Formulation and Evaluation Test of Herbal Lipstick

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***Abstract*—Lipstick is commonly regarded, for good or ill, as the typical, perhaps even the proto-typical decorative cosmetic. Since the days of Nefertiti, modification or accentuation of lip colour has been known to play a prominent part in the achievement of cosmetic effect. Enabling the user to adjust lip outline and modify external perception and visual impact of mouth form and texture, lipstick has become an almost universal constituent of ladies' handbags. Moist lips, dry lips, shiny lips, smooth lips, all are simple matters of cosmetic application. Put on skillfully, lipstick can substantially alter the apparent facial characteristics of the user.**

***Index Terms*—Introduction, Ideal Properties, Composition, Manufacturing of Lipstick Formulation, Composition Evaluation**

I. INTRODUCTION

Lipstick are basically dispersions of colouring matter in a base containing a suitable blend of oils, fats and waxes suitably perfume, flavoured and moulded in the form of stick and enclosed in a case Base emollient action It should have pleasant odour flavour. It should not lose its smooth and shiny appearance during storage. Is should remain free from bloom or sweating during storage. It should remain firm within reasonable variation of climatic temperature. Many colors and types of lipstick exist. Some lipsticks are also lip balms, to add both color and hydration.

It is a cosmetic product for coloring lips, composed of a dispersion of pigments in a base of oils, waxes, and emollients. It enhances appearance by adding color, shine, and protection while preventing dryness. Key topics for a presentation include the composition, manufacturing process, ideal properties, and the emergence of medicated lipsticks with additional benefits like hydration or sun protection.

I. Definition and Purpose

- Definition: A cosmetic product consisting of a dispersion of coloring matter in a base of oils, fats, and waxes, molded into a stick.
- Primary Purpose: To apply color, texture, and gloss to the lips.
- Secondary Purpose: To protect the lips from external environments and prevent drying and cracking.

II. Composition

- ❖ Waxes: Provide structure and hardness to the stick (e.g., beeswax, carnauba wax).
- ❖ Oils and Fats: Act as emollients, providing lubrication and a smooth feel (e.g., castor oil, mineral oil).
- ❖ Coloring Agents: Pigments and dyes that give the lipstick its color.
- ❖ Emollients and Preservatives: Add a smooth texture and prevent microbial contamination.
- ❖ Fragrance and Flavor: To make the product more pleasant to use.
- ❖ Key Characteristics:

- Smooth application and even spread.
- Good color intensity and consistency.
- Firmness and resistance to temperature changes.
- Long-lasting color and no smudging.

Modern Developments:

- Medicated Lipsticks: Formulations containing active ingredients like vitamins or sunscreens for added benefits such as protection, hydration, and treatment of dryness or infections.
- Innovation**:** Continuous development in long-wear formulas, matte finishes, and transfer-proof properties.

FIG NO:1

FIG NO:2

ADVANTAGES OF LIPSTICK

- Enhances hydration to the lips.
- Keeps protection to your lips from climate changes.
- Gets your facial appearance increase and makes you gorgeous.
- 3. Moisturizes and Protects Lips:Many modern lipsticks contain moisturizing ingredients like

shea butter, vitamin E, and oils that keep lips soft and hydrated.
- Some also include SPF to protect against sun damage.
- 💋 4. Defines Lip Shape
- Helps outline and shape the lips, making them appear fuller and more symmetrical.

DISADVANTAGES OF LIPSTICK:

1)Health and Safety Concerns:Contains harmful chemicals: Some lipsticks may contain lead, parabens, or other toxic metals, which can accumulate in the body over time.

2)Allergic reactions: Certain ingredients, dyes, or fragrances can cause irritation, rashes, or allergic reactions on sensitive lips or skin.

3)Dryness and chapping: Frequent use of lipstick—especially matte or long-wear types—can dry out lips and lead to cracking or peeling.

4)Bacterial contamination: Sharing lipstick or using it past its expiry date can spread bacteria or viruses, potentially causing infections.

IDEAL PROPERTIES OF LIPSTICK:

A. It should be non-toxic & non-irritant to the lips.
B. It should be non-toxic & non-irritant to the lips.
C. It should be impart uniform color to the area of application.
D. It should make lips soft.
E. It should have stability toward environment conditions.
F. It should completely free from grittiness.
G. The container should operate easily.

It should be impart uniform color to the area of application.

Types of Lipsticks :

1. Matte Lipstick
A. Gives a flat, non-shiny finish.
B. Highly pigmented with long-lasting color.
C. Contains less oil and more wax.
D. Can feel dry on the lips.

2. Satin / Semi-Matte Lipstick
A. Balanced finish—not too shiny, not too flat.
B. Smooth application with good moisture.
C. Popular for everyday use.

