



RESEARCH ON: FORMULATION AND EVALUATION OF HERBAL LIPSTICK FROM BEETROOT (*BETA VULGARIS*) EXTRACT

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ABSTRACT

The word cosmetics or makeup are applied on the skin to enhance the overall appearance. There are so many makeup items are available the market like lipstick, kajal, mascara, eye liner etc. Lipstick is used for enhancing appearance, look attractive and protection of lips. It's available in the market in variety of shades and form like liquid as well as stick. Lipstick containing synthetic colorants which are made up of harmful chemicals and it is very harmful for our skin. It creates so many problems like- allergy, nausea, dermatitis, and drying of the lips and in more severe form they can be carcinogenic and even fatal. So, the demand of the cosmetics containing herbal ingredients increased universally because it is safe. The main aim of this work is to formulate and evaluate natural lipstick from colored pigments of *Beta vulgaris* taproot by using natural colouring pigment and minimizing the side effects of synthetic formulations.

KEYWORDS: Beetroot, acacia, vanilla essence, bees wax, evaluation tests.

INTRODUCTION:

According to Drug &Cosmetics act 1940 and rules 1945, cosmetic means any article intended to be sprayed, poured, rubbed or sprinkled on, or introduced into, or applied to the human body or its any part for cleansing, beautifying, promoting attractiveness or altering the appearance. It also includes any articles intended for use as a component of cosmetic. Cosmetics are substances used to enhance the appearance of the human body. Cosmetics include skin-care creams, lotions, powders, perfumes, lipsticks, fingernail and toe nail polish, eye and facial makeup, permanent waves, colored contact lenses, hair colors, hair sprays and gels. Deodorants, baby products, bath oils, bubble baths, bath salts, butters and many other types of products are in great demand in both developing and developed countries.

ANATOMY OF LIPS

Lips are a visible body part at the mouth of many animals, including humans. Lips are soft, movable, and serve as the opening for food intake and in the articulation of sound and speech.

Labium superius oris and Labium inferius oris – This are the upper and lower lips respectively.

vermilion border- The juncture where the lips meet the surrounding skin of the mouth area is the vermillion border.

vermilion zone- Reddish area within the vermillion borders is called the vermillion zone.

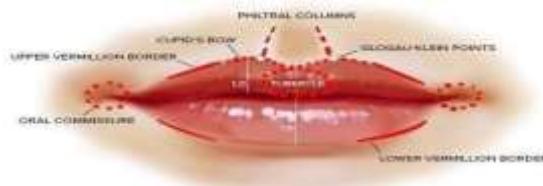


Figure 1: Anatomy of lips

The skin of the lip, with three to five cellular layers, is very thin compared to typical face skin, which has up to 16 layers. With light skin colour, the lip skin contains fewer melanocytes (cells which produce melanin pigment, which give skin its colour). Because of this, the blood vessels appear through the skin of the lips, which leads to their notable red colouring. With darker skin colour this effect is less prominent, as in this case the skin of the lips contains more melanin and thus is visually darker. The skin of the lip forms the border between the exterior skin of the face, and the interior mucous membrane of the inside of the mouth.

The lip skin is not hairy and does not have sweat glands. Therefore, it does not have the usual protection layer of sweat and body oils which keep the skin smooth, inhibit pathogens, and regulate warmth. For these reasons, the lips dry out faster and become chapped more easily.

The lower lip is formed from the mandibular prominence, a branch of the first pharyngeal arch. The lower lip covers the anterior body of the mandible. It is lowered by the depressor labii inferiors muscle and the orbicularis oris borders it inferiorly.

The upper lip covers the anterior surface of the body of the maxilla. Its upper half is of usual skin color and has a depression at its center, directly under the nasal septum, called the philtrum, which is Latin for "lower nose", while its lower half is a markedly different, red-colored skin tone more similar to the color of the inside of the mouth, and the term vermillion refers to the colored portion of either the upper or lower lip.

• HERBAL LIPSTICKS: -

The lips constitute the most sensitive part of our body and it is also very close to the nose and mouth. The natural aroma and colors compounds used in the lipstick, by transdermal absorption of the skin, lips and also inhaling the vapors of selected combinations of aroma principles could release neurochemicals in the brain through the receptors in the mouth (lips) and nose takes the desired effects.

