ISSN: 2320-5407
International Journal of Advanced Research
Publisher's Name: Jana Publication and Research LLP
www.journalijar.com

## REVIEWER'S REPORT

Manuscript No.: **IJAR-52844** Date: 17-07-2025

**Title: IMPACT OF STARCH ADDITIVES ON COCONUT PALM FIBRES FOR THERMAL INSULATING PANEL APPLICATIONS**

**Recommendation:**
**Accept as it is .....YES.....**
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

| Rating | Excel. | Good | Fair | Poor |
|---|---|---|---|---|
| Originality | | ✓ | | |
| Techn. Quality | | | ✓ | |
| Clarity | | ✓ | | |
| Significance | | ✓ | | |

Reviewer Name: Mr Bilal Mir

**Reviewer's Comment for Publication.**

Overall Evaluation:

This manuscript presents a relevant and scientifically grounded investigation into the role of starch additives in enhancing the thermal and structural characteristics of coconut palm fibre-based insulating panels. It successfully aligns with the current research momentum toward sustainable materials in the construction industry and demonstrates a clear understanding of biopolymer-fiber interactions.

Abstract Evaluation:

The abstract effectively summarizes the scope, methodology, and main findings of the study. It emphasizes the practical relevance of incorporating starch additives in lignocellulosic matrices, highlighting improvements in thermal stability and moisture resistance. The use of established analytical techniques—DSC, TGA, and FTIR—adds credibility and scientific depth to the reported outcomes.

Relevance and Topicality:

The manuscript addresses a highly pertinent topic within materials science and sustainable

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construction. It contributes meaningfully to the growing field of bio-based composites, particularly in the context of energy-efficient building materials. The focus on coconut palm fibres—an underutilized yet abundant agricultural byproduct—enhances the ecological and economic relevance of the study.

Methodological Soundness:
The approach is experimental and supported by robust analytical instrumentation. The combination of Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), and Fourier Transform Infrared Spectroscopy (FTIR) is appropriate for assessing the thermal and structural evolution of the biocomposite system. The methodology is clearly scientific and contributes to the reproducibility of the research.

Findings and Scientific Contribution:
The results suggest meaningful improvements in thermal performance and material behavior upon starch addition. By demonstrating improved thermal stability and reduced moisture sensitivity, the study establishes a foundation for further development of natural fibre-reinforced insulating materials. These outcomes reinforce the viability of integrating biodegradable polymers in structural applications.

Clarity and Presentation:
The introduction is well-articulated, situating the study within current material science challenges and opportunities. It clearly identifies the research gap concerning the interaction between starch and coconut palm fibres, providing a logical rationale for the investigation.

Theoretical and Practical Contribution:
The work combines fundamental analysis with application-driven research. It contributes both to the scientific understanding of fibre-additive interactions and to the practical development of environmentally friendly, thermally efficient building panels. The emphasis on durability, biodegradability, and performance enhancement makes the research valuable for academia and industry alike.

Originality:
The manuscript offers a novel contribution by focusing specifically on the synergistic effects of starch additives on coconut palm fibres for insulation purposes. This particular material

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combination and its analytical treatment provide new insights within the broader field of biocomposites.

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Final Recommendation:

This is a relevant, well-formulated, and experimentally grounded study. It contributes to the advancement of bio-based insulating technologies and enriches the literature on sustainable composite materials through its analytical rigor and material innovation.

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