

Formulation and Evaluation of Herbal Lipstick by Using Natural Coloring Agent

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Abstract

These days, the market is filled with a greater number of dangerous cosmetic items. The current research provides information about herbal lipstick as a solution to this issue. The benefits, features, and biological qualities of herbal lipstick are covered. Here, we use herbal elements to create lipstick formulation with little or no adverse impacts. Because they are safe for the skin and have no negative effects, demand for herbal cosmetics is rising sharply. Cosmetics made from herbs are typically also called natural cosmetics. One or more organic components are correctly combined on a natural basis that is first prepared in the formulation of herbal cosmetics. Recent trends in the beauty and fashion sectors involve the usage of herbal cosmetics. As opposed to synthetic cosmetics, these beauty products provide customer satisfaction, improve health, and provide the right nutrients. Natural components can enter the body through the protective layer that is human skin. To meet the needs of women, a large variety of natural cosmetic products are available. Instead of artificial beauty products, herbal ones are good for human health. Herbal cosmetics, including pastes, lotions, lipsticks, and shampoos have long attracted a lot of attention because they work well and typically have less side effects than synthetic ones.

Keywords: Herbal lipsticks, beet root, carrot juice, dragon fruit, natural, *Beta vulgaris*

INTRODUCTION

The Greek term “kosmtikos,” which means ability, organization and power in beautifying, is where the word “cosmetics” originates [1]. In this study, the term “cosmetics” is used more widely to include oral hygiene. Cosmetics are actually “materials of diverse origin, which is scientifically synthesized with applications for cleaning, alleviate skin troubles, cover up defects, and beautify” [2]. Cosmetics are a must for any woman these days. Herbal ingredients having skin-benefiting features make up one or more of the permitted cosmetic components used in the creation of herbal cosmetics. Herbal cosmetics are another term for them [3]. Common cosmetics include things like foundation, eye makeup, shampoo and conditioner, lipstick, cream, mascara, and skin cleanser [4].

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Herbal lipsticks are applied to the lips to give them a beautiful color, texture, and protection. Wax, oils, pigments, dyes, alcohol, aroma, colors, surfactants, antioxidants, and preservers are all ingredients found in lipsticks. This well-known cosmetic product is available in a range of lipstick forms, styles, and packaging. Despite all its advantages, it needs to be non-drying and non-grit-filled [5].

In the modern day, beauty products are increasingly more popular, and a wider range of shades and qualities are now available. We

designed and tested a herbal lipstick using carrot and beetroot juice that has no negative effects in response to the different negative effects of the synthetic preparations currently on the market. Making a goods that women in our surrounding areas can use widely with trust along with satisfaction is the primary objective of this work [6].

HISTORY OF LIPSTICK

Around 3000 BC, men began to decorate with color, using it to depict the animals they wished to hunt. In general, Raymond Reed (1961), who also created the US Association of cosmetic Chemists [7], was the one who first developed and established “cosmeceuticals”. “Cosmeceuticals” are compounds that are beneficial for both the skin and the body; Albert Kligman first used this term in 1984 [7]. People have been using lipstick for approximately 500 years [8] Lipstick was found as a rough brick piece in the past of Mesopotamia [8]. In 1915, lipstick was originally sold in metal tubes with a cylinder shape [9]. Many consumers are seeing lipstick as essential. There is a wide range of colors, tones, and textures. This is evidenced by the fact that lipstick is now available in hundreds of color shades to meet the increasing demand [10].

TYPES OF LIPSTICK

Matte Lipstick

- Matte lipsticks are the most widely used variety. It is entirely matte and shine-free, just like the name implies.
- Both stick and liquid lipstick versions of this lipstick are available in a variety of colors and tints.
- Despite not shining, matte lipstick creates a really striking effect.
- There are a lot of matte lipsticks that also include moisturizers.
- These could appear a little glossier than a real matte [10].

