are well-presented with clear tables and figures. The comparison of different samples based on tensile strength, flexural strength, impact resistance, and water absorption is thorough.

Discussion: The discussion effectively ties the results to the study's objectives, but it could benefit from a comparison with existing literature.

Inconsistencies: There appears to be a repetition in the water absorption test section, which could be an editing oversight.

Questions:

Were there any notable differences in the behavior of the composites during these tests that could be attributed to the unique properties of sisal and sugar palm fibers?

How does the water absorption property affect the potential applications of these composites?

Were there any unexpected results or anomalies in the data?

How can the findings of this study be applied to improve the design and use of natural fiber composites in industry?

Conclusion

Summary of Findings: Conclusions are well-summarized, focusing on the performance of different composite samples.

Practical Implications: The paper concludes with practical implications, but a discussion on potential applications of these findings would be more impactful.

Future Work: Suggestions for future research, such as exploring other natural fibers or different environmental conditions, would be a valuable addition.

Questions:

What are the next steps in research to further explore and utilize sisal and sugar palm fiber composites?

How might these findings influence future trends in composite material research and development?

Overall Assessment

Technical Depth: The study provides a thorough examination of the mechanical properties of the composites, with a commendable level of detail in experimental procedures.

Innovation: The paper contributes to the field of natural fiber composites, especially in exploring less common fibers like sugar palm.

Readability: The paper is generally well-written, though some sections could be more concise.

Questions for Further Consideration

What was the rationale behind the specific ratios of sisal and sugar palm fibers chosen for the study?

How does the NaOH treatment chemically modify the fibers, and what is its impact on the composite properties?

How do the properties of these composites compare with those reinforced by more traditional fibers like glass or carbon?

What are the potential real-world applications for these hybrid composites, and how do they compare cost-wise with synthetic alternatives?

How do economic considerations (cost of production, market availability) impact the feasibility of using sisal and sugar palm fiber composites on a larger scale?

Are there any considerations for the end-of-life treatment or recycling of these composites?

Could future studies explore the long-term durability of these composites under various environmental conditions?