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Preparation and Assessment of Herbal Lip Balm by using *Butea Monosperma* Flowers

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ABSTRACT

The cosmetic industry has witnessed a significant shift towards natural and herbal products in recent years, aligning with the global trend of embracing a more sustainable lifestyle. This transition is evident in the growing demand for herbal cosmetics, which are regarded as invaluable gifts from nature. Among these products, lip care items such as lipstick, lip balm, and lip jelly play a pivotal role in enhancing facial beauty and maintaining lip health. Across history, a plethora of natural ingredients have been harnessed for lip care, with documented usage tracing back to ancient civilizations such as the Egyptians. Notably, The *Butea monosperma* flower, commonly referred to as the flame of the forest, presents medicinal properties and serves as a cosmeceutical ingredient owing to its antifungal, antibacterial, and anti-inflammatory attributes, among others. Evaluating the quality of lip balm products involves assessing performance parameters such as color, odor, spreadability, pH, texture, and skin compatibility. This abstract highlights the importance of herbal cosmetics, particularly in lip care, and underscores the significance of evaluating product quality to ensure consumer satisfaction and safety.

Key Words: Cosmetic, lip balm, Herbal, color, consumer, lip care

INTRODUCTION

Cosmetics are products or substances used to enhance or alter the appearance of the human body. They can be applied to the skin, hair, nails, lips, and other parts of the body.[1]Cosmetics play a crucial role in contemporary lifestyle. Moreover, there's a prevailing trend across various industries, including cosmetics, to embrace sustainability and natural living practices. Natural foods, herbal medicines, and natural cures for healthy living are better options. Additionally, there exists a robust demand for organic plant products. The utilization of herbal cosmetics has surged within the personal care sector. For millennia, natural products have served as traditional remedies across diverse cultures worldwide.[2]The global market for herbal cosmetics is on the rise, presenting nature's invaluable bounty. With a vast array of herbal cosmetic products catering to various beauty routines, incorporating herbs into cosmetics proves to be exceptionally safe for the skin. The beauty of the lips can be enhanced by the coloring of the lips, it also improves overall face glamour. Various lip care and makeup products mainly include lipstick, lip balm, and lip jelly. The major role of lip care products is to impart attractiveness, retain moisture, protect against harmful ultraviolet rays, etc. [3]. Lip coloring is an age-old technique for enhancing lip beauty and adding a glamorous touch to face makeup. The earliest documented remedy for dry lips dates back to 40 B.C. in Ancient Egypt. During this era, individuals utilized beeswax along with natural elements like olive oil and animal fats to concoct a lip balm-esque solution. For hundreds of years, lip care remained relatively the same, that is until late 1870 when inventor, Robert Chesebrough, patented his new creation: Vaseline.[4]

The *Butea monosperma* flower is renowned for its medicinal properties as well. *Butea monosperma* is a species native to tropical and subtropical regions of South Asia and Southeast Asia. It is also known as the flame of the forest, dhak, palash, and bastard teak.[6] Historically, palash originated in Bihar and Jharkhand.[7] Different part of an extract of *Butea monosperma* shows various cosmeceutical activities such as antifungal, antibacterial, anti-inflammatory, free radical scavenging activity, natural coloring agent, and sun protecting factor.[8,9,10] The leaves and flowers of *Butea monosperma* are also utilized in traditional dyeing processes, with the flowers producing a yellow-orange color and the leaves producing a green color.

The quality of a lip balm product can be assessed by the product's performance. Therefore the significance of the evaluation parameters of any product is abundant. It helps to maintain stability along with the purity and uniformity of the product. This includes color, odor, spreadability, pH, texture, and skin irritation of the product.[11]

1. LITERATURE REVIEW

1.1 Chirag Panchal et al, formulation and evaluation of herbal lip jelly using pigments of *Butea monosperma* flowers (2015) Here Herbal Lip Jelly prepared from the extract of *Butea monosperma* which is previously used for wound healing activity, antimicrobial activity along with topical safety which gives an ideal formulation for cosmetics which is having similar organoleptic properties as compared to marketed one and having no side effects. Thus we can move towards the use of natural pigments to prepare many cosmetics like lipsticks, lip rouges, nail paints, etc.

