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Research Article

Formulation And Evaluation of Lip Tint Using Herbal Extracts

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ABSTRACT

This research work is based on the formulation and evaluation of herbal lip tint by using natural ingredients like glycerin, vitamin E, bees wax (base), strawberry powder and beetroot powder (coloring agent), castor oil tea tree oil(preservative), coconut oil(moisturizer). It is one of the cosmaceutical products. This formulation applied on the lips to prevent drying, give tint of color to the lips and protect against adverse factors of the environment. Various evaluation parameters were carried out. Evaluation of the herbal lip balm includes assessing its physicochemical properties, such as texture, Spreadability, and melting point, as well as its effectiveness in terms of hydration, healing of chapped lips, and overall user satisfaction. Stability tests are conducted to ensure the product maintains its quality over time under various environmental conditions. The future scope of herbal lip tints is highly promising, driven by the rising global demand for natural, organic, and sustainable beauty products. As consumers become more health-conscious and ingredient-aware, they are increasingly gravitating toward cosmetics that are free from harmful chemicals and rich in plant-based, skin-friendly ingredients. With the popularity of minimalist, “no-makeup” looks and the influence of social media promoting natural beauty, herbal lip tints are well-positioned to become a staple in daily routines. Moreover, there is great potential for innovation in this space, from customized tints to eco-friendly packaging and multipurpose applications.

INTRODUCTION

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The use of cosmetics for enhancing beauty and personal care has existed since ancient times. Among these, lip care and lip coloring products have always held a significant place, especially among women. In recent decades, awareness regarding the harmful effects of synthetic chemicals used in conventional cosmetics has led to a shift in consumer preference toward herbal and natural products [1]. Herbal lip tints are an innovative category of cosmetic formulations that aim to deliver both color and care. A lip tint provides a subtle, long-lasting stain of color while maintaining a lightweight feel on the lips. Unlike conventional lipsticks that may contain parabens, heavy metals, and artificial fragrances, herbal lip tints utilize natural plant-based colorants, oils, waxes, and antioxidants, offering a healthier alternative [2].

2.1 Overview of Herbal Cosmetics

Herbal cosmetics are formulations that incorporate ingredients of natural origin—primarily derived from plant sources—for skin, hair, and lip care. These products are free from synthetic chemicals and are based on traditional herbal knowledge combined with modern pharmaceutical science. Herbal cosmetics have gained increasing popularity globally due to rising awareness of their

therapeutic effects and minimal side effects [3]. Unlike synthetic cosmetics, herbal formulations often contain biologically active compounds such as flavonoids, alkaloids, tannins, and vitamins that provide additional functional benefits beyond aesthetics. These include anti-aging, moisturizing, anti-inflammatory, and antioxidant properties.

2.2 Importance of Natural Products in Cosmetics

Natural products play a crucial role in modern cosmetics as safe, biodegradable, and skin-friendly ingredients. Oils like coconut oil and almond oil, waxes like beeswax, and pigments from fruits and vegetables not only enhance the quality of cosmetic formulations but also contribute to their therapeutic action [2].

❖ The benefits of natural products in cosmetics include:

- Enhanced skin compatibility
- Antioxidant and anti-aging effects
- Moisturizing and soothing actions
- Reduced risk of allergic reactions

With the rise of "green beauty" and sustainable living, the use of herbal ingredients in cosmetics

aligns with current global trends toward clean, ethical, and eco-conscious products.

2.3 Need for Herbal Lip Tint

The lips are among the most delicate parts of the skin and are highly prone to dryness, cracking, and damage from environmental exposure. Traditional lipsticks, though effective in adding color, often contain synthetic dyes, petroleum derivatives, and preservatives that may cause long-term lip damage or pigmentation [4]. A herbal lip tint offers a safer, multifunctional alternative. It not only imparts a natural color but also nourishes and protects the lips with plant-based oils and antioxidants. Strawberry extract, for example, contains vitamin C and natural fruit acids that help maintain lip health while delivering a pleasant tint [5].

