



Formulation And Evaluation Of Herbal Lip Balm By Using Strawberry Extraction

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ABSTRACT:

Since ancient times, there has been a huge demand for cosmetics. The current lip balm formula enhances facial features and adds a glamorous touch to cosmetics. Herbal lip balms have emerged as an effective solution for moisturizing and treating various lip disorders. This study explores the formulation of a herbal lip balm infused with strawberry extract, known for its flavouring, nourishing and antioxidant-rich properties. The lip balm acts as an effective moisturizer, providing relief from dryness, chapping, and irritation. This herbal solution presents a natural, safe, and efficient alternative to conventional lip care products, addressing both cosmetic needs and therapeutic benefits..

Keywords-cosmetics ,herbal lipbalm, lip care,lip disorder, strawberry extraction lipbalm.

INTRODUCTION-

Herbal cosmetics have gained significant attention in modern lifestyle due to their natural and medicinal properties^[1].Herbal cosmetics ,in particular have gained popularity due to their numerous application in personal care^[2].These product exhibit pharmacological properties such as antimicrobial ,anti-inflammatory ,and cytotoxic effects, making them both effective and beneficial for overall skin health^[3].Cosmeceuticals ,which combine medicinal benefits with cosmetic applications ,not only improve topical action but also help protect against degenerative skin condition^[4].

The term “herbal” signifies safety, making these products a preferred alternative to synthetic options , which are often associated with adverse health effects^[5].coloring the lips is an ancient practice aimed at enhancing their beauty and adding a glamorous touch to facial makeup^[6] .This tradition is evident in

modern products like lip jellies, lip balm and lipsticks, which are available in hundred of shades to meet diverse preference and demands^[7]

Lip balm -Lip balm is a cosmetics products designed to prevent dryness and protect the lips from environmental factors . It serves a similar purpose to lipstick and is formulated with natural or herbal ingredients .The production of lip balm involves stability testing ,which includes evaluating the melting point and organoleptic characteristics such as colour and odour and appearance. Lip balm is used by both men and women to maintain healthy lips. The key ingredients such as butter, oils and waxes -must be carefully balanced to create a high quality products. The primary functions of lip balm is to create an occlusive layer on the lips.it is especially useful for treating chapped lips and conditions like stomatitis [cold sores]^[8].

Ideal characteristics of herbal lip balm

1. Smooth and easy to apply
2. Non-irritant and non-toxic
3. Free from contamination
4. Long lasting
5. Free from gritty particles

Advantages of herbal lip balm

1. -1. Lip balm maintain natural lip health and softness of the lips
2. Sunblock lip balm protect lips from harmful uv-radiation, effectively reducing the risk of sunburn or damage.
3. These products are suitable to use for men and women.
4. Lip balm helps to prevent chapping, dryness, and cold sores

5. These product often feature natural ingredients that only care for the lips but also enhance facial aesthetics by keeping the lips nourished and vibrant .
6. Lip balms are especially helpful for soothing irritation caused by cold weather, allergies, or viral infections like the flu, offering relief and comfort.

Disadvantages of herbal lipbalm

1. -1. Low-quality lip balms may harm the lips by drying them out instead of providing adequate moisturization.
2. Regular use of certain lip balms may create a perceived need to reapply frequently, leading to dependency.
3. Homemade lip balms, while natural, often wear off quickly, requiring more frequent application compared to commercial alternatives.
4. Some manufacturers focus primarily on the visual appeal of their lip balms, potentially compromising the product's effectiveness and skin health benefits.

Benefits of lip balm



1. -1.Prevents loss of moisture.
2. Smooths out fine lines on lips.
3. Protects lips with antioxidants.

Uses of lip balm

1. Apply it to your cuticles, especially before bedtime.
2. Focus on the corners of your lips for extra care.
3. Spread evenly across your lips for full coverage.[9]

Why Wear Lip Balms?

1. -1.Hydrated lips make you look more youthful.
2. Lip balms help lips heal quickly.
3. They prevent lips from becoming chapped.
4. Well-moisturized lips enhance your appearance and allow for smooth lipstick application.[10]

Lip disorder

1.Swelling- Allergic reactions can cause lip swelling. This may be due to sensitivity to certain foods, drinks, drugs, lipsticks, or airborne irritants. If the cause is found and removed, the swelling usually goes away. However, sometimes the cause remains unknown. A condition called hereditary angioedema can cause repeated swelling. Other causes, like sunburn, cold or dry weather, or injury, can also lead to swollen lips^[11].



