



# Formulation And Evaluation Of Herbal Lipsticks Employing Natural Pigments Like Betalain (Beet Root), $\beta$ -Carotene (Carrot), Anthocyanin (Rose Petals) And Their Comparative Approach

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**ABSTRACT:** Herbal word is a symbol of safety in contrast to synthetic one which has adverse effects on human health. Herbal preparations like herbal tablets, herbal tonic, herbal paste, herbal creams, herbal shampoos and herbal lipstick etc. has become more popular among the consumer herbal medicines represent the fastest growing segment to heal the various ailments. Coloring skin particularly skin of face or lips is an ancient practice going back to prehistoric period. In present days the use of such products has increased and choice of shades of color, texture and luster have been changed and become wider. This can be observed from the fact that lipsticks are marketed in hundreds of shades of colors to satisfy the demand of women. The present investigation was done to formulate herbal lipsticks using three natural pigments of beetroot, carrot and rose petals since lipsticks are one of the key cosmetics to be used by the women. Attempt was also made to evaluate the formulated herbal lipstick. The results showed that all the lipsticks were stable and had a good force of application while the breaking point reached 25-31g. The melting point of the lipsticks was in the range of 57°C-65°C while the pH test resulted in the range of 5.7-6.9. The lipsticks

themselves did not cause any irritation, so they were safe to wear. The lipstick formulations had met the physical requirements, stability standard, as well as a safety requirement.

**Key words:** - Herbal, Lipsticks, Non-Irritant, Pigments, Safety

## AIM & OBJECTIVE OF THE WORK

### Aim:

The present study was aimed at formulating and evaluating lipsticks containing natural pigments

### Objective:

The present work was undertaken with the following objectives,

- To extract natural coloring pigments from beetroot, carrot and rose petals
- To formulate the lipsticks using the extracted natural pigments
- To evaluate the lipsticks prepared from natural pigments

## 1. INTRODUCTION TO LIPSTICKS

**Cosmetics** are constituted mixtures of chemical compounds derived from either natural sources, or synthetically created ones.<sup>[1]</sup> Cosmetics have various purposes. Those designed for personal care and skin care can be used to cleanse or protect the body or skin. Cosmetics designed to enhance or alter one's appearance (makeup) can be used to conceal blemishes, enhance one's natural features (such as the eyebrows and eyelashes), add color to a person's face, or change the appearance of the face entirely to resemble a different person, creature or object. Cosmetics can also be designed to add fragrance to the body. Cosmetics is constituted from a mixture of chemical compounds derived from either natural sources, or synthetically created ones.

In the United States, the Food and Drug Administration (FDA), which regulates cosmetics,<sup>[2]</sup> defines cosmetics as products "intended to be applied to the human body for cleansing, beautifying, promoting attractiveness, or altering the appearance without affecting the body's structure or functions". This broad definition includes any material intended for use as an ingredient of a cosmetic product, with the FDA specifically excluding pure soap from this category.<sup>[3]</sup>

Cosmetics are substances or products used to enhance or alter the appearance of the face or fragrance and texture of the body. Since ages, cosmetic products are on primary demand for enhancing the beauty, used by both men and women. Many cosmetics are designed for applying to hair, body and face. These are generally mixture of chemical compounds. One of these is lipsticks, especially for females, intended to color the lips. Used for thousands of years, in a variety of shades, according to the timely fashion.

Lipsticks, is also termed as lip cosmetics, are widely used by women. Lipsticks have become so popular in the last couple of decades that they are now probably used more than any other single cosmetic product. Its popularity can be gauged from the fact that market has been flooded with plenty of products with hundreds of shades<sup>[4]</sup>

Lipsticks are made from hydrophobic materials, when the solid formula is applied to the lip surface, friction melts it briefly and allows for transfer. The material cools and re-forms creating a film that sticks to the surface due to hydrophobic interactions. In addition to the hydrophobic base, color is another key ingredient in lipstick. The color reflects light of a certain wave length to give the impression of a new color on the surface. Silicones and oily materials are also added to reflect light and provide shine<sup>[5]</sup>

### 1.1 Characteristics of ideal lipstick:

- ★ It should cover lips adequately.
- ★ It should have long last effect.
- ★ It should make lips soft.
- ★ It must adhere firmly to lips without being brittle and tacky.
- ★ It should have good degree of quality.
- ★ It should be completely free from grittiness.
- ★ It should be non – drying.
- ★ It should be non- irritating to skin of lips.
- ★ It should have desirable degree of plasticity.
- ★ It should have high retention of colors intensity without any change in shades.
- ★ It should have pleasant odour and flavour.
- ★ It should be free from sweating.
- ★ It should have shiny and smooth appearance.
- ★ It should be easily applicable and removable.
- ★ It should be stable both physically and chemically.
- ★ It should not dry on storage.

