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Sensory Acceptability and Characterizationof All Purpose Banana Blossom Gourmet Paste

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Abstract: *This study developed an all-purpose gourmet paste using banana blossom (Musa acuminata) as the main ingredient and evaluated sensory qualities, and nutritional composition. Three formulations with varying amounts of banana blossom were created and assessed by a group of food experts and consumers. The developmental-descriptive and experimental approach allowed for comprehensive testing and comparison of appearance, aroma, taste, texture, and overall acceptability. Statistical analyses, including mean, standard deviation, and MANOVA, were employed to examine differences among formulations. Findings revealed that among the three formulations, Formulation C was the most preferred due to its superior aroma, taste, and texture. The physico-chemical and nutritional analysis of Formulation C confirmed its potential as a nutritious, plant-based food product with moderate fat and protein content, though its relatively high sodium level suggests a need for mindful consumption. The study supports the use of banana blossom as a functional food ingredient and a promising component of local product development initiatives.*

Keywords: *banana blossom, gourmet paste, sensory evaluation, nutritional analysis, functional food*

I. INTRODUCTION

The growing global interest in plant-based and functional foods has fueled innovative research into alternative food sources that offer nutritional, environmental, and culinary benefits. The Musa acuminata, commonly known as the banana blossom, is one of the most widely cultivated fruits globally, especially in tropical regions. However, parts of the banana plant, such as the banana blossom, remain underutilized despite their potential to contribute to nutritional, environmental, and economic goals. Banana blossoms are rich in essential nutrients like fiber, antioxidants, vitamins, and minerals, but they are often discarded or used minimally in culinary applications. This gap in the utilization of banana blossoms presents an opportunity for innovation and sustainable food development. This study, titled "Development and Acceptability of All-Purpose Banana Blossom (Musa acuminata) Gourmet Paste," aims to explore the potential of transforming banana blossoms into a gourmet paste that can serve as a nutritious, versatile, and sustainable food product.This research is closely aligned with the Sustainable Development Goals (SDGs), particularly those related to food security, health, and sustainable production. First and foremost, SDG 2: Zero Hunger is relevant to this study as banana blossom, when developed into a gourmet paste, has the potential to address food security challenges by providing a nutritious and affordable food source. In addition, SDG 3: Good Health and Well-being is integral to this study, as the nutritional benefits of banana blossoms—such as their antioxidant, fiber, and mineral content—make them a promising addition to human diets, contributing to improved public health and reducing malnutrition. Furthermore, SDG 12: Responsible Consumption and Production is embedded in this study's focus on sustainable food development by utilizing an underutilized agricultural product, thereby reducing food waste and promoting responsible food production practices.

The development of innovative food products from local resources also aligns with the goals of i2Fame (Innovation for Food, Agriculture, and the Environment). i2Fame emphasizes the importance of utilizing innovative approaches to improve food security and agricultural sustainability. Through this research, the banana blossom will be processed into a new value-added product, demonstrating an innovative solution to food production that maximizes the potential of local agricultural resources. This innovation is crucial for promoting sustainable practices in food production and

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processing, thereby contributing to i2Fame's broader goals of improving food systems.Moreover, this study supports the aspirations outlined in Ambisyon Natin 2040, the Philippines' long-term vision for inclusive growth and sustainable development. The development of a banana blossom gourmet paste directly supports Ambisyon Natin 2040's objectives of promoting sustainable food systems and creating a more resilient agricultural sector. By tapping into locally available resources like banana blossoms, this study contributes to a more resilient food system that maximizes the potential of indigenous agricultural products. Additionally, the creation of a value-added food product can create new market opportunities and stimulate local economic development, which is in line with the national vision of improving the quality of life for Filipinos.

This study seeks to address the gap in knowledge and innovation concerning the under utilization of banana blossoms in food products. By developing a gourmet paste from this underused agricultural resource, the research contributes not only to the advancement of food science but also to the broader global and national objectives of food security, sustainable agriculture, public health, and economic development. Through this work, we aim to offer a practical and innovative solution that supports the goals of the SDGs, i2Fame, and Ambisyon Natin 2040.The potential of banana blossoms, specifically from Musa acuminata, as an underutilized agricultural resource with significant nutritional and functional benefits. It discusses the growing interest in alternative food ingredients, the need for sustainable food sources, and the potential health benefits of incorporating banana blossoms into food products. The study highlights how utilizing such local and sustainable resources can meet food security challenges while promoting innovation in food development.

The development of an all-purpose gourmet pastes using banana blossoms aligns with these emerging trends and serves the dual purpose of introducing a nutritious, sustainable food product while addressing consumer demand for novel and healthy food options. Additionally, it emphasizes the relevance of exploring the acceptability of this novel food product in the market.