Liquid Lipstick

- Liquid lipstick is another popular and often used type of lipstick.
- Once applied on the lips, their liquid formula dries swiftly.
- For ideal applications, they come in a tube with a doe-foot applicator.
- A matte finish lipstick may be what you are seeking when you desire a modern style.
- Matte lipsticks exist in a range of colors, but they will give you a flat look [10].

Glossy Lipstick

- Compared to cream lipstick, gloss lipstick will be slightly more noticeable.
- Your lips will appear larger than they are if you apply gloss to them.
- Gloss lipstick is a terrific option for women with very small lips.
- Some people use gloss lipstick over cream lipstick [10].

Pearl Lipstick

Pearl lipstick is designed to reflect light. Where the lipstick stain focuses on color, the pearl lipstick will be more about shining and light. Many of the pearl lipsticks will also sparkle. This can be an excellent look for a dinner party or formal event.

Lip Primer Lipstick

- A lip primer functions the same as a paint primer, facial primer, or even both.
- The primer gets your lips ready for the lipstick you are going to put on.
- You will need to apply lipstick or lip gloss after using a lip primer.
- This method of applying lipstick should make it last longer and ensure that your color is flawless [11].

Lip Gloss Lipstick

- Glossy lipsticks are not the same as lip gloss.

- If you want to keep your lips hydrated and glossy all day, you will typically need to apply lip gloss more frequently.
- Lip gloss is available in a wide range of colors, just like lipstick.
- You may apply lip gloss straight onto your lips, and it works wonders to prevent them from drying out.
- The product itself will not stay on the lips for as long because it's much lighter than other lipsticks [10, 11].

Lip Tint Lipstick

- Lip tint is a method that is favored by those who do not want to be stuck reapplying and spending time on their lipstick because it is quite like a lip stain.
- You may achieve gorgeous lip look with less effort thanks to the lip tint's easy application, broad color selection, and ease of use.
- Because lip tints are typically thinner, less striking cosmetics, they also don't do the best job of long-term lip moisturization [10, 11].

CHARACTERISTICS OF LIPSTICK

A Good Lipstick Should Have the Following Qualities

1. It should be smooth and simple to apply.
2. It should not cause irritation or be harmful.
3. It should have the necessary plasticity.
4. It must be long lasting.
5. It should have an appealing color and shine.
6. It should not be gritty or dry.
7. It should have the essential plasticity [12, 13].

INTRODUCTION TO HERBAL INGREDIENTS [12] (Table 1)

Bees Wax

- *Synonym:* Paraffin-wax, Cranauba.
- *Biological source:* It is an item created from bee comb, including honeybee and other types.
- *Family:* Apidae.
- *Chemical constituents:* The main chemical constituents are carbon (73.3%), hydrogen (13.2%), and oxygen (7.5%).
- *Uses:* It provides a moisturizer to keep your lips from drying out and cracking. It's also a component of lip gloss, balm, etc.

Castor Oil

- *Synonym:* Ricinus oil, linseed oil.
- *Biological source:* It is a non-volatile fatty oil made from *Ricinius communis*, the castor bean's seeds.
- *Family:* Spurges.
- *Chemical constituents:* It is mainly composed of fatty acids and neutral lipids.
- *Uses:* It has laxative properties. It has a moisturizing purpose. It might facilitate the healing of lip cracks. It helps one stay hydrated.

Olive Oil

- *Synonym:* Vegetable oil
- *Biological source:* It is a liquid fat made by pressing entire olives and extracting oil from the fruit of the olive tree, *Olea europaea*, which is a traditional tree crop in the Mediterranean region.
- *Family:* Oleaceae.
- *Chemical constituents:* Triacylglycerols compose most of its substances, with small quantities of glycerol, free fatty acid phosphate compounds, sterols, and pigments.

- **Uses:** It helps you stay more hydrated. Its relief from dry and parched lips. It provides natural SPF protection. It retains the moisture on your lips. It exfoliated dead skin cells from your lips and revitalized your skin. It nourishes the lips.

