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**UNIAXIAL TENSILE CHARACTERISTICS OF NATURAL FIBER COMPOSITES
FROM BANANA FIBRE AND THERMOPLASTIC WASTE**

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ABSTRACT

Environmental sustainability has motivated in a renewed interest in waste management, and consequently issues such as recyclability of natural waste and plastic waste. Therefore in recent decade, clear attention has been paid for seeking potential engineering applications of natural fibre composites (NFC) as alternatives for structural and infrastructural construction applications. In this study, NFCs were prepared using extracted copped banana fibre (without any pre-treatment) and waste thermoplastic by simple equipment and technique which are hand mixing, shedder machine, and hot and cold press machine. Four types of NFCs were produced by varying the weight of banana fibre content as 10%, 15%, 20% and 25% with respect to the weight of the thermoplastic and no additional bindings were added. Uniaxial tensile test was performed and tensile behaviour was studied systematically with focus on modulus, stresses, elongation, and energy absorption capacities. Experimental findings suggest that the NFC has positive effects as an alternative material for structural and infrastructural application in terms of structural capability. In addition, among four type of NFCs with different banana fibre contents, NFC20 (which contain 15% (w/w) banana fibre with respect to thermoplastic content) show the best correspondence with their mechanical response.

Keywords: Natural fibre composites, Waste, Banana fibre, Thermoplastic, Tensile characteristic