

Characterization of new cellulosic *Cyrtostachys renda* and *Ptychosperma macarthurii* fibers from landscaping plants

ABSTRACT

Cyrtostachys renda (CR) and *Ptychosperma macarthurii* (PM) fibers, as new cellulosic fibers were studied. The objective of this research is to evaluate the fibers from stem, leaf stalk, and frond of these two plants as reinforcement in the polymer composites. The density, chemical composition, functional group, crystallinity index, and thermal stability were studied for CR and PM fibers. From the analysis, the density and thermal stability of both leaf stalk fibers are found almost similar. The highest crystallinity index (55.67%) of the leaf stalk of CR was attributed to the highest cellulosic content (38.99%) and the functional group (C-H stretching). From the results, the optimized properties were found for the leaf stalk of CR fiber. The tensile strength, interfacial shear strength (IFSS), morphology of the leaf stalk of CR were explored. The ultimate tensile strength, Young modulus, and IFSS of the leaf stalk of CR is 51.82 ± 9.41 MPa, 0.69 ± 0.18 GPa, and 3.27 ± 0.5 MPa, respectively. The Scanning Electron Microscopy observation revealed that the leaf stalk fiber of CR possesses anti-microbial properties which has been corroborated through the presence of silica bodies over the fiber surface. Hence, the leaf stalk of CR acts as a potential reinforcement in the polymeric composites for lightweight applications.

Keyword: *Cyrtostachys renda*; *Ptychosperma macarthurii*; Stem top; Stem middle; Stem bottom; Leaf stalk; Frond