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Formulation, Acceptability, and Utilization of Gumamela-Aloe Vera Lip Tint

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ABSTRACT

Over the past decades, the demand for natural cosmetic products has increased as consumers have become more aware of the harmful effects of synthetic chemicals used in cosmetics. This study developed and formulated a lip tint using gumamela flower and aloe vera gel as natural ingredients. The product was evaluated in terms of sensory attributes and acceptability, specifically color, texture, fragrance, and flavor. Significant differences in sensory attributes and acceptability were also determined, and the pH level of each formulation was tested and analyzed. An experimental research design using a Completely Randomized Design was employed. A total of 30 evaluators participated. A 5-point Likert scale was used for evaluation. Data were analyzed using mean and one-way ANOVA. Results showed that Treatment A (with 2 parts gumamela and 1part aloe vera) consistently received the highest ratings across all sensory attributes. Treatment B (with 1 part gumamela and 1part aloe vera) obtained favorable ratings, followed by Treatment C (with 1 part gumamela and 2 parts aloe vera), which received generally good ratings across all sensory attributes. In terms of acceptability, Treatment A obtained the highest mean rating, while Treatments B and C were also rated as very acceptable. Regarding product application performance, Treatment A achieved the highest ratings. Treatments B and C received good ratings. Statistical analysis showed a significant difference in color among three treatments, with Treatment A obtaining the best result. However, no significant differences were found in texture, fragrance, and flavor. There was no significant difference in general acceptability. In terms of pH level, Treatment C obtained a pH value of 5, which falls within the acceptable range for lip cosmetic products. In contrast, Treatments A and B recorded lower pH values of 3 and 4, respectively. The combination of gumamela flower and aloe vera in a lip tint may satisfy consumer needs for a non-toxic, natural component that is good for the skin while fulfilling its cosmetic function.

INTRODUCTION

Cosmetics play a significant role in improving a person's facial features. Through the application of various cosmetic products, individuals are able to highlight their desirable features, such as their eyes, lips, and cheeks, while also concealing minor imperfections. According to Nayak *et al.* (2021), cosmetics are primarily used to enhance attractiveness and appeal, which plays a significant role in the development of an image and helps in appearing presentable to other people.

Over the past decades, the cosmetic industry has seen major innovation, which has led to an increase in sales and a wider variety of products (Ferreira *et al.*, 2022). Today, the estimated value of the cosmetic industry is around 20 billion dollars globally. Many people are drawn to using beauty and personal care products, as they are supposed to make people improve their appearance and make them beautiful. One of the most popular cosmetics is the lip tint, a type of cosmetic product that serves a decorative purpose by adding pigment and enhancing the natural color of the lips (Lowra *et al.*, 2024). However, due to its demand, it raised concerns about the potential harmful effects of synthetic materials used in making this beauty product. Chemicals, which may trigger allergic reactions, skin irritation, and long-term health hazards.

In the Philippines, there is a fast growth of cosmetics usage especially green cosmetics. As stated in IMARC Group (2025), Filipino consumers are increasingly choosing organic, cruelty-free, and eco-friendly cosmetics due to the growth of awareness of environmental and health concerns. There is also a rising demand for natural ingredients like aloe vera, coconut oil, and plant extracts due to people choosing chemical-free make-up and skincare products. One of the probable ingredients in natural lip cosmetics are gumamela flower and aloe vera gel.

The formulation of gumamela flower and aloe vera as ingredients in lip tint aligns with the Sustainable Development Goals (SDG) 12 - Responsible Consumption and Production, as it focuses on developing lip tint cosmetic products using indigenous plant-based sources as an alternative to synthetic ingredients, which promotes sustainable production and consumption practices. This study could help reduce environmental impact with its eco-friendly formulation, encourage the use of locally available sources, and support the shift towards greener manufacturing and end-users' choices. This aligns with the United Nations' emphasis on sustainable resource use and environmentally responsible production.

The formulation of gumamela flower and aloe vera as a lip tint requires the researcher to carefully develop and apply research methods in assessing the cosmetic

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quality and acceptability of the developed product. The integration of gumamela flower and aloe vera in a lip tint could cater to a wide consumer demand for a natural and non-toxic ingredient, which is beneficial to the skin while serving its purpose as a cosmetic product.

