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Formulation and Evaluation of Herbal Lipstick by Using Beta Vulgaris (Beet Root): A Review Paper

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ABSTRACT

Natural and herbal choices are becoming more and more popular as people become more conscious of the possible negative effects of synthetic cosmetic ingredients. Among the most widely used cosmetics, lipsticks frequently include petrochemical compounds, artificial coloring, and preservatives. These substances have the potential to cause long-term toxicity, allergic responses, lip darkening, and other health problems. On the other hand, for customers looking for clean cosmetics, herbal lipsticks which are manufactured from plant-based ingredients and natural colorants offer a safer and more environmentally responsible choice. Beetroot, or Betavulgaris, is a colorful root vegetable that is high in antioxidants, vitamins, minerals, and natural colorants called betalains. It is a perfect choice for use as a plant-based pigment in lipstick formulas because of its reddish-purple color. In addition to adding color, beetroot extract has health benefits like hydration, skin nourishment, and antioxidant effects that support the general health of the lips.

The formulation procedures for natural lipsticks that use extract from Beta vulgaris are examined in this research. It covers beetroot pigment extraction techniques, different formulation tactics, and the selection and function of natural components. The study also identifies key evaluation criteria, such as consumer acceptance studies, microbiological testing, and physicochemical properties (such as the pH level, point of melting, spreadability, and stability). Herbal lipsticks made from beetroot have several benefits over synthetic ones, including being environmentally friendly, skin-friendly, and environmentally beneficial.

Nonetheless, issues with natural pigment stability, microbiological growth sensitivity, and decreased longevity are also covered. In conclusion, herbal lipstick compositions can effectively use Beta vulgaris as a natural colorant. Beetroot-based lipsticks are a promising step toward safer, more effective,

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and environmentally friendly personal care products as consumer curiosity in natural skincare and the green beauty movement grows. Stability, user experience, and commercial acceptance could all be improved by continued investigation and advancement in this field.

Keywords : Beta vulgaris, Beetroot, Herbal cosmetics, Natural colorants, Lipstick formulation, Betalains

I. INTRODUCTION

The materials used to improve the human body's look are called cosmetics. The term "cosmetics," which comes from the Greek word "kosmtikos," denotes the proficiency, organization, and ability to beautify. Cosmetics are formulas that make people look more beautiful. Cosmetic ingredients include lipstick, lotions, skin care products, fragrances, powders, hair dyes, nail polish, gels, infant goods, and many more items that are highly sought after in both developed and developing nations.[1]

Herbal cosmetics are highly sought after, and their application in personal care systems has multiplied too many times. The overuse of synthetic materials is the cause of all of this. The global market for herbal cosmetics is growing, and they are a priceless gift from nature. Numerous herbal cosmetic products are available to meet beauty regimens, and incorporating herbal ingredients into cosmetics is extremely safe for skin.[2] The word "herbal" is a sign of safety as opposed to "synthetic," which is harmful to human health. As the fastest-growing market for treating a variety of illnesses, natural remedies have gained popularity among customers. Because the available synthetic preparations have more adverse effects, many people in their personal health care system are turning to medicines made from herbs.[3]

Herbal Lipstick

One of the most widely used cosmetics is lipstick, however store-bought lipsticks contain substances and artificial hues that may not be healthy for you. Natural components are used to make herbal lipsticks, making them a safe and efficient substitute.[4] Herbal lipsticks are used by people to give their lips a gorgeous shade, texture, and shield. A type of cosmetic, lipstick is made up of oils, waxes, pigments, dyes, alcohol, scent, colors, surfactants, preservatives, and antioxidants. These lipsticks don't have any negative effects or cause harm to our lips. By eliminating folds and wrinkles, they smooth out your lips and change their color, giving them a smoother, more glossy appearance. A popular cosmetic item, lipstick is available in a wide range of shapes, designs, and packaging.[5]. When making lipstick, oil, emollients, waxes, and pigments are the most often utilized materials. These substances are mostly utilized to protect the texture, color, and protection of the lips. Since herbal lipstick is made with natural materials like beetroot powder, rose water, and beeswax, it is safer to use, free of dangerous chemicals, and acceptable for consumption. Natural, non-toxic chemicals make up herbal lipstick as opposed to synthetic ones.[6]



