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Formulation and Evaluation of Lip Balm by using Beet Root

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Abstract: *Cosmceuticals are the products of cosmetics that are biologically active ingredients that impersonateo medical or drug like benefits. The design, quality, formulation of lip balm made from natural ingredients were studied. In this study, lip balm has been made by using various ingredients like beetroot, almond oil, aloe vera, vitamin E and rose essence. A homogeneous mixing method was used to produce lip balm. The formulation of lip balm was tested by applying it on a glass slide. Various parameters such as chemical stability, pH melting point, and spread ability were carried out for the evaluation of lip balm. The pH was found to be 6.0 and the melting point was 63-65 °C. After performing stability studies at room temperature (25.0±3.0°C), refrigerated condition (4.0± 2.0°C) and oven temperature (40.0± 2.0°C), it proved that prepared lip balm was uniform in nature, was perfectly applied, without any deformation at room temperature and refrigeration. Lip balm prepared from above ingredients could be a better option for treatment of various lip issues..*

Keywords: Beetroot, Organic lip balm, natural ingredients, antioxidants, hydrated, cosmetics, nourish, etc

I. INTRODUCTION

Cosmetics are substances or items that are applied to the body in order to enhance one's look. The use of cosmetic items is continuously growing. Key variables such as rising urbanisation, lifestyle improvements, and the trend of publishing images on social media all encourage the usage of cosmetic items. An increase in the number of working women and time spent on social media has increased people's awareness of their appearance (Bellis, 2017). The growing young population in emerging countries, combined with rising disposable money, leads to a growth in the sale of cosmetic products, especially lip cosmetics (P&S Market Research, 2018). The Inclusion of hazardous compounds in cosmetics poses a threat to industry expansion. Consumers are increasingly concerned when it comes to selecting cosmetic items. Manufacturers compete to cre ate cosmetics that are both safe to use and good to the environment. Because of rising demand for organic and natural lip care products, increased awareness of the need to protect the lips from overexposure to the sun, and new product innovations, Global Industry Analysts, Inc. (GIA) has launched the global market for lip care products, forecasting it to reach US$2 billion by 2020. (Global Industry Analysts, 2015)/(Global Industry Analysts, 2015)/(Global Industry Analysts, 2015. Lip colouring has been done since ancient times, and the use of lipsticks has grown in popularity. Shades of colour, texture, and sheen options have also evolved and expanded. Lip jelly, lip balm, and other similar products are examples. The structure of the lips differs from that of the skin. The top corneum layer of the skin has 15-16 layers in general, primarily for protection. In comparison to regular face skin, the top corneum layer of the lips comprises only 3-4 layer and is quite thin. There aren't many melanin cells in the skin of the lips. Blood vessels visible more clearly through the skin of the lips as a result, giving the lips a gorgeous pinkish tint. There are no hair follicles or sweat glands on the surface of the lips.

As a result, it lacks the sweat and body oils that protect it from the elements (Kudu et al., 2015). Lip balm is one sort of lip product. Its major purpose is to keep the skin from drying out and to protect it from harmful environmental influences. Some lip balms, however, have negative side effects. Lip b alms containing phenol, menthol, and other low-quality chemicals, for example, might be harmful to the lips. Lipsticks, lip balms, lip jellies, lip salves, lip gloss, and lip rouge are some of the cosmetic compositions used on the lips. These formulas give the lips a lovely colour and a glossy finish. Lip rouge is a lipstick substitute. In nature, they are almost semisolid or liquid. They can be made by mixing