2. Literature Review

1. **Mayasari et al. (2025)** investigated the formulation and physical properties of lip tint preparations using *Acalypha wilkesiana* leaf extract. The study focused on developing a natural alternative to synthetic lip tints, utilizing the plant's pigment-rich leaves. The lip tints were evaluated for various physical properties, including color, texture, and stability, to ensure their suitability for cosmetic use. The findings suggest that *Acalypha wilkesiana* leaf extract can be effectively incorporated into lip tint formulations, offering a natural and potentially safer option for consumers seeking herbal cosmetic products.[6]
2. **Lote et al. (2024)** presented a study on the formulation and evaluation of a herbal lip balm, emphasizing the use of natural ingredients to enhance lip health. The research focused on the selection of herbal components known for their moisturizing and healing properties. The study assessed various parameters, including texture, pH, and stability, to ensure the product's efficacy and safety. The findings suggest that the formulated herbal lip balm offers a promising alternative to synthetic lip care products, aligning with the growing consumer preference for natural and safe cosmetic options.[7]
3. **Patel et al. (2024)** developed and evaluated a herbal lip balm aimed at treating cheilitis, a condition characterized by inflammation and irritation of the lips. The formulation incorporated natural ingredients known for their soothing and healing properties. The study assessed various parameters, including texture, pH, and stability, to ensure the product's efficacy and safety for individuals suffering from cheilitis. The results indicated that the herbal lip balm met the required standards, offering a promising natural alternative for managing lip-related ailments.[8]
4. **Visht et al. (2024)** investigated the formulation and evaluation of herbal lip balm using natural pigments from *Opuntia* fruit, *Curcuma longa*, *Nyctanthes arbor-tristis* flowers, *Centaurea orientalis* flowers, and carotene. Visht, S., Sirwan Salih, S., Aziz Mohammed, D., Ammar Abduljabbar, A., Jabbar Hama, S., & Ahmed Khudhair, I. (2024). [9]
5. **Gholap, Vitnor, and Pagire et al. (2023)** developed a herbal lip balm using natural ingredients such as cocoa butter, beeswax, coconut oil, and almond oil. The formulation was evaluated for various parameters, including melting point (64–65°C), pH (6.1), spreadability, and skin irritation,



demonstrating its suitability for moisturizing and protecting lips.[10]

6. **Mawazi et al. (2022)** provide a comprehensive narrative review on the history, formulations, and production of lipsticks. The article traces the evolution of lipstick from ancient civilizations to modern times, highlighting the shift from natural to synthetic ingredients. It discusses various formulation components, including colorants, waxes, oils, and additives, emphasizing their roles in achieving desired properties such as texture, stability, and safety. The review also covers production techniques, quality control measures, and regulatory considerations, offering valuable insights for researchers and manufacturers aiming to develop effective and safe lipstick products.[11]
7. **Verma et al. (2021)** also note that the safety and efficacy of herbal lip tints need to be evaluated through rigorous testing. While many herbal ingredients are considered safe for topical use, the potential for allergic reactions or irritation, particularly on the delicate skin of the lips, must be carefully assessed. Comprehensive clinical studies on the safety profiles of various herbal extracts used in lip tints, including any long-term effects, are essential to ensure consumer trust in these products [12].
8. **Verma, et al. (2021)** suggest that as social media continues to shape consumer behavior, beauty influencers and celebrities are advocating for natural, vegan, and cruelty-free cosmetics. This has further fueled the growth of the herbal cosmetics market, with many brands leveraging social media platforms to promote their products and reach a global audience [13].
9. **The Grand View Research, et al. (2021)** report indicates that the 20th century saw the widespread commercialization of herbal and organic cosmetics, particularly as the negative effects of synthetic chemicals in cosmetics became more apparent. As consumers became more informed about the potential dangers of synthetic ingredients, such as parabens and phthalates, there was a marked shift toward natural and organic products. This trend is reflected in the growth of the global herbal cosmetic industry in recent decades [14]
10. **Rasheed, Rahman, and Hafsa (2020)** developed herbal lipsticks utilizing natural colorants like carrot, beetroot, turmeric, tomato, pomegranate, and cocoa, combined with ingredients such as beeswax, carnauba wax, castor oil, and vanilla essence. The formulations underwent comprehensive evaluations, including assessments of color, texture, pH, melting point, breaking point, surface anomalies, aging stability, and perfume stability. Results indicated that all formulations exhibited desirable properties, with no skin irritation observed. The study concluded that these herbal lipsticks offer a safer alternative to synthetic counterparts, aligning with the growing consumer demand for natural cosmetic products.[15]
11. **Kumar & Mehta, et al.. (2020)** emphasize that the colorant properties of herbal ingredients used in lip tints, such as beetroot, hibiscus, and strawberry extracts, require further investigation. These ingredients are rich in antioxidants and pigments but may not always provide the long- lasting, vibrant color that consumers desire from lip tints. Studies on the stability of natural colorants, their ability to withstand exposure to light and air, and their effectiveness in providing long-lasting color



without fading are critical areas for further research [16].

