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# FORMULATION AND EVALUATION OF HERBAL LIPSTICK COMPRISING NATURAL COLOURING MATERIALS FOR ENHANCED ELEGANCE AND SAFETY

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## ABSTRACT

The Present study aims at developing herbal lipsticks using natural ingredients from plant sources which helps in reducing toxicity and supports in improving safety of formulation. The trend of using herbal cosmetics has been increased due to various advantages like natural antioxidant, anti-inflammatory effects, improved moisturization, natural elegance and shine, etc. Herbal lip beautifying products are made-up of natural plant extracts that rejuvenate lip skin with original freshness. The objective of the present research involves formulation and evaluation of herbal lipsticks using natural coloring material from natural sources such as beetroot, pomegranate, litchi, strawberry and grape fruit. The composition includes natural ingredients such as beeswax, carnauba wax, coconut oil, olive oil, vitamin E, Vanilla essence, lemon juice were used to formulate herbal lipstick. All the formulated herbal lipstick were evaluated for different evaluation tests like color, texture, pH, melting point, breaking point, surface anomalies, aging stability, skin irritation. The results revealed that evaluation parameters of prepared herbal lipstick were in standard limit values. It can be finally concluded that the F3 was found to be good concerning all the evaluation parameters like melting point, aging stability, breaking point and the colour produced. The F3 formulation meets with all the ideal requirements of good lipstick and it was best with stability based on the composition. The research concludes that herbal lipsticks are safe to use with fewer or no toxicities as compared to lipsticks comprising synthetic colouring materials.

**KEYWORDS**: Natural, extracts, safety, toxicity and beetroot.

## INTRODUCTION

Cosmetics are substances or products applied to the body, typically the skin, hair, or nails, to enhance, alter, or maintain one's appearance. They encompass a wide range of items, including skincare products, makeup, hair care products, fragrances, personal care products, and nail care products. Cosmetics serve various purposes, from cleansing and moisturizing the skin to adding color and definition to features like the eyes, lips, and nails. They can enhance natural beauty, express individuality, and boost confidence, but it's important to use them responsibly and choose products suitable for one's skin and personal preferences. Cosmetics play a significant role in self-expression, creativity, and personal grooming. They can enhance natural beauty, boost confidence, and serve as a form of self-care and relaxation. However, it's essential to use them responsibly, choosing products that suit your skin and hair type and following proper application techniques to ensure optimal results and minimize the risk of adverse reactions Cosmetics are products used to enhance or alter the appearance of the face, body, or hair. They have been an integral part of human culture for thousands of years, dating back to ancient civilizations like Egypt, Greece, and Rome, where people used various substances to adorn themselves.

Herbal cosmetics are beauty products that utilize natural ingredients derived from plants, herbs, fruits, and other botanical sources. These cosmetics typically avoid synthetic chemicals and instead rely on the healing and nourishing properties of nature. Herbal cosmetics can include a wide range of products such as skincare creams, lotions, serums, shampoos, conditioners, hair oils, soaps, and more.[1] They often contain ingredients like aloe vera, Neem, turmeric, rosemary, tea tree oil, chamomile, lavender, and various fruit extracts. One of the main appeals of herbal cosmetics is their perceived safety and minimal risk of adverse reactions compared to products containing synthetic chemicals. Many people prefer herbal cosmetics because they believe they are gentler on the skin and have fewer potential side effects. Additionally, these products are often marketed as environmentally friendly and cruelty-free, appealing to consumers who prioritize sustainability and ethical sourcing.

Lipstick is a cosmetic product used primarily to add color and texture to the lips. It's one of the most iconic and widely used makeup products, available in various formulations, colors, and finishes. The primary purpose of lipstick is to enhance the appearance of the lips by adding pigment and creating different effects, ranging from subtle to bold. It can also help