The limited research on the food processing and culinary applications of banana blossoms, specifically highlighting the knowledge gaps in utilizing banana blossoms in novel food products. Banana blossoms are rich in nutrients and have potential as a functional food ingredient, their utilization remains low, and there is insufficient exploration of their acceptability as a food product, particularly in processed forms like pastes, sauces, and spreads.To establish the gap in current research lies in both the development of value-added products from banana blossoms such as a gourmet paste and in understanding consumer acceptability of such innovations. It underscores the need for further investigation into processing methods, nutritional benefits, and consumer preferences, all of which the study aims to address.The main goal of this study is to create a versatile and healthy all-purpose gourmet paste using banana blossoms as the main ingredient. We want to explore how this paste is received by consumers, focusing on aspects like taste, texture, appearance, and overall satisfaction. By using banana blossoms, an ingredient that is often overlooked, the study hopes to bring forward an innovative and sustainable food product that can enhance food variety and offer nutritional benefits. Moreover, we aim to understand the potential of banana blossom-based products in the growing market for plant-based and healthier food options.This research will guide the development of the paste, as well as help evaluate its sensory qualities and market potential.

II. LITERATURE REVIEW

Banana Blossom (Musa acuminata)

Banana flowers were found to be rich in nutrients and minerals. Singh (2022) summarized that banana flower contains the following the following nutrients and minerals: (1) protein; (2) fiber; (3) carbohydrates; (4) sodium; (5) phosphorous; (6) potassium; (7) calcium; (8) magnesium; (9) iron; and (10) zinc. Banana blossom was also used in different cuisines. In Indonesia, vegetarian meatballs consisting 40% banana blossom and 60% oyster mushroom were made as an alternative to commercial meatballs and were proven healthier and more nutritious (Farida & Rawiniwati, 2021).A mushroom and blanched banana flower mix formula in making mushroom balls was studied andfound out that the higher content of banana flowers, the lower of elasticity, the higher of hardness, texture and gum feeling, thus improving health benefits without compromising consumer acceptance (Chaiwongsa et al., 2021). Using banana

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blossom in making patty for burgers were also innovated as a healthier substitute to meat patties (Orogo, J. M. et al., 2020).Banana inflorescence is a health boon to mankind due to its medicinal properties including, anti-oxidant, anti-diabetic, anti- microbial activity, among others. Banana flowers are a good source of nutrients with tremendous health benefits. Therefore, it is of interest to document the health benefits and therapeutic potential of banana flower. Banana flowers are valued for their nutritional and health benefits. (Govindaraj, et.al 2022).

Blossom is an edible flower rich in many nutrients and anti-oxidants which can give several health benefits but it is mostly discarded as waste during cultivation of banana.The extract of banana blossom possesses antioxidant properties which helps to prevent tissue damage caused due to increase in amount of toxins produced in our body. The flower considered as a vegetable which has a potential to be regarded as functional food due to its high nutritional content, being an excellent source of fiber, protein, vitamin A, C and E including minerals like phosphorous, Iron, Zinc and Potassium. The flower is found to be a rich source of fiber and some biologically active compounds like vitamin C, tannins myoinositol, phosphates and alpha tocopherol.The bracts of banana flower are good source of carbohydrates, proteins and minerals. (Soni et. Al 2021)

Banana Blossom Health Benefits

Musa species are widely known for their medicinal properties to mankind. Heart pain, menstrual cramps, diabetes, endocrine problems and asthma can be treated from the flowers of banana also weak body and infantile malnutrition can be suppressed using the blossoms of banana.Blossoms are found to cure stomach and throat ulcers, redness/itching of eyes, nervous disabilities, breathing immune system and reduce the growth of blood flow problems. They have also been reported to boost cancer cells together due to their antioxidant properties can reduce the risk of chronic diseases like cardiovascular and diabetes. The flower due to rich in anti-oxidants and fiber is known to stabilize the blood sugar levels; helps fight anemia and menstrual problems in women. Also, it is believed to inhibit the growth of pathogenic bacteria and malarial bacterial growth. (Soni et. Al 2021). The therapeutic use of insulin, the main recommended treatment was diet therapy with the utilization of traditional remedies derived mainly from plants. Vilhena et al. (2020) reported that after 15 days of treatment with aqueous extract of Musa paradisiaca (200 mg/kg), all streptozotocin (STZ)-induced diabetic rats treated with extracts and fractions of M.paradisiaca had shown a significant reduction in fasting glycemia compared to the rats of the untreated diabetic group.

Banana inflorescence is a health boon to mankind due to its medicinal properties including, anti-oxidant, anti-diabetic, anti-microbial activity, among others. Compounds such as alkaloids, phenols, tannins, flavonoids are responsible for these activities (Mahmood et al., 2011).Banana flowers are a good source of dietary fiber in the form of soluble and insoluble fiber. Soluble fiber dissolves in water and forms a gel, which allows food to pass easily through the digestive tract. The insoluble fiber in banana flowers does not dissolve in water and it helps provide bulk to undigested waste products.Both types of dietary fiber promote healthy digestion and absorption of food in the gastrointestinal tract. Biologically active molecules are held by dietary fiber from plantain inflorescence. These biologically active molecules are always released in digestion with probiotic bacteria which helps in fermentation, all these have advantageous effects on gastrointestinal health and decreasing the exposure of colon cancer. It is reported that the intake of dietary fiber exerts beneficial role in the prevention and management of gut related problems,cardiovascular diseases, type2 diabetes, certain types of cancer and obesity.(Govindaraj, et. Al 2022).Banana flower was a good source of dietary fiber and antioxidants and is rich in micronutrients like polyphenols, gallic acid, catechol, syringic acid and ferulic acid [3]. These antioxidants and micronutrients neutralize free radicals and prevent oxidative damage. Since oxidative damage greatly increases the risk of several diseases including heart disease and cancer, antioxidants can play a vital role in preventing or even slowing down the progression of these conditions. (Govindaraj, et. Al 2022).