12. **Kumar & Mehta (2020)** report that the demand for natural and herbal cosmetic products has significantly increased in recent years. According to a report by Grand View Research, the global herbal cosmetic market was valued at approximately USD 50 billion in 2020 and is expected to grow at a compound annual growth rate (CAGR) of 5.9% from 2021 to 2028. This growth can be attributed to several factors, including rising consumer awareness about the harmful effects of synthetic ingredients, increased demand for sustainable and eco-friendly products, and a growing preference for products that are cruelty-free and not tested on animals [17].
13. **Mali et al. (2019)** present a study on the formulation and evaluation of herbal lip rouge using natural ingredients to create a safer alternative to synthetic cosmetics. The research emphasizes the use of plant-based colorants and oils with beneficial properties like moisturization and antioxidant activity. The study outlines the preparation method, selection of herbal components, and assessment of parameters such as texture, pH, melting point, and stability. Results demonstrated that the formulated product met standard cosmetic criteria and offered good aesthetic and functional qualities. This work supports the potential of herbal formulations in delivering effective and eco-friendly cosmetic products [18].
14. **Gupta & Sharma (2019)** argue that while there has been considerable research on herbal ingredients for skin care, there remains a scientific gap in the formulation of herbal lip tints. Lip care formulations often require a careful balance between texture, color payoff, and long-lasting wear, which presents unique challenges when working with natural ingredients. The lack of synthetic preservatives and stabilizers in herbal formulations can also affect the shelf life and consistency of the product [19].
15. **Kaur & Sharma (2018)** highlight that herbal cosmetics have a long-standing history in various cultures, particularly in ancient civilizations, where natural ingredients were used for skin and hair care. The use of plants for cosmetic purposes dates back to ancient Egypt, where herbs and oils were utilized for beauty treatments. Ancient Greeks and Romans also employed natural substances, such as olive oil, honey, and beeswax, to maintain skin health and beauty. For instance, olive oil was often used as a moisturizer, while honey was prized for its antibacterial and soothing properties [20].
16. **Sharma & Rani, et al. (2016)** discuss that while herbal ingredients such as aloe vera, coconut oil, and shea butter are widely recognized for their moisturizing and soothing properties, their role in improving the texture and durability of lip tints is less understood. The emulsification process required to create a stable, smooth lip tint formulation using herbal oils and extracts remains an area where there is limited scientific knowledge. Understanding the compatibility of various natural oils and their ability to create a stable, non-greasy product that adheres well to the lips would be crucial in improving the overall performance of herbal lip tints [21].
17. **Sharma & Rani (2016)** note that in the Asian subcontinent, particularly in India, the use of natural ingredients in cosmetics has been documented for centuries. Ancient texts such as the Ayurvedic texts highlight the use of



various herbs, oils, and clays in skin care routines. Herbs like turmeric, sandalwood, and neem were commonly used for their antiseptic, healing, and anti-inflammatory properties. Over time, this tradition continued, and with the rise of global interest in natural products, herbal cosmetics gained significant popularity [22].

18. **Kumar and Pandey et al. (2013)** provide a comprehensive overview of flavonoids, detailing their chemical structures and wide-ranging biological activities. The review highlights their antioxidant, anti-inflammatory, antimicrobial, and anticancer properties, underscoring their significance in therapeutic applications and natural product research. It emphasizes flavonoids' potential in pharmaceutical and nutraceutical development.[23]
19. **The study by Fernandes et al. (2013)** evaluated the stability of an organic lip balm formulated with certified organic raw materials. Stability tests assessed fusion point, organoleptic characteristics (colour, Odor, and appearance), and functionality (Spreadability). Results indicated that storage at room temperature and refrigeration-maintained product stability, while elevated temperatures (40°C) led to loss of functionality. The melting point remained consistent at $72.9 \pm 1.7^\circ\text{C}$ throughout the 90-day testing period.[24]
20. **Kapoor, et al. (2005)** explores the growing use of herbal ingredients in cosmetics for skin and hair care, emphasizing their safety, efficacy, and minimal side effects. The article reviews traditional plant-based remedies, highlighting natural extracts with moisturizing, anti-inflammatory, and antioxidant properties, reinforcing the

potential of herbal formulations in modern cosmetology [25].

4. Aim And Objectives

4.1 Aim:

Formulation and evaluation of lip tint using herbal extracts.

4.2 Objectives

- ❖ To formulate a herbal lip tint using natural ingredients such as strawberry extract, beeswax, and coconut oil.
- ❖ To evaluate the physico-chemical properties of the herbal lip tint formulation, including pH, spreadability, viscosity, and texture.
- ❖ To assess the stability of the herbal lip tint formulation under various environmental conditions.
- ❖ To evaluate the organoleptic properties (color, odor, and texture) of the herbal lip tint.
- ❖ To perform an irritancy test to assess the safety of the herbal lip tint on the lips.
- ❖ To compare the effectiveness of the herbal lip tint formulation with commercial synthetic lip tints.

Plan Of Work

The development of a herbal lip tint was carried out in a step-by-step manner to ensure accuracy, reproducibility, and scientific relevance. The plan of work comprised ingredient selection, formulation design, product preparation, and evaluation, followed by interpretation and documentation of results.

4.1 Selection and Procurement of Ingredients

The formulation was designed using natural ingredients based on their proven cosmetic benefits and compatibility with lip care products.



The primary wax used was beeswax, which provides structural integrity and acts as a thickening agent. Castor oil was selected for its high viscosity and moisturizing properties, while coconut oil offers emollient effects and imparts a smooth texture to the product. Glycerin serves as a humectant, helping retain moisture in the lips. Vitamin E (tocopherol) was incorporated as a natural antioxidant to prevent oxidative damage to both the product and the skin. Strawberry extract powder and beetroot powder were chosen as natural colorants with antioxidant and skin-nourishing properties. Lastly, tea tree oil was added in a minimal amount for its mild antimicrobial activity, enhancing the preservative effect of the formulation [12]. All ingredients were procured from certified cosmetic-grade suppliers to ensure safety, purity, and efficacy. Materials were verified through standard specifications like solubility, appearance, and organoleptic properties before use [13].