Coconut Oil

- **Synonyms:** Copra oil, *Cocos nucifera* oil, and coconut palm oil.
- **Biological source:** The oil is taken from the dried, solid part of the endosperm of *C. nucifera*.
- **Family:** Palmae.
- **Chemical constituents:** Fatty acids, lauric acid (C-12:0 (49%), myristic acid (C-14:0 (8%), palmitic acid (C-16:0 (8%), stearic acid (C-18:0 (2%), oleic acid (C-18:1 (6%), and 2% of C-18:2 linoleic acid make up this mixture.
- **Uses:** It protects skin from ultraviolet light. It reduces agitation. It is administered as a moisturizer.

Beetroot

- **Synonym:** *Beta vulgaris rubra* Chukandar.
- **Biological source:** It consists of fresh root of *B. vulgaris*.
- **Family:** Amaranthaceae.
- **Chemical constituents:** It is a rich source of several minerals like potassium, sodium, phosphorus, calcium, magnesium, copper, iron, and zinc. It also contains a variety of biologically active phytochemicals, such as betalains, flavonoids, polyphenols, saponins, and inorganic nitrates.
- **Uses:** It functions as a coloring agent. It functions as a binder. It provides lips with a shiny sheen. Additionally, it has emollient properties for lips. It also keeps lips from breaking.

Vitamin E

- **Synonym:** Tocopherol.
- **Biological source:** A wide variety of foods can include this class of chemicals.
- **Chemical constituents:** It represents a family of eight different compounds, the tocopherols α , β , γ , and δ , and the corresponding four tocotrienols.
- **Uses:** As a form of preservation, it is used on wrinkles and fine lines. As a result, lips became softer.

Rose Oil

- **Synonym:** Rose otto, Rose odor.
- **Biological source:** It is derived from the petals of several *Rosa* species, particularly *Rosa centifolia* and *Rosa damascena* mill.
- **Family:** Rosaceae.
- **Chemical constituents:** The most common components of rose oil are farnesol, stearoptene, limonene, eugenol, geraniol, nerol, linalool, phenyl ethyl alcohol, and geraniol.
- **Uses:** It acts as a scent. It is employed to provide an aroma that is more organic. Its purpose is to give a pleasant scent.

MATERIALS AND METHODS

Materials Used

- **Beetroot extraction:** We bought the beetroot from the nearby market. Beetroot was cleaned, peeled, and sliced into thin, even pieces. Spread it out on butter paper, cover with tiny mesh, and let it dry in the shade for a day. If there is still moisture on it, dry in an oven. Take the dried beetroot and grind it into a powder. Over the ground substance, run a fine sieve. See whether something granular is present. Sieve it again if required. Weigh the amount of powder and pack it [2].
- **Carrot juice extraction:** From the nearby store, we purchased fresh carrots. Carrots' outermost layer is peeled using a peeler. The carrot is neatly shredded after it has been peeled. The juice and seed are then extracted by pressing the mixture against a fine cotton cloth. Following its extraction from the beaker, the juice was stored for further use [2].

- **Dragon fruit extraction:** *Hylocereus polyrhizus*, a red-fleshed fruit, was cut into uniformly sized cubes using a knife. After that, the cubes spent 30 seconds combined in the lab mixer. To enhance the extraction process and reduce the sample's moisture content, the homogenized material was initially freeze dried [13]. The mixture of natural dragon fruit juice and distilled water was mixed at a 2:3 (w/v) ratio in a 500 ml flask. Subsequently, the flask was placed in a shaking water bath and heated to 60°C while covered with aluminum foil. The solvent was subsequently extracted from the filtrate combination by centrifuging it for 4 hours at 40°C in a rotating evaporator. After that, the extracts' remaining water was eliminated by lyophilization. The air was packed into the dried extraction [13].

Table 1. List of materials.