### 1.2. Herbal Cosmetics:

Herbal cosmetics have expanding demand in the world market and are a helpful gift of nature. There is a wide range of herbal cosmetics products to satisfy your beauty establishment, adding herbal in cosmetics is much protected for the skin. Human beings have been using herbs for disparate directions like food, medicine, beautifying with the advancement of science and technology use of natural things counting plants has been reduced except for food, vegetarian takes to plant and plant only. However, there is the rebound of the use of herbs both as drugs and cosmetics. Human skin acts as a protective barrier, through which natural ingredients penetrate. Therefore, consumers always search for natural-based cosmetics to avert allergic conditions or reactions and any sort of side effect lipstick is a lip tinting agent that has its primordial use dating back to the archaic age. At present, the popularity of this product has increased and the choice of its different shades, texture, and lustre has become very demanding.

#### 1.2.1 Advantages of herbal cosmetic over synthetic cosmetics:

Herbal cosmetics are popular nowadays and are favoured over chemicals as these products afford nutrients to the body boost health and are free from synthetic chemicals and have no side effect as related to synthetic cosmetics. Some of the advantages of using natural cosmetics which make them a better choice over synthetic ones are safe to use, compatible with body, natural in nature, affordable and non-expensive, variety of products, no side effects and not tested on animals.

### 1.3. FORMULATION OF LIPSTICKS:

Lipstick contains wax, oils, antioxidants, and emollients. Wax provides the structure to the solid lipstick. Lipsticks may be made from several waxes such as beeswax, ozokerite and candelilla wax. Because of its high melting point, carnauba wax is a key ingredient in terms of strengthening the lipstick. Various oils and fats are used in lipsticks, such as olive oil, mineral oil, cocoa butter, lanolin, and petrolatum <sup>[6]</sup>

### 1.3.1 Composition <sup>[7]</sup>

The raw materials involved the formulation of the lipsticks could be as follows:

#### 1) The Solid Components/Waxes

The solid components are responsible for the final structure of the product by solidifying the liquid matrix. The materials required for attaining a reasonable body, hardness, melting point and shrinkage necessary for the easy release of the mold are together referred to as natural waxes <sup>[8]</sup>

- **White Bees wax**

It is so known as the common wax and forms the oily base in the formulation of lipsticks.

**Source:** It is naturally obtained from honey combs of the honey bee *Apis mellifera*.

**Melting Point:** The ranges between 62 - 65°C.

**Concentration:** It is used in concentrations of about 3-10% of the total formulation.

**Available Forms:** It is available in the form of blocks, pills, slabs and cakes. The commercially available bleached form is widely used.



Figure 1: White Bees wax

#### Uses:

1. It forms an important base and is extensively used for entrapping castor oil.
2. It has good plastic property and can be readily deformed when it is warmed.
3. It is used as a traditional stiffening agent for lipsticks.
4. It forms a good base in the formulation of moulded products.

#### Advantages:

1. It is compatible with vegetable minerals and animal waxes.
2. It can be moulded into required form.

#### Disadvantage:

1. When it is used at a concentration of more than 20%, it forms a dull film on the surface of the lips.
2. It is usually mixed along with other waxes such as Ozokerite wax, carnauba wax and candelilla wax.

- **Ozokerite Wax**

**Source:** It is a type of amorphous hydrocarbon obtained naturally, from bituminous products.

**Melting Points:** It is available in various grades with melting point ranging between 56°C 82°C.

**Concentration:** It is used in a concentration range of between 5 to 10%.

#### Uses:

1. It is used in order to increase the Melting point of the base.
2. It is also efficient in promoting the formulation of a fine crystalline wax gel and thus ensures the maximum retention of the Oil matrix.
3. It can be easily transformed into required shapes.



**Figure 2: Ozokerite Wax**

**Advantage:**

It is easily available in various grades.

**Disadvantage:**

It may be subjected to adulteration.

- **Ceresine Wax**

**Source:** It is also obtained naturally from the bituminous products like the Ozokerite wax.

**Melting Point:** The melting point range is between 60-75°C.



**Figure 3: Ceresine Wax**

**Uses:**

1. It is used as stiffening agents to provide firmness to the finished product.
2. It is used to increase melting point of the base.

- **Candelilla Wax**

**Source:** It is obtained from Euphorbiaceae plants such as Euphorbia cerifera and Euphorbia antisiphilitica. The extraction involves the immersing of the plant in boiling water containing sulfuric acid and later skimming off the wax that rises to the surface.

**Melting Point:** Its melting point ranges between 65- 75°C.



**Figure 4: Candelilla Wax**

**Uses:** It is used to increase the hardness and melting point of the product either alone or in combination with carnauba wax.

- **Carnauba Wax**

**Source:** It is obtained as exudates from the pores of the leaves of the Brazilian wax palm tree *Copernicia prunifera*. The extraction involves cutting, drying and heating of the leaves.