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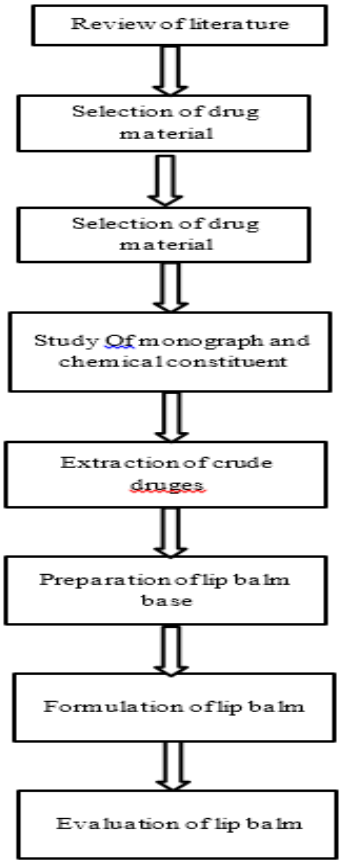
pigments with a base that contains the appropriate proportion of aqueous phase. This formulation is ideal for integrating pharmaceuticals encapsulated in noisome. This type of formulation's consistency makes it simple to apply with the help of a brush attached to the container's lid. It also aids in improving the active medicament's penetration through the lip membrane. The cosmetic formulation has a good aesthetic appeal and is simple to apply. The more precisely the active substance is applied to the affected location, the more successful the illness treatment becomes. When compared to the current fo rmulation, the cosmetic formulation will be more patient-acceptable, which may improve patient compliance. The study's goal was to create a medicated lip rouge containing noisome acyclovir to treat recurrent herpes labialis. This study was an attempt to design a formulation capable of delivering a higher concentration of the medicine in the dermal tissue for effective cold sore therapy. Because the medicine is encapsulated inside a lipophilic niosomal carrier, the formulation may be able to penetrate deep into the lip membrane and release the drug at the site of action.[1]

Aim:
Formulation and Evolution of Lip Balm by using beet root

Objective :
1- To provide an occlusive layer on the lip surface.
2- Sealing in moisture and protecting the lips from external exposure.
3- Moisture and hydrate your lips.
4- To restore balance and good health for your lips.
5- Enhancing the natural lip color.

Plan of Work :



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Review of literature

1. Lip balm

Women frequently use lip balm to give their lips a lovely colour and protection. Lip balm is a cosmetic product with added benefits. Oil, colorant, and other chemicals are the basic components of a lip stick. Beeswax is the typical wax used in lip balm. In lip Lick composition 10, camellias are wax and c camellias are wax are combined to create strength and strike true colour in the lip balm. The composition of lip uses a variety of plant-based oils, including jojoba seed oil, the oil of sweet almonds, and castor seed oil. Oils serve as a moisturising agent in lip balm and help to combine the substance to create a smooth and flawlessly flexible substance. Shea Butter works as a moisturiser to create stable lip balm mixtures that are rigid at ambient temperature yet glide and melt over the lips once applied.

2. Global Lip balm Demand

The quick urbanisation. Consumers' purchasing power is increased by 11ion in developing nations. The global demand for lip balm is driven by the trend of increased internet usage. According to Alana from Thai advertising tactics, consumer appetite for lip balm will increase over the course of the upcoming year as they advertise their products on social media platforms like YouTube, YouTube, Facebook, and Instagram.

Based to a company analysis, worldwide sales for lip balm peaked in 2016 at

$7.15 billion and is expected to reach $9.2 billion in 2018. The Lipbalm market is predicted to produce S13.4 billion in sales by the year 2021. The market's rise is mostly attributed to the increase in demand from young adults who work women globally. In the near future, the demand for lip balm will progressively rise. A negative impact of synthetic colours on the health of people has increased along with the population. The current study's goal is to produce natural lip balm colouring. Give the most effective answer to this problem.

3. Self-Decoration

Mankind have long decorated themselves to draw attention to the other gender. Anthropologists contend that women utilise cosmetics to mimic an orgasmic condition in their bodies. Doune Ackerman living in Pallingston in 1999. Because the lips resemble the genitals, The consciously and unconsciously causes why women constantly make them look even redder using lip balm are that they blush red and swell while around. Despondent animal behaviourist these assertions are supported by Moates, who sees makeup as a trick. [2]

4. Women and beauty

Highlighted society's commercialization of young girls as they attempt to achieve the unrealistic lanky model image portrayed in popular culture. According to Thompson and, who also looked at how the body came to be seen as the ideal form, women normalize their bodies to preserve an appearance that is regarded as the cultural standard through the practise of self-care (Rook, 1985). Additionally, studies have looked closely at the impact that these signals have on women's aspirations for their physical appearance (Solomon). Similar to other study, society gives greater significance to physically attractive persons (Setoff 1999). Richens, 1991; Fabricant and Gould, 1993.According to studies, those who are seen to be more beautiful typically have greater social standing than those who are less attractive (Fabricant and Gould the year 1993). Richens and Mc Nell, 1991. It is understandable that there are complaints about cosmetics given how well they are promoted to achieve a goal and how they are used to enhance female appearance. Due to the widespread belief that a woman's look and her perception of her own value are linked, Witham was famous colure has been aggressively abused (English, Lurky 1996; Simon and Ashmore 1994.And lipbalm is a crucial component of the appearance that many women work so hard to achieve.

