

Formulation and Evaluation of Coffee Herbal Lip Balm

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Abstract: *Since ancient times, cosmetics have been used extensively to improve appearance and personal hygiene. Due to rising knowledge of the negative consequences of synthetic components, natural and herbal cosmetics have become more and more popular in recent years. Long-term use of many conventional lip care products may result in discomfort or other health issues since they include heavy metals, artificial chemicals, and preservatives. Lip balms and lipsticks are frequently used to enhance facial attractiveness, preserve lip suppleness, and improve the appearance of balm. Because it is made with natural components that help moisturise, protect, and nourish the lips, herbal lip balm is seen to be a safer and more advantageous option. These treatments offer a smooth and appealing appearance while also preventing dryness, cracking, and environmental damage. People of all genders frequently use lip balms, and the growing demand for various tints and compositions has spurred the creation of better herbal products. The use of safe and non-toxic components is crucial because lip balm is applied directly to the lips and could be mistakenly consumed. Herbal lip balms are a popular option in contemporary lip care because of their moisturising qualities as well as their ability to provide subtle colouring and cosmetic enhancement.*

Keywords: Herbal lip balm, lip disorder, lip care, moisturizer of lips, coffee lip balm, cosmetics, Natural.

I. INTRODUCTION

Consumer concern has increased in recent years due to greater awareness of the potential risks associated with synthetic ingredients in cosmetic products. As a result, many people are shifting toward natural and organic alternatives that are considered safer and more environmentally friendly. The preference for these products is mainly driven by concerns about the harmful effects of synthetic substances and the rising demand for sustainable, skin-friendly formulations. Health Environmental factors such as wind, pollution, cold weather, and exposure to sunlight can further increase dryness, leading to chapping, cracking, and irritation. Consequently, the use of appropriate lip care products is essential for keeping the lips healthy and protected.

Conventional lip balms commonly contain substances such as petrolatum, artificial waxes, parabens, hydrogenated oils, alumina, and synthetic colors or fragrances. Because lip care products may be accidentally ingested during daily use, these ingredients can create potential health concerns. Long-term exposure to such chemicals may also result in skin irritation, allergic reactions, or other possible adverse effects, encouraging consumers to choose safer and more natural options.

The growing demand for herbal and natural cosmetics has encouraged the use of plant-based ingredients in lip balm formulations. Natural oils such as coconut oil, almond oil, and castor oil are widely known for their moisturizing, nourishing, and emollient properties. These ingredients help in restoring the natural texture of the lips while minimizing the chances of irritation and allergic reactions.



Beeswax, a natural substance produced by honeybees, is one of the essential ingredients commonly used in many lip balm formulations. It offers excellent moisturizing properties, creates a protective barrier on the lips, and helps retain moisture effectively. In addition, it imparts a mild and pleasant fragrance to the product. Beeswax also functions as a natural stabilizer and emulsifying agent, enhancing the consistency, texture, and overall stability of the formulation. Research studies have further shown that beeswax possesses antibacterial properties, making it highly beneficial for lip care and protection.

Lip balms are mainly intended to moisturize and protect the lips rather than improve their appearance. They form a protective layer that helps lock in moisture, reduce dryness, and defend the lips against harsh environmental factors. Natural lip balms generally avoid the use of artificial colorants and instead emphasize safety, functionality, and overall lip health.

Along with beeswax, antioxidants such as vitamin E play a significant role in protecting the lips from oxidative stress caused by environmental factors including UV radiation and pollution. These bioactive compounds aid in the repair of damaged lips while helping to maintain their softness and elasticity.

The development of an ideal lip balm requires a balanced combination of ingredients to achieve desirable properties such as smooth application, suitable hardness, stability under varying temperature conditions, and long-lasting moisturization. Therefore, the careful selection and blending of ingredients are essential for ensuring the quality, effectiveness, and overall performance of the product.

Overall, the increasing preference for natural lip care products reflects a wider trend in the cosmetics industry that prioritizes safety, efficacy, and environmental sustainability. This study focuses on developing a natural lip balm formulation using safe and functional ingredients such as beeswax, with the goal of delivering effective lip care while reducing the risks associated with synthetic components.[1]

II. AIM

To formulate and assess a lip balm made with different herbal ingredients.