Figure-1 Herbal lipstick

History of Lipstick

The term "cosmeceuticals" was later used by Albert Kligman in 1984 to describe substances that have both therapeutic as well as cosmetic uses.[7] Men began using colors as decoration around 3000 BC to attract the animals they wanted to hunt. In general, the concept and construction of “cosmeceuticals” was first articulated by Raymond Reed (1961), founder of the US Society of Cosmetic Chemists.[8] In 1869, lipstick was initially sold in France as a cosmetic product derived from beeswax and animal fat. There is a large assortment of colors and textures. In response to the increasing demand, lipsticks are now offered in a hundred different color options.[9] Mauvine, the first synthetic hue, was created in 1856 by Sir William Henry Perkin. That first synthetic color, mauvine, was created in 1856 by Sir William Henry Perkin. The bulk of synthetic color production and recovery from petroleum-derived products, such as aniline, was noted at the start of the 19th century. As a result, these colors were dubbed "coal-tar" colors because the initial ingredients came from coal.[10]

Beetroot

Because betalains give beetroot (Beta vulgaris) its vivid color, they are a natural supply of red pigment. It is a useful component of herbal cosmetics because it also possesses moisturizing and antioxidant qualities [11]. Natural ingredients nourish the lips and relieve dry, chapped, and sore lips. Although the raw chemicals in natural lipsticks are also potent, we typically assume they are not very convincing. It has the best natural components for moisturizing our lips. It maintains the moisture, suppleness, and softness of our lips. Organic waxes and oils included in natural lipsticks shield the lips from ultraviolet light [12]. The primary ingredient of beet red, a naturally occurring red hue, is beet (Beta vulgaris). Traditional cuisines have long employed beet roots and leaves.



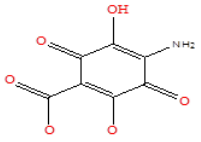
Figure: 2- Beetroot

Phytoconstituents of beetroot (*Beta vulgaris*)

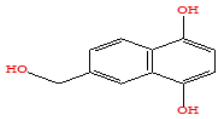
Category	Examples	Functions / Properties
Betalains (Pigments)	Betacyanins (e.g., betanin, isobetanin), Betaxanthins (e.g., vulgaxanthin)	Antioxidant, anti-inflammatory, colorant properties
Phenolic Compounds	Ferulic acid, caffeic acid, p-coumaric acid, syringic acid, vanillic acid	Antioxidant, anti-inflammatory
Flavonoids	Rutin, epicatechin, kaempferol, quercetin	Antioxidant, cardioprotective
Nitrates and Nitrites	Inorganic nitrate (NO_3^-), nitrite (NO_2^-)	Improves blood flow, lowers blood pressure (via nitric oxide pathway)
Saponins	Steroidal saponins (trace amounts)	Cholesterol-lowering, immune-modulating
Alkaloids	Various low-level alkaloids	May contribute to therapeutic properties
Vitamins	Vitamin C, Vitamin A, Folate (B9), B-complex vitamins	Antioxidant, cell repair, blood formation
Minerals	Potassium, magnesium, iron, phosphorus	Electrolyte balance, muscle function, oxygen transport

Category	Examples	Functions / Properties
Sugars and Carbohydrates	Glucose, fructose, sucrose, dietary fiber (pectin)	Energy source, digestive health
Organic Acids	Oxalic acid, ascorbic acid	Antioxidant (ascorbic acid), mineral chelation

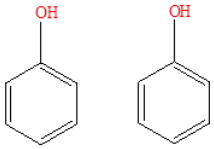
Phytochemistry of beetroot (*Beta vulgaris*)



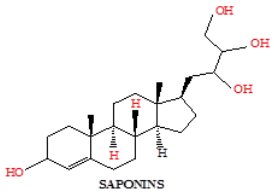
BETALAINS



FLAVONOIDS



POLYPHENOLS



SAPONINS

The Value of Beetroot in the Creation of Herbal Lipstick

a) One of its uses is as a coloring agent.
b) It functions as a binder. It provides lips a shiny sheen.It also gives lips an emollient effect.
c) It also prevents cracking of lips.[13]