This study explored the potential of gumamela flower and aloe vera as key ingredients in creating a natural lip tint and evaluating its physical features (color, texture, fragrance, and flavor), product application performance (ease of application, moisturizing effect, long-lastingness, and drying time), and the willingness of consumers to use the product. Assessing its utilization through the factors involved helps to determine the usability of the product for end-users. Through this evaluation, the study determined whether a gumamela-aloe vera lip tint is acceptable and functional as a cosmetic product.

LITERATURE REVIEW

Today, cosmetics are regarded as an essential part of people's lives as they focus more on maintaining healthy looking and pleasing appearance. According to Khan and Alam (2019), the word 'cosmetics' is taken from a Greek word "kosmeticos" which means to adorn. Since ancient times, materials used to enhance or beautify a person's appearance have been known as cosmetics. The pursuit of beauty dates back to the earliest stages of human civilization. The tradition of decorating the body and enhancing physical features has been deeply rooted in human culture since tribal times. For centuries, cosmetics have played a significant role in enhancing the appearance of the human body.

Sai *et al.* (2023) formulated a lipstick that contains anthocyanin and evaluated the possibility of it as a natural colorant in lipstick formulation, as well as assessed its stability over a one-month storage period. Anthocyanins are pigments from plants responsible for red, purple, and pink hues, making them valuable for cosmetic pigment. In this research, anthocyanin was extracted from a fresh hibiscus flower using water by compression. The extracted pigment of gumamela (Hibiscus rosa-sinensis) was used to prepare herbal lipstick. According to the study, although the gumamela extract demonstrated relatively low pigmentation intensity compared to the synthetic pigment, it exhibited potential as a natural alternative to artificial colorants in lip balm due to its anthocyanin property, and it showed that the formulated lipstick remained more stable under dark storage conditions, while greater color degration occurred in samples exposed to light. The findings suggest that gumamela extract is a promising botanical ingredient for the development of safer and natural cosmetic products.

Patil *et al.* (2025) conducted a research and made an herbal-infused lip balm. One of the ingredients of their natural lip balm is aloe vera, which helps in soothing the lips and a natural remedy for irritated lips. Their study showed that the combination of ingredients demonstrated to be superior for lip balm development.

Hirata *et al.* (2022) argued that demand for natural and sustainable products has clearly increased, particularly within the cosmetic industry. This change in consumer behavior is driven by greater awareness of environmental concerns and heightened attention to potential health effects of the cosmetic products they use. As a result, cosmetic companies showed interest in these issues in order to meet market demand and remain competitive. Moreover, according to Itegboje (2025), the pursuit of enhanced appearance has driven the evolution of beauty practices from natural ingredients to processed and packaged products. However, this progression has significantly impacted the environment through pollution and waste. The cosmetics business has a significant environmental impact because it relies on natural resources, energy consumption, and packaging waste.

Dos Santos Nascimento *et al.* (2021) stated that plants are abundant sources of diverse bioactive compounds and represent one of the plentiful sources of new ingredients used in the prevention and treatment of various diseases. They also provide natural moisturizers, flavoring agents, and pigments, making them highly valuable for cosmetic applications on the skin. Among these compounds, phenolics have attracted considerable attention as active ingredients due to their anti-inflammatory, antimicrobial, and antioxidant properties. These characteristics make phenolic compounds effective for both the prevention and treatment of skin disorders, with wide applications in cosmetology and dermatology. Their antioxidant activity also contributes to anti-aging effects, likely through the reduction of collagen degradation and the provision of protection against UV radiation. Consequently, the use of natural extracts rich in phenolic compounds and possessing high antioxidant capacity has been widely explored and promoted as a safer alternative to synthetic antioxidants in skincare products.

In the study of Lakshmi *et al.* (2024), they formulated and evaluated herbal lipstick made from natural coloring pigments (beetroot powder, turmeric powder, and alkanet root powder). They found that the formulated herbal lipstick has numerous advantages, which made it an appealing choice for consumers. The herbal lipstick formulated eliminates the use of synthetic chemicals that are commonly found in traditional cosmetics, as it has plant-based ingredients. Naturally-made herbal lipsticks are softer on the lips and can cause less to no irritation or inflammation. Additionally, lipstick made from natural sources contains moisturizing components such as plant oils, which provide moisture and softness to the lips. It was emphasized that the natural lipstick formulation meets the demand to the growing desire for a safer and environmentally-friendly cosmetic product. It helps end-users to improve their lips with a natural and sustainable component while eliminating the use of synthetic chemicals. Natural lipsticks resulted in safer, healthier, and more attractive lips, especially for people who choose eco-friendly cosmetics.