Banana Blossom Traditional Medicinal Uses

Traditionally, different parts of banana have been used as herbal remedies for managing several illnesses, such as dried peels of ripe banana for cough, cold and gastritis, pseudo stem exudates for pinworm infection, and ripe pulp for

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dysentery. (Sarma et. Al 2021).Banana flower, stalk and leaves are used to treat different diseases and are of incredible medicinal value for human being . It is considered to be an excellent nutritional and mineral source of high level of natural bioactive substances (e.g., phenolic compounds, flavonoids, carotenoids, or quercetin) and exhibits a great antioxidant property which is related to health benefits and disease prevention. Therefore, they are beneficial health food supplement for diabetic individuals. (Govindaraj, et.al 2022). According to Govindaraj, et.al (2022) the banana flower can be a good source of beneficial unsaturated fatty acids such as oleic, linoleic, and α-linolenic acids (accounting for more than 60% of total fatty acids) that may reduce the risk of cardiovascular diseases. In addition Banana blossoms have been utilized to treat the excessive blood loss during the menstrual cycle. Magnesium content of banana flower is reported to reduce the anxiety during that period. Consumption of one cooked banana flower with one cup of curd or yogurt is the most effective treatment for excessive bleeding during menstruation. This combination increases the level of progesterone in the body and thereby reduces bleeding associated with menorrhagia. Traditionally; banana flower is used to treat women who are suffering from polycystic ovarian syndrome.(Jayamathi Govindaraj, et.al 2022).

Banana Blossom Nutritional Value and Food Consumption

Banana flowers were also used in bakery and pastry products. Banana flowers being used in plain cakes were also found suitable for improving dietary health and are found to be supplemented with up to 4% to improve the nutritional value of the cake (Tasnim et al., 2020).The flower is considered as a vegetable which has a potential to be regarded as functional food due to its high nutritional content, being an excellent source of fiber, protein, vitamin A, C and E including minerals like phosphorous, Iron, Zinc and Potassium. According to Tasnim et al.Blossoms are good source of high-quality protein, dietary fiber,vitamins, minerals including Iron, copper, magnesium and also rich in flavonoids specially quercetin. Sugars being the bio-available source of energy, flower is found to be rich in sugars like maltose, sucrose, arabinose, glucose and fructose. Classes of phytochemical which include amount of tannins, saponins, flavonoids are also reported in banana bracts. (Damini Soni and Gargi Saxena, 2021).

Banana flower has tremendous nutritional value and is consumed as food additive in many Asian countries such as Sri lanka, Indonesia, Thailand and Myanmar. The flower is found to be a rich source of fiber and some biologically active compounds like vitamin C, tannins, myoinositol, phosphates and alpha tocopherol. The bracts of banana flower are good source of carbohydrates, proteins and minerals. The flower in Thailand is usually considered as a vegetable which has a potential to be regarded as functional food due to its high nutritional content, being an excellent source of fiber, protein, vitamin A, C and E including minerals like phosphorous, Iron, Zinc and Potassium. According to Tasnim et al. blossoms are good source of high-quality protein, dietary fiber, vitamins, minerals including Iron, copper, magnesium and also rich in flavonoids specially quercetin. Sugars being the bio-available source of energy, flower is found to be rich in sugars like maltose, sucrose, arabinose, glucose and fructose. Classes of phytochemical which include amount of tannins, saponins, flavonoids are also reported in banana bracts. (Damini Soni and Gargi Saxena; 2021).

According to Damini Soni and Gargi Saxena, (2021) The flowers of banana are been consumed in many countries including Indonesia, Thailand, Myanmar. It is considered as vegetable and is cooked in variety of dishes in India, Sri Lanka and South East Asian countries. It is exclusively included in south Indian cuisines and Bengali recipes; the Assamese community use it in a rustic and a simple way with fewer spices to make koldil bhaji and koldil mangxho. The extract of banana blossom has also been used to prepare banana tea in United States. Blossom is also consumed in Bangladesh as vegetable and as salad with ice and wheat bread in different countries of Asia.Banana flowers are considered a natural food additive in many Asian countries due to their high nutritional content, which includes fiber, vitamins, protein, and minerals such as phosphorus, iron, zinc, and potassium. It is also an excellent source of flavonoids, tannins, saponins, etc. Reported that the banana blossoms had protein content from 8.89 % to 10.35 % dry weight, fat content from 4.95 % to 15.69 % dry weight, and moisture content from 92.29 % to 93.73 % flesh weight, ash content from9.88 % to 12.25 % dry weight (Florent et al., 2015). Moreover, the banana flowers were reported to be high in micronutrients such as potassium (6480 mg/100g), calcium (687 mg/100g), magnesium (273 mg/100g), and phosphorus (211 mg/100g). (Soni and Saxena, 2021).

