

BMM: Bio-Floor wax

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Abstract: Floor wax, despite its benefits for polishing floors, can harm both the environment and people's health. According to recent studies, the odor of commercial floor waxes causes respiratory problems and dermatological side effects (K. Ong, 2019; Manintim, 2019; Pabular, 2021). The purpose of this study was to create a bio-friendly floor wax that contains harmless ingredients. The objectives of this study were to develop an environmentally friendly floor wax, reduce waste, determine the benefits to human health and the environment, and investigate the significant differences between different ratios of each variable in three mixtures in terms of friction, odor, and shine. The scope of this study focused only on creating the bio-floor wax made from lakatan banana peels (*Musa acuminata x colla*), malunggay leaves (*Moringa oleifera*), and madre de cacao (*Gliricidia sepium*). In order to obtain a precise result, this study employed an experimental approach. This wax was assessed for odor, shininess, and friction through testing methods like odor testing, slip resistance testing, and visual inspection. The results showed the bio-floor wax had a milder odor compared to commercial waxes. While shine varied between mixtures, friction was comparable to commercial waxes for mixture B. In conclusion, Mixture B was identified as the most effective formulation. The results of the study also showed that the researchers rejected the null hypothesis, indicating that there was a significant difference in terms of odor, shininess, or friction when using an alternative floor wax made from banana peel, malunggay leaves, and madre de cacao compared to commercialized floor waxes. The researchers recommend further studies to explore the longevity of BMM: bio-floor wax when applied to floor surfaces and the affordability of the product.

Key Words: Bio-friendly floor wax; Lakatan banana peels (*Musa acuminata x colla*), malunggay leaves (*Moringa oleifera*), and madre de cacao (*Gliricidia sepium*); Slip resistance testing, visual inspection, and odor testing; Mixture B

1. INTRODUCTION

Many floor waxes nowadays contain various synthetic chemicals such as cresol, formaldehyde, nitrobenze, perchloroethylene, toluene, and xylene that, when inhaled, cause respiratory problems and dermatological side effects (K. Ong, 2019; Manintim, 2019; Pabular, 2021). The researchers derived from the idea of creating a bio-floor wax using plants including lakatan banana peels (*Musa acuminata x colla*), madre de cacao (*Gliricidia sepium*), and malunggay leaves (*Moringa oleifera*).

The lakatan banana peel, known for its phytochemicals such as phenolics, tannins, flavonoids, and alkaloids, is a promising candidate for creating a protective and glossy coating for various surfaces due to its rich natural oils, waxes, and organic compounds. Its unique properties make it ideal for contributing to the shine and durability of floor wax. *Gliricidia sepium* and *Moringa oleifera* both contain phytochemicals that are useful for creating a stable and durable bio-floor wax. *Gliricidia sepium* contains alkaloids with surfactant properties, flavonoids with antioxidant and antimicrobial properties, steroids with water-repellent properties, and tannins with adhesive

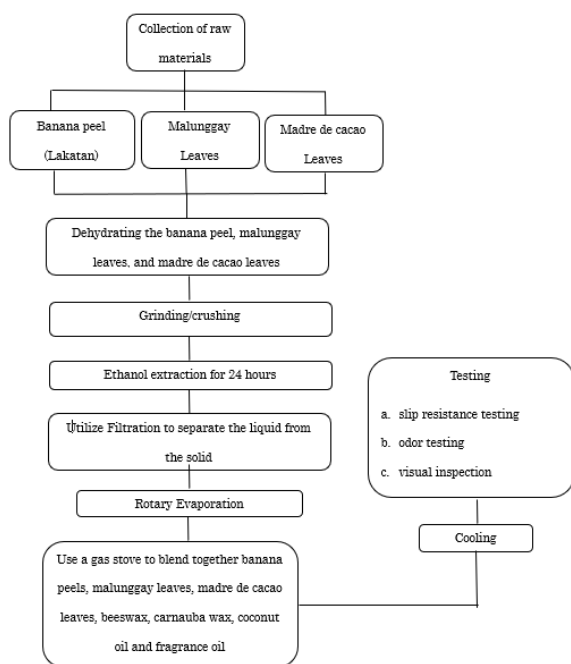
properties. *Moringa oleifera* contains alkaloids and camourines with surfactant properties, saponins with foaming and emulsifying properties, and water-repellent properties. Together, these phytochemicals help to emulsify oils and water, protect the bio-floor wax from degradation and spoilage, and bind the different components of the bio-floor wax together.

This research study, BMM: bio-floor wax is aligned to the Sustainable Development Goals (SDGs) of good health and well-being. This research aims to create a bio-floor wax made from eco-friendly materials such as banana peel, malunggay leaves, and madre de cacao.

This study explores the potential of using banana peel, malunggay leaves, and madre de cacao to create an eco-friendly floor wax that is non-toxic and biodegradable. This alternative solution effectively maintains the shine and cleanliness of floors.

2. METHODOLOGY

2.1 Subsection



3. RESULTS AND DISCUSSION

	Odor	Shininess	Friction
Mixture A (Banana peel – 200g, malunggay leaves – 100g, and madre de cacao – 100g)	4	4	0.4
Mixture B (Banana peel – 175g, malunggay leaves – 110g, and madre de cacao – 115g)	3	5	0.3
Mixture C (Banana peel – 150g, malunggay leaves – 125g, and madre de cacao – 125g)	4	4	0.4
Commercialize	5	5	0.4

Table 1. Significant difference of Banana Peel (*Musa Acuminata Colla*) Malunggay Leaves (*Moringa oleifera*) Madre De Cacao Leaves (*Gliricidia sepium*): Bio-Floor wax to commercialize floor wax.

The given data presented the effectiveness of banana peel, malunggay leaves, and madre de cacao in different ratios within mixtures a, b, and c as an alternative floor wax in terms of odor, shininess, and friction. The measurement of each mixture was also taken into account.

According to the researchers, three mixes were compared to commercial floor wax, and noticeable differences were found in odor, shine, and friction. Mix B had the mildest smell and the best texture for floor surfaces, while mixes A and B had the highest friction, similar to commercial wax. The results suggest that mix B is the best option for those looking for a less offensive odor and ideal texture for floor surfaces.

Table 2. ANOVA Analysis

Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
odor	4	16	4	0.666667		
shininess	4	18	4.5	0.333333		
friction	4	1.5	0.375	0.0025		
ANOVA						
Source of Variation	SS	df	MS	F	P-value F crit	
Between Groups	40.54167	2	20.27083	60.66085	5.98E-06	4.256495
Within Groups	3.0075	9	0.334167			
Total	43.54917	11				

$F < F_{crit}$ = The test is not significant

$F > F_{crit}$ = The test is significant

The study found that banana peel, malunggay leaves, and madre de cacao are effective alternative ingredients for bio-floor wax. The null hypothesis was rejected, indicating that these alternatives perform differently from commercial floor wax. This proves a significant variance in performance between bio-floor wax and its commercial counterparts.

The study evaluated the effectiveness of floor wax mixtures made from banana peel, malunggay leaves, and madre de cacao based on odor, shininess, and friction. Mixture B was found to be the most effective and acceptable, resulting in the creation of bio-floor wax.

4. CONCLUSIONS

Based on study, banana peel, Malunggay leaves, and madre de cacao are effective alternatives to commercial floor waxes. The researchers rejected the null hypothesis, indicating a significant difference in odor, shininess, and friction between the alternative and commercial options. Mixture B was found to be the most effective as shown in table 1.

Further research is necessary to investigate the performance and durability of bio-floor wax, as well as to analyze and optimize the cost of production to improve affordability.

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