OBJECTIVES

1. To develop a herbal lip balm using natural ingredients including coffee bean powder, beeswax, honey, ghee, and Vitamin E.
2. To create a safe and efficient lip care product with fewer adverse effects than commercially available synthetic lip balms.
3. To assess the formulated lip balm based on parameters such as color, fragrance, texture, spreadability, pH, melting point, and stability.
4. To investigate the moisturizing and nourishing benefits of the coffee bean herbal lip balm for dry and cracked lips.
5. To evaluate the antioxidant and protective potential of coffee bean extract in the lip balm formulation.
6. To design an affordable and easy-to-use herbal cosmetic product suitable for everyday application.
7. To improve lip softness, smoothness, and protection from environmental factors through the use of natural ingredients.



III. REVIEW LITERATURE

1. Gudade Gayatri Ashok: Herbal Lotion Review Herbal cosmetics are created when consumers' desire for herbal products led to the use of natural herbs and their products for their aromatic value in cosmetic preparations, which in turn created a demand for natural products and natural extracts.
2. Chavhan Shankar Parmeshwar, Mr.-Cosmetic Science Review: Everyday lip care products include dangerous heavy metals and preservatives. These heavy metals and other chemicals have the potential to accidentally enter your mouth in addition to seeping through your lips' pores.
3. Urwashi Lanjewar: Introduction and Assessment of Herbal Lip Balm Infused with Papaya and Turmeric: The objective of the study was to create and assess an occlusive layer of herbal lip balm infused with papaya and turmeric to seal in moisture and shield the lips from the elements.
1. 4.Sharma et al: (2018): reported that herbal lip balms prepared using natural ingredients such as beeswax, coconut oil, and plant extracts compared to synthetic lip products. The study concluded that herbal formulations are and more suitable for regular use.
4. Joshi and kulkarni (2021): formulated a natural lip balm using honey, beeswax, and herbal oils. The formulation showed excellent emollient properties, good consistency, and consumer acceptability, Honey contributed moisturizing and healing effects.
5. Pawae and Shinde (2022): evaluated herbal lip balms prepared with ghee and coconut oil. The results showed improved moisturization, smoothness, and healing activity on dry and chapped lip without causing irritation.
6. Chavan et al (2024): developed and evaluated coffee bean herbal lip balm formulations using coffee powder, beeswax, honey, and Vitamin E. The study revealed satisfactory pH, spreadability, melting point, and moisturizing properties, indicating that coffee bean lip balm is an effective natural cosmetic preparation.

IV. COSMETICS

Cosmetics are substances or products used to cleanse, beautify, promote attractiveness, or alter the appearance of the body without affecting its structure or functions. These products are applied to different parts of the body such as the skin, hair, nails, lips, and face to improve appearance and maintain hygiene.

V. HISTORY OF COSMETIC SCIENCE

Ancient Egyptians and Sumerians were among the first people to use cosmetics thousands of years ago. Though attitudes toward cosmetics changed, the use of cosmetics persisted in Europe throughout the middle Ages, when the face was made whiter and the cheeks were made redder. Varied throughout history, with the use of makeup being publicly disapproved of in the West at many occasions. Even though societal perceptions of cosmetics have changed, many people have occasionally used makeup to attain ideals of appearance. Some early significant advancements in cosmetics include the following, per one source:

1. Ancient Egyptians used kohl.
2. Ancient Egyptians also used castor oil as a protective balm.
3. The Romans mentioned using beeswax, olive oil, and rose water to make skin creams.
4. The nineteenth-century use of lanolin and Vaseline. [2,3]



VI. LIP BALM

Lip balm is a cosmetic preparation designed to moisturize and protect the lips from dryness, cracking, and environmental damage. It is commonly used to maintain soft and healthy lips, especially during exposure to harsh weather conditions such as cold, wind, or excessive heat. Although lip balm resembles lipstick in form and texture, its primary purpose is to provide hydration and protection rather than color or shine.

An ideal lip balm should have a smooth texture, remain stable under different temperatures, and be easy to apply and remove. Unlike lip gloss, which mainly enhances appearance by adding shine, lip balm focuses on nourishing and conditioning the lips. It is suitable for regular use by individuals of all ages and genders.