Herbal lipsticks are used to impart an attractive color, texture and protects to lips. Lipstick is a cosmetic product containing waxes, oils, pigments and dyes, alcohol and fragrance, preservatives and antioxidants, colors, surfactants. These lipstick preparations do not damage to our lips and no side effect. They involve a color change as well as shine and smooth out of wrinkles and folds on lips. It is a most famous cosmetics items and available in different styles, design and packaging of lipstick. Lipstick having many advantages it should be protect lips from dryness and cracking. It brightens your smile and provides hydration to our lips. It should be free from grittiness should be non-drying required plasticity. In herbal lipstick many natural nutrients available safe for lips. It is free from chemicals like paraben, sulphate, phthalate and others its unsafe to consume that's why we are doing herbal lipstick like bee's wax, beetroot juice, castor oil, vanilla essence. Coloring lips in an ancient practice date back to prehistoric period. In present days the use of product has increased and choice of shades of colors textures, luster, have been

changed and become wider.

In recent time's lipsticks have been under the scanners of many health watchers. Lipsticks are often eaten away by the user and hence it is imperative that health regulators have a microscopic look at the ingredients that go in to the lipstick. The dyes that contribute to the color of the lipstick are dangerous to humans on consumption. In a mild form, the coal tars that are the basic ingredients from which synthetic dyes are formed can cause allergy, nausea, dermatitis, and drying of the lips. In a more severe form they can be carcinogenic and even fatal. Due to various adverse effects of available synthetic preparation the present work was conceived by me to formulate an herbal lipstick having minimal or no side effects which will extensively use by the women of our communities with great surety and satisfaction.

DIFFERENT TYPES OF LIPSTICK AND THEIR USES

You can find various kinds of lipsticks and they can be utilized based on your mood or shape of one's lips. Today's lipstick market contains number of products with many effects and characteristics. Below are a few forms of lipsticks with basic characteristics.

Moisturizing Lipsticks: -

Individuals who have dry lips should use moisturizing lipsticks as it keeps lips soft and smooth. These lipsticks moisturize lips due to ingredients like vitamin E, glycerin and aloe. Other great things about using moisturizing lipsticks are wet and very shiny lips.

Satin and Sheer Lipsticks: -

These lipsticks also moisturize and nourish lips and ensure it is shiny and glossy. Sheer and satin lipsticks have high oil ingredients and they could appear darker in the package than they are on lips. Another characteristic of lipsticks with oil components is that it must be replied many times.

Mate Lipstick: -

Mate lipsticks are perfects selection for women who are seeking colorful and nice shade. These lipsticks have affection of flat and not shiny lips. Your lips will look smoother and younger with matte lipstick. Plus, it is advised to mix products with vitamin E and aloe with mate lipsticks.

Cream Lipstick: -

Women who'd small lips should use cream lipsticks. Lipstick with cream formula is not shiny, but it's smooth influence on lips. You need to use lip gloss afterward for desire look. Cream lipsticks contain more wax to be able to protect lips, but also cause after effect of dry lips.

Pearl and Frosted Lipstick: -

Frosted lipstick makes lips sparkle and glisten. Pearl and frosted lipstick reflects light and makes very shiny effect on your own lips. Negative effects are that could cause lips feel heavy, crack and dry. It is advised to moisturize your lips before utilize this lipstick.

Gloss Lipstick: -

Gloss is extremely popular lipstick for girls with thin and small lips because make lipsshine and improve the dimension of depth. Gloss may be along with traditional lipstick.

Long Wearing and Transfer Resistant Lipsticks: -

Women who don't have time to utilize Lipstick frequently may use long wearing lipstick. These lipsticks have formula that keep lips look perfect from 4-8 hrs. They're resilient and soon you eat something greasy or oily. Many of them contain moisturizer to balance the dryness of lips.

IDEAL CHARACTERISTICS OF GOOD LIPSTICK

- 1) It should be non - irritant.
- 2) It should have required plasticity.
- 3) It should non-toxic.
- 4) It should be stable (physically and chemically).
- 5) It should not dry on storage.
- 6) It should be free from gritty particle.
- 7) It should be long lasting.
- 8) Its appearance should be smooth, shiny and free from sweating.
- 9) It should have pleasant taste, odor and flavor.
- 10) It should not melt or harden within reasonable variation of climatic temperature.