Sun Damage:

Sun damage can make the lips, especially the lower lip, dry and hard. Red spots or a white film may appear, indicating damage that could increase the risk of skin cancer. To reduce this, use lip balm with sunscreen or protect your face with a wide-brimmed hat [11].

**Inflammation:**

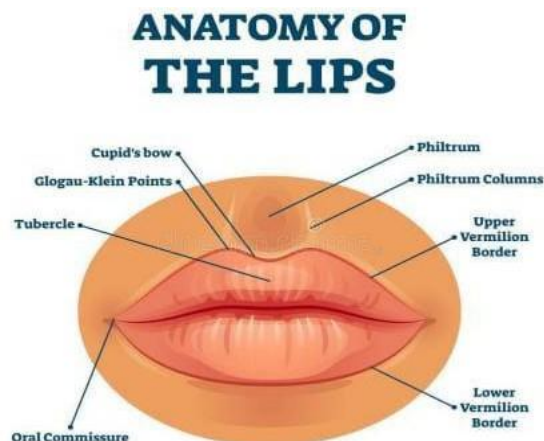
Cheilitis, or inflammation of the lips, can cause pain, redness, cracking, and flaking at the corners of the mouth. It can result from a lack of vitamin B2 in the diet [11].

Discoloration:

Freckles and brown spots (melanotic macules) are common around the lips and usually last for years without worry. However, multiple brown spots could indicate a condition called Peutz-Jeghers syndrome, which causes polyps in the stomach and intestines. Kawasaki disease, which affects young children, can cause dry, cracked lips and redness inside the mouth [11].

**Sores:**

A raised sore with hard edges on the lips may be a type of skin cancer. Other sores could be caused by conditions like oral herpes or syphilis. Keratoacanthoma, which causes unusual growths, may also lead to sores, though its cause is unknown [11].

**Anatomy of lips :**

Vermilion Border

-The vermilion border is the distinct line that defines the edge of the vermilion zone (the reddish part of the lips) and separates it from the surrounding skin. Labium superius oris refers to the upper lip, and labium inferius oris refers to the lower lip. The lower lip extends from the lateral commissures (corners of the mouth) to the labiomental crease (the line on the chin). The upper lip extends from the nasolabial folds (creases beside the nose) to the inferior border of the nose^[12].

Tubercles

The tubercle (also called procheilon) is the fleshy prominence in the middle of the philtrum. It contributes to the downward arch of the cupid's bow, giving the upper lip its characteristic shape.

Oral Commissures

The oral commissures are the points where the upper and lower lips meet at the corners of the mouth. Muscles responsible for lip movement, such as those controlling smiling or speaking, attach to this region.

Philtrum

The philtrum is the central groove or depression on the upper lip. It is bordered by philtral ridges, which are symmetrical vertical ridges on either side of the philtrum. The philtrum is formed from dermal collagen and elastic tissue, providing skin that can stretch during facial expressions and lip movements. The philtrum plays a role in upper lip mobility, aiding in actions such as smiling and speaking^[13].

Types of lip balm

1. UV Filter Lip Balm

-Use: All year round, but especially useful in summer. Purpose: Protects lips from harmful UV rays.

2. Nourishing Lip Balm

-Use: Best suited for winter months.

Purpose: Provides deep hydration and care for chapped, dry lips during cold weather.

3. Moisturizing Lip Balm

-Use: Effective for dry lips and can be used all year round. However, avoid using it in extreme cold as it absorbs too quickly, which may cause lips to crack.

Purpose: Keeps lips soft and hydrated.

4. Medicated Lip Balm

-Use: Should be applied with caution.

Purpose: Acts as a softening agent and antiseptic for damaged or severely chapped lips.

5. Tinted Lip Balm

- Use: Suitable for year-round use.

Purpose: Adds a hint of color to lips while providing hydration^[14].

Materials and methods –

1. Coconut Oil –



Definition: Coconut oil, sometimes referred to as coconut butter, is a consumable oil derived from the meat, milk, and wick of the coconut palm fruit. At room temperature (approximately 25°C or 78°F), it is a white solid fat, but it melts into a clear liquid in warmer climates. Unrefined coconut oil has a distinct, strong coconut fragrance^[15]

Related Terms: Copra oil, coconut butter, coconut oil.