moisturize and protect the lips from dryness and environmental factors Herbal lipsticks have gained popularity as a natural alternative to traditional lip products. Unlike conventional lipsticks that often contain synthetic chemicals and artificial ingredients, herbal lipsticks are formulated using plant-based ingredients, such as botanical extracts, oils, and waxes. These lipsticks typically contain ingredients like Shea butter, coconut oil, jojoba oil, and various plant extracts known for their nourishing and moisturizing properties. Additionally, herbal lipsticks may incorporate natural pigments derived from plants, minerals, or fruits to provide color without the use of synthetic dyes. One of the primary benefits of herbal lipsticks is their potential to be gentler on the skin, particularly for individuals with sensitivities or allergies to common cosmetic ingredients. The absence of harsh chemicals may reduce the risk of irritation or adverse reactions, making herbal lipsticks suitable for those seeking more natural beauty options. Furthermore, many herbal lipstick brands prioritize sustainability and eco-friendliness by using ethically sourced ingredients and minimizing their environmental impact through packaging and production practices. Overall, herbal lipsticks offer a blend of natural ingredients, vibrant colors, and skincare benefits, appealing to consumers looking for cosmetics that align with their values of health, sustainability, and beauty.

**Advantages of Herbal Lipsticks**

Herbal lipsticks offer several advantages over conventional lipsticks, which may appeal to individuals looking for natural, eco-friendly, and skin-friendly makeup options. Here are some advantages of herbal lipsticks

- Herbal lipsticks are typically formulated with plant-based ingredients such as botanical extracts, oils, and waxes. These natural ingredients can provide moisturizing and nourishing benefits to lips without the use of synthetic chemicals or harsh additives.[2]

- The absence of synthetic chemicals and artificial fragrances in herbal lipsticks makes them gentler on the skin, reducing the risk of irritation, dryness, or allergic reactions. This can be particularly beneficial for individuals with sensitive skin or those prone to allergies.

- Many herbal lipsticks contain moisturizing ingredients like Shea butter, coconut oil, and jojoba oil, which help to hydrate and condition the lips. These natural emollients can prevent dryness and keep the lips feeling soft and smooth throughout the day.

- Herbal lipsticks often prioritize sustainability and eco-friendliness by using ethically sourced ingredients and eco-conscious packaging.

- Many herbal lipstick brands are cruelty-free, meaning they do not test their products on animals. This ethical stance aligns with the values of consumers who prefer to purchase cosmetics that are not tested on animals.

**Disadvantages of Herbal Lipsticks**

Herbal lipsticks, while often marketed as natural and beneficial alternatives to conventional lipsticks, also have some disadvantages

- Herbal lipsticks may have a more limited range of colors compared to conventional lipsticks. This can be a drawback for those who prefer a wide variety of shades to choose from.[3]

- Due to their natural ingredients, herbal lipsticks might have a different texture and consistency compared to conventional ones. Some people may find them less smooth or less creamy.

- Herbal lipsticks may have natural fragrances that some people find unpleasant or unusual. This can be off-putting for those who prefer fragrance-free or lightly scented products.

## MATERIALS AND METHODS

The materials for formulation of herbal lipsticks were procured from the following as presented in the table 1. The fruits were purchased from local market.

**Table 1: Materials used in Herbal sunscreen formulation.**

| **Materials and Supplier Company Name** | |
|---|---|
| **Materials** | **Source of material** |
| Bess wax | Laboratory |
| Carnauba wax | Laboratory |
| Coconut oil | Organic Harvest |
| Olive oil | Dabur |
| Vitamin E | Simply herbal vitamin E capsules |
| Vanilla essence | Natural essence |
| Litchi colour extracts | Local fruit market |
| Grape fruit colorant extracts | Local fruit market |
| Pomegranate colorant extracts | Local fruit market |
| Beta vulgaris colorant extracts | Local fruit market |
| Strawberry colorant extracts | Local fruit market |

**I) Preparation and extraction of colouring constituents from the natural plant material**

**A) Preparation of colouring extract from grape fruit with red pulp**

Fruits of red grapefruit were purchased from the local market and were washed with potable water to remove dirt and foreign material. The peel of the fruits was removed by knife followed by separating the pulp.[4] The pulp was sliced into small pieces after removal of seeds and the contents were grinded using a juicer- mixer without adding water, followed by filtration of juice using muslin cloth to remove any seed pulpy materials or impurities. The fresh juice extract was further concentrated by heating until its volumes decreases without affecting its natural colour.[22] The juicy extract was stored in air tight container until for further use.[5]

