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Banana Peel Extract As Juice

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Abstract

The outer layer of the banana plant, known as the peel, is typically disregarded as having no economic significance and often ends up as waste. However, it is important to note that these peels hold valuable nutrients like potassium, dietary fiber, vitamin A, protein, starch, and sugar, which are crucial for the body's well-being. These nutrients are readily accessible in densely inhabited areas or near facilities that process bananas, and they are abundant in tropical and sub-tropical areas. Recognizing the potential, researchers have explored ways to repurpose the peel instead of simply discarding it.The primary focus of the research aimed to create a beverage utilizing extract derived from banana peels, and to assess the level of acceptability of this juice based on its fragrance, visual appeal, and flavor across three distinct variations. These variations were designated as follows: T1, consisting of 30 grams of banana peel extract combined with sugar; T2, comprising 60 grams of banana peel extract mixed with honey; and T3, involving 90 grams of banana peel extract blended with condensed milk. To achieve this, the researcher employed a combination of experimental and descriptive research methods, employing a questionnaire as a tool for data collection. The questionnaire utilized a 4-point Hedonic scale to determine consumer preferences and satisfaction with the product.The collected data were organized through the application of weighted mean and analysis of variance techniques. These methods were employed to identify notable variations in the preferences of the participants across the three distinct treatments. The research took place at the main campus of Bohol Island State University. The study encompassed a total of seventy-five (75) participants, which included twenty (20) students from Food Technology I, twenty (25) students from Food Technology II, twenty-five (25) students from

Food Technology III, and an additional five (5) instructors specializing in Food Technology.Based on the findings, Treatment 2 with 60 grams of Banana peel extract with honey was the best formulation with an average weighted mean of 3.36 which described as “like very much”. Based on the results of the study, the researcher concluded that there is no significant difference between the acceptability level of the three treatments of banana peel extract as juice and can be consider as the of the best choices of nutritional drinks to be serve in any occasion, was good potential for commercialization and innovation.

Keywords banana, banana peel, juice, extract.

INTRODUCTION

In the Philippines, a tropical Asian nation, there is an abundance of tropical fruits and vegetables. These items are frequently found in markets due to their plentiful availability, with some remaining accessible throughout the entire year. A prime example of this is the banana, which thrives even in nutrient-deficient soil, resulting in a consistent and ample supply within the market. There exists a variety of banana types, including Apple Banana, Cavendish Banana, Lady Finger Banana, Pisang Raja Williams Banana, and Cooking Banana. These bananas range from being suitable for raw consumption to being suitable for cooking. While the majority of the banana's economic value centers around its edible flesh, the peels are often neglected, leading to their disposal as waste.

Banana peels are a plentiful reservoir of numerous nutrients and are recognized for their elevated carbohydrate content. They boast significant levels of vitamin B6, vitamin B12, magnesium, and potassium. Additionally, they contain traces of protein, dietary fiber, vitamin A, starch, and sugar.

Beverages are a customary presence at various events, yet the nutritional content of the juice is contingent on the constituents integrated. In light of these considerations, the researcher aimed to craft a juice utilizing banana peels, which are typically discarded due to their lack of economic significance. However, these peels encompass vital nutrients crucial for bodily health. Armed with this awareness, the proposal is to repurpose the peels, thereby generating an economical and nutrient-rich juice option rather than discarding them, yielding a cost-effective and healthful beverage alternative.

Given this backdrop, the researcher encountered a compelling incentive to incorporate banana peels into the formulation of juice. This decision stemmed from the peels' nutritional richness and their ready availability both within the market and through local sources.

Hence, the researcher contemplated the potential of employing banana peels as a constituent in beverage preparation, with the additional aim of evaluating the level of acceptability for the resulting banana peel juice.

OBJECTIVE

The primary objective of this research was to create a beverage using extract from banana peels, a readily available resource both in the local market and the surrounding area. Furthermore, the study aimed to evaluate the degree of acceptance of the banana peel juice based on its fragrance, visual presentation, and flavor. This investigation was carried out at Bohol Island State University's Main Campus in Tagbilaran City, within the academic period of 2014-2015.

METHODOLOGY

This research employed a combination of experimental research design and descriptive research approach. The utilization of an experimental design was driven by the researcher's manipulation of key variables, particularly the incorporation of Banana peel and its blending with other components to create a juice. Concurrently, the descriptive method was adopted to assess the level of acceptance concerning the fragrance, visual characteristics, and flavor of the banana peel juice. Additionally, the study observed the shelf life of the juice under room temperature conditions, varying the volume of banana peel juice across the three distinct treatments.