Biological Source: Coconut oil is extracted from the seed of the coconut palm, *Cocos nucifera*, and is considered a fixed oil.

Uses: in cooking, cosmetics, and personal care products due to its moisturizing, nourishing, and versatile properties.

Family- palmae

Chemical composition -Coconut oil, derived from the coconut palm (*Cocos nucifera*), is a semi-solid at 20°C and consists mainly of triglycerides, with 80-85% of the acids being saturated, primarily lauric and myristic acid. It is commonly used in dietary supplements containing medium-chain triglycerides (MCTs)^[15]

2. Honey:



Properties: Antiseptic, anti-inflammatory, and moisturizing. It helps heal acne, reduces redness, and removes pollutants from the pores.

Benefits: Reduces skin dryness, minimizes fine lines and wrinkles, and acts as a wound-healing agent.

Synonym: Madhu, Honey Purified, Mel.

Biological Source: A sugary substance secreted by bees (*Apis mellifera*, *Apis dorsata*) and placed in honeycombs.

Uses: Sweetening, demulcent, beneficial for infants and patients, flavouring agent and used as an antiseptic on burns^[15]

3. Ghee



Properties: Nourishing, moisturizing, and helps soften dry and chapped lips. Penetrates deep into skin layers for hydration. Synonym: Butter, oil, margarine, oleo.

Biological Source: Made from cow milk butter, clarified through low heat, leaving behind liquid fat.

Uses: Used as a natural moisturizer, especially for lips. These products provide both nutritional and therapeutic benefits, especially for skin care and hydration^[16].

4. 5.Vitamin E



Synonyms: Tocopherol

Biological Sources :Sunflower oil ,Olive oil, Soya ,Cereals & cereal products ,Nuts. Chemical Constituents:

Alpha-, beta-, gamma-, and delta-tocopherol Alpha-, beta-, gamma-, and delta-tocotrienol

Uses:

- Protects against free radicals.
- Promotes cell regeneration
- Contains anti-inflammatory properties.
- Reduces hyperpigmentation.

Role in Lip Balm :Acts as a natural antioxidant and conditioner . Stimulates cell turnover and regeneration, helping in faster healing of chapped lips .This information reflects the benefits of Vitamin E in maintaining healthy and hydrated lips, making it a valuable ingredient in lip balm formulations^[17].

5. 6.Beeswax:



Beeswax is a natural thickening agent widely used in lip balms, lip glosses, and hand creams for its moisturizing and protective properties. It helps retain skin moisture and is a key ingredient in many cosmetic products.

Synonyms: Beeswax, Cera-flava.

Biological Source: Obtained from the bee comb of *Apis mellifera*

Chemical Constituents: Contains 80% Myricin (Myricyl palmitate), along with Cerotic acid, Melissic acid, and Cerolein.

Family: Apidae Uses:

- Used in making ointments, plasters, and polishes.
- Commonly used for manufacturing candles and molds in dental and electronic industries^[15].

6. Strawberry extraction



can be a valuable ingredient in herbal lip balms due to its beneficial properties, including; Natural Flavor and Aroma: Strawberry extract adds a pleasant, fruity scent and taste to the lip balm, enhancing the sensory experience.

The biological source - *Fragaria × ananassa*,

commonly known as the garden strawberry. This hybrid species is the most widely cultivated and consumed type of strawberry globally.

Family: Rosaceae Genus: *Fragaria*

Common Varieties: Different cultivars of *Fragaria × ananassa* include 'Albion,' 'Chandler,' 'Camarosa,' and 'Festival,' among others, depending on the region and purpose of use.

Other species - in the *Fragaria* genus, such as *Fragaria vesca* (wild strawberry), may also be used for specific extractions due to their unique biochemical profiles [18-19]

Solvent Extraction methods-

This method uses a solvent (such as ethanol or food-grade alcohol) to extract flavor compounds from strawberries.

Process:

- Fresh strawberries are chopped or crushed and placed in a container.
- A solvent (like ethanol) is added to the strawberries and left to soak for several hours or overnight.
- The mixture is then filtered to remove the solids.
- The solvent is evaporated (using heat or vacuum) to leave behind a concentrated strawberry extract [20].

