

Blumea balsamifera (Sambong) Extract as a Therapeutic Ice Cream

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Abstract: *The use of medicinal plants for health treatment, cure or even disease prevention can be considered one of the oldest forms of medical practice. This study proposes developmental research to create a convenient delivery system from extracted Blumea balsamifera (Sambong) in production as a therapeutic ice cream that would make it readily available for consumers to buy and consume as a tasty treat, while potentially providing a natural and effective treatment for diseases and illnesses such as colds, coughs, and kidney problems. To determine the acceptability of the Blumea balsamifera extract, the researchers conducted a sensory evaluation. Twenty (20) participants, consisting of Canteen Staff, TLE teachers, Science teachers, and parents are chosen as evaluators. The assessment focuses on key sensory attributes, including appearance, aroma, taste, and texture. Additionally, participants provide feedback on the overall acceptability of the product.*

Keywords: *Herbal treatment, Blumea balsamifera, Therapeutic ice cream, Convenient*

I. INTRODUCTION

Medicines have existed in human society probably as long as sickness itself. However, with the advent of the modern pharmaceutical industry, biochemical approaches to preventing and treating diseases and common illnesses, it has acquired a new level of prominence in the evolving relationship between microbes and their human hosts. As such, one of the ways of treating diseases and illnesses is the use of antibiotics. But their use can lead to increasing bacterial resistance and adverse effects.

Thus, there is a growing need for alternative treatments that are effective, safe, and have fewer side effects. The use of medicinal plants for health treatment, cure or even disease prevention can be considered one of the oldest forms of medical practice. Even today, the use of medicinal plants or other alternative practices can be the only therapeutic resources for many communities and ethnic groups, especially in developing countries (De Moraes Mello Boccolini & Boccolini, 2020). As evidenced by Maqbool *et al.* (2019), the use of herbal drugs is becoming more and more streamlined as improvements in analysis and quality control along with advances in clinical research show their value in the treatment and prevention of disease. Sometimes, the conventional

synthetic drugs which are used for treatment of patients with chronic ailments can be replaced by herbal medicines. Also, they are comparably cheaper than synthetic medicines commonly prescribed by doctors nowadays. In fact, low budget consumers are opting for this solution to their health problems in order to get as much savings they can get to address their health-related concerns.

In the study conducted by Alkhamaiseh & Aljofan (2020), with their findings of prevalence use of herbal medicine, the respondents' belief about the safety of herbal medicines, some participants claimed that herbal's affordability and availability make them a more convenient option to use than the standard therapy and a number of studies from Saudi Arabia and other countries have also reported that the cost of herbal medicine makes them a suitable option for many people particularly those from a low socioeconomic background.

Given the limited availability and high cost of branded pharmaceutical products in remote areas, exploring the efficacy of natural remedies is crucial. The use of herbal medicines has been a promising alternative in these situations. One potential solution is the use of *Blumea balsamifera*, also known as Sambong, a medical plant commonly found in Southeast Asia, it used as medicine to treat colds, coughs, and kidney problems. It is also used to treat respiratory infections and stomach pains. Sambong is very popular among people with kidney problems because of its diuretic qualities (Boy *et. al.*, 2018). Developing a convenient and accessible delivery system for Sambong could provide a natural and effective treatment option that are readily available for consumers to buy and consume.

II. STATEMENT OF THE PROBLEM

The study aimed to develop an ice cream from *B. balsamifera* (Sambong) extract to provide convenience to people and produce an alternative and effective treatment.

Specifically, this study sought to answer the following:

1. What are the ingredients in making *Blumea balsamifera* (Sambong) ice cream?
2. What is the nutritional fact analysis of *Blumea balsamifera* (Sambong) ice cream?
3. Using Hedonic rating scale and Descriptive evaluation, what is the sensory evaluation of *Blumea balsamifera* (Sambong) in terms of:
 - 3.1. Appearance;
 - 3.2. Aroma;
 - 3.3. Taste; and
 - 3.4. Texture
4. Is there a significant difference between the Sensory evaluation of *Blumea balsamifera* (Sambong) ice cream using the Hedonic rating scale in Descriptive rating scale?

III. ASSUMPTION

It assumed that *Blumea balsamifera* (Sambong) ice cream is accepted and recommended as an alternative medicine and received favorable sensory evaluation and provide beneficial nutritional components as a Therapeutic Ice cream.

IV. METHODOLOGY

This study employed a developmental research design to develop an Ice Cream with *B. balsamifera* (sambong) extract. The study conducted four phases: (1) fermentation process of *B. balsamifera* (sambong), (2) Ice cream production, (3) sensory evaluation of the Ice cream, (4) data analysis. The purpose of this study was to determine the potential of *B. balsamifera* (sambong) extract into ice cream. Additionally, the researchers used Hedonic Rating Scale wherein a numerical rating from 1 to 9 implied to rate the acceptability of the product, where 9 indicates highly recommendability and 1 indicates high non-recommendability.