In the study of Thaker *et al.* (2023), they made a herbal lip balm and lipstick from herbs, including gumamela flower

(hibiscus rosa-sinesis) and concluded that the formulated herbal lip balm and lipstick produce minimal to no side effects, while providing effective action on the lips.

MATERIALS AND METHODS

Method of Research

This research employed an experimental method as it formulated three (3) treatments with varying ratio of gumamela flower and aloe vera gel and it assessed the characteristics and features of lip tint formulation with gumamela flower (Hibiscus rosa-sinensis) and aloe vera gel (Aloe barbadensis miller) based on sensory attributes (color, texture, fragrance, flavor), product application performance (ease of application, moisturizing effect, longevity, and drying time), and the acceptability of the evaluators on the formulated lip tint.

Research Design

The experimental design used in the study was a Completely Randomized Design (CRD). The experimentation included three (3) treatments which vary in the proportion of the gumamela flower and aloe vera: Treatment A with two (2) parts of gumamela and one (1) part aloe vera, Treatment B with one (1) part of gumamela and one (1) part of aloe vera and Treatment C with one (1) part of gumamela and two (2) parts of aloe vera. In this experiment, gumamela flower and aloe vera gel were the main ingredients in making the lip tint. The three (3) treatments were then utilized by evaluators to evaluate their characteristics based on a set of criteria. The different physical factors to evaluate were its color, texture, fragrance, and flavor. The different performance application factors to evaluate were ease of application, moisturizing effect, longevity, and drying time. Evaluators also evaluated the overall acceptability of the lip tint.

Materials, Tools and Equipment

The tools and equipment used in the study were the following: double boiler; one (1) blender; six (6) bowls; measuring spoons; one (1) spatula or stirrer; empty lip tint containers; one (1) strainer; and one (1) weighing scale.

Treatments Used

Table 1 shows the proportion of ingredients among the three treatments in making lip tint from gumamela flower and aloe vera extract. Each lip tint treatment contained the same amount of vegetable glycerine, jojoba oil, castor oil, flavor oil, and vitamin E, however, there were variations on the gumamela flower and aloe vera gel proportion. The treatments were then used by the evaluators to evaluate its sensory attributes: color, texture, fragrance, and flavor; product performance: the ease of application, moisturizing effect, longevity, and drying time; and the overall user satisfaction of the evaluators.

Table 1: Proportion of ingredients of the gumamela-aloe vera lip tint

Ingredients	Treatment A	Treatment B	Treatment C
Gumamela Flower	40g	30g	20g
Aloe Vera Gel	20g	30g	40g
Vegetable Glycerin	5ml	5ml	5ml
Jojoba Oil	.3ml	.3ml	.3ml
Castor Oil	.3ml	.3ml	.3ml
Flavor Oil	.05ml	.05ml	.05ml
Vitamin E	400IU	400IU	400IU

Experimental Procedure

Procedures in Making Lip Tint Using Gumamela Flower and Aloe Vera

The preparation of lip tint using gumamela flower (Hibiscus rosa-sinensis) and aloe vera was carried out through a systematic procedure to ensure proper extraction, blending, and formulation of the product.

a.Gathering of Ingredients, Tools, and Materials

All necessary ingredients and materials were prepared before the actual formulation. These included fresh gumamela flowers (Hibiscus rosa-sinensis), aloe vera leaves, vegetable glycerin, and other optional additives for lip tint formulation. Tools such as a blender, strainer, double boiler setup, mixing bowls, spatula, measuring tools, and sterilized lip tint containers were also assembled to ensure cleanliness and proper processing.

b.Washing and Drying of Gumamela Flowers and Aloe Vera Leaves

The gumamela flowers and aloe vera leaves were thoroughly washed under running water to remove dust, dirt, and other impurities. After washing, they were air-dried to eliminate excess moisture that could affect the quality and stability of the formulation.

c. Plucking of Gumamela Petals

The petals of the gumamela flowers were carefully separated from the calyx and other non-essential parts. Only the healthy and fresh petals were selected to ensure better pigment extraction and product quality.

d. Extraction, Blending, and Straining of Aloe Vera Gel

The aloe vera leaves were cut open, and the fresh gel was extracted using a spoon. The gel was then blended to achieve a smooth and uniform consistency. After blending, it was strained using a fine mesh or cloth to remove fibrous particles and obtain a refined aloe vera gel suitable for cosmetic use.