Taxonomical Classification of Beetroot (Beta vulgaris)

Taxonomic Rank	Classification
Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Caryophyllales
Family	Chenopodiaceae (now often placed under Amaranthaceae)
Genus	Beta L.
Species	Beta vulgaris

The health advantages of beetroot: - [14]

a) Treats anxiety disorder
b) Lowers blood pressure
c) Anti-thrombotic and Anti-inflammatory properties
d) Improve athletic performance
e) Protects Liver
f) Prevents dementia
g) Anti-cancerous
h) Treat anemia
i) Good for pregnancy
j) Healthy heart
k) Prevents birth defects

Herbal lipstick's ideal charatestrics [15]

a) Applying herbal lipsticks is simple and they are silky.
b) It doesn't cause irritation or toxicity.
c) There is no pollution present.
d) It doesn't harden or melt when the temperature varies.
e) It must not dry out. It shouldn't become less bright while being stored.
f) Throughout storage, it should not be exposed to bloom or perspiration.
g) It needs to be a durable

Herbal Lipstick Advantages:

a) It is safe to use.
b) It occurs naturally in the environment.
c) It's inexpensive and economical.
d) It has no adverse effects.
e) There are no dangerous compounds in it.
f) It is better for the environment.
g) No animals are used for testing. [16]

Disadvantage of Herbal Lipstick

a) Allergic Responses
b) Issues with Pigment and Color Variation
c) Shorter shelf life
d) Contamination potential
e) Difficulty masking flavor and odor.
f) No pharmacopeia specifies how to properly use herbal ingredients or prepare herbal cosmetics
g) It starts to become a habit. [17]

TYPES OF LIPSTICK AND THEIR USES

Type	Description	Finish	Best For
Matte Lipstick	Highly pigmented, non-shiny; lasts long but can be drying.	Flat, no shine	Bold color, long wear, professional looks
Cream Lipstick	Balanced moisture and pigment; glides smoothly.	Soft sheen	Everyday wear, normal to dry lips
Satin Lipstick	Moisturizing with a slight shine; rich in color.	Slightly glossy	Natural, elegant finish
Glossy Lipstick	High shine, lower pigment; makes lips look fuller.	Glossy, shiny	Youthful look, plumping effect
Sheer Lipstick	Light pigment, more like a tinted balm; hydrating.	Light shine	Subtle color, casual wear
Liquid Lipstick	Liquid formula, dries to matte or glossy; highly pigmented.	Varies	Long-lasting, dramatic looks
Lip Stain/Tint	Lightweight, long-lasting color that "stains" the lips.	Natural, barely-there	All-day wear, no smudging
Lip Balm with Tint	Moisturizes with a hint of color.	Dewy or subtle	Dry lips, natural look
Frosted/Metallic	Reflective particles for a shimmering effect.	Shimmery/metallic	Glamorous, retro or festive styles
Lip Crayon/Pencil	Crayon-like form for precision; can be creamy or matte.	Varies	On-the-go use, defined lip lines
Lip Plumper	Contains ingredients to temporarily enhance lip volume.	Glossy or tinted	Fuller-looking lips

ANATOMY OF LIPS

The lips play both practical and decorative duties, making them a noticeable and significant feature of the human face. They engage in a number of vital functions, including speaking, eating, and emotional expression. An outline of the lips' physiology, anatomy, and clinical significance is provided below. [18]

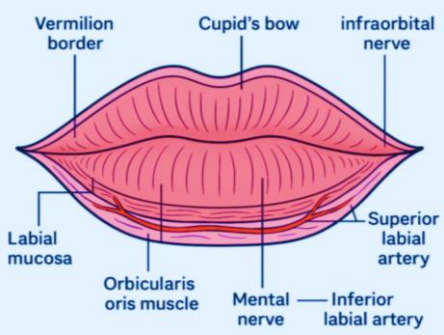


Figure 3. Anatomy of Lips

Structure	Description
Vermilion Border	The edge where the colored part of the lips meets the surrounding skin.
Cupid's Bow	The double curve of the upper lip, forming a bow shape.
Philtrum	The vertical groove between the nose and upper lip.
Oral Commissures	The corners where the upper and lower lips meet.
Vermilion Zone	The pink-red part of the lips; has thin skin with blood vessels visible underneath.
Labial Mucosa	The inner side of the lips, lined with moist mucous membrane.
Orbicularis Oris Muscle	The main muscle responsible for lip movement (pursing, closing).