ADVANTAGES OF NATURAL LIPSTICKS OVER EXISTING SYNTHETICONES

- Herbal colors are non-toxic, highly lipophilic, antioxidant and anti-microbial anti- inflammatory and are used in leukoderma more particularly of lips.
- Colorant has different original shades of colors from purplish red, ruby red, beetroot purple, dark violet, pastel red, pale red, purplish red, rose red, deep magenta, dark purple, orange, deep violet.
- From these colors, by different combinations, further shades can be obtained. Color may be changed to different shades with organic and inorganic acids and bases.

BEETROOT (Garden beets):

SCIENTIFIC CLASSIFICATION



Kingdom	Plantae
Order	Caryophyllales
Family	Amaranthaceae
Genus	Beta
Species	Beta vulgaris
Subspecies	Beta vulgaris subsp. vulgaris

Figure 2: Beetroot

Beetroot (*Beta vulgaris*) is a plant in the Chenopodiaceae family that is now included in the Amaranthaceae family. It is best known for its many cultivated varieties, the best known of which is the root vegetable known as beets or garden beets. Beet (*Beta vulgaris*) is the main source of natural red dye, known as "beet red". Beet roots and leaves have been used in traditional medicine to treat a wide variety of ailments. The ancient Romans used beets as a treatment for fever and constipation, among other ailments. The color of red / purple beets is due to a variety of betalain pigments and is used industrially as a red food colouring and can be used as a colouring agent in lipsticks.

USES OF BEET: -

- Garden beets are reported to have powerful detoxification
- Kidney ailment
- Increases sex drive
- Lowers cholesterol, blood pressure
- In skin disorder
- Decomposition of anticarcinogen factors
- Antioxidant

METHODS AND MATERIAL: -

Collection of plant material

The various herbs used in present formulation of herbal lipsticks were selected on the basis of literature survey. The herb used in formulation of herbal lipstick i.e. Beetroot was procured from local market of kankavli, sindhudurga.

Pigment Extraction Procedure –

Method –I

Decoction process was used for the extraction of color pigment and it was prepared by boiling the beetroot with ethanol. The vegetable material was cut into slices having approximately 21mm length, 5mm width and 1-2mm and boiled with ethanol at 60 to 80 °C approximately for 15 min. The starting ratio of crude drug to ethanol is 1:6; the volume is then brought down to one-fourth its original volume by boiling during the extraction procedure. Then, the concentrated extract is filtered and used as such in the formulation. Dark reddish colored extract was obtained. The concentrated extract was then kept in desiccators to remove the excessive moisture. The dried extract was packed in air tight glass container for further studies.

Method-II

Extraction of pigment was done by homogenization of equal ratio of pulp and solvents (1/1 w/v). Typically, 100 g of peeled beetroot, of watery consistency, was shacked and macerated with 100 ml solvents (EtOH, aqueous ethanol 50:50) for 15 min using ice cooling condition. Aqueous mixture was then centrifuged at 18,000 rpm and 4°C for 20 min followed by filtration on nylon mesh. Ethanol was completely removed after concentration process and samples were kept in a dark vessel.

COMPOSITION OF HERBAL LIPSTICK

Table 1: composition of lipstick formulation

SR.NO.	INGREDIENT	IMPORTANCE	QUANTITY
1	Olive oil	Blending agent	1 ml
2	Paraffin wax	Glossiness	6 g
3	Bees wax	Glossy and hardness	14 g
4	Pigment-betanin	Coloring agent	5 g
5	Acacia	Surfactant	1 g
6	Lemon juice	Anti-oxidant	1 ml
7	Vanilla essence	Preservative	1 ml
8	Perfume	Fragrance	Q.S.

USES OF INGREDIENTS: -

1. BEES WAX:

- ❖ It is thickening agent.
- ❖ Bees wax is used in lip-balm, lip-gloss and hand creams.
- ❖ Bees wax can help to the lips.
- ❖ Bees wax helps retain moisturizing skin.
- ❖ Bees wax is widely used in cosmetic products.

2. WHITE SOFT PARAFFIN:

- ❖ It is used in many cosmetic and personal care products like lipstick, lotion, creams.
- ❖ It reduces friction on the skin.
- ❖ It is used as emollient.
- ❖ It helps to restore the skin's smoothness, softness and flexibility.

3. OLIVE OIL:

- ❖ It softens lips.
- ❖ It provides superior hydration.
- ❖ It relieves from cracked and chapped lips.
- ❖ It gives natural SPF Protection.

4. ACACIA: -

- ❖ It is emulsifying and a suspending agent.
- ❖ It's increasing the viscosity of lipstick.
- ❖ Preventing the colour from lightening.
- ❖ It's used to demulcent.
- ❖ Maintenance the thickness of lipstick.