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The study of Zhang et al. (2022) reported that cooked banana blossoms have moderate amounts of **carbohydrates, proteins**, and **fats,** with about 2.5 to 3 grams of protein and 0.5 grams of fat per 100 grams of cooked blossom. The carbohydrate content was reported as 15–18 grams, and the dietary fiber content was substantial at 3–4 grams per 100 grams. The cooked banana blossom was found to contain a significant amount of **vitamin C** (7.5–10 mg), which is critical for immune health and collagen synthesis. There were also moderate amounts of **potassium, magnesium,** and **calcium**. These minerals help support heart health, muscle function, and bone health. The cooked banana blossom was rich in **flavonoids** and **phenolic compounds,** which have antioxidant properties that could help combat oxidative stress and inflammation.

III. METHODOLOGY

The study utilized the developmental-descriptive research design. This is the appropriate method because it developed a product and described its physical characteristics. Moreover, it was experimental because it determined which of the formulations or mixtures of banana blossom sauce and its potential products is acceptable. The samples are grouped accordingly with controlled measures of banana blossom;50 grams, 75grams, and 100 grams respectively. These different controlled mixtures were evaluated through their qualitative characteristics.The developmental research study on all-purpose banana blossom gourmet paste was conducted at the Food Technology Innovation Center within Surigao del Norte State University, Surigao City, Surigao del Norte, Philippines.The respondents were compost of ten Secondary Teachers handling TLE subjects in Loreto District, Experts and 50 consumers.

IV. RESULTS AND DISCUSSION

Table 1 presents the acceptability ratings for the appearance of three different formulations of the all-purpose banana blossom gourmet paste.

Formulation A received an overall mean of 7.59 (SD = 1.22), with the highest rating for the statement "The color of the product looks appealing" (M = 7.78), suggesting that raters found the visual appeal of the product notably attractive. The lowest rating within this formulation was for "The product's color matches my expectations for this type of product" (M = 7.37), which, while still favorable, only reached the "Like Moderately" (LM) level, indicating slightly less agreement among raters on this expectation-based aspect.Formulation B performed slightly better, with an average mean of 7.70 (SD = 1.11). The highest-rated item was again "The color of the product looks appealing" (M = 7.90), reinforcing its importance in visual acceptability. The lowest score was for "The product's color matches my expectations" (M = 7.43), which, similar to Formulation A, was the only item to drop to the LM level. This indicates that while raters liked the color overall, some had minor reservations when comparing it to their preconceived expectations for such a product.Formulation C obtained the highest overall appearance score among the three, with a mean of 7.79 (SD = 1.21). The top-rated item was once more "The color of the product looks appealing" (M = 8.10), which reached the higher end of the "Like Very Much" range, signifying a particularly strong impression. The lowest mean was recorded for "The product's color matches my expectations" (M = 7.50), though this was still within the LVM category for this formulation, unlike the other two which had LM for the same item. This suggests that Formulation C most effectively met the raters' expectations in terms of color and overall appearance.

TABLE 1: ACCEPTABILITY OF APPEARANCE OF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Statement	Formulation A			Formulation B			Formulation C		
	M	SD	*D*	M	SD	*D*	M	SD	*D*
1. The color of the product looks appealing.	7.78	0.99	***LVM***	7.90	1.07	***LVM***	8.10	0.90	***LVM***
2. The color is vibrant and fresh.	7.57	1.28	***LVM***	7.52	1.24	***LVM***	7.72	1.33	***LVM***
3. The product's color is consistent and uniform.	7.68	1.60	***LVM***	7.88	1.28	***LVM***	7.83	1.60	***LVM***
4. The color of the product is suitable for its type.	7.55	1.85	***LVM***	7.78	1.66	***LVM***	7.78	1.76	***LVM***

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5. The product's color matches my expectations for this type of product.	7.37	1.88	***LM***	7.43	1.54	***LM***	7.50	1.75	***LVM***
Average	**7.59**	**1.22**	***LVM***	**7.70**	**1.11**	***LVM***	**7.79**	**1.21**	***LVM***

Table 2 shows the acceptability ratings for the aroma of the three all-purpose banana blossom gourmet paste formulations.

TABLE 2: ACCEPTABILITY OF AROMAOF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Statement	**Formulation A**			**Formulation B**			**Formulation C**		
	M	**SD**	***D***	**M**	**SD**	***D***	**M**	**SD**	***D***
1. The product has an appealing odor.	7.80	1.12	***LVM***	8.03	1.01	***LVM***	8.30	1.03	***LVM***
2. The product's odor is pleasant and not overpowering.	7.82	1.10	***LVM***	7.98	1.13	***LVM***	8.15	1.10	***LVM***
3. The product has a natural odor.	7.58	1.12	***LVM***	7.70	1.20	***LVM***	8.02	1.13	***LVM***
4. The odor of the product is pleasant enough to encourage consumption.	7.75	1.16	***LVM***	7.87	1.03	***LVM***	8.22	1.04	***LVM***
5. The product's odor is consistent with its intended flavor.	7.77	1.36	***LVM***	7.85	1.26	***LVM***	8.03	1.33	***LVM***
Average	**7.74**	**0.98**	***LVM***	**7.89**	**0.87**	***LVM***	**8.14**	**0.93**	***LVM***