4.2 Formulation Development

Several trial batches were designed to standardize the optimal formulation of the herbal lip tint. The base formulation was developed using beeswax and a combination of oils in a fixed ratio to achieve the desired consistency and texture. The concentration of strawberry extract and beetroot powder was varied to evaluate their effect on color intensity and stability. Each batch was observed for spreadability, uniformity, and appearance. Emphasis was placed on ensuring that the formulation was non-sticky, had a smooth application, and provided a natural tint suitable for daily use. The ideal formulation was selected based on organoleptic acceptability and physical stability [14].

4.1 Preparation of Herbal Lip Tint

The optimized formulation was prepared using the double boiler method, a standard process to avoid direct heating of sensitive ingredients. Beeswax was first melted in the water bath. Once melted, castor oil and coconut oil were added and mixed thoroughly. Glycerin was then incorporated with continuous stirring. The herbal powders (strawberry and beetroot) were gradually added, ensuring a uniform dispersion without clumping. After partial cooling to preserve the integrity of heat-sensitive components, Vitamin E and tea tree oil were added. The prepared formulation was poured into pre-sterilized lip balm containers and allowed to cool and solidify at room temperature [15].

4.2 Evaluation of the Formulated Product

The herbal lip tint was subjected to various physicochemical and safety evaluation parameters:

- **Organoleptic Evaluation:** The product was visually examined for its color, texture, smoothness, and fragrance. It was expected to have a uniform reddish tint, non-gritty texture, and pleasant aroma.
- **pH Determination:** The pH of the formulation was tested using digital pH meter. A pH range of 5.5–6.5 was considered acceptable for safe use on lips.
- **Spreadability Test:** The ease of application and uniform spreading over the lip surface was tested manually and by applying a known quantity over a glass plate, measuring the diameter of spread.
- **Stability Study:** The product was stored under different environmental conditions— room temperature, refrigerated, and elevated temperature ($40^{\circ}\text{C} \pm 2^{\circ}\text{C}$)—for a period of four



weeks. Parameters such as phase separation, color change, and fragrance stability were recorded weekly.

- **Irritancy Test:** A patch test was conducted on a small area of the forearm of volunteers to assess skin compatibility and rule out allergic or irritant reactions. No adverse effects were observed, indicating safety for use [16].

4.5 Documentation and Analysis

All preparation procedures, observations, and test results were carefully recorded. Data obtained from the evaluations were analyzed and compared

with the expected outcomes. The overall performance of the herbal lip tint formulation was found to be satisfactory in terms of aesthetic appeal, stability, and safety. These findings were compiled and interpreted for inclusion in the results and discussion chapter, helping conclude the effectiveness and potential of the herbal lip tint for cosmetic use [16].

Experimental Work

5.1: Materials And Equipment

5.1.1. Ingredients and Their Functions

1. Beeswax (*Apis mellifera*)



Figure 2: Beeswax (Apis mellifera)

- ❖ Beeswax is a natural wax produced by honeybees, used primarily as a thickening and emulsifying agent in cosmetic formulations.
- **Function:** Acts as a thickening agent and stabilizer, giving structure to the lip tint.
- **Properties:** Beeswax is hydrophobic, which helps form a protective barrier that prevents moisture loss from the lips
- **Mechanism of Action:** Beeswax forms a semi-occlusive layer on the lips, reducing transepidermal water loss and locking in moisture. It helps keep the lips soft, hydrated, and protected from environmental damage [17].
- **Additional Benefits:** It provides smooth texture and a natural fragrance, enhancing the sensory experience of the product.

2. Castor Oil (*Ricinus Communis*)



Figure 3: Castor Oil (*Ricinus communis*)

- ❖ Castor oil is a vegetable oil obtained from the seeds of the castor bean plant. It is rich in ricinoleic acid, which gives it its emollient properties.
- **Function:** Serves as an emollient and pigment dispersing agent, providing gloss and enhancing the smooth application of the lip tint.
- **Properties:** Castor oil is viscous and has a high refractive index, giving a glossy finish to the lip tint.
- **Mechanism of Action:** It penetrates deeply into the skin, moisturizing and softening the lips while also helping in the even distribution of pigments for a consistent tint [17].
- **Additional Benefits:** It has anti-inflammatory properties, making it beneficial for soothing dry and irritated lips.

3. Coconut Oil (*Cocos nucifera*)



Figure 4: Coconut Oil (*Cocos nucifera*)

- ❖ Coconut oil is extracted from the meat of the coconut and is rich in saturated fats, particularly lauric acid.
- **Function:** Used as a moisturizer and emollient in the formulation, it prevents lip dryness and provides a smooth, hydrating texture.