Formulation of lip balm :-

Sr. no	Ingredients	Quantity taken	Quantity Given	Uses
1.	Strawberry extraction	0.8 ml	0.6 ml	Colouring agent
2.	Beeswax	9.0 gm	5.0gm	Import glossiness
3.	Coconut oil	0.6 ml	0.4 ml	emulsifier
4.	Vitamin E	0.5ml	0.3 ml	Antioxidant
5	Honey	Q.S	Q.S	Flavouring agent
6.	ghee	2gm	0.48 gm	moisturizer

Formulation process-

1. weigh all excipients accurately to ensure proper proportions.
2. Melt beeswax, coconut oil, ghee in beaker and heat them gently in water bath, keeping the temperature between 55°C and 60°C.
3. add other ingredients like strawberry extraction, honey, vitamin E and stir thoroughly to prevent clumping.
4. Transfer the mixture: Before pouring the prepared mixture into the container, coat the container with glycerin using a cotton ball for easy removal later. Then, carefully pour the mixture into the container.
5. Cool and set the mixture: Submerge the filled container into an ice bath for 30 minutes to allow the mixture to solidify and set properly [21].

Equipment's and instruments:-

1. Ice bath
2. Weighing Balance
3. Melting point apparatus
4. Autoclave
5. Water Bath
6. Beaker
7. PH meter

Evaluation parameter of lip balm :

Evaluating lip balm ensures its quality, stability, and safety while maintaining customer satisfaction. The key evaluation parameters include:

1. Spreadability Test

Method: Lip balm is applied to a glass slide, and deformation or breakdown is observed [22]

Criteria: Good (G): Consistent application, no fragments, flawless spread, no deformation.

Intermediate (I): Few fragments, proper application, minimal deformation.

Bad (B): Difficult application, numerous fragments, severe deformation [23]

2. Hardness Analysis

Method: AMETEK Brookfield CT3 Texture Analyzer with Probe TA 39 is used to measure the lip balm's hardness.

Purpose: Evaluates the firmness of the lip balm [24]

3. Skin Irritation Test

Method: Lip balm is applied to the skin & left for 10 minutes to check for irritation.

Purpose: Ensures safety for users [25]

4. pH Parameter

Method: 1 g of lip balm is dissolved in 100 ml of water, and pH is measured using a pH meter.

Purpose: Assesses compatibility with skin pH [26]

5. Organoleptic Properties

Evaluation: Examines colour, odour, taste, and appearance.

Purpose: Ensures aesthetic appeal and sensory quality^[27]

6. Melting Point

Method: Lip balm is melted in capillaries connected to a thermometer. The temperature at which melting occurs is recorded.

Purpose: Determines the stability of the product under different temperatures.

7. Perfume Stability

Method: Fragrance stability is tested after 30 days of production. Purpose: Ensures lasting aroma of the product^[28-29]

8. Surface Anomalies

Evaluation: Checks for surface defects like crystal formation, microbial growth, or mould contamination.

Purpose: Ensures product purity and stability^[29]

9. Breaking Point

Method: Lip balm is placed horizontally 1 inch from the support edge. Weight is gradually increased in 10 g increments every 30 seconds until breaking.

Purpose: Assesses the strength of the product.

By adhering to these criteria, lip balm quality, user safety, and satisfaction are maintained effectively^[30]

Result-:

sr.no	Evaluation parameter	observation
1	colour	Pink
2	Odour	pleasant
3	apperance	Smooth
4	Texture	Smooth &soft
5	Skin irritation	No
6	Melting point	63°C – 65°C
7	PH	6.2

Production photos -



Conclusion-:

The current research aimed to create a lip balm using primarily herbal ingredients. strawberry extract served as the main coloring agent, honey as the flavoring, coconut oil as the stabilizer and softener, and vitamin E as the antioxidant. The study examined the impact of these ingredients on physicochemical properties, such as organoleptic characteristics, melting point, consistency, and lubricity. The results demonstrated that the lip balm formulation was successfully developed with these herbal additives. Various tests confirmed that the preparation passed physicochemical evaluations

and is safe for use. Stability data indicated that the product is best stored at room temperature. The herbal lip balm exhibits several beneficial properties:-

- Enhances the natural beauty of the lips.
- Prevents dryness and keeps lips hydrated.
- Protects the lips from harmful UV rays and environmental pollutants.
- Provides a smooth and soft texture to the lips.
- Is easily accessible in the market.

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