e. Mixing of Aloe Vera Gel and Vegetable Glycerin

The extracted aloe vera gel was combined with vegetable glycerin and mixed thoroughly. This mixture served as the base of the formulation, enhancing moisture retention and improving the smooth application of the lip tint.

f. Heating of Gumamela Petals with Aloe Vera–Glycerin Mixture

The gumamela petals were placed in a double boiler together with the aloe vera–glycerin mixture. The mixture was gently heated using indirect heat to allow gradual extraction of the natural pigments from the petals without damaging the active properties of the ingredients.

g. Straining the Heated Mixture

After sufficient heating, the mixture was strained to remove the solid gumamela petals and other residues. This process ensured a smooth liquid extract containing the natural color pigment of the gumamela flower.

h. Mixing of Remaining Ingredients with the Heated Extract

The strained extract was then combined with the remaining ingredients needed for the lip tint formulation. The mixture was stirred continuously to ensure even distribution and a uniform consistency.

i. Final Mixing and Homogenization

The entire formulation was mixed thoroughly until a smooth, consistent, and well-blended solution was achieved. This step ensured that all ingredients were properly incorporated and that the color was evenly distributed.

j. Transferring the Mixture into Lip Tint Containers

Finally, the prepared lip tint was allowed to cool before being carefully transferred into sterilized lip tint containers. The containers were properly sealed and labeled for storage, evaluation, and testing.

Note: The same procedure was followed for Treatments A and B.

Collection of Data

The instrument used in the study was a researcher-made product evaluation sheet. It assessed the sensory attributes of the lip tint, including color, texture, fragrance, and flavor, as well as product application performance, such as ease of application, moisturizing effect, longevity, and drying time, along with the overall consumer satisfaction of the product.

A 5-Point Hedonic Scale was used to determine the level of acceptability of the formulated lip tint, which evaluators rated the product based on their degree of liking or preference. This scale helped measure the general acceptability and sensory perception of the respondents in a standardized manner.

The product was evaluated by 30 respondents, composed of 10 experts (5 make-up artists and 5 salon owners or workers), 10 cosmetology teachers, and 10 cosmetology students. These evaluators were tasked to determine and describe the sensory attributes, product application performance, and general acceptability of the formulated lip tint using gumamela flower and aloe vera.

Prior to the evaluation, the researcher explained the formulation of the three (3) treatments and provided clear instructions on how to accomplish the evaluation sheet. After the evaluation of the finished products, all completed evaluation sheets were collected, tallied, and used for data analysis.

In scoring the variables, the researcher used the 5-Point Likert Scale to rate the product.

Statistical Tools and Analysis

The data gathered from the evaluation of the formulated gumamela-aloe vera lip tint were analyzed using appropriate statistical tools. To determine the evaluators' assessment, the mean was used to determine the sensory attributes (color, texture, fragrance, and flavor), product application performance (ease of application, moisturizing effect, longevity, and drying time), and the average level of acceptability of the gumamela-aloe vera lip tint.

To determine if there were significant differences among the three (3) treatments in terms of sensory attributes and the general acceptability, One-Way Analysis of Variance (ANOVA) at 0.05 alpha level was employed.

RESULTS AND DISCUSSION

Sensory Qualities of Gumamela-Aloe Vera Lip Tint

The result revealed that in terms of color, Treatment A (2 parts of gumamela and 1 part of aloe vera) got the highest mean score of 4.73, which was described as "Very Appealing," followed by Treatment B (1 part of gumamela and 1 part of aloe vera) with a mean score of 4.43, described also as "Very Appealing," and Treatment C (1 part of gumamela and 2 parts of aloe vera) with a mean score of 4.10, described as "Appealing," as evaluated by the evaluators.

In terms of texture, Treatment A (2:1) got the highest mean score of 4.43, which was described as "Very Smooth". This was followed by Treatment B (1:1) with a mean score of 4.40, which was also described as "Very Smooth," and Treatment C (1:2) with a mean score of 4.37, described as "Very Smooth," as evaluated by the evaluators.

In terms of fragrance, Treatment A (2:1) got the highest mean score of 4.10, described as "Pleasant," followed by Treatment B (1:1) with a mean score of 4.07, described as "Pleasant," and Treatment C (1:2) with a mean score of 4.03, described also as "Pleasant," as evaluated by the evaluators.