**B) Preparation of colouring extract from strawberry**

Fruits of Strawberry were purchased from the local market and were washed with potable water to remove dirt and foreign material. They were sliced into small pieces and the contents were grinded using a juicer- mixer without adding water, followed by filtration of juice using muslin cloth to remove any seed pulpy materials or impurities.[6] The fresh juice extract was further concentrated by heating until its volumes decreases without affecting its natural colour. The juicy extract was stored in air tight container until for further use.[7]

**C) Preparation of colouring extract from Pomegranate fruit**

Fruits of Pomegranate were purchased from the local market and washed to remove dirt. The peel was removed manually followed by separating the pomegranate inner fruity contents (flesh of fruit along with seeds). The contents were grinded using a juicer- mixer without adding water, followed by filtration of juice using muslin cloth to remove any seed pulpy materials or impurities.[8] The fresh juice extract was further concentrated by heating until its volumes decreases without affecting its natural colour. The juice was stored in air tight container until for further use.[9]

**D) Preparation of colouring extract from Beta vulgaris**

The beetroots were obtained from the local market and they were washed to remove any dirt and impurities. The skin (outer surface) of the beetroot was peeled and they were sliced them into small uniform size slices. The slices were Spread on paper towel and shade dried for 24 hours and they were further dried in an oven for about 5 min for removal of moisture.[10-12] Then the slices were Grinded into fine powder followed by the Powder was sieved from sieve no 80/ 100 which helps in removing the gritty particles. The powder was packed in a well closed contained and stored for further use.

**Figur. 3: Beet root slices.**

**E) Preparation of colouring extract from Litchi fruit**

Litchi Fruits were purchased from the local market and washed to remove dirt and impurities. The peel was removed manually followed by separating the seeds. The fruit pulp was sliced into pieces followed by grinding using a juicer- mixer with addition of two tablespoon water. The contents were, followed by filtration of juice using muslin cloth to remove any seed pulpy materials or impurities.[15] The fresh juice extract was further concentrated by heating until its volumes decreases without affecting its natural colour. The juice was stored in air tight container until for further use.

**Formulation of herbal Lipstick**

The herbal lipstick preparation involves general method of formulation with following steps. The wax phase formulation was prepared by melting beeswax, carnauba wax, in a 100 ml beaker on a water bath with decreasing order of their melting point[16]. The other oil phase was prepared by heating of coconut oil and olive oil and melted at around 70°c on a water bath in decreasing order of their melting points. The coloured pigment juicy extracts (beetroot, litchi, pomegranate, grape fruit and strawberry) were added to the oil phase based on the formulation composition until a homogenous mixture was produced. Then it was added to the wax phase at the same temperature with continuous stirring.[17] The mixture was cooled a little followed by addition of vanilla essence, vitamin E and lemon juice. The mixture was then poured into lipstick moulds which are lubricated with liquid paraffin.[18] The moulds were cooled on ice bath/ refrigeration and upon solidification lipsticks were removed gently from moulds. They were filled into suitable lipstick cases and stored for further evaluation. The formulation composition is represented in Table 3.

**Table 7 Composition of herbal lipsticks**

| Ingredients (%) | F1 | F2 | F3 | F4 |
|---|---|---|---|---|
| Bees wax | 6 g | 3 g | 4 g | 7 g |
| Carnauba wax | 4 g | 7 g | 6 g | 3 g |
| Coconut oil | 2.5 ml | 3 ml | 2 ml | 1.5 ml |
| Olive oil | 1.5 ml | 1 ml | 2 ml | 2.5 ml |
| Grape fruit (Colour) | - | - | 2.5 ml | |
| Strawberry fruit (colour) | - | - | 2.5 ml | |
| Pomegranate (Colour) | - | - | - | 2.5 ml |
| Beet root (Colour) | - | 5 g | - | 2.5 g |
| Litchi fruit (Colour) | 5 ml | - | - | - |
| Vanilla essence | q.s | q.s | q.s | q.s |
| Vitamin E | 0.5 ml | 0.5 ml | 0.5 ml | 0.5 ml |
| Lemon juice | 0.5 ml | 0.5 ml | 0.5 ml | 0.5 ml |