S.N.	Common name	Role
1.	Beeswax	• Lubricating agent • Waterproofing agent • Thickening agent
2.	Castor oil	• Humectants • moisturizer
3.	Olive oil	• Emollient • Occlusive agent
4.	Coconut oil	• Hydrating agent • Moisturising agent • Rejuvenate
5.	Beet root	• Colouring agent • For Nourishment
6.	Dragon fruit	• Colouring agent
7.	Carrot	• Colouring agent
8.	Vitamin E	• Preservative
9.	Rose oil	• Fragrance

METHOD OF PREPARATION

- **Formulation 1:** The conventional method for making lipstick was applied to generate natural lipstick. In this process, beeswax is melted in a beaker under a water bath at 70°C. Similarly, a different container was filled with the melting points that are of castor, coconut, and olive oil in decreasing sequence, and it was heated to 70°C over a water bath. Its colored pigment (beetroot) was mixed into the oil phase until a homogenous mixture was obtained. It was subsequently added to the wax phase in the same temperature. The vitamin E and the rose oil were included when the mixture had reached 40°C. The mixture was poured into lipstick molds when it had liquefied. It was removed from the molds and put into a lipstick case once it had solidified.
- **Formulation 2:** The conventional method for making lipstick was applied to generate herbal lipstick. In this process, beeswax is melted in a beaker under a water bath at 70°C. Similarly, an alternate beaker was filled with the melting temperatures of castor, and coconut oil and olive oil in decreasing order, and the mixture was heated to 70°C inside a water bath. After adding carrot juice, the colored pigment, to the oil phase, a homogeneous mixture was created. A few drops of rose oil were used once the mixture cooled to 40°C. The mixture was poured into lipstick molds when it had liquefied. It was removed from the molds and inserted into the lipstick casing once it had solidified [2].
- **Formulation 3:** Using the conventional method to create lipstick, the natural lipstick was produced. Beeswax or plant-based wax is melted in a double-boiler during this process. Following the melting process, thoroughly mix in the oil made from coconuts, the shea butter, and the vitamin E oil. Once you reach the right color quantity, gradually add the coloring agent or dragon fruit extract [14, 15]. To guarantee uniform color distribution, constantly stir the mixture. Pour

mixture into lipstick molds after removing from heat. Prior to removing the liquid lipstick from its molds, let it cool and solidify [16, 17].

DEFECTS IN PREPARATION OF LIPSTICK

Formulation Related Problems

- *Sweating*: Because of its high level of oil or poor oil binding, it is an extremely common problem with lipstick composition. Any climate or vary in temperature may see its emergence.
- *Bleeding*: This is the process of separating-colored liquids from their waxy base.
- *Streaking*: The final products include a small range or line that is a different color or material.

Molding Related Problems

- *Laddering*: Lipstick loses its smooth, homogeneous appearance and begins to form multiple layers after setting and solidifying.
- *Deformation*: The lipstick appears to be in a deformed shape due to a molding problem. It is obvious and can be seen on the lipstick's two sides.
- *Cratering*: When the stick has dimples, this appears burning and occurs in split molding.
- *Mushy failure*: This issue arises from the lipstick's core breaking and lacking strength in the middle.

EVALUATION PARAMETERS OF LIPSTICK (Table 2) [17–19]

Melting Point

The melting point of pigments in pomegranate colors is crucial for safe storage. This point was verified using the capillary method [20]. The process involved filling the capillary with lipstick, letting it stand at the desired temperature, and then calculating the outcome three times with additional tubes (Table 2) [22, 23].

Table 2. Comparative study of beetroot, carrot, and dragon fruit from that dragon fruit lipstick is the best.