In terms of flavor, Treatment A (2:1) got the highest mean score of 3.93, described as "Satisfactory," followed by Treatment C (1:2) with a mean score of 3.90, described as "Satisfactory," and Treatment B (1:1) with a mean score of 3.77, also described as "Satisfactory," as evaluated by the evaluators.

For the overall evaluation of the sensory attributes of the gumamela–aloe vera lip tint, including color, texture, fragrance, and flavor, Treatment A (2:1) obtained the highest mean score of 4.30. This was followed by Treatment B (1:1) with a mean score of 4.17, while Treatment C (1:2) obtained the lowest mean score of 4.10. The results suggest that all three formulations were generally well-accepted by the evaluators, as reflected in their high mean ratings. However, Treatment A (2:1) emerged as the most preferred formulation in terms of overall sensory quality. This implies that a higher proportion of gumamela relative to aloe vera may contribute to a more favorable balance of sensory characteristics such as color intensity, aroma, texture consistency, and flavor acceptability.

pH Test Result among the Three Treatments

The pH evaluation was carried out to determine whether the pH level of the lip tint preparation is safe for use. Based on the result of the pH paper strip, it showed that Treatment A had a value of 3 and Treatment B got a pH level of 4, which indicates that it did not meet the required pH level of lip tint preparation. Treatment C showed a pH level of 5, which indicates that it met the safe pH range for lip tint.

General Acceptability of Gumamela-Aloe Vera Lip Tint

The result revealed that in terms of the acceptability of the gumamela-aloe vera lip tint, Treatment A (2:1) got the highest mean score of 4.53, which was described as "Very Acceptable," followed by Treatment B (1:1) with a mean score of 4.37, described as "Very Acceptable," followed by Treatment C (1:2) with a mean score of 4.23, described as "Very Acceptable," as evaluated by the evaluators.

Product Application of the Gumamela-Aloe Vera Lip Tint

The result showed that in terms of ease of application, Treatment A got the highest mean of 4.67, which was described as "Very Easy," followed by Treatment B with a 4.53 mean, described as "Very Easy". Treatment C got a mean score of 4.47, which was described as "Very Easy".

In terms of moisturizing effect, result revealed that Treatment C (1:2) got the highest mean score of 4.27, described as "Very Hydrating". Treatment A (2:1) got the mean score of 4.20, described as "Hydrating" and Treatment B (1:1) had a mean score of 4.07, described as "Hydrating" also.

The result on longevity showed that Treatment A (2:1) had the highest mean score of 4.50, described as "Very Long Lasting," followed by Treatment B (1:1) with a mean score of 4.27, described as "Very Long Lasting". Treatment C (1:2) showed a mean score of 4.23, also described as "Very Long Lasting" also.

In terms of the drying time, Treatment A (2:1) had the highest mean score of 4.57, described as "Very Quick". Treatment B (1:1) followed with a mean score of 4.40, described as "Very Quick," and Treatment C (1:2) got a mean score of 4.27, described as "Very Quick".

For the overall evaluation of the product application performance of the gumamela-aloe vera lip tint, Treatment A (2:1) had the highest mean score of 4.49, followed by Treatment B (1:1) with a mean score of 4.32, and Treatment C (1:2) with a mean score of 4.31. This indicates that, in terms of the product application performance among the three (3) treatments, Treatment A (2:1) was most favored by the evaluators.

Difference in the Sensory Attributes of the Gumamela-Aloe Vera Lip Tint among the Three Treatments

The results showed that there was a significant difference in terms of color of the gumamela-aloe vera lip tint among the three treatments, as rated by the evaluators (H-value = 14.778, p-value = 0.001 < 0.05). This signifies a significant difference among the samples. Therefore, the null hypothesis stating that there is no significant difference in the physical attributes among the three (3) treatments in terms of color was rejected.

The result showed that there was no significant difference in terms of texture, fragrance, and flavor of the gumamela-aloe vera lip tint among the three (3) treatments, as rated by the evaluators. Texture obtained an H-value of 0.09 with a p-value of 0.955 (> 0.05), fragrance revealed an H-value of 0.119 with a p-value of 0.942 (> 0.05), and flavor obtained an H-value of 0.64 with a p-value of 0.728 (> 0.05). Therefore, this failed to reject the null hypothesis stating that there is no significant difference in the sensory attributes of the gumamela-aloe vera lip tint.