**Melting Point:** Its melting point ranges between 81 -90°C.

**Available Forms:** It is available in three colors yellow, gray and brown. It is available in hard forms and soft forms.

**Uses:**

1. It is used to provide rigidity to the stick.
2. It is used in modest proportion in order to ensure high melting points.
3. It helps in Moulding by shrinking the stick away from the surface of the Mould in order to aid easy removal.

**Disadvantage:** It is not miscible with the other waxes and remains as a separate solid phase due to its high melting point.

- **Hard Paraffin**

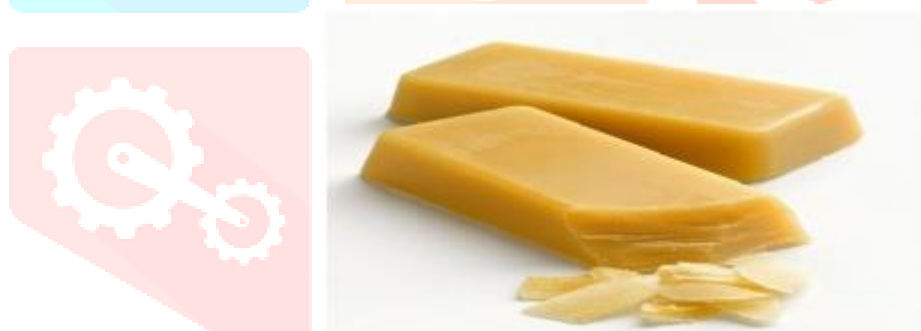
**Source:** It may be present as a purified blend of several solid Hydrocarbon bases that are obtained from petroleum.

**Melting Point:** Its melting point ranges between 55° C - 65°C.

**Uses:**

1. It is occasionally used in minor quantities to improve the gloss of the finished products.
2. It imparts rigidity to the product.

**Disadvantage:** It has limited solubility in the castor oil and hence doesn't dissolve and may provide a greasy look.



**Figure 5: Hard Paraffin**

## 2) The Liquid Components

The liquid components are mostly constituted by the oils such as mineral oil, vegetable oil, castor oil, alcohol etc. The properties of the oils should be as follows:

- (i) It should possess good dissolution properties in order to dissolve all the bromo acids.
- (ii) It should possess an optimum viscosity range.
- (iii) It should be colourless, odourless and tasteless.
- (iv) It should be non-toxic and non-irritating.
- (v) It should be easily compatible and stable.

The most commonly used liquid components may be as follows:

**(a) Mineral Oils**

- (i) They consist of a blend of hydrocarbons obtained from petroleum source.
- (ii) They may be available as either light mineral oils or heavy mineral oil.
- (iii) They are mostly used in order to impart gloss to the product rather than their solvent property.

**(b) Vegetable Oils**

The vegetable oils used may be sesame oil and olive oil. The vegetable oils provide low solubility towards staining dyes and hence less commonly used.

**(c) Castor Oil**

It is obtained from the seeds of the castor plant, *Ricinus communis*. It forms a most valuable lipstick base. It may be used in concentration of 40 - 50% of the total formulation. It has high viscosity and good dissolving power. It possesses stability towards oxidation. It is widely compatible with other ingredients. The high viscosity may avoid smearing off of the lipsticks.

**(d) Butyl Stearates**

They are useful for the dispersion of colour though they possess less solubility. They can readily wet the colouring pigments. They are odourless and free from rancidity.

**(e) Propylene Glycol**

It is non-toxic and possesses a sweet taste. It has good wetting property towards high colouring stains. It is always used in combination with other monoesters of propylene glycol.

**(f) Water**

It is not used as a solvent but may be used in minor quantities in order to dissolve the colour.

**(g) Silicone Fluid**

It is mostly used to aid in mould release and prevent the rub-out of the wax. It is used in minor quantities.

**(h) Isopropyl Maleate (IPM)**

It is used in concentration of 2.3% to increase lip gloss. It acts as a co-solvent along with mineral oil and helps in increasing lip gloss.

**3) The Softening Agents**

They are used to increase the spread ability by softening the lipstick. The most commonly used softening agents include.

**(a) Anhydrous Lanolin**

It is also known as wool fat or wool wax. It is used at low concentration of about 0.25% in order to impart gloss, softness, emolliency and protection to the lips. The melting point ranges between 36 - 42° C.

**(b) Lanolin**

It is also referred to as hydrous wool fat. It is used in minor quantities in order to improve the covering properties of the film. It contains 25-30% of water and may result in sticky and greasy products. It aids in the dispersion of colored pigments.

**(c) Lanolin Derivatives**

They include ethers, esters and lanolin oils. They are almost non-drying and thus provide a non-greasy look to the film. They are also used as blending agents or plasticizers.