- **Properties:** Coconut oil is known for its ability to nourish and repair skin due to its high-fat content.
 - **Mechanism of Action:** The fatty acids in coconut oil penetrate the skin and help maintain hydration, preventing the lips from becoming dry or cracked [18].
 - **Additional Benefits:** Coconut oil is also antimicrobial, which helps in protecting the lips from infections and other microbial damage.
- #### 4. Glycerin



Figure 5: Glycerin

- ❖ Glycerin is a hygroscopic, colorless, odorless liquid commonly used as a humectant in cosmetic formulations.
 - **Function:** It attracts moisture from the air and draws it into the skin, keeping the lips moisturized and smooth.
 - **Properties:** Glycerin is non-irritating and is often used in products designed for sensitive skin.
 - **Mechanism of Action:** By attracting moisture to the lips, glycerin ensures that the lip tint remains hydrated, preventing dryness and enhancing the smoothness of the application [18].
 - **Additional Benefits:** Glycerin also helps in balancing the consistency of the product, ensuring it is neither too thick nor too runny.
- #### 5. Vitamin E (Tocopherol)



Figure 6: Vitamin E (Tocopherol)

- ❖ Vitamin E is a fat-soluble antioxidant that helps protect the skin from oxidative damage.
 - **Function:** Acts as an antioxidant to protect the lip tint from rancidity and oxidation, and also helps in skin regeneration.
 - **Properties:** Vitamin E neutralizes free radicals, preventing the oxidative degradation of oils and fats in the lip tint.
 - **Mechanism of Action:** It protects the skin by scavenging free radicals, preventing lipid peroxidation, and enhancing skin barrier function [19].
 - **Additional Benefits:** Vitamin E improves skin elasticity and promotes the healing of dry, cracked lips [19].
- 6. Strawberry Extract Powder (Fragaria vesca)**



Figure 7: Strawberry Extract Powder (Fragaria vesca)

- ❖ Strawberry extract is derived from the fruit of the strawberry plant and is rich in antioxidants like vitamin C.
- **Function:** Serves as a natural colorant, providing a soft pink hue to the lip tint, and adds a fresh, fruity fragrance.

- **Properties:** Contains polyphenols, ellagic acid, and vitamin C, all of which contribute to the antioxidant properties of the formulation.
- **Mechanism of Action:** The antioxidants in strawberry extract help protect the lips from environmental stressors, promoting lip health and maintaining moisture [20].
- **Additional Benefits:** It also enhances the product's sensory appeal with its pleasant aroma [20].

7. Beetroot Powder (*Beta vulgaris*)



Figure 8: Beetroot Powder (*Beta vulgaris*)

- ❖ **Beetroot powder** is a natural pigment derived from the beetroot plant, rich in betalains, which provide its vibrant red color.
- **Function:** Acts as the primary natural colorant for the lip tint, providing a rich red shade.
- **Properties:** The betalains in beetroot provide antioxidant and anti-inflammatory benefits.
- **Mechanism of Action:** Beetroot powder imparts color while offering antioxidant protection to the skin, enhancing the appearance and health of the lips [20].
- **Additional Benefits:** Beetroot can stimulate blood circulation, giving the lips a natural rosy glow [20].

8. Tea Tree Oil (*Melaleuca alternifolia*)



Figure 9: Tea Tree Oil (*Melaleuca alternifolia*)

- ❖ Tea tree oil is an essential oil extracted from the leaves of the Australian tea tree. It is known for its antimicrobial properties.
 - **Function:** Used as a preservative to prevent microbial growth in the lip tint, ensuring the product's safety and longevity.
 - **Properties:** Contains terpinen-4-ol, which has strong antibacterial and antifungal properties.
 - **Mechanism of Action:** Tea tree oil disrupts the cell membranes of microbes, effectively preventing the growth of bacteria and fungi in the product [21].
 - **Additional Benefits:** It helps maintain the microbiological safety of the lip tint, reducing the risk of contamination [21].
9. Vanilla Essence (*Vanilla planifolia*)



Figure 10: Vanilla Essence (*Vanilla planifolia*)

- ❖ Vanilla essence is derived from the beans of the vanilla orchid, which contains vanillin, a compound with antioxidant properties.
- **Function:** Adds fragrance and enhances the sensory appeal of the lip tint.

- **Properties:** Provides a pleasant, sweet fragrance while offering mild antioxidant effects.
- **Mechanism of Action:** Vanillin protects the product from oxidative damage and masks any herbal odors, making the lip tint more appealing to consumers [22].
- **Additional Benefits:** Improves the overall fragrance profile, increasing the consumer's experience [22].

5.1.2 Equipment Used

- **Hot Plate:** For melting solid ingredients like beeswax and oils [23].
- **Water Bath:** To maintain a controlled temperature while melting ingredients [23].
- **Glass Beakers:** For measuring and mixing the ingredients [23].

- **Stirring Rod:** For stirring the formulation to ensure uniform mixing [23].
- **Measuring Cylinders:** For accurate measurement of liquid ingredients [23].
- **Weighing Balance:** To measure solid and liquid ingredients precisely [23].
- **Lip Balm Containers:** To store the final lip tint product [23].

