The Effect of Bamboo Fiber on the Tensile Strength of Tapioca-Based Bioplastic

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This study details the effects of alkali-treated bamboo fiber on the tensile strength of tapioca-based bioplastic, by incorporating bamboo fiber treated in a 0.5 molar solution for 24 hours and washed with water and acetone. Once dried, the bamboo was ground and incorporated into the bioplastic formulas in varying amounts (0g, 1.5g, and 2.5g). The tensile strength was tested using the Vernier Materials and Strength tester (Model VSMT5014R1). After collecting data, a single factor ANOVA was used to determine significance. A p-value of 4.2E-2 using an alpha value of .05 indicated that the null hypothesis was rejected. Afterwards a post-hoc Tukey test was used to determine between which groups there was a statistical difference. The Dmin of 7.61 indicated there was a statistical difference between the 2.5g bioplastic and the 1.5g bioplastic. Therefore, the research hypothesis, “If the bamboo fiber is incorporated into a bioplastic in varying quantities, then the bioplastic that contains the most bamboo fiber will have the most tensile strength” was supported. The experiment concluded that there is an even greater possibility of bioplastics becoming a reliable and sustainable alternative to traditional plastic.

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