Ingredients and uses

- Almond Oil
- Beeswax
- Vitamin E
- Honey
- Beetroot extract
- Rose water

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1- Almond Oil

Almond oil's lipids aid to moisturize the lips by deeply into the skin tissues. Olive oil's soothing effects lessen the discomfort of cracked and sunburned lips. To combat inflammation, aloe Vera extract possesses anti-inflammatory effects. Antioxidants that prevent wrinkles and other types of skin damage are infused into the lips.

1. Beeswax: -

Figure Number 2 :- Bees wax

Beeswax, a natural secretion produced by honeybees, stands as a testament to the intricate harmony between nature and the industriousness of these remarkable insects. Revered for millennia for its versatile properties, beeswax serves as a cornerstone in various human endeavors, spanning from ancient civilizations to modern industries.

As bees construct their intricate hives, they produce this waxy substance to build honeycomb cells and safeguard their precious honey reserves. Beyond its role in bee colonies, beeswax finds itself woven into the fabric of human civilization, revered for its myriad applications in cosmetics, pharmaceuticals, art, and craftsmanship.With its unique blend of compounds, including esters, fatty acids, and hydrocarbons, beeswax offers not only structural integrity but also therapeutic and aesthetic benefits. As we delve into the fascinating world of beeswax, we uncover a natural treasure imbued with history, ingenuity, and boundless possibilities.

2. Vitamin E: -

Figure Number 3:- Vitamin E

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Vitamin E, often heralded as the "skin vitamin," stands as a vital nutrient essential for maintaining optimal health and well-being. As one of the body's primary antioxidants, vitamin E plays a crucial role in neutralizing harmful free radicals, protecting cells from oxidative damage, and bolstering the immune system.

Beyond its antioxidant properties, vitamin E encompasses a diverse array of functions, influencing everything from cardiovascular health to neurological function and skin integrity. Found abundantly in various foods such as nuts, seeds, and leafy greens, as well as available in supplement form, vitamin E continues to captivate researchers and health enthusiasts alike with its potential therapeutic benefits. In this exploration of vitamin E, we uncover its multifaceted roles in promoting vitality, longevity, and resilience throughout the human body.

3. Honey:-

Figure Number 4:- Honey

Honey, often dubbed "liquid gold," has been cherished across civilizations for its delightful taste, rich cultural significance, and diverse medicinal properties.

Formed through the laborious efforts of bees gathering nectar from flowers, honey serves as a timeless symbol of vitality and healing. It's remarkable ability to resist spoilage, coupled with its antibacterial, anti-inflammatory, and antioxidant properties, has made it a staple in both culinary traditions and traditional medicine practices worldwide.

From ancient rituals to modern kitchens, honey continues to captivate with its golden hue, evocative aroma, and myriad health benefits, offering a sweet and wholesome connection to nature's bounty.

4. Beetroot extract: -

Figure Number 5 :- Beetroot extract

Beetroot extract, derived from the vibrant root vegetable known for its deep crimson hue, represents a potent and versatile natural compound with a myriad of health benefits. Rich in essential nutrients, antioxidants, and bioactive

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compounds, beetroot extract has garnered increasing attention in both traditional and modern medicine for its potential therapeutic properties.

From supporting cardiovascular health and enhancing exercise performance to promoting liver detoxification and combating inflammation, the multifaceted benefits of beetroot extract continue to be explored by researchers and health enthusiasts alike. With its vibrant color and nutrient-rich composition, beetroot extract offers a promising avenue for harnessing the power of nature to optimize health and well-being.

5. Rose Water:-

Figure Number 6:- Rose water

Rose water, a fragrant distillation of rose petals, stands as a time-honored elixir cherished for its delicate scent, versatile applications, and potential therapeutic benefits. Dating back centuries, rose water has been revered across cultures for its aromatic allure and its role in beauty rituals, culinary creations, and holistic remedies.