Hence the use of natural pigments in the formulation of cosmetics is a step towards healthy cosmetics.

1.2 Ragnathan Muthuswamy et al, Anatomical investigation of the flower of *Butea monosperma* Lam. (2015) The pharmacognostic evaluation of the transverse section and powder form of *B. monosperma* flowers was conducted, and the presence of important elements in the powder were established. The macro and microscopic profile of the flower can be used as standard data for the identification of *B. monosperma* species from its adulterants and its substitutes.

1.3 Manprit Kaur, Palash: Sources, Macroscopical Characters, and Uses (Your article Library) About the pharmacognosy study of the whole plant of the *butea Monosperma*.

1.4 P. S. Pandit et al, Colour extraction from *Butea monosperma* (Palash) Flowers (2016) For color extraction from *Butea monosperma* flower at ambient conditions 50% methanol water-based v/v solution performs better with solvent extraction steeping method.

1.5 Dewalrani M Rewatkar et al, Utilization of color extract from Palash flowers (*Butea Monospermous*) in traditional sweets.

Extraction of Pigment

Identify and Collect Mature Flowers: Look for fully grown flowers that have bloomed and have a deep red or orange color. Collect fresh *Butea Monosperma* flowers and remove the petals from the rest of the flower.

Harvesting: Cut the flowers from the tree using a sharp knife or pruning shears. It is best to harvest the flowers early in the morning before the heat of the day causes the flowers to wilt.

Drying: Spread the flowers in a thin layer on a clean, dry surface and allow them to dry in the sun for several days. Stir the flowers occasionally to ensure even drying. Alternatively, you can use a dehydrator or oven set to a low temperature to dry the flowers.

Storing: Once the flowers are completely dry, store them in a location that is cool, dry, and shielded from direct sunlight.

Using the Flowers: To use *Butea monosperma* flowers for pigment extraction, grind them into a powder and mix it with rosemary oil to make a paste or extract using solvents like ethanol or methanol under controlled conditions.

Flow Diagram for the Extraction of Pigment from *Butea Monosperma* Flowers

Rosemary oil	0.3	0.3	0.3	0.3	0.3	Antimicrobial and Flavouring agents
Butea monosperma powder	2.5	2.7	2.0	3.0	3.2	Coloring agent
Lemon peel powder	0.2	0.2	0.2	0.2	0.2	Antioxidant

Table no. 1:- Ingredients commonly employed in general formulations, along with their corresponding amounts.



Figure No.1: Formulation 1



Figure No.2 : Formulation 2

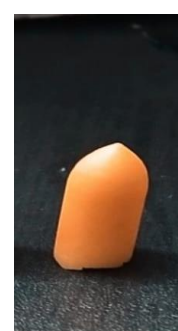


Figure No.3 : Formulation 3

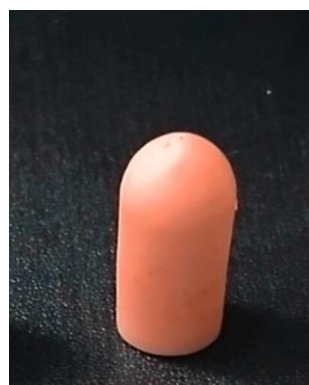


Figure No.4 : Formulation 4



Figure No.5 : Formulation 5

4. RAW MATERIAL

4.1 Castor oil

Castor oil finds frequent use as an ingredient in skincare products, including lip balms and lipsticks. It contains an abundance of ricinoleic acid, a monounsaturated fatty acid recognized for its humectant properties. Oil is extracted from the seeds of *Ricinus communis* belonging to the family, Euphorbiaceae. It possesses a subtle scent; the oil is either yellow in color or colorless. It consists of a mixture of glycosides, in which 80% of ricinoleic acid is the major constituent. At 0°

C, it forms a clear liquid. It is used as an emollient, in the preparation of lipsticks, hair oils, creams, and lotions.