**(d) Cocoa Butter**

It was used in the past due to its good emollient property. The usage has been stopped due to rancidity and surface crystallization. It provides oily look on the lips and hence imparts good gloss.

**(e) Petrolatum**

It is a hydrocarbon obtained from petroleum. It is odourless and tasteless. It is added mainly to enhance the gloss.

**(f) Lecithin**

It is used in minor quantities to impart smoothness and emollient effect. It increases the ease of application

**4) Coloring Agents**

Color may be imparted to the lips either by staining the lip with a dyestuff colour or by covering the lips with coloring layers. The colors used in the formulation of lipsticks are of two types:

**(a) Soluble Colours:** They are dye stuff agents which are easily soluble in oil, water and alcohol.

**(b) Insoluble Colours:** They are organic or inorganic pigments which are insoluble.

**Properties of Colouring Agents:**

They should impart good opacity to the lips by imparting good colour. They should be easily and uniformly miscible with the oils used.

The colours must be certified with the F, D and C grade.

They should possess very low content of impurities such as arsenic, lead etc.

**1.4 The commonly used colorants for lipsticks:**

**(i) Carmine:** It was extensively used in the past and is obtained as carminic acid from the cochineal insects by extracting the insects with ammonia. The carminic acid obtained is precipitated with alum and is dried and used.

**(ii) Dye Stuff Stains:** They include eosin dyes and provide a long-lasting effect on the lips by retaining the color on the lip cells. They are:

**(a) Eosin Dye:** It is used to impart orange red color to the lips.

**(b) Acid Eosin Dye:** It has orange colour and may change to intense red colour at acidic pH of 4. But they may have toxic effects such as allergic reactions or cheilitis and hence used alone with bromo acids.

**(iii) Pigmented Stains:** They form dispersion in the solvent base. They may be either organic or inorganic. They are used in combination with metallic lakes in order to improve the intensity of the colour.

**(iv) Lakes:** They are potential pigments of many of the D and C colours. They may be adsorbed on the aluminium hydroxides, barium oxides, calcium oxides etc.

Example: Aluminium lakes, barium or calcium lakes, strontium lakes. They are used at concentrations of about 8-10%.

**5) Pearlescent Pigments**

They are used to impart pearl like appearance to the product when applied on the lips. The natural pearlescent pigments may be guanine crystals obtained from fish scales. Bismuth oxychloride in 70 % castor oil may also provide a lustrous look.

**6) Opacifying Agent**

It is used for opacifying or whitening of lipsticks. It can also alter the basic shade of the pigment. Various shades can be obtained by, varying the proportions.

- Titanium dioxide is used in lipsticks as pigment or to alter the colour of the basic pigments. It has a high degree of brightness, which could give it a covering power over other white pigments. <sup>(9,10,11)</sup> When it comes to covering power, it outperforms and is preferred over zinc oxide in lipsticks and other cosmetic items. It was originally used to create vibrant effects with high colour proportions, but it is now widely employed with low colour proportions to create delicate pastel tones, while maintaining the required degree of opacity <sup>(12)</sup>.



- The primary colouring elements, as opposed to the staining materials, are insoluble dyestuffs and lake colours such as calcium, barium, and aluminium lakes. Depending on the tint and opacity of the film, the amount utilised in a lipstick varies between 10% and 15% <sup>(13)</sup>.

## 7) Perfumeries

Light floral fragrances can be used in lipsticks. The fruity flavours that cover fatty odour of the oily waxes may also be used. They should be tasteless, non-irritating and compatible.

**8) Miscellaneous Agents:** They include the following:

- (a) Preservatives:** They are used to increase life period of the product by reducing the microbial growth. Though they are anhydrous preparations, preservatives such as methyl paraben and propyl paraben may be commonly used. The concentration of the preservative should not exceed 0.1%.
- (b) Antioxidants:** The ingredients used in the formulation may be susceptible to oxidation. This may result in the degradation of the product. Thus, antioxidants are added in order to prevent oxidation of the ingredients. The commonly used antioxidants are butylated hydroxyl anisole (BHA), butylatedhydroxytoluene (BHT), tocopherol, propyl gallate, butylated hydroxyl quinines etc.
- (c) Flavoring Agents:** They are included in order to impart good flavor to the product. They may include the spearmint oil, cinnamon oil etc. Along with the flavoring agents, sodium saccharin and the ammonium glycyrrhizate may also be used in order to improve the taste.

## 1.5 Risk of heavy metals: <sup>(14)</sup>

Heavy metals occurring in the natural environment (water, soil, rocks) are found in trace amounts in raw materials used in the cosmetic industry. They can be desirable ingredients (e.g., dyes) or undesirable in many cosmetics and dietary supplements. Metallic impurities posing a threat to the health of consumers are particularly harmful elements such as lead (Pb) and nickel (Ni). Their content in cosmetic products is prohibited or restricted by the regulations of some countries, but, in many countries, there are no regulations in this regard. Apart from these toxic trace metals, elements such as iron (Fe), copper (Cu), and zinc (Zn) are necessary, but dangerous in excessive amounts, may also be present in cosmetics.