S.N.	Evaluation Parameters	Formulation 1 (beetroot)	Formulation 2 (carrot)	Formulation 3 (dragon fruit)
1.	Color	Brown	Red	Pink
2.	pH	6.2	6.4	6.5
3.	Skin irritation test	No	No	No
4.	Melting point	59–60°C	60–61°C	61–63°C
5.	Breaking point	21	22	24
6.	Force of application	Easy	Good	Good
7.	Perfume stability	++	++	+++
8.	Surface anomalies	No defects	No defects	No defects
9.	Aging stability	Smooth	Smooth	Smooth
10.	Solubility	Chloroform	Chloroform	Chloroform

Breaking Point

The breaking point test was employed in the study to ascertain the lipstick's strength. The lipstick's weight was gradually raised by 10 g during a 30-second period while it was maintained horizontally in a socket. The study found that better texture correlates with higher breaking point test values [24, 25].

Thixotropy Character

The lipstick's thixotropic composition was determined using a penetrometer, with a thixotropy between 9 and 10. The lipstick's thixotropic structure was measured by the depth of penetration, with a soft, thixotropic structure providing favorable application properties. However, no studies have compared thixotropic outcomes with reference criteria, suggesting no established recommendations for this test [26].

Force of Application

Using an angle of 45°, the force that is required to apply lipsticks is measured in this test. A shadow graph balance is used to hold a coarse brown paper, and a pressure readout provides information about the applied force [27].

Surface Anomaly

This was investigated using surface errors, like crystal formation, fungal and mold contamination and wrinkle formation, and evaporation of solids as well as liquid fatty substances [28].

Aging Stability

In 40°C for one hour, the product was kept. The following criteria were noted: bleeding, surface crystallization, and application case.

Solubility Test

The pigment of pomegranate colors is soluble in distilled water, acetone, methanol, and ethanol, while lipstick containing castor oil dissolves in alcohol.

pH Parameter

Using a pH meter, the pH of the herbal lipstick formulation was verified. One gramme of lipstick was dissolved in one hundred milliliters of distilled water to find its pH.

Skin Irritation Test

Test for skin inflammation. It is completed by putting a substance on the skin and waiting 10 minutes.

Perfume Irritation Test

After 30 days, the herbal lipstick mixture was tested to note the scent.

Softening Point

An aluminum ring was used to insert a lipstick tablet into a lipstick sample, which was then placed in a beaker of water and stirred. The softening point was determined by tracking the temperature that caused the lipstick mass to sink to the bottom.

Permeability Study

The cellophane membrane was submerged in ethanol buffer, coated with lipstick mass, and fitted on a diffusion cell with a 6.4 pH buffer, agitated magnetically, and maintained at 32°C.

Penetrometer Test

The lipstick's surface penetration was measured at multiple points, with the average reported in micrometers, using a penetrometer needle resting on the lipstick rod's molded surface.

Microbial Testing

Microbial growth can occur from contamination, such as raw material or mold. Two culture media are used, with a sample incubated for a predetermined time to form visible colonies, with a maximum limit of 100 µo/gm.

Rancidity

Dark-colored lipstick tests may taint results due to unclear peroxide number endpoint. Producers typically use peroxide number tests to determine lipstick raw materials' rancidity; especially vegetable-based oils.

Spreadability Test

The spreadability of lipstick consistency is evaluated using a spreadability test [28, 29].

RESULT

A comparative study of beetroot, carrot, and dragon fruit-based lipsticks shows that the dragon fruit formulation is the best. It has a vibrant pink color, the highest melting and breaking points, and a skin-friendly pH of 6.5.

CONCLUSION

Over the past few decades, women have used cosmetics at a significantly higher rate. The usage of natural cosmetics is safer in comparison of other kinds of cosmetics. This lipstick gives your lips the essential nutrition they need. It helps to eliminate wrinkles, dryness, cracking, and lips creasing. Regular use of natural lipstick may help minimize the damaging effects of pollution and bad weather on the lips. They slow down the early ageing process of the lips by preserving the flexibility of the lip cells. Large quantities of herbal formulations are needed to fulfil the demands of the growing global market. The goal of creating an herbal lipstick with various natural nutrients is successful.

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