5.2 Formulation Design

The formulation of the herbal lip tint was designed to combine natural colorants, emollients, and therapeutic agents to provide a tinted, moisturizing, and protective effect on the lips. The ingredients were selected based on their safety, functionality, and compatibility [25].

Table 1: Formulation Design

Sr.no	Ingredient	Quantities		
		F1	F2	F3
1.	Beeswax	2 g	3.5 g	2.5 g
2.	Castor Oil	1 ml	2 ml	1 ml
3.	Coconut Oil	2.5 ml	2.5 ml	2.5 ml
4.	Glycerin	0.5 ml	1 ml	1 ml
5.	Vitamin E Capsule	1 ml	1 ml	1 ml
7.	Beetroot Powder	0.50 g	1 gm	2 gm
8.	Tea Tree Oil	0.1 ml	0.1 ml	0.1 ml
9.	Vanilla Essence	0.1 ml	0.1 ml	0.1 ml

5.1 Method of Preparation of Herbal Lip Tint

Procedure:

1. Melting Base:

- Take a clean beaker and add 2 g of beeswax, 1 ml castor oil, and 1 ml coconut oil [24].

- Place the beaker in a water bath and heat gently until the beeswax melts completely [24].

2. Addition of Glycerin:

- Once melted, add 1 ml of glycerin to the mixture and stir thoroughly to ensure uniform blending [25].



3. Cooling and Addition of Actives:

- Remove the beaker from the heat source and allow the mixture to cool slightly (but not solidify)
- Add the contents of 1 Vitamin E capsule, 2 g strawberry extract powder, and 0.5 g beetroot powder.
- Stir continuously until the powders are well dispersed [24].

4. Addition of Essential Oils and Flavor

- Add 0.1 ml (1–2 drops) of tea tree oil and 1 ml of vanilla essence.

- Mix thoroughly to ensure even distribution of fragrance and therapeutic oils [26].

5. Final Molding:

- Pour the prepared mixture into lip balm containers or small pots while still in liquid form.
- Allow it to cool and solidify at room temperature (or refrigerate for faster setting) [25].

6. Labeling and Storage:

- Once solidified, close the containers, label them properly, and store in a cool, dry place [26].



5.2 Evaluation Parameters of Herbal Lip Tint

To ensure the quality, safety, and effectiveness of the prepared herbal lip tint, the following evaluation parameters were assessed:

1. Organoleptic Properties

- The formulation was evaluated for its color, odor, texture, and appearance

- It was found to be smooth, uniform, and appealing in color with a pleasant fragrance [27]

2. pH Determination

- A small quantity of the lip tint was dispersed in distilled water, and the pH was measured using a digital pH meter.

The ideal pH for lip products ranges between 5.5 to 6.5, which is suitable for application on skin.



1. Spreadability

- A fixed amount of lip tint was placed between two glass slides, and a weight was applied.
- The diameter of the spread was measured to determine how easily the product spreads on the lips [29].

Formula:

$$(\text{Spreadability}) = M \cdot L / T$$

Where:

M = Weight tied to upper slide (g)

L = Length the slide moves (cm)

T = Time taken in seconds

Reading-

$$M = 100\text{g}$$

$$L = 6.5\text{cm}$$

$$T = 20\text{sec}$$

$$(\text{Spreadability}) = \{100 \cdot 6.5\} / \{20\} = 32.5 \{ \text{g} \cdot \text{cm} / \text{sec} \}$$

1. Melting Point

- The melting point was checked by placing a small amount of the lip tint in a capillary tube and observing the temperature range at which it melts.
- This helps assess the product's thermal stability [30].

2. Washability

- The ease of removal of the lip tint was tested by applying it to the skin and attempting to remove it with plain water.
- A good lip tint should be semi-permanent but removable with mild cleansing [31].

3. Stability Studies

- The prepared lip tint was stored at different temperature conditions (room temperature, 4°C, and 40°C) for 2–4 weeks.
- Any changes in color, odor, consistency, or phase separation were observed [32]

4. Smear Resistance

- A sample of lip tint was applied to a glass slide and pressed with another slide.

- The amount of smear or transfer was checked to determine resistance [33].

5. Irritancy Test (Patch Test)

- A small amount of the lip tint was applied to the forearm skin of volunteers and observed for redness, itching, or irritation for 24 hours.
- No adverse reactions indicated that the product was non-irritant and safe for use [34].

RESULTS AND DISCUSSION

6.1 General Observations During Formulation

The initial observations during the formulation process provide insight into the behaviour and compatibility of the ingredients used.

□ Texture and Blending

- Beeswax was the first ingredient to be melted, and it mixed smoothly with castor oil and coconut oil. The mixture began to thicken as the beeswax solidified upon cooling, forming a stable base.
- The beetroot powder and strawberry extract powder, known for their natural pigmentation, dispersed well into the oil phase. There were no visible clumps, indicating good compatibility between the powders and the oils.
- The incorporation of glycerin helped the formulation achieve a smooth and creamy texture, without any greasy or sticky residue.
- Observation: The formulation resulted in a smooth, semi-solid texture that was neither too thick nor too runny, making it suitable for lip application.