Procedures

I. FERMENTATION PROCESS

The *B. balsamifera* (Sambong) was produced at Barangay Lower Patag Sison Surigao Del Norte. These were chopped into small sizes and was placed on a small container then added with water and sugar then sealed to be fermented for over one week by the study of Parsgas, Cruz, and Fiegalan "Green Synthesized Copper

Nanoparticles from *Blumea balsamifera* Linn. Leaves and its Biocidal Activities Against *Bactrocera dorsalis* (Hendel)”

II. PRODUCTION OF ICE CREAM

The flavonoids extracted from the fermentation of *B. balsamifera* (sambong) was strained into a new pail. A bowl was prepared for the ice cream ingredients, including, condensed milk, heavy cream, and the extracted flavonoids. In one bowl, the heavy cream was whipped constantly until it peaks. In another bowl condensed milk with a measurement of 200g and extracted flavonoids with 138g was mixed together. In a mixer pour a heavy cream with a measurement of 250g then mix until it thickens. The mixture was slowly folded into the mixed cream using a rubber spatula. After being completely mixed, the ice cream mixture was poured into a Tupperware container and sealed before being put in the freezer until it was frozen and ready to serve.

III. SENSORY EVALUATION DESIGN

To evaluate the sensory characteristics of *B. balsamifera* (sambong) ice cream a group of (20) trained panelists was recruited, specifically science and TLE teachers. They should have normal or corrected-to-normal vision, no allergies to any of the ice cream ingredients, not be pregnant or under any medication and other medical conditions that can affect the evaluation. Hedonic Rating Scale was used for the degree of consumer acceptance. Additionally, the objective was to evaluate the sensory characteristics linked with top-notch merchandise that are crucial in creating and manufacturing goods that meet the expectations of consumers.

IV. PRODUCT EVALUATION

The evaluators utilized a Hedonic Rating Scale and Food action rating scale to evaluate the characteristics of the product. A numerical rating from 1 to 9 was used to rate the desirability of the product, where 9 indicates highly recommend ability and 1 indicates high non-recommendability. This approach was adapted from the book "Sensory Evaluation of Food Statistical Methods and Procedures" by O'Mahony (2017). The degree of the consumer acceptability of the *B. balsamifera* (sambong) ice cream was evaluated using Hedonic Rating Scale. To calculate the score for the product, each descriptor was assigned a score value: To calculate the score for the product, each descriptor was assigned a score value: Like extremely = 9, like very much = 8, like moderately = 7, like slightly = 6, neither like nor dislike = 5, dislike slightly = 4, dislike moderately 3, dislike very much = 2, dislike extremely = 1.

V. RESULTS AND DISCUSSION

Table 1 Shows a comprehensive summary of the ingredients used in the formulation, providing their quantities and respective percentages in relation to the total mixture.

Ingredients	f	(P)%
Heavy Cream	400g	54.42%
Condensed Milk	200g	27.1%
Sambong Extract	135g	18.37%
Total	735g	100%

Table 1. Used Ingredient

Table 1 presents an overview of the ingredients utilized in the formulation, delineating both their individual quantities and respective percentages concerning the total mixture. The dominant component, Heavy Cream, gives a significant 54.42% of the entire blend, indicating its pivotal role in shaping the formulation and it also provides calcium and vitamin A (Kolb, 2023). The smallest portion at 18.37%, likely brings nuanced flavors and potential health benefits to the concoction is the Sambong Extract. Sambong extract contains volatile oils, flavonoids, and terpenoids (Huang et al. 2022) being the most crucial ingredient to make the ice cream therapeutic. The foundation for further analysis, be it the nutritional profile or the distinct influence of each component on the ultimate creation.

Parameters	Ice Cream using <i>Blumea balsamifera</i> (Sambong) Extract with ingredients condensed milk and heavy cream	Methods
Crude Fat, %	0.93	Soxhlet
Carbohydrates, %	46.9	By calculation (Kjeldahl; Soxhlet; Gravimetric)
Calories/100g	203	
Crude Protein, %	1.7	Kjeldahl

Table 2. Nutritional Facts Analysis

Table 2 presents the nutritional component of the ice cream. The dominant Carbohydrates, constituting 46.9% of the ice cream, were assessed through a combination of methods including Kjeldahl, Soxhlet, and Gravimetric. Carbohydrates act as an energy source, help control blood glucose and insulin metabolism, participate in cholesterol and triglyceride metabolism, and help with fermentation (Holesh *et al.*, 2023). This ensures accurate measurement and interpretation of the carbohydrate content, offering valuable insights into the ice cream's energy-providing component. The lowest content which is the Crude Fat, determined as 0.93% using the Soxhlet method, provides insights into the ice cream's fat composition. Crude proteins contribute three important functional roles to ice cream that can be divided into three categories: emulsification, aeration, and solution behaviour (Goff, 2015). This information is crucial for understanding the product's richness and overall taste. In terms of caloric content, the calculated value of 203g was derived through various combinations of Kjeldahl, Soxhlet, and Gravimetric methods. The entire approach to caloric assessment provides a thorough understanding of the energy content of the ice cream, contributing to the overall nutritional profile (Braizer., 2017). The methods employed, such as Soxhlet for Crude Fat, and a combination of Kjeldahl, Soxhlet, and Gravimetric for Carbohydrates and Calories, ensure precision and reliability in the quantitative measurements. These findings are essential for a comprehensive analysis of the ice cream's nutritional composition, taste profile, and potential impact on dietary considerations.