3. Cream Lipstick
A. Soft, creamy texture.
B. Moisturizing and comfortable to wear.
C. Gives medium shine.
D. May not be very long-lasting due to high oil content.

4. Gloss Lipstick / Lip Gloss
A. Provides a shiny, wet look.
B. Sheer pigmentation.
C. Hydrating and ideal for dry lips.
D. Needs frequent reapplication.

5. Liquid Lipstick
A. Comes in liquid form with an applicator wand.
B. Dries down to matte or semi-matte finish.
C. Very long-lasting and smudge-proof.

6. Lip Stain / Tint
A. Lightweight and long-wearing.
B. Gives a natural flush of color.
C. Water or gel-based formulas.

7. Lip Balm / Tinted Lip Balm
A. Primarily for hydration.
B. Contains moisturizing ingredients like shea butter, oils, and waxes.
C. Light tint suitable for natural looks.

II. ANATOMY OF THE LIPS

Includes the outer skin, the inner mucous membrane, and the muscle layer, primarily the orbicularis oris muscle, which is responsible for movement. Key landmarks include the vermilion border (the sharp line between the red lip and the skin), the philtrum (the vertical groove under the nose), and the Cupid's bow (the double curve in the center of the upper lip). The lips are supplied with blood by the superior and inferior labial arteries and receive nerves from branches of the trigeminal and facial nerves.

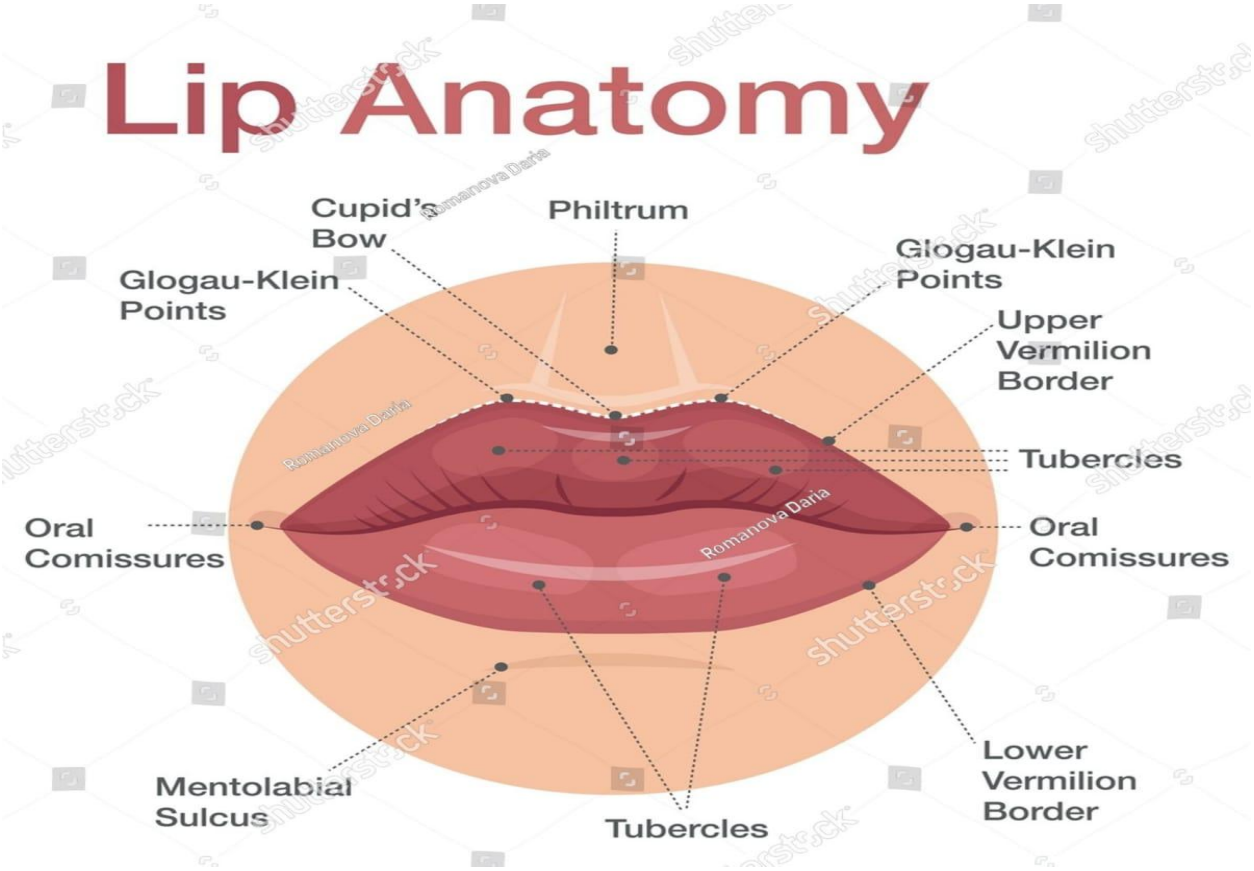


FIG NO:3

FORMULATION:
INGREDIENT:
1)Carnauba Wax : 10g
2)Bees Wax : 15 g
3)Lanolin : 5g
4)Cetyl Alcohol: 4g
5)Castor Oil: 62g
6)Candelilla Wax: 2g
7)Ozokerite Wax: 2g 8)Dye: q.s perfume.