Lip balm formulations often contain natural ingredients that contribute to both texture and therapeutic benefits. Common ingredients include coconut oil, which acts as an effective moisturizer; beeswax, which provides firmness and creates a protective barrier; vitamin E Makes lips soft and smooth coffee bean powder, which contains natural antioxidants; and shea butter, which deeply nourishes and softens the lips. Honey .,Heals cracked and chapped lips Ghee;Protects lips from harsh weather.

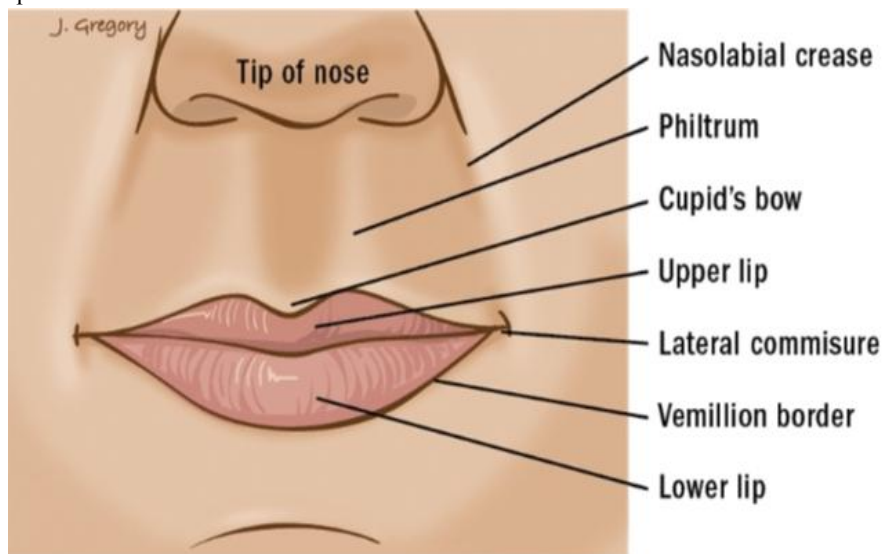


Fig.1 lips [4,5]

ANATOMY OF LIP

The lips are specialized structures of the face that play an important role in appearance, communication, eating, and speech. Anatomically, the lips are divided into five major regions: the vermilion or white roll, subvermilion, peristomal area, philtral column, and commissures. Each region has a distinct structure and function that contributes to the overall activity and appearance of the lips.

The vermilion is the visible red portion of the lips. It is covered by a thin layer of specialized squamous epithelium, and its reddish color is due to the rich network of blood vessels located close to the surface. Around the vermilion lies the cinnabar border, which forms a pale boundary separating the lips from the surrounding facial skin. The upper lip also contains the Cupid's bow, an "M-shaped" curve that enhances facial aesthetics.

Inside the lips lies the subvermilion, a dry area situated beneath the vermilion, and the peristomal region, where the dry outer lip merges with the moist inner mucosal lining. The inner mucosa is soft and flexible and folds toward the gums, creating upper and lower midline folds. In infants, this mucosal region contains sebaceous glands and papillae that help support feeding.



The corners of the mouth are known as the commissures, where the upper and lower lips join together. These areas serve as attachment sites for important facial muscles, particularly the orbicularis oris muscle, which surrounds the mouth and enables actions such as speaking, smiling, chewing, and swallowing.

The lips are highly sensitive because they contain numerous nerve endings and vascular papillae, especially near the margins. This sensitivity is essential for touch perception, feeding in newborns, and accurate pronunciation during speech. The shape, size, and contour of the lips differ among individuals and are influenced by factors such as genetics, age, and ethnicity.

Functionally, the lips are essential in daily life. They assist in suction during drinking, help in food intake, and contribute significantly to speech formation. In addition, lips are important in non-verbal communication, expressing emotions such as happiness, sadness, and anger. Their flexible structure, composed of skin, muscle, and mucosal tissue, allows them to perform multiple functions while also protecting the oral cavity from external environmental factors.[6]

VII. MATERIAL USES

1. Ghee



Fig 2. ghee

Enriched with essential fatty acids, it Ghee on lips helps to nourish dry and chapped lips. Ghee is a natural moisturizer which can penetrate deep into the layers of the skin, providing hydration to the cells. Regular use of Ghee on the lips may help to soften.