Contamination of cosmetic preparations with heavy metals occurs in the process of production, or as a result of inadequate purification of the natural raw materials used as ingredients. Despite numerous controls in the manufacturing process, production in accordance with the principles of Good Manufacturing Practice (GMP), and campaigns for the safe use of cosmetics, these elements are still present even in the best quality products. The single use of a cosmetic containing a toxic element is not usually associated with the appearance of side effects. One of the main problems is the presence of lead in lipsticks and in coloring agents. Some of the metals found in cosmetics, such as nickel and copper, cause allergic reactions. The effect of long-term exposure to heavy metals is their accumulation in the body, and as a consequence, the increased risk of various health problems. <sup>(15)</sup>

- **Lead** accumulation in the body can negatively affect the nervous system, immune system and the kidneys. Lead poisoning is difficult to diagnose as it can manifest in many ways including fatigue, insomnia, fertility issues, headache and joint pain, loss of appetite, and irritability. Children are especially susceptible to lead poisoning. Lead and other trace metals may be found in many lipsticks, these occur naturally and can accidentally contaminate other ingredients during production, contaminants are not added intentionally, and they will not be listed as ingredients. The study found in 2007, a study by the Campaign for Safe cosmetics released a report called "A Poison Kiss" that tested 33 popular brands of lipstick for lead content. That 61 percent of lipsticks contained lead with levels up to 0.65 parts per million (ppm).
- **Cadmium** exposure has been linked to kidney damage and possibly also bone effects and fractures.

- **Arsenic** exposure has been linked to increased risks of skin, bladder, liver, and lung cancer.
- **Mercury** toxicity is known to cause damage and disruption to the nervous system. Chronic poisoning is characterized by neurological and psychological symptoms, such as tremor, changes in personality, restlessness, anxiety, sleep disturbance and depression.

### 1.6 MANUFACTURING OF LIPSTICKS:

The formulation of herbal lipstick involves the basic manufacturing process like

1. **Pigment pre-milling:** The first step involved in the formulation of herbal lipstick is pigment pre-milling where the agglomerates in the powder are broken down to provide homogeneous smooth and even color to the lipstick.
2. **Melting and Mixing:** The next step involves the melting and mixing stage, since waxes are solid at room temperature they cannot be mixed with other ingredients to make this process easy as the waxes are melted. It can be usually mixed with oil and melted to the melted base, the pigment and other additives are added and mixed to form a homogeneous product.
3. **Molding:** Molding is the actual step where the melted lipstick is poured into metal or plastic mold, the mix is poured while it is hot however it is beneficial to harden, and then it is removed from the mole with slight pressure.
4. **Flaming:** Flaming is the last step where the lipstick is passed through the flame, it is typically held and twisted in the flame for up to a second and then removed to avoid melting and losing shape to obtain a glossy finish, and then it is placed in the containers.