5. VANILLA ESSENCE: -

- ❖ It is used in an ingredient of herbal lipstick.
- ❖ The role of vanilla essence is flavouring agent.
- ❖ It is the natural of lipstick.
- ❖ It gives the different color and flavour of herbal lipstick.
- ❖ it softens the lips, nourishes and protects them against environmental impact.

6. PERFUME: -

- ❖ It is used as fragrance.
- ❖ It is used to create a more natural aroma.
- ❖ It is used to give the pleasant scent.

METHOD OF PREPARATION OF LIPSTICK: -

- First, the raw ingredients for the lipstick are melted and mixed separately because of the different types of ingredients used.
- One mixture contains the solvents; a second contains the oils, and third contains the fats and waxy materials. These are heated in separate stainless steel or ceramic containers.
- The solvent solution and liquid oils are then mixed with the color pigments.
- After the pigment mass is prepared, it is mixed with hot wax
- The mixture is agitated to free it of any air bubbles. Then it is poured into tubing moulds, cooled and separated from the moulds.
- After final touch up and visual inspection, the lipstick is ready for packaging.

EVALUATION OF HERBAL LIPSTICK: -

PRE-FORMULATORY EVALUATION OF HERBAL LIPSTICK-

To evaluate the preformulatory control tests including visual assessment and powder characteristics are performed. Also to assure the quality of product.

Physical appearance /visual assessment –

The formulations prepared were evaluated in terms of their color, glossy and texture.

➤ **PH: -**

The pH was determined using digital pH meter. Twenty (20ml) of the juice was transferred into a beaker and the pH was determined after the meter was calibrated using standard buffer of pH 4.0 and 7.0, sufficient time was allowed for stabilization before readings were taken.

➤ **Powder Characteristics: –**

General powder characteristics includes evaluation of those parameters which are going to affect the external properties (like flow properties, appearance, packaging criteria etc.) of the preparation, Characteristics evaluated under this section are particle size, angle of repose, bulk density and tapped density.

➤ **Particle Size: –**

Particle size is a parameter, which affect various properties like spread ability, grittiness etc., particle size was determined by sieving method by using I.P. Standard sieves by mechanical shaking for 10 min.

➤ **Angle of repose: –**

It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow.

➤ **Funnel method: –**

Required quality of dried powder is taken in a funnel placed at a height of 6 cm froma horizontal base. The powder was allowed to flow to form a heap over the paper on the horizontal plane. The height and radius of the powder was noted and recorded the angle of repose (θ) can be calculated by using the formula.

$$\theta = \tan^{-1}(h / r)$$

Where, θ – Angle of repose, h – Height of the heap, r – Radius of the base

➤ **Bulk density: –**

Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder upto 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder is measured. Then the powder is weighed. This is repeated to get average values. The Bulk Density is calculated by using the below given formula.

$$\text{Bulk density} = \text{Mass of powder} / \text{Volume of cylinder}$$

➤ **Tapped density: –**

The tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass readings are taken until little further volume or mass change was observed. It was expressed in grams per cubic centimeter (g/cm3).

Tapped density = Weight of powder / Tapped volume of powder

➤ **Moisture content:** -

Moisture content was determined by

% Moisture content = Loss in weight / weight of sample * 100

QUALITY CONTROL TESTS: -

It is very essential to maintain a uniform standard for herbal lipstick, keeping this view in mind the formulated lipstick was evaluated on the parameters such as melting point, breaking point, force of application, surface anomalies etc. which are as follows: -

1) Physical appearance /visual assessment: –

The formulations prepared were evaluated in terms of their color, odor, texture, etc.

2) PH parameter: -

The pH of formulated herbal lipstick was determined using pH meter.

3) Melting point: -

Determination of melting point is important as it is an indication of the limit of safe storage. The melting point of formulated lipstick was determined by capillary tube method the capillary was filled, keep in the capillary apparatus and firstly observed the product was slowly melted. After sometimes was observed the product was completely melted. The above was done in 3 times and the melting point was observed.

Softening point: -

Place the lipstick with protruded salve in the flat bottom tube. Fix the thermometer through a cork in such a way that the bulb of the thermometer just touches the lipstick salve. Insert this arrangement into a 1-liter beaker filled with water to a levelone centimeter above the upper tip of the lipstick salve. Slowly heat the water while stirring so that temperature rises at a rate not exceeding 2°C per minute. When the temperature reaches about 45°C, raise the temperature at the rate of 1°C per minute. Constantly watch the lipstick salve. Record the temperature when the salve starts bending and losing its shape.

