

**STRENGTH ANALYSIS OF BIOPLASTIC MADE FROM CARDAVA
BANANA PEEL STARCH REINFORCED WITH DIFFERENT
CHITIN-BASED MATERIAL**

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ABSTRACT

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This study was conducted to evaluate the flammability, biodegradability, acid solubility, and tensile strength of the bioplastic made from cardava banana peel starch and different chitin-based material. The experimental samples were laid in complete randomized design (CRD) with three treatments, namely; T1 (Commercial), T2 (Eggshell) and T3 (Golden Apple Snail Shell) and each was replicated three times. The data gathered was analyzed using One-way ANOVA and LSD at 5% level of significance.

Based on the result, T3 has the highest mean flammability and biodegradability value of 3.35 mm/sec and 77.04% respectively, followed by T2 (3.09 mm/sec and 66.62%) and T1 (2.74 mm/sec and 20.39%) that has the lowest mean flammability and biodegradability value. Acid solubility results revealed that Treatment 1 has the highest acid solubility with the value of 7.53% followed by Treatment 2 with 6.8% and Treatment 3 with

5.76% that has the lowest acid solubility. In the tensile strength, Treatment 2 has the highest tensile strength with the value of 7.12074 MPa followed by T3 (6.8932 MPa) and T1 (5.87459 MPa) which has the lowest tensile strength value. The ANOVA results revealed that there's a highly significant difference in the flammability and biodegradability among the means of the three treatments.

In general, the results revealed that different chitin-based materials (particularly eggshell and golden apple snail) and cardava banana peel starch can be used to make bioplastics given that they exceed the flammability standard, have excellent biodegradability, low solubility, and has high tensile strength. Furthermore, it is produced from waste materials, decreasing the threat of environmental pollution.

Keywords: *Bioplastic, Banana peel, Eggshell, Golden apple snail, Chitin*