Formulation A had an overall average mean of 7.74 (SD = 0.98), with the highest rating recorded for the statement "The product's odor is pleasant and not overpowering" (M = 7.82), closely followed by "The product has an appealing odor" (M = 7.80). The lowest, although still rated as LVM, was "The product has a natural odor" (M = 7.58), suggesting that while the aroma was well liked, some respondents perceived a slight deviation from what they consider a truly natural scent.Formulation B showed a slightly improved performance with a higher overall mean of 7.89 (SD = 0.87). The statement that received the highest score was "The product has an appealing odor" (M = 8.03), confirming that aroma is a crucial factor in consumer acceptance. The lowest-rated item was "The product has a natural odor" (M = 7.70), which was again the lowest for this formulation, reflecting a similar trend to Formulation A. Nonetheless, all items remained firmly within the LVM range.Formulation C outperformed the other two with the highest overall aroma score of 8.14 (SD = 0.93), indicating very strong positive feedback. The highest mean was for "The product has an appealing odor" (M = 8.30), showing that consumers found the scent particularly attractive. The lowest, though still high, was again "The product has a natural odor" (M = 8.02), which remains within the LVM category and is higher than the same item in the other formulations.

Table 3 presents the sensory evaluation results for the taste acceptability of the three formulations of the all-purpose banana blossom gourmet paste.

TABLE 3: THE ACCEPTABILITY OF TASTEOF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Statement	**Formulation A**			**Formulation B**			**Formulation C**		
	M	**SD**	***D***	**M**	**SD**	***D***	**M**	**SD**	***D***
1. The taste is delicious and well-balanced, enhancing the overall dish.	7.58	1.17	***LVM***	7.65	1.38	***LVM***	7.87	1.49	***LVM***

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2. The taste is neutral and does not stand out in the dish.	7.45	1.33	***LM***	7.73	1.01	***LVM***	7.90	1.22	***LVM***
3. The taste of the product is unique and refreshing.	7.58	1.27	***LVM***	7.80	1.01	***LVM***	7.88	1.64	***LVM***
4. The product has the appropriate level of starch and saltiness.	7.55	1.38	***LVM***	7.62	1.35	***LVM***	7.78	1.52	***LVM***
5. The aftertaste of the product is pleasant.	7.57	1.39	***LVM***	7.62	1.33	***LVM***	8.18	1.02	***LVM***
Average	**7.55**	**1.06**	***LVM***	**7.68**	**0.95**	***LVM***	**7.92**	**1.09**	***LVM***

Formulation A had an overall mean score of 7.55 (SD = 1.06), with the highest-rated statement being both “The taste is delicious and well-balanced, enhancing the overall dish” and “The taste of the product is unique and refreshing,” each with a mean of 7.58. These scores suggest that the flavor profile of this formulation was appreciated for both its balance and distinctiveness. The lowest-rated statement was “The taste is neutral and does not stand out in the dish” (M = 7.45), which received only a "Like Moderately" (LM) rating. This suggests that some respondents may have found the flavor less prominent or engaging compared to the other attributes.Formulation B showed slightly higher taste acceptability with an overall mean of 7.68 (SD = 0.95). The most positively rated aspect was “The taste of the product is unique and refreshing” (M = 7.80), highlighting the appeal of novelty and freshness in the flavor profile. The lowest score, although still within the LVM range, was again for “The taste is neutral and does not stand out in the dish” (M = 7.73), implying a consistent pattern where the neutral flavor profile is less preferred, even if still acceptable.Formulation C received the highest overall mean of 7.92 (SD = 1.09), indicating the most favorable consumer response in terms of taste. The highest-rated statement was “The aftertaste of the product is pleasant” (M = 8.18), suggesting that Formulation C left a strong, positive lasting impression on the palate. The lowest mean, though still within the LVM range, was “The product has the appropriate level of starch and saltiness” (M = 7.78), which still reflects a good balance but shows slightly more variability in perception.

Table 5 illustrates the sensory evaluation results for the texture acceptability of the three formulations of the all-purpose banana blossom gourmet paste.

Formulation A had an overall mean of 7.64 (SD = 1.02). The highest rating was given to the statement “The texture is suitable for the type of product” (M = 7.82), indicating that raters found the texture appropriate for a gourmet paste. This was followed closely by “The texture makes the product enjoyable to eat” (M = 7.78). The lowest mean score for Formulation A was “The texture of the product is soft and noticeable when eaten” (M = 7.23), which, unlike the other indicators, was rated only as “Like Moderately” (LM). This suggests that while the product’s chewiness and consistency were appreciated, its softness might not have been as prominent or ideal for some participants.