**Application of ingredients**

| Name of ingredient | Use |
|---|---|
| Coconut oil, olive oil | Blending agent |
| Bees wax | Impart Hardness and gloss |
| Carnauba wax | Impart Hardness and gloss |
| Grape fruit (Colour) | Colouring agent |
| Strawberry fruit (colour) | Colouring agent |
| Pomegranate (Colour) | Colouring agent |
| Beet root (Colour) | Colouring agent |
| Litchi fruit (Colour) | Colouring agent |
| Vitamin E, lemon juice | Antioxidant |
| Vanilla essence | Flavouring agent and mild preservative |

**Evaluation of lipsticks**

**A) Colour and Texture**

The formulated lipsticks were checked and evaluated for colour produced, glossy nature and smooth texture without any grittiness.[19]

**B) Solubility test**

1g of the sample was taken in different test tubes containing the different solvents. After the addition of each portion of solvent, test tubes were shaken vigorously and then observed visually.[19]

**C) Melting point**

Determination of melting point is important as it indicates the limit of safe storage and temperature conditions. The melting point of formulated lipstick was determined by capillary tube method, the capillary was filled and keep in the capillary apparatus and firstly observed the product was slowly-slowly melted. The capillary was filled, kept in the capillary apparatus and observed the product for its melting.[20] The procedure was performed for 3 times and the melting point ratio was observed for the prepared formulations

**D) PH**

The pH of formulated herbal lipsticks was determined using pH meter. A weighed sample of herbal lipstick was dissolved in a suitable solvent and made into liquid solution. The pH meter was calibrated using pH buffer capsule followed by dipping the electrode in lipstick solution of lipstick and pH was determined.[20]

**E) Breaking point**

Breaking point was done to determine the strength of lipstick. The lipstick was held horizontally in a socket inch away from the edge of support. The weight was gradually increased by a specific value (10 gm) at specific interval of 30 second and weight at which breaks was considered as the breaking point.[21]

**F) Force of application**

It is test for comparative measurement of the force to be applied for application. A piece of coarse brown paper kept on a shadowgraph balance and lipstick was applied at 45º angle to cover a 1 sq. Inch area until fully covered. The pressure reading is an indication of force of application.[21]

**G) Surface anomalies**

This was studied for the surface defects, such as no formation of crystals on surfaces, no contamination by moulds, fungi etc.[22]

**H) Aging stability**

The product was stored in 40ºC for 1 hour and various parameters such as bleeding, crystallization of on surface and ease of application were observed.[23]

**I) Skin irritation test**

This test was carried out by applying the formulated product on the skin elbow surface for duration of 10 min.[24]

**J) Perfume stability**

The test was performed by storing the lipstick for duration of 30 days, followed by the fragrance and essence of formulation was recorded.[24]

**Evaluation of Herbal lipsticks**

**A) Colour and Texture**

The formulated herbal lipstick comprising of litchi extract, pomegranate extract, grape fruit extract, and strawberry extract, beetroot extract as natural colouring pigments were visually inspected for their colour and also appearance and the colour including appearance is tabulated in table 8 and in figure 4 (a, b, c ,d) and in figure 5.

**Table.8. physical appearance of formulations**

| Colouring pigment | Colour | Appearance |
|---|---|---|
| Litchi extract | Creamy to off-white | Glossy- shiny |
| Beetroot extract | Magenta-pink | Glossy- shiny |
| Grape fruit extract with strawberry extract | Dark red | Glossy- shiny |
| Pomegranate extract with beetroot extract | Light pink to medium | Glossy- shiny |

**Fig 4-a) F1- Litchi extract**

**Fig 4-b). F2- Beetroot extract.**

**Fig 4-c) F3-Grape fruit and strawberry extract.**

**Fig 4-d) F4- Pomegranate-beetroot extract.**

**Figure.5: various formulated Herbal lipsticks.**

**B) Solubility test**

The formulation herbal lipstick was dissolved in various solvents to observe the solubility. The solubility of the formulated herbal lipstick was found by dissolving 100 mg of lipstick in various solvents such and the results showed that all the formulations from F1 to F4 were soluble in ethanol and methanol.