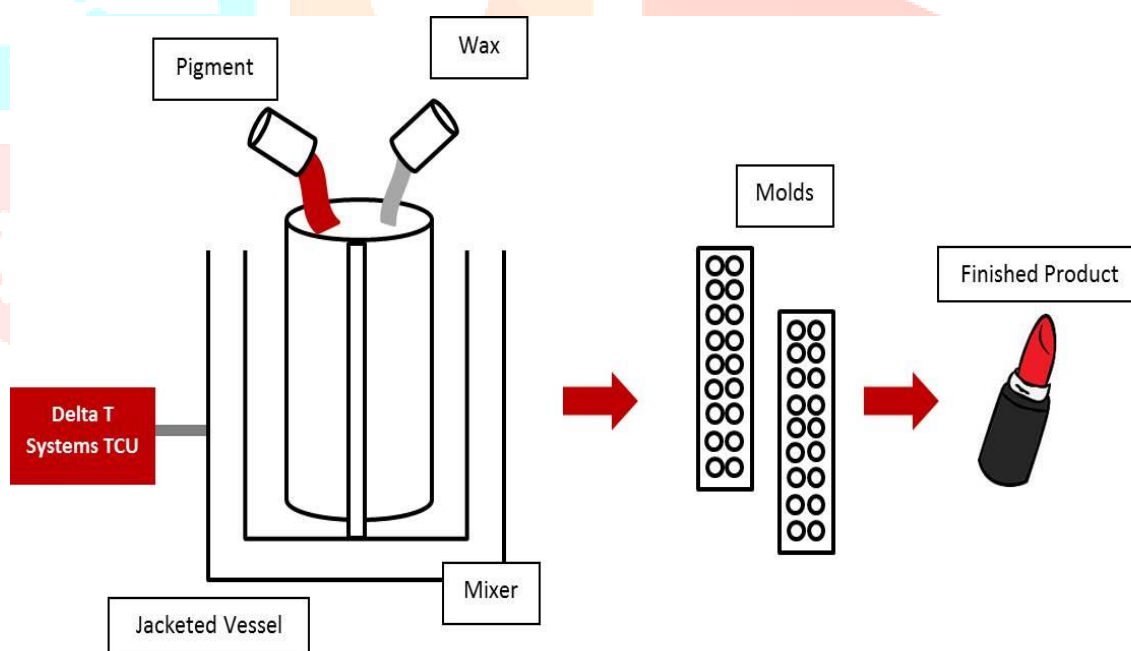


Figure 6: Manufacturing process of lipsticks

## 1.7 Defects in lipsticks:

- **Formulation related problems:**

- **Sweating:** It is the most common problem of lipstick formulation due to high oil content or inferior oil binding. It may arise in any climate or temperature range.
- **Bleeding:** This refers to the separation of colored liquids from the waxy base.
- **Streaking:** A thin line or band of a different colour or a substance appears on the finished product.

- **Moulding related problems:**

- **Laddering:** Lipstick does not look smooth or homogeneous after congealing and setting but instead has a multi-layered appearance.
- **Deformation:** This is a moulding problem where the shape of the lipstick looks deformed. It is noticeable and appears on both sides of the lipstick.
- **Cratering:** This appears in split moulding and it shows up flaming when the stick develops dimples.
- **Mushy failure:** This is a problem in which the central core of the lipstick lacks structure and breaks.

## 2. Materials & Methods:

**Materials:** Beeswax, White soft paraffin, castor oil, Lanolin, Pigments (beetroot, rose petals, carrot), Lemonjuice, Rose essence.

### Rationale for the selection of ingredients in the study:

- Castor oil serves as an emollient and prevents bleeding and feathering of product into the skin creases around the lips.
- Beeswax contains natural moisturizers that lock in moisture from the air and help keep the skin looking firm and plump.
- Paraffin wax is used because it has a melting point close to natural human body temperatures.
- Beetroot, carrot and rose petals impart colours as they have natural colouring pigments.
- Lanolin is used for its hydrating properties and high melting point
- Lemon juice can help our lips stay luscious by preventing free radicals from damaging the collagen in our lips, keeping our pout plump and pretty.
- Essence includes a lot of great benefits for the skin and acts as a primer for the skincare routine. It makes existing ingredients much more effective.

### 3.1 Methodology:

#### Formulation of lipstick containing pigments from beetroot, carrot and rose petals:

Table 1: Composition of different ingredients in the formulation of lipstick containing pigments from beetroot, carrot and rose petals

S.NO	Ingredients	BLP1 (gm)	BLP2 (gm)	BLP3 (gm)	CLP1 (gm)	CLP2 (gm)	CLP3 (gm)	RLP1 (gm)	RLP2 (gm)	RLP3 (gm)
1	Castor oil	13	12	11	13	12	11	13	12	11
2	Bees wax	14	12	9	14	12	9	14	12	9
3	White soft paraffin	6	7	6	6	7	6	6	7	6
4	Lanolin	3	3	3	3	3	3	3	3	3
5	Acacia	1	1	1	1	1	1	1	1	1
6	Pigment*	1	2	6	1	2	6	1	2	6
7	Lemon juice	1ml	1ml	1ml	1ml	1ml	1ml	1ml	1ml	1ml
8	Flavour (Rose)	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s

\*BLP- Beetroot lipstick, CLP- Carrot lipstick, RLP- Rose petals lipstick

#### Extraction method of Betalain pigment from Beetroot:

Extraction of pigment is by homogenization of equal ratio of fruit pulp and solvents (1/1 w/v). Take 100 g of the peeled fruit, of a watery consistency, and macerated it with 100 ml. Solvents (Ethyl alcohol and aqueous ethanol - 50: 50) for 15 min under ice bath. Centrifuge the aqueous mixture at 18,000 RPM, 40 °C for 20 min, and filter immediately through Nylon mesh by using rotary evaporation to concentrate the extract in vacuum at 350 °C, to 3 to 4 ml. completely remove the alcohol through the concentration process and keep the samples in a dark vessel.

#### Identification of pigment:

Identification of betalain pigment extracted from Beetroot is performed by taking 5 gm of the extract and adding few drops of diethyl ether will give violet colour that turns into yellow color.

#### Extraction method of $\beta$ -carotene pigment from carrot:

The shade dried coarsely powdered *Daucus carota* (100 gm) was extracted with ethanol (60-80°C) for 18 hrs. After completion of extraction, the defatted extract was filtered while hot through Whatman filter paper (No.10) to remove any impurities if present. The extract was concentrated by vacuum distillation to reduce the volume to 1/10; the concentrated extract was transferred to 100 ml beaker and the remaining solvent was evaporated on a water bath. 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. Coloring agent ‘‘Carotenoid’’ can be obtained from carrot root by milling followed by pressing, filtration and evaporation of the resulted juice <sup>(16)</sup>.