Synonym:-Butter, oil, margarine, oleo.

Biological source:- Is made from cow milk butter, which is treated with low heat until the water evaporates, leaving behind milk solids. The solids are skimmed off or strained if needed. What remains is only clarified liquid fat.

Uses:-

1. Chapped lips
2. Brightens of skin and lips..
3. Regular use of ghee on the lips may help to soften and remove flaky skin.

Benefits :-

Good for skin and hair.

Strengthens Bones.[7]

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2. Coconut Oil



Fig 3.Coconut Oil

Coconut oil, sometimes known as coconut butter, is a consumable oil made from the meat, milk, and wick of the coconut palm fruit. Coconut oil is a white solid fat that melts at room temperature, about 25 °C (78 °F). During the summer, in warmer climates, it becomes a clear, thin liquid oil. The unrefined types smell strongly of coconut.

Related terms:- Copra oil, coconut butter, and coconut oil.

Biological Source:- Extracted or expressed from the seed of the coconut palm, *Cocos nucifera*, coconut oil is the fixed oil.

Family:- Palmae.

Chemical composition:- At 20 °C, the oil is a semisolid made up of a mixture of glycerides in which 80-85% of the acids are saturated. It is primarily composed of lauric and myristic acid triglycerides.

Uses:-

1. Protect skin.
2. Moisturize skin.

Benefits:-

1. Promotes healthy skin & hair,
2. Moisturises hair. [8]

3. Honey



Fig 4. Honey



Honey has antiseptic and anti-inflammatory properties that help heal acne outbreaks and stop further infections. Additionally, honey lessens acne's redness and swelling. It removes pollutants from the pores and regulates the amount of dust that collects in the skin's pores. By delivering sustained hydration, it lessens the dryness of the skin. Honey helps to minimize fine lines and wrinkles by moisturizing the skin's outermost layers. Use it as a woundhealing substance.

Synonym:-Madhu, Honey Purified, Mel.

Biological source:- Honey is a sugary substance secreted by bees (*Apis mellifera*, *Apis dorsata*) and placed in honeycombs.

Family:- Apidae.

Uses:-

1. Good for wrinkles and aging.
2. Remove dirt from pores.
3. Skin- lightening agent.

Benefits:-

Treat sunburns

Treat acne and pimples. [7]

4. Coffee



Fig 5.Coffee

Coffee is a luxurious lip treatment enhanced with coffee extracts from Southern India's hilly Coorg region, which produces some of the best coffee beans in the world. The anti-oxidant and detoxifying properties of Coorgi coffee beans are abundant in this lip balm. Coffee bean, coffee seed, Arabica coffee, Arabian coffee are some synonyms.

Source of Biology:-The prepared leaves and leaf buds of *A. sinensis* (Linne) kuntz, which are a member.

Family:- Theaceae.

Chemical Constituents:- The leaves are a rich source of caffeine (1-5%). It also contains the bromine and the ophylline in minor quantities.



Uses:-

1. Anti-Aging Effect.
2. Cellulite Reduction, Improves Blood Circulation, Promotes Collagen Production.
3. Help to remove dead and dry skin, is a natural exfoliate and prevent tanning.
4. Reduce pigmentation.

5. Nourishes and smoothens of lips.[9]

5. Vitamin E capsule



Fig 6. Vitamin E capsule

Vitamin E is a naturally occurring antioxidant and Conditioner By lessening the symptoms of aging and dry lips, vitamin E contributes to the preservation of the lips' smooth, youthful texture. Vitamin E accelerates the production of new cells on dry lips because it encourages cell turnover and regeneration. Using lip balm helps chapped and dry lips heal more quickly.

Synonyms:- Tocopherol.

Biological source:- Sunflower oil, Olive oil, Soya, Cereals and cereal products, Nuts.

Chemical constituents:- Alpha-, beta-, gamma-, and deltatocopherol and alpha-, beta-, gamma-, and delta-tocotrienol.