4.2 Beeswax

Beeswax seals in moisture and protects against dryness. Beeswax possesses anti-inflammatory properties that aid in soothing chapped or irritated lips. Additionally, it forms a protective barrier between the lips and the surrounding environment, which makes it particularly beneficial during windy or cold weather conditions.

4.3 Cocoa butter

Cocoa butter serves as an emollient and is renowned for being a rich source of natural antioxidants. It creates a protective, hydrating barrier on the lips, safeguarding them from harsh temperatures and indoor heating that may cause dryness.

4.4 Petroleum jelly

It forms a protective layer on the lips and penetrates deep down to rehydrate the lips and speed up the natural renewal process.

4.5 Rosemary oil

Rosemary essential oil is another excellent option for softening and volumizing your lips. It seals in moisture to give your lips long-lasting protection, leaving them softer for longer periods. The essential oil is rich in antiseptic properties and boasts an energizing and refreshing aroma.

4.6 Butea monosperma

Butea monosperma contains a natural pigment called "butein" that is responsible for its vibrant orange-red color. Butein, categorized as a flavonoid, belongs to a group of plant compounds recognized for their antioxidant and pigmentation attributes. It finds application as a natural dye and coloring agent in diverse sectors such as textiles and cosmetics.

4.7 Lemon peel powder

Lemon peel contains ascorbic acid and vitamin C in huge quantities. It also has a high concentration of antioxidants that help in detoxification. Lemon peel also harbors citric acid, which aids in skin rejuvenation by facilitating the shedding of dead skin cells. It can gently peel away the sun-damaged from the outer layer of the lips.

Compounds	Uses	References
Castor oil	It serves as a blending agent in the formulation of lip balm.	[31]
Beeswax	The most used wax is beeswax which is a good emollient and thickener.	[32]

Cocoa butter	It will nourish and moisturize lips and help heal chapped and dry lips because it contains antioxidants.	[32]
Petroleum jelly	Keeps the skin moist and soft by preventing the loss of water.	[33]
Rosemary oil	Rosemary oil's antimicrobial properties have been demonstrated to aid in shielding the lips from infections.	[34]
Butea monosperma powder	Different part of an extract of Butea monosperma shows various cosmeceutical activities such as antifungal, antibacterial, anti-inflammatory, free radical scavenging activity, natural coloring agent, and sun protecting factor.	[35]
Lemon peel powder	Used as a source of natural antioxidant	[36]

Table no. 2: Raw material used for formulations

5. EVALUATION OF LIP BALM

The evaluation parameter has been followed to formulation F1 to F5 with characteristic testing performance listed below:

- **Color and Texture:** Formulated lips balm were checked for color, glossy, and smooth texture.
- **pH:** The pH of the formulated herbal lip balms was assessed by dispersing one gram of the formulation in 25 ml of distilled water. Measurement of pH for lip balm was carried out. Prior to proceeding with the pH measurement of the lip balm, the pH meter was calibrated using a buffer solution. The pH value for the lip balm sample was measured and recorded.[10]
- **Skin irritation test:** This test was performed by applying the prepared lip balm onto the skin for 30 minutes to observe skin irritation like rashes, itchiness, redness, etc.[11]
- **Perfume Stability:** After 30 days, the formulation of herbal lip balms underwent testing to evaluate fragrance retention. [12]
- **Test of spreadability:** The spreadability of the lip balm was assessed by applying the formulated product onto a glass slide at room temperature. This allowed observation of uniformity in the protective layer formation and whether the stick fragmented, deformed, or broke during application. [13]



Figure No.6: Lip Balm formulation for evaluation performance

6. RESULT

The formulations contain various useful ingredients for beneficial applicability like castor oil, beeswax, cocoa butter, petroleum jelly, rosemary oil, and lemon peel powder with the Butea monosperma powder acting as a coloring agent to develop the five formulations comprising varying ratios of ingredients. Furthermore, the formulations processed with the next step to finalize their results testing carried out by the different evaluation methods such as color and texture, pH, Skin irritation, perfume stability, and spreadability exhibit the outcomes with showing the formulation (F1) to formulation (F3) depicted the good results while the formulation F4 and F5 exhibits the best and excellent in perfume stability except spreadability in F4, intermediate represented. These results of the formulation will be possible to stand as good for marketing and further studies.