**Identification of Carotenoid pigment:**

The identification test of carotenoid pigment extracted from carrot is performed by adding phloroglucinol, and conc. HCl (1:1) which gives pink colour which indicates the presence of glycosides.

**Extraction method of Anthocyanin pigment from rose petals:**

**Powdering of sample:** Flower petals were shade dried at room temperature for 4-5 days. After moisture content was completely removed, dried petals were powdered, stored in a closed container for further use

**Method of extraction:** The powdered rose petals were taken in a closed vessel with solution containing 50% EtOH and 50% water. The vessel was heated in water bath at 60-80°C for 3-4 hours and filtered through a filter paper to remove any impurities present. The filtrate was collected in a Petri dish and placed in hot air oven at 60°C overnight so that EtOH and water were completely removed. Thus, natural coloring agent or pigment was obtained<sup>(17)</sup>.

**Identification of anthocyanin pigment:**

For identification of anthocyanin extracted from rose, about 0.2gm of extract was weighed in separate test tube, 1ml of 2N NaOH was added and heated for five minutes at 100±2°C. This was observed for the formation of bluish green color which indicates the presence of anthocyanin.

**Method of preparation of lipsticks:**

Total nine formulations (BLP1, BLP2- BLP3, CLP 1, CLP2, CLP3, RLP1, RLP2 and RLP3) were prepared by employing natural pigments namely Betalain- source of Beet root (BLP), Carotene- source of Carrot (CLP) and anthocyanin –source of Rose petals (RLP) respectively. Each formulation consists of varying quantities of pigments.

- All of the waxes were melted in a porcelain dish with agitation while maintaining the temperature at from 75° to 80° C. After the waxes were melted, the oil components (softener) and the remaining components of the base intermediate were added and agitation was continued.
- The pigments and antioxidant were added to the castor oil in a separate dish and heated with agitation at 70°- 75° C. Agitation was continued until a proper dispersion achieved. The color dispersion was added to the base intermediate with mixing for 40 to 80 minutes.
- Fragrance was then added with mixing for 10 minutes.
- The resulting lipstick formulation was poured into Moulds for which lubrication is done with soap solution and excess lubricant was drained and it was kept inverted in fridge or on ice (for half an hour) and taken to freezing temperatures to form the lipstick (figure 7-10)<sup>(18)</sup>.



**Figure 7 : Lipstick without pigment**



Figure 8: Formulations of Lipsticks containing beetroot pigment



Figure 9: Formulations of Lipsticks containing Carrot pigment

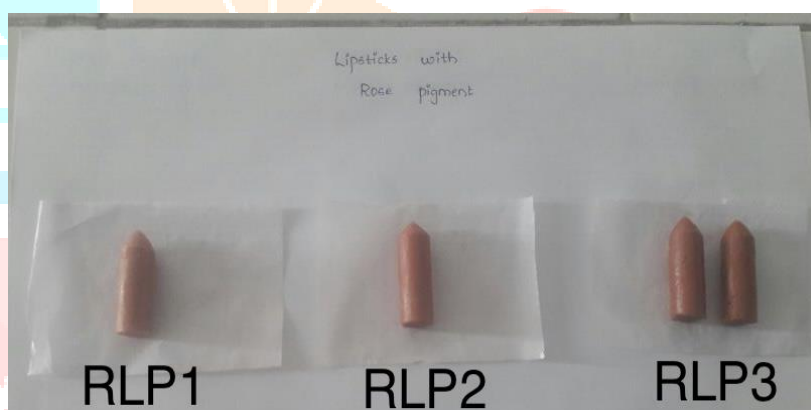


Figure 10: Formulations of Lipsticks containing Rose pigment

### 3.2 CHARACTERIZATION OF LIPSTICKS <sup>(19, 20, 21)</sup>

The evaluation studies are important in order to determine the efficiency, stability and the consistency of the finished product. The evaluation tests for the lipsticks are as follows,

#### 1) Organoleptic properties:

The prepared herbal lipsticks were evaluated for organoleptic properties such as color, odour and texture.

#### 2) Melting Point Determination Test:

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, kept in the capillary apparatus and firstly observed the product was slowly melted. After sometimes was observed the product was completely melted. The above procedure was done in 3 times and the melting point ratio was observed in different-different formulation.

#### 3) Determination of pH:

The pH of the formulated lipstick was analyzed by using PH meter.

4) **Breaking point:** Breaking point was determined to access the strength of the lipsticks. The lipsticks were separately held horizontally in a socket about half inch away from the edge of support. Gradual increasing

weights (10 g every time successively) at specific interval of 30 s were loaded until the lipsticks broke. The final weight at which the lipstick broke was considered as the breaking point.