The research took place at Bohol Island State University's Main Campus, specifically at the Bingag Extension. The selection of participants was carried out through purposive sampling. The study encompassed a total of seventy-five (75) respondents, comprising twenty (20) students from Food Technology I, twenty-five (25) students from Food Technology II, twenty (25) students from Food Technology III, and five (5) instructors specializing in Food Technology.Regarding data analysis, the researcher employed a customized 4-point Hedonic scale to gauge the level of acceptability, serving as an evaluation mechanism for the product.

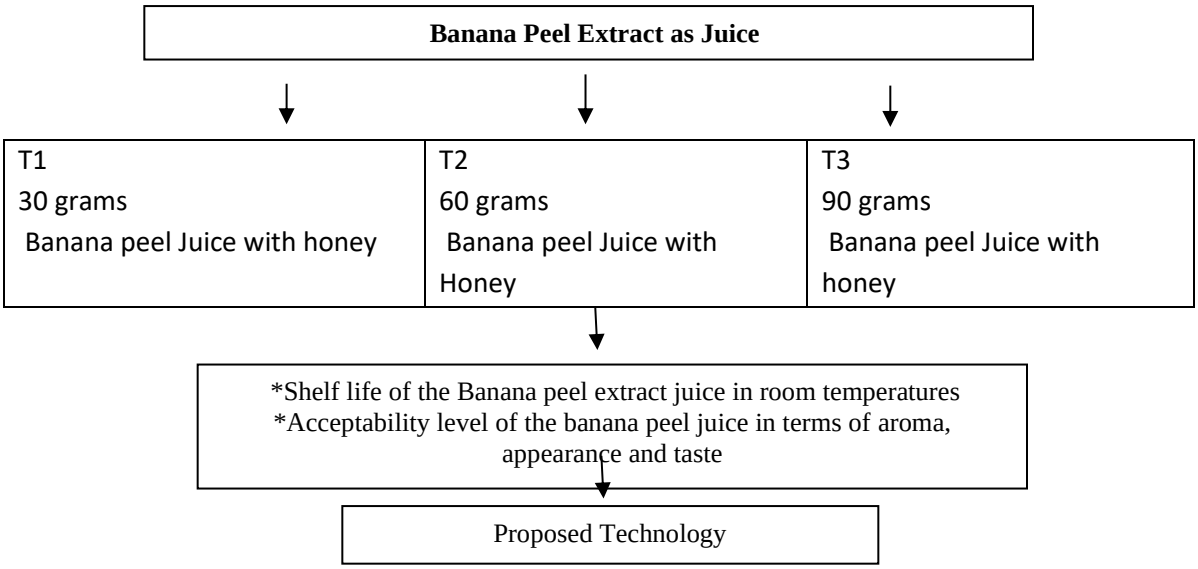

Figure 1. Theoretical and Conceptual Framework

4 point Hedonic Scale for Descriptive test

Range of Scale	**Appearance**	**Aroma**	**Taste**
3.25-4.00	Dark Yellow	Very tasty	Very Pleasant
2.50-3.24	Golden yellow	Moderately Tasty	Moderately Pleasant
1.75-2.49	Light yellow	Slightly Tasty	Slightly Pleasant
1.00-1.74	Yellow	Tasty	Unpleasant

To determine the degree of preference of the respondents towards the banana peel extract as juice in terms of appearance, aroma and taste the 4-point Hedonic Scale was used.

Table 1. Descriptive test of Banana Peel extract as Juice in terms of Appearance, Aroma and Taste

Sensory Attributes	**Treatment 1**		**Treatment 2**		**Treatment 3**	
	AVM	Description	AVM	Description	AVM	Description
Appearance	2.34	Light Yellow	2.84	Golden yellow	3.24	Golden Yellow

Aroma	2.34	Slightly Pleasant	2.84	Moderately Pleasant	3.34	Very Pleasant
Taste	2.14	Slightly Tasty	2.75	Moderately Tasty	3.35	Very Tasty
Average Weighted Mean	2.27		2.81		3.31	
Rank		Rank 3		Rank 2		Rank 1

This table illustrates the outcomes of the descriptive sensory evaluation for Banana Peel Extract transformed into juice. Among the three distinct treatments, Treatment 3 received the highest score of 3.35 in the taste category, characterized as "Highly Delicious." Respondents attributed this high rating to the utilization of 90 grams of banana peel extract, positioning Treatment 3 at the top due to its ample amount of banana extract content. Treatment 2 secured the second position with a rating of 2.75 for taste, described as "Reasonably Flavorful." Conversely, Treatment 1 garnered the lowest score of 2.14 in the taste aspect, denoted as "Mildly Palatable," attributed to its lesser quantity of banana peel extract utilized.

