

**ELUCIDATION VARIOUS BIODEGRADABILITY TEST OF THE BIOPLASTIC
FROM BANANA PEEL WASTE**

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ABSTRACT

ELUCIDATION VARIOUS BIODEGRADABILITY TEST OF THE BIOPLASTIC FROM BANANA PEEL WASTE

Plastics that are biodegradable can break down into water, carbon dioxide, and biomass when living things typically microbes get involved. Biodegradable plastics which derived from fruit and vegetable waste have been innovating to overcome the pollution problems because of biodegradable plastics can be decomposed by microorganisms such as bacteria, fungi and actinomycetes in the soil ecosystems. Banana peels can be recommended as an ideal alternative for the production of biodegradable plastics. The SBT approach has a few disadvantages when it comes to biodegradability studies. The outcomes of this method are only dependent on the data and the sample weight loss value (quantitative analysis); no additional qualitative method or analysis, such as the dip hanging method, has been used to support it. Using Fourier Transform Infrared Spectrometry (FTIR) analysis and optical microscopy, describe the functional groups and morphological structure of Banana Peel Waste (BPW) bioplastic prior to biodegradation research soil burial test. The aims of the research was to examine the BPW bioplastic's biodegradability behavior using the weight loss value as a percentage and to assess the impact of two distinct biodegradability studies on the weight loss of BPW bioplastic (SBT and Dip Hanging Method). The research employs FTIR function to analyze biodegradable plastics, identifying functional groups and defining their chemical structure and content. The degradation rate of plastic film from BPW was compared to the plastic film from soluble starch (SS). The soil burial test revealed that 100% banana starch (BS) bioplastic lost the highest weight (73.33%), demonstrating rapid biodegradation in natural environments. The dip hanging approach, which suspends the biodegradable plastic in a solution containing *Bacillus subtilis* (*B. subtilis*) bacteria, resulted in a lower weight loss for the sample 0 % BS while for 100% BS resulted 26.68% indicating the effective microbial activity on the sample. The improved performance of bioplastic in SBT illustrates its potential for sustainable end-of-life management, but the dip hanging test reveals its vulnerability to certain microbes. Weight loss of the sample can be occurred effectively in the SBT and also dip-hanging methods due to the environment which encouraged the biodegradable plastic to degrade.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	II
LIST OF TABLES	IX
LIST OF FIGURES	X
LIST OF ABBREVIATIONS	XI
ABSTRACT	III
ABSTRAK	IV
CHAPTER 1 INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	3
1.3 Significance of study	4
1.4 Objectives of study	5
1.5 Scope and Limitation of Study	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Waste	7
2.1.1 Solid Waste	8
2.1.2 Liquid Waste	9
2.1.3 Food Waste	10
2.1.3.1 Fruit Waste	11
2.2 Banana Peel Waste (BPW)	13
2.2.1 Application of BPW	14
2.2.2 Sustainable Development Goals (SDGs)	15
2.3 Plastic	17
2.3.1 Bioplastic	18
2.3.1.1 Biodegradable Plastic from BPW	20
2.3.1.2 Biodegradation Process	21
2.4 Biodegradability Study for Biodegradable Plastic	
2.4.1 Soil Burial Test (SBT)	24
2.4.2 Dip Hanging Method	25
2.5 Characterization of Biodegradable Plastic	

2.5.1	ATR – FTIR Analysis	26
2.5.2	Optical Microscopy	28
CHAPTER 3 METHODOLOGY		
3.1.	Materials	
3.1.1	Chemicals and Apparatus	30
3.1.2	Instrument	30
3.2	Methods	
3.2.1	Pre-treatment of raw BPW	31
3.2.2	Starch Extraction from BPW	31
3.2.3	Production of Biodegradable Plastic from BPW	32
3.2.4	Biodegradability Test for Biodegradable Plastic	33
3.2.4.1	SBT	33
3.2.4.2	Dip-Hanging Method	35
3.2.5	Characterization	
3.2.5.1	ATR- FTIR Analysis	35
3.2.5.2	Morphological Analysis	36
CHAPTER 4 RESULTS AND DISCUSSION		
4.1	Percentage Yield of BPW Starch	
4.1.1	Weight Loss of BPW Starch	37
4.2	Characterization of the Banana Starch and Bioplastics	38
4.2.1	FTIR Analysis of BPW Starch and Soluble Starch (SS)	39
4.2.2	FTIR Analysis of BPW Biodegradable Plastic	40
4.3	Soil Burial Test (SBT)	42
4.4	Dip-Hanging Method	
4.4.1	Weight Loss of BPW for Dip-Hanging Method	47
4.4.2	Morphological Study by Optical Microscopy Analysis	48
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		
5.1	Conclusion	53
5.2	Recommendation	54
CITED REFERENCES		55
APPENDICES		56
<i>CURRICULUM VITAE</i>		