Produced through the steam distillation of rose petals, this aromatic water captures the essence of the rose plant, imbuing it with a subtle yet captivating fragrance and a host of bioactive compounds. From soothing skin irritations and enhancing mood to flavoring culinary delights and symbolizing love and beauty, rose water holds a special place in the hearts and homes of individuals worldwide.

As we explore the enchanting world of rose water, we uncover its timeless charm and its potential to elevate both body and soul. [3,4]

Advantage & Disadvantage of Beetroot Lip Balm

Advantages of Beetroot Lip Balm

1. Natural Color: Beetroot lip balm offers a natural tint derived from the vibrant pigments present in beetroot extract, providing a subtle and flattering hue to the lips without the need for synthetic dyes
2. Moisturizing Properties: Beetroot contains natural sugars and antioxidants that help to hydrate and nourish the lips, making beetroot lip balm an effective moisturizing treatment for dry or chapped lips.
3. Antioxidant Benefits: Beetroot is rich in antioxidants such as vitamin C and betaines, which help to protect the lips from oxidative damage caused by free radicals, promoting healthier and more youthful-looking lips.
4. Potential Health Benefits: Some studies suggest that beetroot extract may have anti- inflammatory and wound-healing properties, which could benefit the delicate skin of the lips, especially in cases of minor irritations or inflammation.

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Disadvantage of beet root extract

1. Staining Potential: The natural pigments present in beetroot extract may stain the lips, especially if the lip balm is applied in large amounts or left on for an extended period. This could result in temporary discoloration of the lips, which may be undesirable for some users.

1. Sensitivity Concerns: Some individuals may be allergic or sensitive to components present in beetroot extract, such as certain proteins or compounds. This could lead to allergic reactions or skin irritation upon application of beetroot lip balm.

2. Limited Shelf Life: Beetroot lip balm may have a shorter shelf life compared to synthetic lip balms, as natural ingredients are more prone to degradation over time. Without the use of preservatives or stabilizers, beetroot lip balm may spoil more quickly and require refrigeration or shorter expiration dates.

3. Variable Color and Scent: The color and scent of beetroot lip balm may vary depending on factors such as the concentration of beetroot extract used, the extraction method, and individual variations in beetroot pigments. This could result in inconsistencies in color and scent between batches of lip balm, which may not be ideal for some users looking for uniformity. [5]

. Formulation

Sr no.	Ingredients	uses	Quantity
1	Coconut oil	Moisturize	30 ml
2	Beeswax	Natural emulsifier	5.5 gm
3	Vitamin E	Antioxidant	0.30 gm
4	Honey	Emollient	2 gm
5	Beetroot extract	Pigment	50 gm
6	Rose water	As cooling agent & fragrance	3 ml

Process of making

STEP 1: Begin by melting the beeswax and almond oil together in a heat-safe container or double boiler over low heat. Stir occasionally until fully melted and well
combined.

STEP 2: Once the beeswax and oil are melted, remove the mixture from heat and allow it to cool slightly.

STEP 3: While the mixture is still warm but not hot, add the rosewater, beetroot extract, honey, and the contents of the vitamin E capsule (if using). Stir well to ensure all
ingredients incorporate

STEP 4: Quickly pour the mixture into clean lip balm containers or tubes before it solidifies. Be sure to work efficiently as the mixture may start to solidify as it cools.

STEP 5: Allow the lip balm to cool and solidify completely before using. This may take a few hour depending on the temperature of your environment.

STEP 6: Once cooled, cap the lip balm containers or tubes and store them in a cool, dry place away from direct sunlight.

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Product Photo :

Evaluation

Sr No.	Evaluation parameter	Observed value
1	Melting point	63°C -65°C
2	Organoleptic properties	-
2.1	Colour	Red
2.2	Odour	Pleasant
2.3	Appearance	Smooth
3	Test of spread ability	-
4	pH measurement	6.0
5	Skin irritation	No
6	Breaking point	29gm

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Chapter 5.1. Test of spread ability-

It was observed that the lip balm at room temperature (25.0±3.0°C) and refrigerator (4.0± 2.0°C) showed; Good: uniform, no fragmentation; perfect application, without deformation of the lip balm, but Intermediate: uniform; leaves few fragments; appropriate application; little deformation of the lip balm at oven temperature (40.0± 2.0°C).