Uses

1. Protects against free radicals.
2. Promotes cell regeneration.
3. Contains anti-inflammatory properties.
4. Reduces hyper pigmentation .

Benefits :-

1. Improves skin Health
2. Supports Hair Growth.[10]



6. Bees Wax



Fig 7. Bees wax

Beeswax is a thickening agent. Bees wax is used in lipbalm, lip-gloss and hand creams. Bees wax can help to the lips. Bees wax help retain moisturizing skin. Bees wax is widely used in cosmetic product.

Synonyms:- Bees wax, Cera-flava.

Biological source:- Bee comb is the source of this substance. *Apis mellifera*.

Chemical constituents:- Chief constituent is 80% Myricin (Myricylpalmitate), Cerotic acid, Melissic acid, Ceroleis.

Family:- Apidae.

Uses :-

1. In preparation of ointments, plasters and polishes.
2. Also used in the manufacturing of candles, molds in dental and electronic industries.

Benefits :-

1. Protects Lips
2. Moisturizes Skin
3. Good for Sensitive Skin
4. Natural Healing properties .[8]

FORMULA OF LIP BALM

Ingredients	Quantity [33 gm]	Uses	Quantity(8gm)
Ghee	2gm	Moisturizer	0.48gm
Coconut oil	15 ml	Emulsifier	3.63ml
Honey	5gm	Lighten up of Dark Lips	1.33gm
Coffee	1 gm	Flavoring agents	0.24gm
Vitamin E capsule	5ml	Antioxidant	1.33ml
Bees wax	5gm	Moisturizer and Glossiness	1.33gm

Table.1 Formula of lip balm

FORMULATION OF LIP BALM

1. Weigh each and every excipient. Put coconut oil, beeswax, and ghee in a beaker.
2. To prevent honey from clumping, add honey and vitamin E to a beaker and mix well.
3. Include coffee flavor.
4. Transfer the contents into the receptacle. Using cotton to help, apply glycerin to the container before adding the mixture.



5. Submerge the filled container for thirty minutes in an ice bath .[11]

METHOD AND PREPARATION OF LIP BALM

Step 1. :- Take ghee bees wax, and coconut oil in a beaker .

Coconut oil



Fig.8

Ghee



Fig.9

Bees Wax



Fig.10



Step 2. Melt in water temp 55°/60°c.



Fig.11

Step 3. Add vitamin E, Honey in this beaker .



Fig.12

Step 4. Add coffee in beaker.



Fig.13



Step 5 :- Keep in fridge to solidify, apply glycerin container and transferred .

SHOW LIP BALM



Fig.14

EQUIPMENT'S AND INSTRUMENTS

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

VIII. EVALUATION PARAMETERS OF LIP BALM

1. Organoleptic Properties Evaluation

An examination was conducted to evaluate the organoleptic properties of the lip balm, including colour, taste, smell, appearance, and texture.

- **Texture Analysis:**

The texture of the lip balm formulation was analysed using an AMETEK Brookfield CT3 Texture Analyzer. The lip balm sample was placed on the analyser platform, and texture parameters such as firmness and consistency were measured.

- **Colour Analysis:**

The colour characteristics of the lip balm were evaluated using a Konica Minolta CR-400 Chroma Meter. Three readings were taken for each sample to determine the values of brightness (L^*), redness (a^*), and yellowness (b^*) of the lip balm formulation.

- **Taste, Smell, and Appearance:**

The lip balm samples were visually inspected and evaluated for taste and Odor to assess overall acceptability, uniformity, and sensory appeal. [12,13]



2. Spread ability Test

This test involves applying the lip balm product at room temperature onto a glass slide several times to evaluate whether a uniform protective layer is formed and to observe whether the product breaks, fragments, or deforms during application. The following spread ability criteria were used.[14]

- **G – Good:**
The lip balm applies perfectly, leaves no fragments behind, and maintains its original shape.
- **I – Intermediate:**
The lip balm spreads uniformly and leaves only a few fragments; proper application causes minimal deformation.
- **B – Bad:**
The lip balm undergoes significant deformation; application is difficult or inappropriate and leaves many fragments behind.

