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## Data Article

# Experimental data on the properties of natural fiber particle reinforced polymer composite material



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## ARTICLE INFO

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## Keywords:

Hybrid

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Coconut shell powder

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Rice husk powder

## ABSTRACT

This paper presents an experimental study on the development of polymer bio-composites. The powdered coconut shell, walnut shells and Rice husk are used as reinforcements with bio epoxy resin to form hybrid composite specimens. The fiber compositions in each specimen are 1:1 while the resin and hardener composition 10:1 respectively. The fabricated composites were tested as per ASTM standards to evaluate mechanical properties such as tensile strength, flexural strength, shear strength and impact strength are evaluated in both with moisture and without moisture. The result of test shows that hybrid composite has far better properties than single fibre glass reinforced composite under mechanical loads. However it is found that the incorporation of walnut shell and coconut shell fibre can improve the properties.

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## Specifications Table

Subject area	Materials science
More specific subject area	Natural fibre composites
Type of data	Text file, tables, graphs and figures

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How data was acquired	<i>Mainly by a series of experimental (laboratory) investigations</i>
Data format	<i>Raw, calculated, analyzed, tabulated, plotted</i>
Experimental factors	<i>Mechanical and fracture properties composite material</i>
Experimental features	<i>In this all composites specimen were under goes flexural, tensile, impact and hardness test in both wet and dry condition</i>
Data source location	<i>School of Mechanical Sciences,Hindustan University,Chennai,Tamilnadu,India</i>
Data accessibility	<i>Data is with the article.</i>

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### Value of the data

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- This data set presents a complete mechanical characterization of a hybrid composites.
  - Guidelines for the mechanical and fracture characterization of a hybrid composites material are provided.
  - Mechanical properties of composite material were determined in both with moisture and without moisture condition
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## 1. Data

Authors' presented all data in following tables and figure's by experiments.

## 2. Experimental design, materials and methods

### 2.1. Materials

The matrix material used in this investigation was bio epoxy resin Grade 3554A and Hardner 3554B. Supplied by Lab chemicals, Chennai and reinforcements were obtained from nearby local market as raw form as shown in [Table 1](#). The said fibres were cleaned by water then they are powdered by grinding.

### 2.2. Methods

The said fibres ([Table 2](#)) were cleaned by water then breaking the shells into pieces and they were first ground in a ball mill to produce fibre powder and then separated by mechanical sieving into particle form.

#### 2.2.1. Chemical treatment of said natural fibres

The fibres are powdered. Then the fibres are cleaned normally in clean running water and dried. A glass beaker is taken and 1% NaOH is added and 99% of distilled water is added and a solution is made. After adequate drying of the fibres in normal shading for 2 to 3 h, the fibres are taken and soaked in the prepared NaOH solution [1]. Soaking is carried out for different time intervals depending upon the strength of fibre required. In this study, the fibres are soaked in the solution for three hours. After the fibres are taken out and washed in running water, these are dried for another 2 h. The fibres are then taken for the next fabrication process namely the Procasting process.

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