□ Phase Separation:

- After combining the oils, waxes, and water-soluble glycerin, no phase separation was observed in the formulation. This suggests that the emulsification process was successful, and the oils and water-based components remained homogeneously blended.

- Observation: The absence of phase separation indicated that the emulsion was stable and well-prepared.

6.2 Immediate Changes Post-Preparation

- After the lip tint formulation was prepared and cooled, several immediate changes were noted:

❖ Color Consistency:

- Upon cooling, the color of the formulation remained stable, exhibiting a uniform pinkish hue derived from beetroot powder and strawberry extract powder.
- The color intensity was moderate but consistent, showing no signs of fading or discoloration immediately after preparation.
- Observation: The color retention was consistent, which is a crucial factor for a lip tint. No significant color fading was observed immediately after the product cooled.

❖ Fragrance:

- The vanilla essence provided a subtle, pleasant fragrance, while the tea tree oil added a mild, natural herbal aroma. Both fragrances blended well without overpowering each other.
- The fragrance strength was moderate, not too strong to cause discomfort but noticeable enough for a sensory appeal.



- Observation: The fragrance was stable and contributed positively to the user experience. There was no unpleasant or overpowering odor in the final product.

6.1 Observations Over Time

As the formulation began to undergo storage and the product was left at room temperature for extended periods, several key observations were made:

❖ Settling and Layer Separation:

- No settling or layer separation was observed in the formulation even after a period of 7, 14, and 21 days at room temperature. This suggests that the formulation remained stable and that the emulsifying agents (such as beeswax and glycerin) were effective in maintaining the consistency of the product.
- Observation: The formulation maintained its homogeneous consistency over time, indicating good stability and uniformity.

❖ Drying Time:

- Upon application to the lips, the lip tint dried within 1-2 minutes, leaving a smooth, non-greasy finish. The drying time was optimal, as the product did not feel too heavy or oily, which is an important characteristic for a lip tint.
- Observation: The drying time was satisfactory and aligned with typical lip tint products, suggesting that the formulation was well-balanced in terms of oil content.

❖ Color Stability:

- Over the first week of storage, the pink hue of the lip tint remained consistent without

significant fading. The color was vibrant and well-retained, especially when the product was applied directly to the lips.

- Observation: The color stability of the lip tint was positive, showing no significant fading or discoloration even after 21 days at room temperature.

❖ Consistency Over Time:

- The texture remained stable throughout the storage period. The product did not harden or become too soft at room temperature.
- The lip tint continued to exhibit a creamy texture and did not develop any clumps or solidification, even after 3 weeks.
- Observation: The formulation maintained its ideal consistency without any major texture changes, which indicates its long-term usability and stability under standard conditions.

6. 4 Additional Observations

❖ Storage Conditions:

The product was also tested under different storage conditions:

- Room Temperature (25°C): The lip tint showed no changes in appearance or texture, indicating its ability to withstand normal environmental conditions.
- Refrigeration (4°C): The formulation was stable and showed no separation or solidification, which suggests that it could be safely stored in cooler environments without adverse effects.



- Elevated Temperature (40°C): When exposed to higher temperatures, the lip tint became slightly softer but did not melt or separate. This indicates a reasonable tolerance to heat, but may suggest that the formulation is best stored in moderate conditions.

6.5 Evaluation of Herbal Lip Tint

Table 2: Evaluation of Herbal Lip Tint

Sr. no	Evaluation Parameters	F1 Initial Trial	F2 Improved Texture	F3 Colour Balanced	F4 Final Optimized
1.	Organoleptic Properties	Pale pink color, uneven texture, waxy odor	Better color, still gritty due to undissolved powders	Vibrant color, slightly oily appearance	Smooth texture, rich pink shade, pleasant strawberry scent
2.	pH Determination	5.0 - slightly acidic (caused mild dryness on lips)	6.4 - acceptable	5.7 - within range	6.0 - ideal and skin-friendly
3.	Spreadability	Sticky and patchy; didn't apply smoothly	Slight improvement, still uneven	Better flow but left oily layer	Glides smoothly, uniform layer on lips
4.	Melting Point	Soft at 30-35°C, unstable at room temperature	Improved to 40°C, but still soft	Melts at ~45°C - acceptable	Stable between 45- 55°C - suitable for shelf storage
5.	Washability	Comes off immediately with water - poor retention	Difficult to remove - stained skin	Washed off too easily again	Stays through drinks, cleans off with mild soap
6.	Stability Studies	Phase separation and odor change after 10 days at 40°C	No separation but lost fragrance after 2 weeks	Slight color fading at room temp after 3 weeks	No changes observed at 4°C, RT, and 40°C up to 21 days
7.	Smear Resistance	Wiped off completely with slight contact	Moderate smudge, tint faded easily	Stained objects but didn't last on lips	Minimal transfer, tint stayed up to 4-5 hours

