**Paper No: PU-SOE-MECH-05**

**Millettia Pinnata: A Study on the Extraction of Fibers and Reinforced Composites**

P. B. Mohankumaraa, Shraddha Prashant Thakareb, Vijaykumar Gunac,d & **G. R. Arpithae**

a. Center for Energy Research, S-VYASA University, Jigani, Bangalore, Karnataka, 560105, India

b. Center for Incubation, Innovation, Research and Consultancy, Jyothy Institute of Technology, Thataguni Post, Bangalore, Karnataka, 560082, India

c. Center for Incubation, Innovation, Research and Consultancy, Jyothy Institute of Technology, Thataguni Post, Bangalore, Karnataka, 560082, India

d. Visvesvaraya Technological University–Research Resource Centre, JnanaSangama, Belagavi, Karnataka, 590018, India

e. Department of Mechanical Engineering, Presidency University, Itgalpur, Rajanakunte, Yelahanka, Bangalore, Karnataka, 560064, India

**Abstract**

In this work, the potential for using Millettia pinnata stalk for extracting cellulosic natural fibers and its subsequent use in reinforced composites was studied. The extracted fibers were characterized for its composition, mechanical, thermal stability and morphological properties. Compositional analysis showed that the fibers possessed 54% cellulose, 12% hemicellulose, 15% lignin and 11% ash. The tensile strength of the fiber was 310 MPa, which is comparable to cotton and linen. The tensile strength of the M. pinnata fiber-reinforced polypropylene composites was 17.96 MPa which was similar to other natural fiber-based composites. M. pinnata fibers appear promising for a wide range of applications including textiles and other typical composites applications.

**Keywords:**

Natural fibers, Biopolymers, Lignocellulosic material, Composites, Green materials

**Publication Details:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Journal Name** | **Vol.** | **Month & Year**  | **Page No.** | **Publisher** | **Scimago Ranking** |
| Bioresources and Bioprocessing |  3  | Jan. 2020  | 3 | Springer | Q2 |