Formulation B performed slightly better, with a higher average mean of 7.85 (SD = 0.83). The highest score was recorded for “The texture makes the product enjoyable to eat” (M = 8.05), emphasizing the positive impact of mouthfeel on the overall eating experience. Meanwhile, the lowest score remained with the same statement as in Formulation A—“The texture of the product is soft and noticeable when eaten” (M = 7.40), still within the LM range. This consistent finding may suggest that a slightly firmer texture is preferable for this type of product, or that the perceived softness was not as valued as other texture aspects.Formulation C stood out with the highest overall texture rating, achieving a mean of 7.98 (SD = 1.07). Its highest-rated attribute was “The texture makes the product enjoyable to eat” (M = 8.18), closely followed by “The texture is consistent throughout the product” and “The texture is suitable for the type of product” (both M = 8.08). The lowest-rated item, while still strong, was “The texture of the product is soft and noticeable when eaten” (M = 7.58), which, unlike in the other formulations, reached the LVM category. This indicates that Formulation C not only maintained favorable texture characteristics but also improved perceptions of softness compared to the other variants.

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TABLE 4: ACCEPTABILITY OF TEXTURE OF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Statement	Formulation A			Formulation B			Formulation C		
	M	SD	D	M	SD	D	M	SD	D
1. The texture of the product is soft and noticeable when eaten.	7.23	1.27	*LM*	7.40	1.37	*LM*	7.58	1.55	*LVM*
2. The product has a noticeable chewy texture.	7.65	1.22	*LVM*	7.85	1.01	*LVM*	7.98	1.17	*LVM*
3. The texture is consistent throughout the product.	7.72	1.49	*LVM*	7.90	1.24	*LVM*	8.08	1.45	*LVM*
4. The texture makes the product enjoyable to eat.	7.78	1.01	*LVM*	8.05	0.91	*LVM*	8.18	0.98	*LVM*
5. The texture is suitable for the type of product.	7.82	1.24	*LVM*	8.07	1.02	*LVM*	8.08	1.28	*LVM*
Average	**7.64**	**1.02**	*LVM*	**7.85**	**0.83**	*LVM*	**7.98**	**1.07**	*LVM*

The following two tables present the results of the statistical analyses conducted to determine whether there are significant differences in the sensory attributes—appearance, aroma, taste, and texture, among the three formulations of the all-purpose banana blossom gourmet paste. To identify which formulation of the all purpose banana blossom gourmet paste consumers prefer, a Multivariate Analysis of Variance (MANOVA) for Repeated Measures was first run on the combined appearance, aroma, taste, and texture data, followed by separate univariate F tests for each attribute and Bonferroni adjusted pairwise comparisons.

TABLE 5: SIGNIFICANT DIFFERENCE ON THE ACCEPTABILITY OF THE SENSORY ATTRIBUTES OF THE THREE FORMULATIONS OF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Attribute	F	p	Decision on Ho	Interpretation
Appearance	2.05	.133	Not Rejected	Not Significant
Aroma	9.88	<0.01	Rejected	Significant
Taste	6.01	.003	Rejected	Significant
Texture	6.30	.003	Rejected	Significant

Wilks' Lambda Λ= 0.828, F=2.84, p=0.005

MANOVA using Wilks' λ yielded a value of 0.828, $F = 2.84$, $p = 0.005$, demonstrating that when the four sensory variables are considered simultaneously the three formulations differ as a group. Univariate follow□ups clarified the specific drivers of this overall effect: aroma ($F = 9.88$, $p < 0.01$), taste ($F = 6.01$, $p = 0.003$) and texture ($F = 6.30$, $p = 0.003$) all showed significant differences among formulations, whereas appearance did not ($F = 2.05$, $p = 0.133$). In other words, raters felt the pastes looked similarly attractive, but they detected meaningful distinctions in smell, flavor and mouthfeel.

Bonferroni comparisons in Table 6 pinpoint the sources of those distinctions. For aroma, Formulation C ($M = 8.14$) was rated significantly higher than both Formulation A ($M = 7.74$, $p = 0.003$) and Formulation B ($M = 7.89$, $p = 0.014$), while A and B did not differ from each other, confirming that the marked aromatic appeal of C is unique. The same pattern, though slightly less pronounced, emerged for taste: C again outperformed A ($M = 7.92$ vs. 7.55, $p = 0.017$); B ($M = 7.68$) occupied a middle position, differing from neither C nor A after adjustment, suggesting it delivers a palatable but less distinctive flavour. Texture followed suit: C ($M = 7.98$) was significantly preferred over A ($M = 7.64$, $p = 0.004$), while its difference from B ($M = 7.85$) was not large enough to survive the conservative Bonferroni threshold, and B's advantage over A narrowly missed significance ($p = 0.050$). Taken together, these pairwise findings show that Formulation C is consistently at the top of the sensory hierarchy, particularly excelling in aroma and retaining significant edges in taste and texture, whereas Formulation A lags behind and Formulation B generally occupies an intermediate, statistically indistinct position.