**C) Melting point**

The formulations F1 to F4 formulation have showed a melting point in the range of 65° C to 70° C, exhibiting good physical stability, the results are displayed in table 9 and figure 6.

**Table. 9: Melting point of formulations.**

| Formulation code | Melting point of formulation |
|---|---|
| F1 | 62° C |
| F2 | 66° C |
| F3 | 70° C |
| F4 | 63° C |

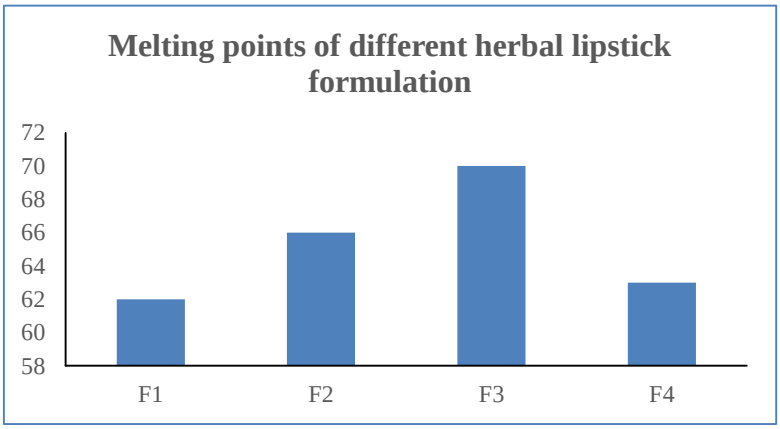


**Figure. 6: Melting points of herbal lipstick formulations.**

**D) PH**

The pH of formulated herbal lipsticks was determined using pH meter. The pH of formulations from F1to F4 was in the range of pH.6.2–pH.7.0, the results are tabulated in table 10.

**Table. 10: PH of formulations.**

| Formulation code | pH of formulation |
|---|---|
| F1 | 6.4 |
| F2 | 6.6 |
| F3 | 6.6 |
| F4 | 6.8 |

**E) Breaking point**

This test helps to understand the value of maximum load that a lipstick can withstand before it is breaking which exhibits the strength of lipstick and the results revealed that all formulations were in the range of 70–100 g, the results are projected in table 11 and figure 7.

**Table. 11: Breaking point of formulations.**

| Formulation code | Breaking point of formulation (gm.) |
|---|---|
| F1 | 40 |
| F2 | 45 |
| F3 | 63 |
| F4 | 38 |

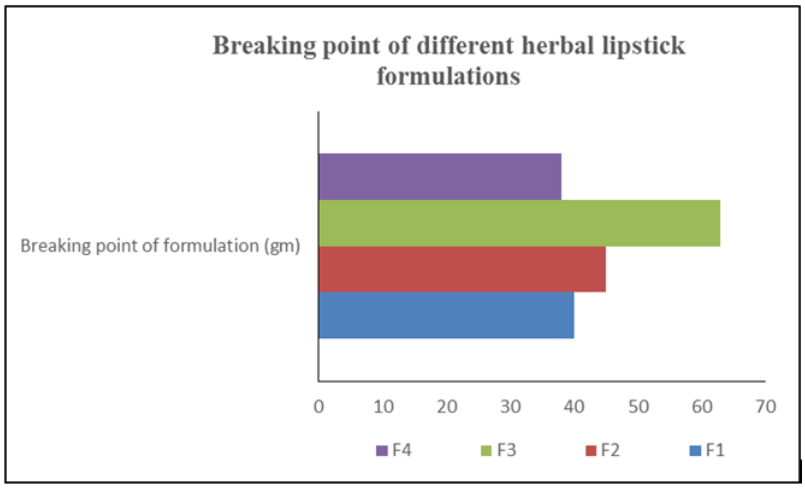


**Figure. 7: Breaking points of herbal lipstick formulations.**

**F) Force of application**

It is test for comparative measurement of the force to be applied for application. A piece of coarse brown paper kept on a shadowgraph balance and lipstick was applied at 45º angle to cover a 1 sq. Inch area until fully covered. All the formulations from F2 to F4 were applied easily with little force, F1 required higher force.