Conclusion, Limitations, And Future Scope

7.1 CONCLUSION

The primary objective of this study was to formulate a herbal lip tint using natural ingredients and evaluate its effectiveness, stability, and user acceptability. Based on the formulation and evaluation conducted, the following conclusions can be drawn: The lip tint was successfully

formulated using a blend of natural ingredients, including beeswax, castor oil, coconut oil, glycerin, vitamin E, and herbal extracts such as beetroot powder and strawberry extract powder. These components contributed to a product that was not only natural and safe for use on lips but also provided essential moisturizing and nourishing benefits typically expected from such formulations. The texture of the lip tint was smooth and provided a light, non-greasy feel upon



application. This was attributed to the balance of oils and beeswax, which provided the right level of moisture and lubrication for the lips. The mild tint achieved by the beetroot and strawberry extracts gave the lips a soft, natural color, ideal for users who prefer subtle cosmetics over bold shades. The formulation contained glycerin and vitamin E, both known for their moisturizing and healing properties. These ingredients contributed to the lip tint's ability to prevent dryness and protect the lips, keeping them soft and hydrated. The coconut oil and castor oil further enhanced the emollient properties, providing additional nourishment and promoting lip health. The product demonstrated good short-term stability over a period of 2-3 weeks, with no signs of separation, clumping, or degradation. This indicates that, under normal storage conditions, the formulation can retain its integrity and performance. However, stability over an extended period remains to be tested. The lip tint formulation demonstrated a safe pH of approximately 6, aligning with the optimal pH range for lip care products and ensuring compatibility with the sensitive skin of the lips. Utilizing primarily natural ingredients, the product was deemed safer and more environmentally friendly compared to synthetic alternatives. The inclusion of natural oils, beeswax, and the absence of harsh chemicals or artificial additives made it suitable for individuals with sensitive skin or allergies to synthetic components. Despite these positive attributes, certain challenges and limitations were encountered during the study, which are discussed in the subsequent section.

7.1 Limitations of the Study

Despite the promising results, several limitations were encountered during the formulation and evaluation process. These limitations could influence the overall outcomes and highlight areas for future improvements: The study identified a

few limitations in the lip tint formulation. One key issue was the limited color intensity provided by the natural colorants like beetroot powder and strawberry extract, which resulted in a soft, subtle tint more suited for natural looks. For users seeking a bolder or more vibrant color, the current formulation may fall short, indicating a need to explore additional natural pigments. Additionally, the stability of the product was only assessed over a short period of 2–3 weeks, which does not adequately reflect its long-term durability. Comprehensive stability testing under various environmental conditions would be necessary to evaluate the product's shelf life and ensure it maintains its quality over time. The study on the lip tint formulation highlighted several areas for improvement. Firstly, microbial testing was not conducted, which is crucial for ensuring the safety of cosmetic products. Without preservatives, ingredients like glycerin can create an environment conducive to bacterial or fungal growth, potentially leading to contamination. Implementing microbial testing and incorporating natural preservatives are essential steps to guarantee product safety. Secondly, the study did not explore additional functional benefits such as sun protection (SPF) or skin healing properties. Given the increasing consumer demand for multifunctional beauty products, investigating whether the lip tint offers benefits like SPF protection or aids in healing chapped lips could significantly enhance its marketability. Lastly, the research was conducted using basic laboratory equipment, which may have impacted the accuracy and precision of the formulation process. The absence of specialized equipment for homogenizing the mixture or precise temperature control could introduce variability into the formulation. Upgrading to more advanced equipment would help refine the formulation process and ensure greater reproducibility. Addressing these limitations would not only



improve the product's safety and efficacy but also align it with industry standards and consumer expectations.

7.2 Future Scope

While this study provided useful insights into the formulation and evaluation of a herbal lip tint, there are numerous opportunities for future research and product development that can enhance its performance, market appeal, and overall quality. The following areas highlight the potential for further exploration: To enhance the color intensity and longevity of the lip tint, future research could focus on incorporating more vibrant natural colorants such as hibiscus, pomegranate, annatto, or turmeric. These ingredients offer a range of hues and can be utilized through advanced extraction techniques like oil-based or ethanol-based extractions to yield more concentrated pigments that last longer on the lip. To ensure the commercial viability of the lip tint, long-term stability testing must be carried out. This should involve storing the product under various conditions such as high and low temperatures, humidity, and exposure to light for extended periods (e.g., 6 months to 1 year). This would help assess how the product performs over time and ensure its shelf life meets industry standards for cosmetics. The lip tint formulation should undergo thorough microbial testing to assess potential contamination risks and ensure its safety for long-term use. The inclusion of natural preservatives, such as rosemary extract, grapefruit seed extract, or vitamin E, should be explored to enhance the product's antimicrobial properties and shelf life. This is especially critical if the product is to be marketed for use over extended periods. Given the increasing demand for multifunctional cosmetic products, future studies should evaluate the SPF (sun protection factor) of the lip tint to provide consumers with additional sun protection

benefits. Additionally, testing the product for anti-aging, healing properties, or its ability to treat chapped lips would improve its appeal as a multifunctional lip care product.

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