



Mechanical Performance of Treated *Bambusa Blumeana* (Bamboo) Fibers

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Abstract

Natural fibers are being explored nowadays to provide tensile strength needed in cementitious matrices. To give better bondage between the fibers and the matrices, surface enhancements for natural fibers can be induced through chemical treatments. In the current study, fibers are extracted from *Bambusa Blumeana*, an abundant local species of bamboo plant from the Philippines. Bamboo slats are pre-treated with varying concentration of 5%, 10% and 15% sodium hydroxide (NaOH) and extracted fibers are treated with 10% aluminium sulfate ($\text{Al}_2(\text{SO}_4)_3$) solution. Extracted bamboo fibers are subjected to Single Strand Tensile test. It is observed that bamboo slats submerged in 5% NaOH provides better mean tensile peak load. Scanning Electron Microscopy (SEM) images shows however that the fibers submerged in higher concentrations has developed rougher surface enhancements. The results can be used for developing bamboo fiber reinforced fly-ash based geopolymer composites and with further studies, can be applied as textile reinforcement for structural strengthening or retrofitting.

Keywords: aluminium sulfate treatment; bamboo fiber; geopolymer; natural fiber; single strand.

1 Introduction

Natural fibers are widely used in making textiles and fabrics. Application of natural fibers is being

explored nowadays as it promotes a more sustainable and environmentally friendly material production. Mechanical properties of fibers that are cut to smaller lengths are lower than of its