Difference in the General Acceptability of the Gumamela-Aloe Vera Lip Tint among the Three Treatments

The results revealed that there were no significant differences in the general acceptability of the product among the three treatments, as rated by the evaluators. The computed H-value was 4.372 with a p-value of 0.112, which was greater than the 0.05 level of significance. Therefore, this failed to reject the null hypothesis, stating that there was no significant difference in the general acceptability of the gumamela-aloe vera lip tint. This implies that the different formulations of gumamela and aloe vera did not significantly influence the overall acceptability of the product.

Discussion

The result showed that Treatment A (2:1) was preferred in terms of color, suggesting that the ratio with more gumamela than aloe vera was the most visually appealing option in terms of color among the treatments, which would make it more desirable to consumers. It was also perceived as having the finest texture among the treatments, more favorable in terms of fragrance and flavor.

The result aligned with the study of Gholap (2023). According to the study, flavor plays an important role in covering the natural odor of oils and waxes while providing a pleasant taste. It should remain stable and compatible with the other ingredient. Additionally, the flavor must not be too strong, so it does not overpower or clash with other components of the product. Obat and Bosire (2022) pointed out that fragrance is an essential part of cosmetics. In the study of Liu (2022), it was stated that fragrance is an important part of cosmetic products. It is usually considered to be the primary factor in consumer choice. Poul *et al.* (2024) emphasized that gumamela flower (Hibiscus rosa-sinesis) contains mucilage that helps in moisture retention of the skin, and aloe vera gel is highly valued for its soothing and hydrating properties, and is especially suitable for sensitive or acne-prone skin because of its lightweight, non-greasy, and non-comedogenic characteristics. The study showed that the formulated cream using both ingredients achieved an appealing appearance and smooth texture.

As to the pH result, only Treatment C was considered safe for application on the lips, as it met the acceptable pH level. This suggests that increasing the proportion of aloe vera in the formulation helps achieve a more suitable and balanced pH, making the product safer and more appropriate for use. Treatment C (1:2) formulation was found to fall within this recommended range, indicating that Treatment C (1:2) is dermatologically safe for use on the lips. This suggests that increasing the proportion of aloe vera gel reduces the acidity of the gumamela-aloe vera lip tint while the higher concentration of gumamela extract in Treatment A (2:1) was found to make the formulation acidic. Moreover, the pH values suggest that Treatment C (1:2) is safer and more comfortable for regular use since products with pH level closer to the natural skin pH are less likely to cause irritation. This further supports the reliability and stability of the lip tint formulation, making it suitable for regular use without causing adverse effects on the lips.

Regarding general acceptability, Treatment A (2:1) was the most preferred ratio of gumamela-aloe vera lip tint. In relation to the present study, these findings supported the use of gumamela and aloe vera as natural ingredients in lip tint formulation. The acceptable physical and sensory properties observed in the product indicate that plant-based components can effectively contribute to both product quality and skin benefits. This further implies that natural formulations are viable alternatives to commercial lip tints, as they can provide safe application, aesthetic appeal, and added skincare advantages. The result aligned with the findings of Lowra *et al.* (2024), who stated that dyes derived from natural ingredients contribute to good physical quality outcomes in lip tint formulation. This suggests that plant-based colorants can effectively provide desirable attributes such as acceptable color intensity, stability, and overall product appearance, making them suitable alternatives to synthetic dyes in cosmetic development.

The result indicates that Treatment A (2:1) was the most preferred when it comes to ease of application and in terms of longevity by the evaluators, and this treatment also had a quick drying time. Treatment C (1:2) was most favored by the evaluators when it comes to moisturizing effect. The formulated lip tint is effective and suitable for cosmetic use. The findings indicate that the product performs well in terms of product application performance. The findings further imply that natural ingredients can be utilized as an alternative component in cosmetic products that promote safer and eco-friendly lip tint formulations. According to Lakshmi *et al.* (2024), long-lasting wear is a highly desirable characteristic of lipstick and lip tint products. It refers to the ability of the product to remain intact on the lips for an extended period despite exposure to normal daily activities such as eating, drinking, and routine facial movements, without significant fading, smudging, or breakdown of color intensity. A lip product with good longevity reduces the need for frequent reapplication or touch-ups, thereby enhancing user convenience, practicality, and overall satisfaction. Moreover, long-lasting performance is often associated with better product quality and higher consumer acceptability, as it ensures both aesthetic appeal and functional durability throughout the day. Poul *et al.* (2024) argued that on the formulation of cold cream using gumamela flower powder and aloe vera gel, both chosen as these natural ingredients, which is known for their well-established skin benefits, including moisturizing, soothing, anti-inflammatory, and antioxidant properties. The formulated cream showed excellent organoleptic properties with an appealing appearance, pleasant fragrance, smooth texture, and ease of application.