Structure	Description
Blood Supply	Mainly from the superior and inferior labial arteries, branches of the facial artery.
Nerve Supply	Sensory innervation by infraorbital (upper lip) and mental (lower lip) nerves.

PHYSIOLOGY OF THE LIPS

Function	Description	Structures Involved
Speech Articulation	Helps produce sounds by shaping airflow and forming consonants (e.g., "p", "b", "m").	Orbicularis oris muscle, vermilion zone, labial mucosa
Facial Expression	Contributes to emotional expressions (smiling, frowning, pouting).	Orbicularis oris muscle, oral commissures
Sensation	Detects temperature, pressure, pain, and touch.	Infraorbital nerve, mental nerve (branches of CN V)
Barrier Function	Protects the oral cavity from pathogens and dehydration.	Skin, mucosa, vermilion zone
Food Intake	Assists in grasping, sealing, and guiding food into the mouth.	Orbicularis oris, labial mucosa, oral commissures
Moisture Maintenance	Keeps lips and mouth hydrated for comfort and function.	Labial salivary glands, mucosa
Thermoregulation (minor)	Rich blood supply allows limited role in heat dissipation.	Superior and inferior labial arteries
Tactile Function	Highly sensitive area for exploring textures (especially in infants).	Dense sensory innervation

Introduction to Herbal Ingredient: Ingredients Used in Formulation of Herbal Lipstick

Ingredients	Biological Source	Quantity Taken	Uses
Beet root	Beta vulgaris	3 ml	Colouring agent For nourishment
Bees wax	Apis mellifera	9 gm	Thickening agent
Castor oil	Ricinus communis	5 ml	Blending agent
Olive oil	Olea europea	2 ml	Moisturizing agent
Vitamin E	-	Q.s	Antioxidant
Coconut oil	Cocos nucifera	5ml	Hydrating agent
Rose oil	Rosa damascena	Q.s	Perfuming agent

1. BEETROOT:

Biological source: Fresh Beta vulgaris root serves as its biological source.

Family: Amaranthaceous.

Chemical composition: Important minerals like potassium, sodium, phosphorus, and zinc are present in good amounts in this blend. Additionally, it contains a number of health-promoting active plant compounds. These consist of polyphenols, flavonoids, and betalains. These substances offer a number of health advantages. Its application is as a binder. It creates the look of glossy lips. It also has an emollient effect on lips. It also prevents lips from cracking. [19]

2. BEES WAX:

Synonym: Carnauba.

Biological source: The bees' honeycomb, which includes honeybees.

Family: Apidae.

Chemical composition: The primary components of beeswax are carbon (73.5%), hydrogen (13.2%), and oxygen (7.5%).

Application: It acts as a thickening agent and moisturizing agent to prevent your lips from drying out and cracking. [20]

3. CASTOR OIL:

Synonym: Castor Bean Oil.

Biological Source: Castor oil is a non-volatile fatty oil that is produced from the seeds of the Ricinus communis castor bean plants.

Family: Spurges.

Chemical composition: Most of it is composed of neutral lipids and fatty acids.

Application: Ricinoleic acid, which is found in lipstick, contraceptive cream, and jellies, is a moderate laxative that is administered as a moisturizing agent and promotes hydration. [21]

3. OLIVE OIL:

Synonym: Swarthy, Cold pressed oil.

Biological source: The oil produced from the fruit of the Olea europaea olive tree is known as olive oil. It comes from the ripe olives' meaty portion.

Family: Oleaceae.

Chemical composition: The substance it contains is primarily composed of triacylglycerols, with trace amounts of glycerol, phosphatides, free fatty acids, pigments, and sterols.

Application: It's also a great way to stay hydrated. It offered natural SPF protection. It preserves your lips' moisture content. It was used to remove dead skin from your lips and to invigorate your skin. It moisturizes the lips. [22]

4. COCONUT OIL:

Synonym: Coconut Butter.