**G) Surface anomalies**

These studies help to determine the surface defects such as crystal formation on the surface, contamination by mould, fungi, and others. There were no observed defects on the surfaces of the formulation from F1- F4.

**H) Aging stability**

Bleeding, streaking, catering, and blooming, parameters were checked and all the formulation of lipsticks from F1-F4 was found to be smooth after 1 hour.

**I) Skin irritation test**

This test was carried out by applying the formulated product on the skin elbow surface for duration of 10 min and all the formulations from F1 to F4 were found to be safe and did not produce any irritation or toxic effects.

**J) Perfume stability**

The test was performed by storing the lipstick for duration of 30 days, followed by the fragrance and essence of formulation was recorded and all the formulations were exhibiting good fragrance after 30 days of duration.

## DISCUSSION

It is very much essential to maintain a uniform standard for herbal lipstick preparations. The formulated lipsticks were evaluated for various parameters like color and appearance, melting point, breaking point, solubility pH, aging stability, force of application, perfume stability and surface anomalies and the results are displayed in table 12.

**Table.12. Evaluation parameters of herbal lipsticks**

| S.no | Evaluation parameters | F1 | F2 | F3 | F4 |
|---|---|---|---|---|---|
| 1. | Colour | Creamy to off-white | Magenta-pink | Dark red | Light pink to medium |
| 2. | Texture | Smooth, Glossy | Smooth, Glossy | Smooth, Glossy | Smooth, Glossy |
| 3. | Solubility | Soluble in ethanol | Soluble in ethanol | Soluble in ethanol | Soluble in ethanol |
| 4. | Force of application | Easy | Easy | Easy | Easy |
| 5. | Surface anomalies | No defects | No defects | No defects | No defects |
| 6. | Aging stability | Smooth | Smooth | Smooth | Smooth |
| 7. | Skin irritation test | No irritation | No irritation | No irritation | No irritation |
| 8. | Perfume stability | +++ | +++ | +++ | +++ |

The present study i.e., formulation and evaluation of herbal lipsticks intended to formulate a lipstick using herbal natural colouring ingredients such that the side effects produced by synthetic agents could be minimized. None of the formulations produced skin irritation. No surface anomalies were found in any formulation. Aging stability was smooth for all the four formulations from F1 to F4. Perfume stability was best in all the formulation upon storage. Solubility of the prepared herbal lipsticks was checked in different solvents and were found to be soluble in ethanol. Depending on the evaluation parameters it is observed that F1

formulation has a problem of not imparting good color to the lips, this may be due to the colour of natural colouring pigment of litchi used and the concentration included might be less.

Based on the evaluation parameters observed between F1 to F4, the formulation F3 was found to be good with respect to all the evaluation parameters like melting point, aging stability, breaking point and the colour produced. The F3 formulation meets with all the ideal requirements of good lipstick and it was ideal with stability based on the composition of wax. The formulation F2 and F4 were also found to be satisfactory with respect to the evaluation parameters and colour produced.

It is evident from the study that herbal lipsticks as prepared form natural origin might produce lower side effects when compared to synthetic lipstick formulations and herbal formulations can rule the world when accessed through proper clinical trials, quality control procedures and guidelines by established methods to prove their safety and quality.

## CONCLUSION

Cosmetics play an important role in day to day life of every human being specifically women, but the hazards produced by synthetic agents and chemicals leads to severe toxicity. This research study deals with the exploration carried out with objective of developing herbal lipsticks using natural ingredients like natural colouring pigments along with bees wax, carnauba wax and other natural ingredients. This research concludes that a successful formulation has been prepared using bees wax, carnauba wax, coconut oil, olive oil, different natural pigments like pomegranate juice, grape fruit juice, strawberry extract, litchi extract, strawberry extract, vanilla essence, vitamin and lemon juice. These natural colouring agents are safe when compared to synthetic agents. Natural substances also produce required softness, glow, smoothness, suppleness, nourishing effect and moisturizing effect to the lip skin. In future herbal formulations like lipsticks will be ruling the commercial cosmetic industry after screening through clinical trials for quality control measures and safety measures. Based on the evaluation the formulation F3 was found to be satisfying all the ideal properties of herbal lipstick.

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