Chapter 5.2. Stability studies-

parameter	**Temperature Conditions**		
25.0±3.0°C	**4.0± 2.0°C**	**40.0± 2.0°C**	
Colour	Red	Red	Red
Oduor	Pleasant	Pleasant	Pleasant
Melting Point	63°C	65°C	64°C
Spread ability	Good	Good	Intermediate
pH	6.0	6.0	6.2

Table 3: Stability studies of lip balm at different temperature

Evaluation Parameters:

Color: Assess the vibrancy and consistency of the color imparted by the beetroot powder. Ensure it provides a pleasing tint to the lips without being too intense or uneven.

Texture: Evaluate the smoothness and spread ability of the lip balm. It should glide easily onto the lips without feeling too greasy or waxy.

Moisturization: Determine the effectiveness of the lip balm in hydrating and nourishing the lips. It should leave the lips feeling soft, smooth, and hydrated without any greasy residue.

Fragrance: If essential oils are added for fragrance, assess the aroma and its compatibility with the overall product. The fragrance should be pleasant and not overpowering.

Longevity: Evaluate how long the lip balm stays on the lips and its ability to provide lasting hydration and color throughout the day.

Here's how to apply lip balm for the best protection: - Step One: Uncap the container.

If the balm is in a tube, you only need to raise it about a half centimeter. If it's in a container, apply a pea-sized amount to your finger.

StepTwo: Apply to the bottom lip. Rub the balm on your bottom lip, just along the outside.

Step Three: Apply to the top lip. Rub the balm on your top lip, just along the outside.

Step Four: Rub your lips together. Rub your top and bottom lip together. This helps spread the balm evenly over your entire mouth.

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Figure Number 8:- How to use lip balm

Types Of Lip Balm:-

1. Moisturizing Lip Balm: Provides hydration to dry and chapped lips, typically containing ingredients like beeswax, shea butter, and oils such as coconut oil or almond oil.
2. SPF Lip Balm: Contains sun protection factor (SPF) to shield lips from the sun's harmful UV rays, helping to prevent sunburn and reduce the risk of skin cancer.
3. Tinted Lip Balm: Adds a hint of color to the lips while providing moisture and protection, combining the benefits of a lip balm with a sheer tint of color.
4. Medicated Lip Balm: Contains active ingredients like menthol, camphor, or salicylic acid to provide relief from pain, itching, or cold sores, and to promote healing.
5. Vegan Lip Balm: Formulated without any animal-derived ingredients, suitable for individuals following a vegan lifestyle or those with allergies to animal products.
6. Flavored Lip Balm:Infused with natural or artificial flavors to enhance the sensory experience and make application more enjoyable, with popular flavors like mint, cherry, or citrus.
7. Hypoallergenic Lip Balm: Formulated without common allergens or irritants, suitable for individuals with sensitive skin or allergies.
8. Natural and Organic Lip Balm: Made with organic and natural ingredients, free from synthetic fragrances, dyes, and preservatives, appealing to those seeking more eco-friendly and skin-friendly options.
9. Matte Lip Balm: Provides moisture and protection without a glossy finish, ideal for those who prefer a more matte or natural look.
10. Long-Lasting Lip Balm: Formulated to provide extended hydration and protection, ideal for use in harsh weather conditions or for individuals with chronically dry lips.

What are the Benefits of Beetroot for Lips?

Beetroot is a one-stop solution for soft, pink and plump lips. Its dyeing property has made it one of the most commonly used products in the cosmetic industry. Beetroot on lips helps you to get rid of darker lips and makes them lighter and brighter. Let's see what some of the
benefits of beetroot for lips are.

1. Brighten Lips:

Beetroot is proven to give amazing benefits for dry and chapped lips. Applying beetroot lip balm on your lips nourishes them and also gives them a natural pink tint.