S.NO	EVALUATION PARAMETER	F1	F2	F3	F4	F5
1.	Color and texture	Light yellow	Yellow	Light yellow	Light pink	Light pink
2.	Ph	5.8	6	5.5	6	6.2
3.	Skin irritation	No	No	No	No	No
4.	Perfume stability	Good	Good	Good	Best	Excellent
5.	Spreadability	Good	Good	Good	Intermediate	Good

Table no. 3: Evaluation Parameter of Formulated Herbal Lip Balm

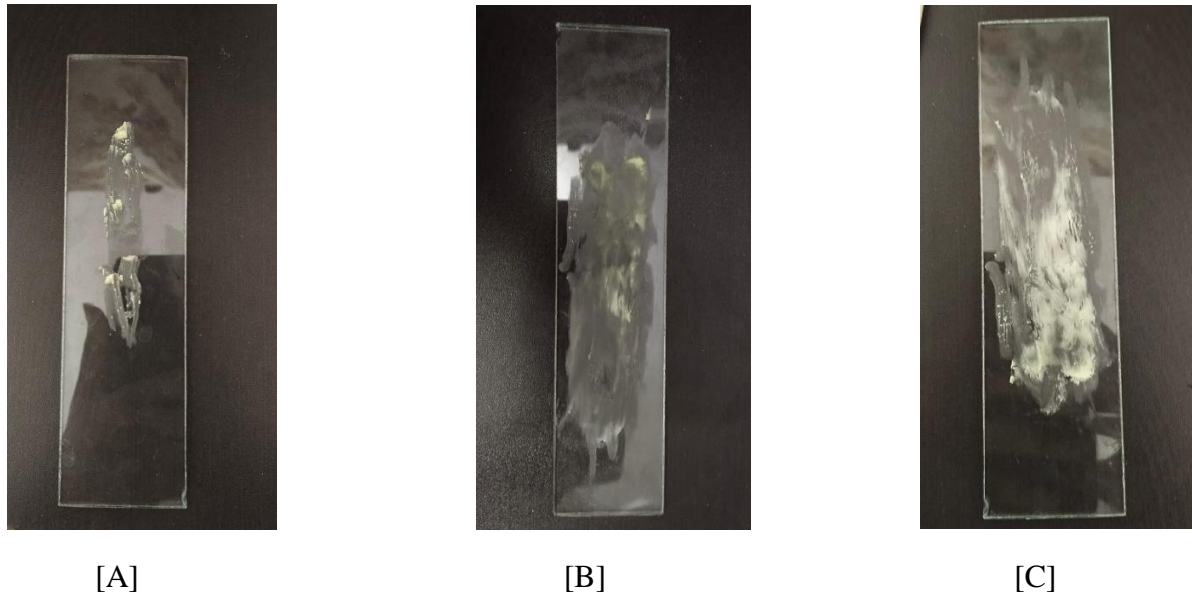


Figure No.7 : Spreadability of lip balm [A] at $25.0\pm 3.0^{\circ}\text{C}$, [B] at $4.0\pm 2.0^{\circ}\text{C}$, [C] at $40.0\pm 2.0^{\circ}\text{C}$

Test of spreadability: Observations revealed that the lip balm, when at room temperature ($25.0\pm 3.0^{\circ}\text{C}$) and refrigerator ($4.0\pm 2.0^{\circ}\text{C}$) 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 ($40.0\pm 2.0^{\circ}\text{C}$).

CONCLUSION

The study concluded that herbal lip balm can be effectively formulated utilizing various natural ingredients such as beeswax, castor oil, rosemary oil, cocoa butter, lemon peel powder, and petroleum jelly. Opting for *Butea Monosperma* Flower powder is preferable over synthetic coloring agents, as it minimizes the risk of potential side effects associated with synthetic alternatives. With the emerging new era, this herbal lip balm offers a light yellow to light pink shade and a delightful rosemary oil fragrance, catering to the preferences of women. Consumers can safely and effectively benefit from this herbal lip balm after thorough clinical trials.

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