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TABLE 6: PAIRWISE COMPARISONS OF THE SENSORY ACCEPTABILITY OF THE THREE FORMULATIONS OF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Attribute	Formulation (Mean)		p	Decision on Ho	Interpretation
Aroma	A (M=7.74)	B (M=7.89)	.098	Not Rejected	Not Significant
	A (M=7.74)	C (M=8.14)	.003	Rejected	Significant
	B (M=7.89)	C (M=8.14)	.014	Rejected	Significant
Taste	A (M=7.55)	B (M=7.68)	.459	Not Rejected	Not Significant
	A (M=7.55)	C (M=7.92)	.017	Rejected	Significant
	B (M=7.68)	C (M=7.92)	.060	Not Rejected	Not Significant
Texture	A (M=7.64)	B (M=7.85)	.050	Not Rejected	Not Significant
	A (M=7.64)	C (M=7.98)	.004	Rejected	Significant
	B (M=7.85)	C (M=7.98)	.632	Not Rejected	Not Significant

Table 7 presents the nutritional composition of Formulation C of the all-purpose banana blossom gourmet paste, based on chemical analysis per 100 grams and converted values per serving size.

TABLE 7: NUTRITIONAL CONTENTS OF FORMULATION "C"OF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Food Nutrient	Result of Chemical Analysis (per 100g)	Amount of Food Nutrient per Serving Size (Rounded Value)	% Daily Value (based on 2000 Calorie Diet, Rounded Value)	% RENI (based on FNRI reference adult requirement of males 19–29 years old)
Calories	174.55	340		13
Calories from Fat	73.35	140		
Total Fat (g)	8.15	16	21	
Sodium (mg)	544.37	1060	46	
Total Carbohydrates (g)	20.09	39	14	
Protein (g)	5.21	10	20	14

*Based on the Report of Chemical Analysis
% Daily Value is based on the New Nutrition Facts Label finalized May 20, 2016

The formulation provides 174.55 calories per 100 grams, which increases to approximately 340 calories per serving, with 73.35 calories derived from fat. This caloric content represents 13% of the recommended daily intake based on a 2,000-calorie diet, indicating that the product is a moderately energy-dense food.In terms of macronutrients, the formulation contains 8.15 grams of total fat per 100 grams, which equates to 16 grams per serving, contributing 21% of the recommended daily value. This suggests a relatively high fat content, which may enhance the flavor and mouthfeel of the product. The sodium content is notably high at 544.37 mg per 100 grams, reaching 1,060 mg per serving, or 46% of the daily recommended value, indicating that while the paste is flavorful, it should be consumed in moderation, especially by individuals monitoring their sodium intake.The product also delivers 20.09 grams of carbohydrates per 100 grams, or 39 grams per serving, which corresponds to 14% of the daily recommended intake, offering a fair contribution to dietary energy. The protein content is 5.21 grams per 100 grams, translating to 10 grams per serving, which is 20% of the daily value and 14% of the Recommended Energy and Nutrient Intake (RENI) for Filipino males aged 19–29, based on FNRI standards. This shows that the paste contributes meaningfully to protein intake, especially valuable in plant-based diets.

Table 8 presents the results of the physicochemical analysis of Formulation C of the all-purpose banana blossom gourmet paste, highlighting its composition in terms of moisture, ash, protein, fat, and sodium content.

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TABLE 8: PHYSICO-CHEMICAL PROPERTIES OF FORMULATION "C"OF ALL-PURPOSE BANANA BLOSSOM GOURMET PASTE

Parameter	Result
Moisture	63.74 g/100g
Ash Content	2.81 g/100g
Crude Protein	5.21 g/100g
Total Fat	8.15 g/100g
Sodium	544.37 mg/100g

The moisture content is 63.74 g per 100 grams, indicating that the product has a relatively high in water content, which contributes to its softness and spreadability, which is an important characteristics for a paste product. High moisture levels also affect shelf life, making the product more prone to microbial growth if not stored properly, thus underscoring the need for appropriate preservation or packaging methods.The ash content, which measures the total mineral content of the food, is 2.81 g per 100 grams. This relatively modest level suggests the presence of essential minerals that contribute to the nutritional value of the product. The crude protein content is 5.21 g per 100 grams, which aligns with the nutritional analysis and highlights the product's potential to contribute to dietary protein intake, particularly in plant-based diets where banana blossom is valued as a meat substitute.The total fat content is 8.15 g per 100 grams, which, while contributing to flavor and mouthfeel, also plays a role in the product's energy density. Fat also aids in the absorption of fat-soluble vitamins and enhances the palatability of the paste. Lastly, the sodium content is 544.37 mg per 100 grams, which is relatively high and consistent with the findings in the nutritional analysis. While sodium enhances flavor, it also requires monitoring, especially for health-conscious consumers or those with dietary restrictions.

V. CONCLUSION

The high acceptability ratings across all sensory attributes confirm that the developed formulations, particularly Formulation C, are well-received and consumer-friendly.The significant differences in aroma, taste, and texture among the formulations indicate that careful adjustment of ingredients can improve product preference, as seen in the success of Formulation C.The physico-chemical composition of Formulation C supports its quality and appeal as a food product but also highlights the need for proper storage and sodium management.The nutritional analysis shows that Formulation C can be a valuable part of a balanced diet, offering key nutrients, though mindful consumption is necessary due to its sodium content.