The results showed that there was a significant difference in terms of color of the gumamela-aloe vera lip tint among the three treatments, signifying a significant difference among the samples. This indicates that the higher the content of gumamela flower in formulating the lip tint affects the color intensity of the product. There was no significant difference found in terms of texture, fragrance, and flavor of the gumamela-aloe vera lip tint among the three (3) treatments.

The findings on fragrance and flavor were supported by Lakshmi *et al.* (2024), who emphasized that smell and taste are important sensory attributes in lipstick and lip tint products. A quality lip product should either have a pleasant aroma or be completely fragrance-free to avoid causing discomfort to the user. Fragrance plays a significant role in consumer preference because

it influences the overall sensory experience during application. If the product has an unpleasant or overpowering smell, it may reduce acceptability even if other attributes are satisfactory. Li *et al.* (2023) stated that anthocyanins are natural pigments that produce vivid and attractive colors. They are considered safe and could provide beneficial effects on the skin. Therefore, it is widely use in cosmetic formulation. The study showed that anthocyanin was a promising natural pigment in cosmetics. Meanwhile, Ansari *et al.* (2022) asserted that natural pigments like anthocyanin provide bright colors and offers health and skin benefits. Anthocyanin are pigments that are commonly used as natural colorants and are valued for coloring ability and antioxidant properties. Lowra *et al.* (2024) stated that lip tint preparation with dragon fruit extract and sweet potato extract provided good quality results in terms of color, texture and aroma. The concentration with higher sweet potato extract that produces anthocyanin pigment, were deemed as the most preferred concentration of the respondents in terms of color.

Relating this to the present findings, the acceptable ratings in terms of fragrance and flavor suggest that the gumamela–aloe vera lip tint formulations are suitable for use, as they do not produce unpleasant odor or taste. This indicates that the natural ingredients used in the formulation may contribute to a more neutral and user-friendly sensory profile, enhancing the product's overall acceptability.

The results revealed no significant differences in the general acceptability of the product among the three treatments. It suggests that the evaluators perceived all treatments as equally acceptable in terms of general quality. The finding suggests that the lip tint met the acceptable standards for the evaluators, and the different formulations are all suitable for utilization and potential cosmetic use. This finding was supported by Ares and Ares (2018), who emphasized that when no significant differences are observed in consumer acceptability tests, it indicates that the products share similar sensory characteristics and are equally preferred by evaluators. This suggests that slight variations in formulation may not significantly affect overall acceptability when the sensory properties remain within an acceptable range. Furthermore, Jaeger (2017) explained that general acceptability reflects the combined influence of multiple sensory attributes such as color, texture, fragrance, and overall feel. When these attributes are consistent across treatments, consumers tend to perceive the products similarly, resulting in no statistically significant difference.

CONCLUSIONS

Gumamela flower and aloe vera gel have strong potential as natural ingredients in the formulation of lip tint. Among the three treatments, Treatment A (2:1) is the most preferred in terms of sensory qualities.

Increasing the proportion of gumamela relative to aloe vera contributes positively to the overall acceptability of the product. Thus, the 2:1 ratio is considered the most favorable formulation in terms of consumer preference.

In terms of product application performance, Treatment A (2:1), having the highest mean score, provides the most effective performance in application.

Furthermore, having a significant difference in color among the three treatments, the ratio of gumamela flower to aloe vera gel has a direct effect on the color of the lip tint.

However, no significant differences found in terms of texture, fragrance, flavor, and overall acceptability across the three treatments can be concluded that while the formulation ratio influences the color of the product, it does not significantly affect its other sensory qualities and overall acceptability.

The variations in ingredient proportions did not significantly influence the evaluators' overall preference.

Additionally, the gumamela–aloe vera lip tint with a 1:2 ratio of gumamela to aloe vera (Treatment C) is safe and suitable for topical application.

The gumamela–aloe vera lip tint is a viable natural cosmetic product and presents a promising herbal alternative to synthetic lip tint formulations.

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