Biological source: The endosperm, or dry white portion, of the coconut tree (Cocos nucifera) is used to make coconut oil.

Family: Palmae.

Chemical composition: Palmitic, stearic, oleic, and inoleic acids are examples of fatty acids. compose this blend. Use: It reduces discomfort. It is used as a moisturizing substance.[23]

6. VITAMIN E:

Synonym: Tocopherol.

Biological source: Collection of substance that can be found in many different foods.

Chemical composition: This phrase refers to eight different compounds, including tocopherols, α-, β-, γ-, and the four tocotrienols that accompany them.

Application: It serves as a preservative and a wrinkle-curing agent. It creates smooth, velvety lips.[24]

7. ROSE OIL:

Synonym: Rose attar.

Biological source: The blossoms of the Rosa damascena shrub are used to make rose oil.

Family: Rosaceous.

Chemical components: Rose oil's primary chemical components are:

- **Citronellol**: A compound with a sweet, flowery scent.
- **Geraniol**: A rather fruity and flowery substance.
- **Nerol**: Has a fresh flowery fragrance, much like geraniol.
- **Phenyl ethanol**: Contributes a scent reminiscent to roses. Rose oil gets its distinct scent and medicinal properties from these ingredients.

Application: It is employed to produce a perfume that is more organic. To create a lipstick. [25]

Extraction Method:

Beetroot Extraction:

a. Color pigment extraction from beetroot extract: "Beet Root Red" is the primary supply box's natural red dye, which is made from beets.

b. The primary ingredient in the vibrant red pigments that are derived from beetroot is bethanin. a variety of other colors, including red, striped white, and golden yellow.

c. In order to remove the pigment, the fruit flesh and solvents (1/1 w/v) are homogenized in equal amounts. In an ice bath, macerate 100g of the

watery-textured peeled fruit for 15 minutes with 100ml of solvent (Et OH, aqueous ethanol 50:50).

d. The samples should be kept in a darkish container after the alcohol has been totally eliminated during the determination process.[10]

Method of Preparation: -

The standard process for creating lipstick was used to create the herbal lipstick. Using a water bath, beeswax was first melt into a beaker at 70°C. The melting points of castor, coconut, and olive oils were arranged from their highest to their lowest in a separate beaker and melted at 70°C. After adding beetroot coloring to the oils, they were thoroughly blended until they were smooth. The melted beeswax was then heated to the same temperature and mixed with this combination. Vitamin E as well as rose oil were included once the liquid had cooled to 40°C. The liquid mixture was then transferred into lipstick molds. After the lipstick solidified, it was taken out of the molds and put in a lipstick case.

The following are the fundamental steps involved in making lipstick:

The following fundamental manufacturing procedures are employed in the creation of herbal lipstick:

1. Pre-milling of Pigment:

The process of creating herbal lipstick starts with this. Any clumps of pigment powder are broken up by grinding it down. This guarantees a smooth and uniform color for the lipstick.

2. Mixing and Melting:

Since waxes and oils are solid at room temperature, they are melted together in this step. Pigments and additional materials are added after melting and thoroughly blended to create a homogeneous, smooth composition.

3. Molding:

When the mixture has been completed, it is still hot and poured into a mold. Once the lipstick has cooled, it is carefully taken out of the mold, which aids in its shape.

4. Flaming:

The lipstick is then passed across the flame in the following step, known as flaming. Usually, it is removed to prevent after being held and bent there for a short time. Once it has melted and lost its shape, it is placed into the containers to create a glossy exterior. [26–27]

- **Flaws in lipsticks:**

Issues concerning formulation:

a) **Sweating:** Due to either an excessive oil content or inadequate oil binding, sweating is the most common problem with lipstick formulation.

b) **Bleeding:** It can appear in any environment or temperature range. Bleeding is the term for the separation of colored liquids from the waxy base.

c) **Streaking:** Streaking is when a thin line or band that differs in color or composition appears on the finished product.