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2. Hydrates the Lips:
Lack of hydration can make the lips dry. Hydrating properties of beetroot penetrate deep into the skin and moisturize the lips. For best results, you can always use organic beetroot lip balm.
3. Light Pigmentation:
Pigmented lips are never good to look in the mirror and also affect your confidence. A natural bleaching agent, Vitamin-C, present in beetroot, helps in reducing pigmentation, thus giving you the pinky lips you desire.
4. Acts as Exfoliator:
The build-up of dead cells on your skin can be an unpleasant experience and make your lips appear dull. Beetroot is a natural exfoliator that removes dead cells so that your favorite lipsticks can glide on your lips super easily.

Experimental work
Evaluation
1. Melting Point
The sample of lip balm is taken in a glass capillary whose one end was sealed by flame. The capillary containing Drug dipped in liquid paraffin inside the melting point apparatus. Melting was determined and melting point was reported.
2. Organoleptic properties
The formulation was studied for physical appearance, colour and odour. The presence of coarse particles and consistency were used to evaluate the texture and homogenecity of the formulations.
3. Measurement of pH
The pH of lip balm was determined in order to investigate the possibility of any side effects. The pH study was carried out by dissolving 1gm of sample into 100 ml water. The pH measurement was done using pH meter. PH of lip was nearto neutral.
4. Skin Irritation test
It is carried out by applying lip balm on the skin for 10 min
5. Test of spread ability
The test of spread ability consisted of applying the product repeatedly onto a glass slide to visually observethe uniformity in the formation of the protective layer and whether the stick fragmented, deformed or broke during application. Prepared lip balm, initially has shown G- Good: uniform, no fragmentation, perfect application, with any deformation At room temperature
6. Stability studies
Prepared lip balm was placed for accelerated stability studies at room temperature (25.0+3.00 C), refrigeration (4+-2.00C) and oven temperature (40.0+-2.00 C) for 30 days. After 30 days it was again characterized for organoleptic properties, Melting point, spreadability and pH.
7. Effectiveness test on papers
Finally, after taking out the lip balm from chiller, it was tested by applying the lip balm on a piece of paper. This process is important to determine colour obtained from different sources. It also can determine the effectiveness of the colour product.
8. Skin Sensitivity
It was carried out by applying the product in the form of a patch on the skin for 30 min and observe the reactions- N - No reaction R-Redness of the skin I- Itching, swelling, inflammation

Result:
Women's use of cosmetics has increased massively while on the prior couple decades.
Nevertheless, the risks associated with these substances have gained significant attention recently. Following extensive clinical investigations, consumers can safely and effectively benefit from herbal lip redolences. In contrast when it comes to other cosmetics, natural cosmetics are safe.

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II. CONCLUSION

Cosmetics chemists meticulously select ingredients with specific chemical properties to enhance the efficacy and user experience of their products. For example, in the formulation of lip balm, a balance between emollients and waxes is crucial to achieve the desired texture. Oils and butters act as emollients, softening and smoothing the skin, while waxes like beeswax provide structure and thickness. Our patented lip balm incorporates a combination of humectants, emollients, and occlusive agents to lock in moisture and nourish the lips. It caters to both men and women, offering additional benefits such as scar healing and sun protection. Our product concept focuses on long-lasting hydration, utilizing botanical ingredients like honey, hyaluronic acid, and SPF for optimal lip care.

In our research, we aimed to develop a lip balm using predominantly natural ingredients. Beetroot extract serves as a natural colorant, while rose water provides fragrance. Vitamin E capsule acts as an antioxidant, and almond oil serves as a moisturizing agent. Through comprehensive physicochemical studies, we confirmed the successful formulation of the lip balm, ensuring its safety and efficacy. Beeswax was used as a base in the current formulation, but future iterations may explore natural alternatives like shea butter or paraffin wax.

Furthermore, our study explored the potential of natural dyes derived from plant sources for cosmetic applications. Solvent extraction methods, particularly using ethanol, yielded satisfactory results in terms of dye yield and color strength. Lip balms formulated with these natural dyes exhibited stability and good application properties even after prolonged storage. Importantly, they proved non-irritating and safe for use as organic cosmetics. To enhance the quality of extracted dyes, a comprehensive understanding of extraction procedures and plant treatments is essential. Optimization of solvent selection and concentration adjustment are crucial factors in maximizing dye yield and achieving desired colors.

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