However, in overall ranking treatment 1, 2 and 3 got average weighted mean of 2.27. 2.81 and 3.31 respectively all different treatments are acceptable by the respondents in terms of appearance, aroma and taste.

4 point Hedonic Scale for level of Preference test

Range	**Description**
3.25-4.00	Like Very Much
2.50-3.24	Like
1.75-2.49	Like Slightly
1.00-1.74	Dislike

This scaling was used to determine the data from the questionnaires. From these data were calculated and analyzed. These data are essential for drawing conclusions on the findings of the study in order to give recommendations for further improvement of the product.

Table 1 Acceptability of Banana Peel Extract as juice in terms of Appearance, Aroma and Taste.

Sensory Attributes	**Treatment 1**		**Treatment 2**		**Treatment 3**	
	AVM	Description	AVM	Description	AVM	Description
Appearance	2.90	Like	3.33	Like Very Much	3.43	Like Very Much
Aroma	3.15	Like	3.35	Like Very Much	3.40	Like Very Much
Taste	2.98	Like	3.40	Like Very Much	3.45	Like Very Much
Total Average	3.01	Like	3.36	Like very Much	3.43	Like Very Much
Rank	3	Like	2	Like Very Much	1	Like Very Much

The Table 1 shows the acceptability level of the banana peel extract as juice in the three different treatments. It has been observed that the Treatment three got the highest average weighted mean which is 3.43 and described as “Like Very Much” while the treatment two got the average weighted mean of 3.36 and described as “Like Very Much” Treatment 1 which is lower got the average weighted mean of 3.01 and described as “Like” it is because some of the respondents like the juice having more quantity of honey as a sweetener. From the observation, the researcher concludes that even if they have different results in the range, all treatment are acceptable.

It can be determined that both of the treatments are acceptable in terms of its sensory attributes in terms of Appearance, aroma and taste according to the respondent’s judgment.

In terms of its acceptability, the researcher computed the results on the difference of the acceptability level of the banana peel extract as juice in terms of Appearance, aroma and taste in the three different treatments.

Table 3 Difference in the Acceptability of Banana Peel Extract as Juice

Difference in the Acceptability level of each treatment	**Computed F-Value**	**Tabular T-Value**	**Interpretation**	**Description**
	At 5% level of significance			

Treatment 1	1.50667	3.036524	Insignificant	Accept Hypothesis
Treatment 2	2.83423	3.036524	Insignificant	Accept Hypothesis
Treatment 3	31.66342	3.036524	Significant	Reject Null Hypothesis

The results also showed that there was a significant difference among the three treatments in terms of appearance, aroma and taste because the computed F-values were beyond the tabular F-value of 51.53166 at 5% level of significance. But, as to where the difference lies, it has to be tested further with the Scheffe's Test.

RESULTS AND DISCUSSION

The standard method of preparing the juice was followed using the required ingredients, tools and equipment as well as the place of production. The materials required in the study were already present because they are always being used in the household. The ingredients that are used were cheap compared to the other juice production. Since the banana peels are already considered waste and have no economic value, this can already help in producing a low-cost juice.

Since the banana peel extract had its unnecessary flavor that can affect the taste of the juice, it needed a curing time which took a month or more for the unnecessary taste to slowly disappear. The curing time was determined by tasting the product every week, while kept refrigerate.

The shelf life of Banana Peel juice in chilled condition without curing lasted three days which was considered safe for human consumption. Treatment 3 has longer shelf life than treatment 1 and 2 it would simply mean that the too few or too much banana peel extract added affect the shelf life due to its flavor.

The researcher found out that all treatments of the banana peel extract as juice in terms of appearance, aroma and taste were like and acceptable.

The acceptability of banana peel extract as juice among the three different treatments in terms or appearance, aroma and taste based on the average weighted mean in descriptive preference test the appearance was golden yellow, aroma was very pleasant and taste was very tasty. The result implied that all characteristics were classified as good quality.

Based on the findings, Treatment 2 with 60 grams of Banana peel extract with honey was the best formulation with an average weighted mean of 3.36 which described as “like very much”. Based on the results of the study, the researcher concluded that there is no significant difference between the acceptability level of the three treatments of banana peel extract as juice and can be consider as the of the best choices of nutritional drinks to be serve in any occasion, was good potential for commercialization and innovation.

The result revealed that all treatments were acceptable. However, Treatment 3 was most preferred and most liked by the respondents in terms Appearance, aroma, and taste.

CONCLUSION

Based on the result of the study, the description of Banana peel extract can be produced as juice. All treatments were acceptable by the respondents in terms of Appearance, aroma, and taste. Result reveals that it has no significant difference; Banana peel extract as juice is compact with nutrients therefore it is healthy drinks items to serve in any occasions. there was good potential for commercialization and innovation used for business venture.

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