Issues relating to molding:

a) **Laddering:** The finished lipstick has a layered or stripy appearance, resembling a ladder, rather than being smooth.

b) **Deformation:** The lipstick becomes distorted or twisted. It is clearly visible on the lipstick's two sides.

c) **Cratering:** This occurs when the lipstick seems uneven due to tiny dents or holes in the surface. Mushy Failure: The lipstick is weak and unstable because the central portion is mushy and brittle. [28-29]

Evaluation Parameters:

a) **Melting point:** It is measured by the capillary tube method. Both ends of the glass capillary tubes should be open. Place a sufficient amount of lipstick, about 10 mm high, in each of the 5 capillary tubes. After that, let the tubes to stand for the necessary amount of time. The melting point is found to be the capillary tube's temperature. To calculate the result, repeat the process three times using the four remaining capillary tubes.

b) **Breaking Point:** The term "breaking point" refers to the weight that breaks. Determining the strength of the lipstick is the goal of the breaking point test. In a socket, place lipstick horizontally, one inch from the edge of the support. A certain rise in weight is referred to as the breaking point.[30]

c) **Force of Application:** In this test, the pressure leading is used as a gauge for application force, and a piece of coarse brown paper is held on a shadow graph balance. Lipstick is applied at a 45° angle to cover an area of 1 square inch.

d) **Penetrometer test:** The average of the results obtained by probing the lipstick's surface at several locations was expressed in micrometres. It was configured so that the penetrometer needle rested only on the surface of the molded lipstick rod. Once the needle attachment was released, the depth reading was recorded.

e) **Microbial testing:** The materials, molds, holding kettles, and lipstick containers can all contaminate an area and lead to microbial proliferation. A known amount of the specimen is placed on two carefully selected mediums of culture that are particularly well-suited for the development of fungus and bacteria. The plates are then cultured for a specific period of time to enable the production of countable visible colonies. The upper limit is 100 μo/gm.

f) **Rancidity**: Rancidification is the process by which oils, fats, and other lipids break down by oxidation or hydrolysis. It produces an unpalatable taste, an unpleasant odor, a sticky substance, and sometimes a color shift. Rancidity can be tested by calculating the peroxide number.[31]

g) **Surface anomalies**: This test checks for surface defects including the lack of mold, fungus, or other contamination or crystal formation.

h) **Aging stability:** While keeping an eye on several aspects, such as oily bleeds, surface wax crystallization, and usage qualities, keep the product at 40°C for an hour.[32]

i) **Test for solubility**: Note the lipstick's solubility in each solvent after dissolving it in a variety of them.

j) **Ph parameters**: Evaluate the lipstick's pH with a pH meter.

k) **Test for skin irritation**: After applying lipstick for 10 minutes, observe.

l) **Scent stability:** Keeping lipstick in an oven at 40°C and occasionally comparing it to fresh lipstick is another method of assessing smell durability.[33]

m) **Thixotrophy character:** It shows thixotropic quality using a penetrometer. A standard needle with a predetermined diameter was allowed to puncture for five seconds at 25°C and a weight of 50g. By measuring the depth of penetration, the thixotropic structure of the lipstick was determined.

n) **Storage Instructions:**

Just for external use.

Keep in a dry, cool location.

II. CONCLUSION

The development and testing of herbal lipstick utilizing Beta vulgaris, or beetroot, offers a viable, all-natural, and user-friendly substitute for artificial makeup. In addition to being a brilliant natural colorant, beetroot, which is high in betalains, minerals, antioxidants, and vitamins, provides additional therapeutic benefits such lip hydration, feeding, and oxidative stress prevention. The lipstick's moisturizing, stabilizing, and protecting properties are further improved by the use of natural components including wax from bees oil from castor beans, oil of coconut, oil of olive, rose oil, and vitamin E. This research emphasizes how beetroot extract has been successfully incorporated into herbal lipstick formulations thanks to efficient extraction techniques and an easy-to-replicate manufacturing procedure. Extensive test

parameters, including pH, stability, microbiological load, melting point, applying force, and skin irritation, show that herbal lipsticks with proper formulations can meet satisfactory performance standards in terms of consumer attractiveness, safety, and functionality. However, better formulation methods and preservation procedures are still required to solve several issues, such as color change, decreased durability, microbiological susceptibility, and pigment instability. To improve the product's commercial viability and satisfy the rising customer demand for sustainable, eco-friendly, and skin-safe beauty products, additional study and research in this field is crucial. To sum up, herbal lipsticks made from Beta vulgaris are a practical and environmentally responsible development in the natural cosmetics industry. They complement the current green beauty trends and provide customers with a more ethical and healthful option.