Parameters	Ice Cream using <i>Blumea balsamifera</i> (Sambong) Extract with ingredients condensed milk and heavy cream	Methods
Ash, %	0.72	Gravimetric
Moisture, %	49.8	

Table 2.1 Nutritional Facts Analysis

Table 2.1 presents the nutritional component of the ice cream. The dominant component, which is the Moisture content of over 49.8%, assessed via gravimetric method, suggests a product with relatively high moisture levels indicating the ice cream's texture and freshness, potentially impacting its shelf stability. The Ash content, measured at 0.72% using the gravimetric method, indicates the presence of mineral residues having the lowest level out of all parameters. This finding hints at a possible contribution to the ice cream's texture and nutritional profile. The Gravimetric method findings by providing precise, quantitative measurements that are crucial for understanding the ice cream's nutritional composition, texture, freshness, and potential shelf stability.

Attributes	M	SD
Taste	8.81	0.54
Texture	8.75	0.58
Appearance	8.63	0.62
Aroma	8.38	0.81
Average	8.64	0.64

Table 3. Sensory Evaluation of *Blumea balsamifera* extract through Hedonic Rating Scale

Interval	Verbal Interpretation	Code
8.12-9.00	<i>Like Extremely</i>	LE
7.23-8.11	<i>Like Very Much</i>	LVM
6.34-7.22	<i>Like Moderately</i>	LM

5.45-6.33	<i>Like Slightly</i>	LS
4.56-5.44	<i>Neither Like or Dislike</i>	NLOD
3.67-4.55	<i>Dislike Slightly</i>	DS
2.78-3.66	<i>Dislike Moderately</i>	DM
1.89-2.77	<i>Dislike Very Much</i>	DVM
1.00-1.88	<i>Dislike Extremely</i>	DE

Legend

The comprehensive Hedonic Rating Test, detailed in Table 3, employed a discerning scale ranging from “dislike extremely” (scored as 1) to “like extremely” (scored as 9), allowing respondents to articulate their nuanced assessments of various attributes (O’Mahony, 2017). The average score of 8.625 for appearance indicates a generally favorable perception, placing it within the “like very much” category. This suggests that respondents found the visual aspect of the product appealing, contributing positively to the overall aesthetic experience. Aroma, with an average score of 8.375, also received positive recognition falling within the “like very much” range. This implies that the scent of the product was well-received by respondents, enhancing the overall sensory appeal. The taste attribute stands out as the highest scoring, amassing a total of 174 with an average score of 8.8125. Respondents expressed a strong preference, falling into the “like extremely” range. Likewise, the texture garnered positive feedback with an average of 8.75. Respondents leaned towards the “like extremely” category, indicating a favorable assessment of the tactile qualities associated with the product. This positive response suggests that the texture significantly contributed to the overall enjoyment and satisfaction of the sensory experience (Kemp *et al.*, 2018).

Indicators	f(16)	%
I would eat this every opportunity I had	8.81	0.54
I would eat this very often	8.75	0.58
I like this and would eat it now and then	8.63	0.62

Table 4. Sensory Evaluation of *Blumea balsamifera* extract through Food Action Rating Scale

The Descriptive Rating Test, as outlined in Table 4, aimed to gather evaluative insights by utilizing a nuanced scale ranging from 1 to 9, where 9 signifies “highly recommendable” and 1 denotes “highly not recommendable” rating scale collectively paint a positive picture (Bellmunt & Claret, 2022). The highest percentage among the Food action rating scale indicator is “I would eat this every opportunity I had” with a percentage of 56%, this suggests that respondents perceive a strong preference, falling within the category of “Highly recommendable”. The “I would eat this very often” with a 31%, indicates a favorable assessment in the “recommendable” category. Also, with “I like this and would eat it now and then” with a 13%, it indicates a favorable assessment in the “recommendable with some improvement” category, showcasing positive sentiments toward the attributes of the product. In summary, the Food Action Rating Scale reveals an overall positive reception of the sample product. The nuanced scale allows for a detailed understanding of the strengths and areas for improvement, providing valuable insights for product refinement and enhancement (LeBlanc *et al.*, 2023).

VI. CONCLUSIONS

High scores in appearance, aroma, and texture validate the ice cream's formulation, the Sambong extract therapeutic ice cream is well-balanced in composition, nutrition, and taste. Received high ratings for taste, texture, appearance, and aroma, indicating great market potential. Positive feedback from the Food Action Rating Scale emphasizes its redundant. Exploring and improving the ice cream further to make the most of its unique qualities and enhance its presence in the market. Furthermore, the future researchers should focus on enhancing the taste and nutritional balance of therapeutic ice cream made with Sambong extract. Exploring ingredient variations is crucial to optimize its health benefits. Conducting sensory studies will refine the product for potential health advantages. Collaborating with industry partners for market feasibility studies is essential to scale up production and introduce this healthier ice cream option to a broader audience.

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