3.PH determination: A digital pH meter was used to ascertain the herbal lipsticks' ph.[15]

4.Skin irritation test: The product was applied to the back of the palm, and it was left there for 15 minutes.[16]

5. Melting Point Determination

The melting point of the lip balm was determined by filling duplicate capillary tubes with the melted sample. The capillaries were immersed in water contained in a vial maintained at a controlled temperature and connected to a thermometer-equipped system. The melting point was recorded as the temperature at which the lip balm sample began to melt (Gouvea, 1993).[17]

6. Stability Testing

Three of the best formulations that exhibited physicochemical properties closest to those of the commercial lip balm were selected, and their stability was thoroughly evaluated. The lip balm was subjected to stability testing for four weeks at two different temperatures: room temperature (27 ± 1 °C) and refrigerated temperature (4 ± 1 °C), in order to determine their shelf life and stability.

During the stability testing period, physicochemical evaluations were carried out weekly to assess the pH, colour, and texture of the lip balm samples. [18]

The majority of professionals advise using it in the following scenarios

1. Upon awakening in the morning.
2. After consuming food or beverages.[19]

ADVANTAGES

1. Lip balms help to protect the natural health and beauty of the lips.
2. Sun block lip balms are proved to prevent ultraviolet rays from hurting the lips.
3. they are not gender specific products and both men and women can use them.
4. Lip balm products help to protect lips affected by cold sores, chapping and dryness.
5. contact of the product with the skin will not cause a sensation of friction or dryness, and should allow the forming of a homogeneous layer over the lips in the order to protect the labial mucous susceptible to environment factors such as UV radiations, dryness and pollution.
6. It refreshed, renewed and also addresses liprelated symptoms resulting from colds, flu and allergies.

DISADVANTAGES

1. Lip balms made of low-quality ingredients can harm the lips seriously. Such lips balms may dry out the lips instead moisturizing it.



2. lip balm addiction is another disadvantage usually seen with the use of them.
3. compared to the commercially -prepared lip balms tend to stay on the lips or a shorter.
4. duration of time. Thus, need to reapply often.
5. some companies manufacture lip balms considering only the beauty aspect, ignoring the health benefits and soft character of the skin. Such products will gradually damage the natural colour, softness and the glow of the skin.
6. The naturally derived colours and flavours are more difficult to obtain and also have issue related to stability in the product.
7. Natural oils have other disadvantages such as greasier, comedogenic.[20]

APPLICATIONS

1. Moisturizes Lips: Keeps lips soft and hydrated, preventing dryness and cracking.
2. Protects Against Weather: Shields lips from harsh weather conditions like cold, wind, and heat.
3. Natural Healing: Helps repair damaged or chapped lips with natural ingredients.
4. Safe for Everyone: Suitable for all genders and ages due to its gentle and chemical- free formula.
5. Long-Lasting Effect: Provides lasting moisture and protection throughout the day.
6. Daily Use: Can be used regularly without causing harm, making it ideal for routine lip care.
1. 7.Supports Healing of Chapped Lips: Natural ingredients present in lip balm assist in soothing and repairing damaged or chapped lips.
2. 8.Safe and Gentle for Regular Use: Due to its mild and chemical-free formulation, lip balm is generally suitable for people of all ages and genders.
3. 9.Provides Long-Lasting Hydration: Lip balm offers extended moisturization and protection, helping lips remain healthy throughout the day.
4. 10.Ideal for Daily Lip Care: Regular application helps maintain healthy lips and can be safely included in everyday personal care routines.[21]

IX. RESULTS

Sr.No	Evaluation Parameters	Observation
1	Melting point	65°C
2(a)	Organoptic properties colour	Light Brown
(b)	Odour	Pleasant
(c)	Appearance	Smooth
3	Skin irritation	No
4	Spreadability	Excellent
5	PH	6.3

Table.2 Results

X. CONCLUSION

The present study focused on the formulation and evaluation of herbal lip balms using natural ingredients. The main objective of this work was to develop a herbal lip balm that could reduce the side effects commonly associated with commercially available chemical-based synthetic lip balms.

Based on the findings of the study, it was concluded that the formulated herbal lip balm was safer and more effective, with minimal or no side effects. Evaluation results also indicated that the lip balm prepared with natural colorants showed greater satisfaction and better performance compared to marketed formulations.



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