REFERENCES

[1]. Pandit Deepika, Gujrati Aditi, Rathore K S, "Formulation and Evaluation of Herbal Lipstick from the Extract of Papaya", International Journal of Pharmaceutical Science, July-August 2020; 63(1): 107-110.

[2]. Bharat Viswakarma, Sumet Dwivedi, Kushagra Dubey and Hemant Joshi "Formulation and Evaluation of Herbal Lipstick" International Jounal of Drug Discovery and Herbal Research; 2011;1(1); 18-18.

[3]. Abhijeet A. Aher, Shripad M. Bairagi, Preeti T. Kadaskar, Swapnil S. Desai and Pradeep K. Nimase "Formulation and Evaluation of Herbal Lipstick from Coloor Pigments of bixa Orellana (Bixaceae) seeds" Internationa Journal nof Pharmacy and Pharmaceutical Sciences: 2012:4(5): 37-359.

[4]. G. Sudha Rani,G. Pooja, V. Harshvardhan, B. Vamshi Madhav, B.Pallavi, Formulation and Evaluation of Herbal Lipstick from Beetroot (Beta vulgaris) Extract.Research Journal of Pharmacognosy and Phytochemistry. 2019;11(3):197-201. doi:10.5958/0975-4385.2019.00034.7

[5]. Devika R. Kotekar1, RakshataDesai, Nagesh C., Suma N., Pratiksha Patil and Aishwarya Patil.Formulation and Evaluation of Herbal Lipstick Using Natural Colorants.World Journal of Pharmaceutical Research: Volume 11, Issue 4, 1335- 1344.

[6]. D. A. Bhagwat, N. D. Patil, G. S. Patel, S. G. Killedar, H. N. More. Formulation and Evaluation of Herbal Lipstick using Lycopene Extracted from Solanum lycopersicum L. Research J. Pharm. and Tech. 2017; 10(4): 1060-1064. doi: 10.5958/0974-360X.2017.00192.5

[7]. Adam Burrows J.D., Palette of Our Palates: A Brief History of Food Coloring and Its Regulation Comprehensive Reviews in Food science and Food Safety, 8, 394. (2009)

[8]. Nadkarni A.K. Indian Materica Medica, 3rd ed, vol. II. Popular Prakashan, Mumbai .1975.

[9]. Benett, W. et.al, Cosmetic Formulary, Edn-II, Chemical publishing Company, New York, 1983: 90-100.

[10]. Kamlesh.D.Mali et al., "Formulation and Evaluation of Herbal Lip Rouge," 2019.

[11]. G. Sudha Rani, G. Pooja, V. Harshavardhan, B. Vamshi Madhav, B. Pallavi Formulation and Evaluation of Herbal Lipstick from Beetroot (Beta vulgaris) Extract Department of Pharmacy, Joginpally B.R. Pharmacy College, Yenkapally (V), Moinabad(M), Hyderabad-500075.

[12]. Sandhyarani Gajare*, Utkarsha Shivsharan Formulation and Evaluation of Herbal Lipstick from Beetroot Powder D.S.T.S. Mandal's College of Pharmacy, Solapur 413004.

[13]. Gayatri D. Karwate, Madhuri B. Wankhade, Swati P. Deshmukh. Prajakta V. Muthal, Formulation and Evaluations of Beet Root

Herbal Lipstick, https://doi.org/10.5281/zenodo.11389136.

[14]. Adam Burrows J.D., Palette of Our Palates: A Brief History of Food Coloring and Its Regulation Comprehensive Reviews in Food science and Food Safety, 8, 394. (2009)

[15]. Swetha Kruthika V, S Sai Ram, Shaik Azhar Ahmed, Shaik Sadiq, Sraddha Deb Mallick, and T Ramya Sree, "Formulation and Evaluation of Natural Lipsticks from coloured pigments of Beta Vulgaris Taproot", Journal of Pharmacy and Pharmaceutical Sciences, July-September 2014; 3: 65-68.