Breaking point: -

Breaking point was done to determine the strength of lipstick. The lipstick was held horizontally in a socket 1/2 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.

Force of application: -

It is test for comparative measurement of the force to be applied for application. A piece of coarse brown paper can be on a shadow graph balance and lipstick can be applied at 45° angle to cover a 1 sq. inch area until fully covered. The pressure reading is an indication of force of application.

Surface anomalies: -

This was studied by the surface defects, such as no formulation crystals on surfaces, no contamination by moulds, fungi etc.

Aging stability: -

The product was stored in 40°C for period of 1 hour. Various parameters such as bleeding, crystallization of on surface and ease of application were observed.

Solubility test: -

The formulation herbal lipstick was dissolved in various solvents to observe the solubility.

Skin irritation test: -

It is carried out by applying product on the skin for 10 min.

Perfume stability: -

The formulation herbal lipstick was tested after 30 days, to record the fragrance.

RESULT: -

Table 2: Results of pre-Formulatory evaluation

SR. NO.	Test	Observation
1	Color	Dark red
2	Shape	Round
3	PH	6.3
4	Particle size	480 nm
5	angle of repose	26.12 °
6	Bulk density	0.55 g/cm3
7	Tapped density	0.50 g/cm3
8	Moisture content	87.4 %

Quality Control Tests/ Post Formulatory Evaluation-**Physical appearance: –**

On the basis of organoleptic properties, the following observations of formulation are observed and studied.

Sr. No	TEST	OBSERVATION	STANDARD OBSERVATIONS
1	Color	Pinkish Red	Red/pinkish red
2	Odor	Pleasant	Pleasant
3	Texture	Smooth	Smooth

Sr. No	Test	Observation	Standard observation
1	pH	6.5	6.4
2	Melting point	61-63°C	60-66°C
3	Softening point	61°C	>55°C
4	Breaking point	24 gm	-
5	Force of application	Smooth	Smooth
6	Surface anomalies	No defect	No defect
7	Aging stability	Smooth	Smooth
8	Solubility in chloroform	soluble	-

Skin irritation test: -

It is carried out by applying product on the skin for 5 min, 10min,15min and observations was made.

SR NO.	TEST	OBSERVATION	STD. VALUES
1	Application for 5 min	No irritation	No irritation
2	Application for 10min	No irritation	No irritation
3	Application for 15min	No irritation	No irritation

Perfume stability: -

The formulation herbal lipstick was tested after 10 days,20 days and 30 days, to record the fragrance.

SR NO.	TEST	OBSERVATION	STD. VALUES
1	After 10 days	Stable	Stable
2	After 20 days	Stable	Stable
3	After 30 days	Stable	Stable

CONCLUSION: -

The study was undertaken with an aim to formulation and evaluation of herbal lipsticks from the coloured pigments of Beta vulgaris. To overcome the adverse effects of the synthetic lipsticks, it was concluded that this formulated herbal lipstick having minimal and no side effects and thus showing maximum local effect on lips an herbal lipstick is used to rejuvenate the lips muscles maintain the elasticity of the skin, remove adhered dirt particles and improve the blood circulation. The benefits of Herbal based cosmetics are their nontoxic nature. It nourishes the lip skin. This lipstick supplies vital nourishment to the lip. It helps in the elimination of wrinkles, cracking, dryness and folds on lips. Lipstick exfoliates little and provides a soothing, calming and cooling effect on the lip. They restore the natural shine of lip in the optimum time period. Frequent Uses of natural lipstick improve lip texture. Attractive colour. Pollution and harsh climates badly affect the lip and these effects can be countered by the regular usage of Herbal lipstick. They help to retain the elasticity of lip cells, thereby controlling premature aging of the lips. Wrinkles, Fine lines, can be effectively controlled by using natural lipstick. In this work, I found excellent properties of the herbal lipstick and further studies are needed to be performed to ascertain more useful benefits of herbal lipstick as cosmetics. Natural remedies are accepted nowadays with open hands as they are safer with fewer side effects than the chemical based products. Herbal formulations are required in large amounts to fulfil the needs of the growing world market. It is an effective attempt to formulate the herbal lipstick containing different natural nutrients.

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