Online Perspectives Journal: Exact & Engineering
Proceedings of the 5th Research & Development PROVIC/PIBIC Seminar
2nd CNPq Scientific Initiation Meeting,
Vol. 10, Nº 29, Supplement, 2020

Evaluation of mechanical properties of a mycelium composite

Vivyan Pinheiro Simão Ribeiro[1], *Maria das Graças Machado Freire*[2], *Vicente Mussi-Dias*[2], *Michel Picanço Oliveira*[3], *Lucivan Pereira Barros Junior*[4], *Bárbara Ferreira de Oliveira*[5]

(1) PIBIC/ISECENSA Scientific Initiation Student – Civil Engineering Course; (2) Collaborating Researcher – Chemical and Biomolecule Laboratory – LAQUIBIO/ISECENSA; (3) Collaborating Researcher – Mechanical and Materials Laboratory/UFES; (4) Collaborating Researcher – UFSCAR; (5) Advisor Researcher – Mechanical Systems Analysis and Design Laboratory – LAPSIM/ISECENSA – CENSA – ISECENSA Superior Education Institutes, Rua Salvador Correa, 139, Centro, Campos dos Goytacazes, RJ, Brasil

Awareness about natural resources scarcity has currently grown and fostered interest in the use of biological-based materials in the automotive, civil, design and packaging industries. Natural fibers have been used in some biocomposites due to characteristics such as their low cost, low density and high specific resistance. However, those composites matrices are regularly made from synthetic polymer composites, which are generally produced from non-renewable resources, with high environmental impact and high carbon footprint. In opposition to this, biocomposites consisting of a matrix of fully biodegradable and renewable mycelium have been developed. This paper aims to study the mechanical properties of composites based on sugarcane bagasse, sawdust and wheat bran and the mycelium of the fungus *Pyconoporus sanguineus*. For specimens manufacturing, previously sterilized polyethylene terephthalate ethylene glycol molds were used; substrate with grown *P. sanguineus* fungus will be arranged in random orientation and pressed manually. After drying, a morphological analysis of the composite and its individual components will be carried out by the scanning electron microscopy technique. Tests will be performed in seven specimens to assess their mechanical behavior under bending and compression. From tests results, mechanical properties will be statistically determined and analyzed. We intend to develop a composite that will degrade in nature when discarded after its useful life: a composite to be made of easily found agricultural substrates; and which will display mechanical properties that enable it to replace other not completely sustainable materials.

Keywords: Sustainability. Ecoproducts. Mycocomposite.

Supported by: PIBIC; ISECENSA.