[16]. Piccinin MA, Zito PM. Anatomy, Head and Neck, Lips. [Updated 2023 Jun 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507900/

[17]. Carey, J.C., Cohen, M.M. Jr., Curry, C., Devriendt, K., Holmes, L., Verloes, A. 2009. Elements of morphology: Standard terminology for the lips, mouth, and oral region. Am J Med Genet Part A 149A: 77-92. [PubMed]

[18]. Brizuela M, Winters R. Histology, Oral Mucosa. [Updated 2023 May 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan- . Available from: https://www.ncbi.nlm.nih.gov/books/NBK572115/

[19]. Sayali N. Gade*, Ajay K. Shirsat, Geetanjali G. Tambe, Dr. Sagar S. Muley, Toxicity and Adverse Effects of Herbal Ingredients in Cosmetic Products: A Comprehensive Review, Int. J. of Pharm. Sci., 2024, Vol 2, Issue 10, 1837-1842. https://doi.org/10.5281/zenodo.14016553

[20]. Wu SQ, Pan BL, An Y, An JX, Chen LJ, Li D. Lip Morphology and Aesthetics: Study Review and Prospects in Plastic Surgery. Aesthetic Plast Surg. 2019 Jun;43(3):637-643. [PubMed]

[21]. Gediya SK, Mistry RB, Patel UK, Blessy M and Jain HN: Herbal plants: Used as cosmetics. J. Nat Prod Plant Resour. 2011; 1: 24-32.

[22]. Saha R: Cosmeceuticals and herbal drugs: practical uses. International Journal of Pharmaceutical Research and Sciences, 2012; 3: 59-65.

[23]. Kapoor VP: Herbal Cosmetics for skin and hair care. Natural Product Radiance, 306-314.

[24]. Rao Diwan PV: Herbal formulation useful as therapeutic and cosmetic applications for the treatment of general skin disorders, 2001.US6200570 B1.

[25]. Benett w, Benett s. cosmetic Formular,ll. Ed. Chemical publishing company, (NV);1983.

[26]. Rajesh kumar nema, kamal Singh Rathore, BAL Krishna Dubey; Text of cosmetics. 1"Ed. New Delhi; Publication & Distributors'2009.p.69-81.

[27]. Chattopadhyay pk. Herbal cosmetics and ayurvedic medicines, led. National institute of industrial research;2005.(P.45-50).

[28]. Chattopadhyay P.K. (2005). Herbal Cosmetics and Ayuvedic Medicines, Ied. National Institute of Industrial Research, PAGE NO.45-50.

[29]. Sainath M, Kumar KS, Babu KA. Formulation and evaluation of herbal lipstick. International Journal of Advanced Research In Medical and Pharmaceutical Sciences (IJARMPS), 2016; 1(1).

[30]. Jamdade K, Kostha A, Jain N, Dwivedi S, Malviya S, Kharia A. Formulation and Evaluation of Herbal Lipstick Using Beta Vulgaris and PunicaGranatum Extract. International Journal of Pharmacy and Life Sciences, 2020; 1: 11(4).

[31]. Akilandeswari K, Shanthini N, Formulation and Evaluation of Herbal lipsticks, 2018; 1(1): 1-10.

[32]. Sandhyarani Gajare, Utkarsha Shivsharan, Dr. A. H. Hosamani Formulation and Evaluation of Herbal Lipstick from Beetroot Powder D.S.T.S. Mandal's College of Pharmacy, Solapur 413004, Maharashtra, India 2Government College of

Pharmacy, Karad, Maharashtra, India June 2023.

[33]. Swetha Kruthika V, S Sai Ram, Shaik Azhar Ahmed, Shaik Sadiq, Sraddha Deb Mallick, and T Ramya Sree, "Formulation and Evaluation of Natural Lipsticks from coloured pigments of Beta Vulgaris Taproot", Journal of Pharmacy and Pharmaceutical Sciences, July-September 2014; 3: 65-68.

[34]. Anilkumar V., Kalyani R., Sangeeta Kumari L. Design, Development And Evaluation of Herbal Lipstick from Natural Colour Pigment. International journal of pharmacy and pharmaceutical Research. May 2020; volume-18: issue 2.