REFERENCES

[1]. Abdul Wahab, N. B., Mohamad, S. M., & Nor, N. A. M. (2025). Physicochemical and Sensory Characteristics of Banana Blossom Nuggets. Retrieved from https://www.researchgate.net/publication/382251011_Physicochemical_and_Sensory_Characteristics_of_Banana_Blossom_Nuggets

[2]. Archana Ravindran, Jenny Ann John, Sanu Jacob (2020). Nutritional, textural and sensory quality of plain cake enriched with rice rinsed water treated banana blossom flour. Journal of Agriculture and Food Research, 2, 100071. https://doi.org/10.1016/j.jafr.2020.100071

[3]. Bashir, K. M., & Hossain, M. A. (2021). Banana blossom (Musa acuminata) as an underutilized resource for functional food development: Nutritional value, processing, and applications. Food Science & Nutrition, 9(12), 6596-6606. https://doi.org/10.1002/fsn3.2726

[4]. Bishal Thagunnaa, Kamana Kandelb, Bijaya Lamichhanec (2023). Banana blossom: Nutritional value, health benefits, and its utilization. Food Science & Nutrition, 11(1), 130-140.

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[5]. Beng Fye Laua , Kin Weng Kongb,c,*, Kok Hoong Leong c,d , Jian Sun e,f,**, Xuemei He e,f , Zhenxing Wang g, Mohd Rais Mustafa c,h , Tau Chuan Ling a , Amin Ismail (2020). Banana inflorescence: Its bio-prospects as an ingredient for functional foods. Food Research International, 137, 109734. https://doi.org/10.1016/j.foodres.2020.109734

[6]. Farida, F. R. (2021). Agribusiness prospect of banana flowers and oyster mushrooms as raw materials for meatballs vegetarian. Journal of Tropical Biodiversity, 1(3), 149-166.

[7]. Jayamathi Govindaraj, Keerthidaa Govindaraj , UVidyarekha, S. Bhuminathan , Sindhuja Lakshmi & Kesavaram Padmavathy . (2022). A review on the therapeutic potential of banana flower. Journal of Medicinal Plants, 17(4), 34-42.

[8]. João Paulo Souza Simão da Silva,Mirian Bomfim Fernandes, Jociel Honorato de Jesus(2024). Valorization of banana flower residues: Potential therapeutic and antioxidant applications. Reviews in Food and Agriculture (RFNA). https://doi.org/10.26480/rfna.02.2023.62.66

[9]. Karlo Tiongson Ecalne , Liza Marie Chicombing De Guzman , Susan Sy Montemayor , Jan Dominique Reyes Lapig and John Patrick Dela Torre Ramos (2022). Proximate composition and antioxidant activity of the saba (Musa acuminata x balbisiana Colla) banana blossom from the family Musaceae. GSC Biological and Pharmaceutical Sciences, 21(2), 26–32.

[10]. Nur Syahirah Muhammad Suffi, Emida Mohamed, Siti Nazrina Camalxaman, Azlin Sham Rambely, Norhisham Haron (2021). The medicinal benefits, phytochemical constituents, and antioxidant properties of banana blossom: A mini review. International Journal of Medicinal Plants, 12(3), 22-30.

[11]. Partha Pratim Sarma, Nonibala Gurumayum, Akalesh Kumar Verma and Rajlakshmi Devi (2021). A pharmacological perspective of banana: Implications relating to therapeutic benefits and molecular docking. Asian Journal of Pharmaceutical and Clinical Research, 14(2), 50-57.

[12]. Ramos, R. P., & Mercado, J. L. (2020). Utilization of banana blossoms (Musa acuminata) as an alternative food ingredient: Nutritional and functional properties. International Journal of Food Science and Technology, 55(3), 823-833. https://doi.org/10.1111/ijfs.14450

[13]. Ravindran, A., John, J.A., Jacob, S,. (2021). Nutritional, functional and shelf-life assessment of processed banana inflorescence (Musa paradisiaca). Food Science and Technology International, 27(2), 115-123.

[14]. Shwetha Acharya, C. R. Ramesh, Hum (2020). Production of natural banana blossom concentrate. Aegaeum Journal, 8(10). https://doi.org/0776-3808

[15]. Singh, R. (2022). Banana flower: Uses, benefits, and side effects. Pharmeasy.com. Retrieved from https://www.pharmeasy.com

[16]. Soni, D., & Saxena, G. (2021). Complete nutrient profile of banana flower: A review. Journal of Plant Science Research, 38(4), 215-222.

[17]. Soni, D., & Saxena, G. (2021). Analysis of physico-chemical and functional properties of banana flower. International Journal of Food Science, 24(6), 650-657.

[18]. Tariga, E. C., Quitan, J. M., & De Vera, C. M. (2022). Acceptability study of banana blossom (Musa sp.) cupcake fortified with honey: A bread innovation. International Journal of Research Publications, 102(1). Retrieved from https://www.ivysci.com/articles/6428324__Acceptability_Study_of_Banana_Blossom_Banana_Musa_Cupcake_Fortified_with_Honey_A_Bread_Innovation

[19]. Upasana Sarma , Viney Kumar Govila and Akanksha Yadav (2020). The traditional and therapeutic use of banana and its plant-based delicacies in ethnic Assamese cuisine and religious rituals from Northeast India. Journal of Ethnic Foods, 7, 21. https://doi.org/10.1186/s42779-020-00053-5