**5) 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 kept 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 <sup>(22)</sup>.

**6) Skin irritation:** A patch test is useful in identifying the types of reactions to a particular lipstick, whether it is irritant or allergic. The standard test series can help in identifying the agents causing irritation. Of all the formulas, no irritation to the skin was found when given herbal lipsticks. This means that these herbal lipsticks were safe to wear.

**7) Aging stability:** The products were stored in 40°C for 1 hrs. Various parameters such as bleeding, crystallization of on surface and ease of application were observed.

#### **8) Perfume stability:**

The prepared herbal lipsticks were tested after 30 days, to record fragrance.

#### **9) Surface abnormalities:**

The study of surface property of the product is carried out in order to check the formation crystal on the surface or the contamination by microorganism or formation of wrinkles and the exudation of liquid <sup>(23)</sup>.

## **RESULTS AND DISCUSSION**

All the herbal lipsticks were evaluated for their pH, breaking point, force of the application, melting point, perfume stability, and skin irritation etc.

### **4.1 Organoleptic properties:**

The prepared herbal lipsticks were evaluated for organoleptic properties such as color, odor and texture. All the properties were found to be satisfactory.

**4.2 Melting Point Determination Test:** A perfect lipstick has a high melting point (>50 °C) in order not to melt easily in the heat, and it has to be firm enough to withstand pressure when applied. However, it must also be soft and easy to apply, spread evenly, and form a spongy, attractive film. The melting point of all the lipsticks was found to be between 57°C-65°C. The melting point test in this study showed that the more castor oil was used, the lower the melting point was.

### **4.3 Determination of pH:**

The PH of all the formulations was found to be in the range of 5.7-6.9 due to the discrete levels of castor oil in each formula. Castor oil is alkaline, so the higher level of castor oil results in a more alkaline lipstick.

**4.4 Breaking point:** A breaking point shows the ability of lipstick to encounter a mechanical process. The values were found to be in the range of 25-51. A high level of castor oil gives a lower value of breaking point. As a result, the addition of castor oil in a large quantity causes the lipstick to become mushy.

**4.5 Force of application:** The force of application test is designed to measure the force applied to the formula comparatively. The formulations BLP1, BLP2, BLP3 and CLP3 gave good result of the force of application test. The remaining formulations resulted from fair to poor.

**4.6 Skin irritation:** It is carried out by applying product on the skin for 10 min.

**4.7 Aging stability:** All the formulations were found to be stable as there were no signs of bleeding, and crystallization of on surface.

### **4.8 Perfume stability:**

The prepared herbal lipsticks were tested after 30 days, to record fragrance. It was found that BLP3 formulation has excellent perfume stability compared to the remaining formulations.

**4.9 Surface abnormalities:** No surface abnormalities were found in all the formulations.

Table 2: Evaluation Data of Poly Herbal Lipsticks

S.No	Evaluation Parameter	BLP1	BLP2	BLP3	CLP1	CLP2	CLP3	RLP1	RLP2	RLP3
1	Color	Red	Red	Red	Yellow	Yellow	Yellow	Pink	Pink	Pink
2	pH	6.9	5.7	6.2	5.8	6.5	6.2	6.7	5.9	6.5
3	Breaking point	30	25	28	51	48	45	35	46	42
4	Melting point	65	62	59	62	59	57	63	61	59
5	Force of application	Good	Good	Good	Poor	Average	Good	Poor	Fair	Fair
6	Irritation test	No irritation	No irritation	No irritation	No irritation	No irritation	No irritation	No irritation	No irritation	No irritation
7	Perfume stability	++	++	+++	+	++	++	+	++	+
8	Aging stability	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
9	Surface anomalies	No	No	No	No	No	No	No	No	No

Different natural ingredients were used for formulating natural lipsticks that contain coloring agent which is a natural colorant obtained from beetroot, Daucuscarota and rose petals and the effect of different natural ingredients on different evaluation parameters in the formulation have been investigated. The prepared lipsticks were evaluated and it was found that herbal natural lipstick, BLP3 was best among all the nine lipstick formulations. Hence from present investigation it was concluded that this formulated herbal lipstick having minimal and no side effects and thus showing maximum local effect on lips.

#### CONCLUSION:-

In last few decades there has been tremendous boost in use of cosmetics by women. However, the hazards cause by these chemicals has come into limelight very recently. The present work formulation and evaluation of herbal lipsticks was aimed to formulate a lipstick using pigments extracted from beetroot, carrot and rose petals extract with a hope to minimize the side effects as produced by the available synthetic ones.

- Hence, from present investigation it was concluded that natural lipstick formulation (BLP3) from beetroot was best among all natural lipstick formulations. This formulated herbal lipstick has better option to women with minimal side effects though detailed clinical trials may be done to access the formulation for better efficacy.



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