III. ACTIVE PHARMACEUTICAL INGREDIENTS &EXCIPIENTS PROFILE

1)CARNAUBA WAX:
Carnauba wax is a hard, plant-based wax extracted from the leaves of the Brazilian carnauba palm tree and is used in various products for its natural gloss, durability, and protective properties. It is commonly found in cosmetics and polishes for cars and wood, and as a food-grade glazing agent for products like candies, snacks, and cheeses. Its chemical composition consists mainly of esters, and it has a high melting point, making it a strong and durable natural wax.

Source and extraction

- Source: Carnauba wax comes from the leaves of the carnauba palm tree, native to northern Brazil.
- Extraction: The wax is collected during the dry season by cutting the leaves, after which the wax scales are scraped off, beaten, and processed.
- Production of Carnauba Wax:

The wax is obtained from the palm leaves in a systematic process of collection, drying, beating, refining, and finally purification by filtration, centrifugation, and bleaching. The palm produces the wax in the cuticles of the palm fronds. The leaves are collected from the trees grown in the wild or cultivated by cutting the leaves, drying in the sun, and then threshing/beating.

Benefits of Carnauba Wax in Lipstick
1. Provides Hardness & Structure

Carnauba wax has a high melting point (around 82–86°C). It gives the lipstick firm structure, helping it maintain shape even in hot climates.

2. Improves Gloss & Shine
It imparts a smooth, glossy finish to the lipstick, enhancing aesthetic appeal.

FIG NO: 4

2)Bess Wax: Beeswax (Cera Flava or Cera Alba) is a substance from honeycombs of the bee Apis mellifera that is used as an ingredient in ointments, plasters, and cosmetics due to its physical properties and emollient qualities. Chemically, it's a mixture of esters, fatty acids, and alcohols, with key constituents including myricyl palmitate. Its quality is assessed by its melting point, acid value, and saponification value, and it can be adulterated with other waxes or fats, which can be detected through chemical and physical tests. Top of Form

2) BEES WAX :

Beeswax is a key ingredient in lipstick, providing structure, texture, and a protective, moisturizing barrier for the lips. It is a natural emollient that helps bind ingredients, add firmness, and prevent moisture loss, while its antibacterial and vitamin A content promote healing and protect against sun damage.

Beeswax creates a barrier that prevents moisture loss, keeping lips hydrated for hours. Natural Protection: It shields the lips from harsh weather conditions, such as wind and sun, preventing chapping and dryness

Source:

Beeswax is a purified wax obtained from the honeycomb of the honeybee, primarily Apis mellifera L. and other species of Apis, belonging to the family Apidae.

FIG NO:5

3) LANOLIN

Lanolin is a waxy substance sourced from sheep's wool that is widely used in lipsticks and lip balms for its hydrating, emollient, and occlusive properties Lanolin functions as an occlusive, forming a protective barrier over the lips to prevent moisture loss.

Source:

Lanolin is the purified, fat-like waxy secretion from the sebaceous glands of the sheep, Ovis aries Linne´ (Family: Bovidae). This secretion is naturally deposited onto the wool fibers to protect the animal from the environment and keep its coat waterproof .

Lanolin Extraction:

Lanolin is the waxy, yellowish substance that sheep secrete to protect their wool and skin. The commercial product used in pharmacy is a highly refined version of that natural fat. Below is a step – by-step overview of the pure lanolin that ends up in ointments,creams &other topical preparations.

FIG NO:6

4) CETYL ALCOHOL

Cetyl alcohol is a fatty alcohol derived from vegetable sources like palm or coconut oil. It helps to increase the product's viscosity, which gives the lipstick a solid, manageable texture. It helps to combine oil- and water-based ingredients, creating a smooth and consistent formula.

Is Cetyl Alcohol Safe?

Yes—it's generally non-irritating and considered safe for sensitive skin.

However, rare allergic reactions can occur, especially in people with very sensitive or compromised skin.

Definition : Cetyl alcohol (hexadecanol, C16H34O) is a long-chain fatty alcohol obtained from natural fats or petroleum sources. It appears as a waxy, white, solid substance used widely as an emollient, thickening agent, and stabilizer in pharmaceutical and cosmetic formulations.

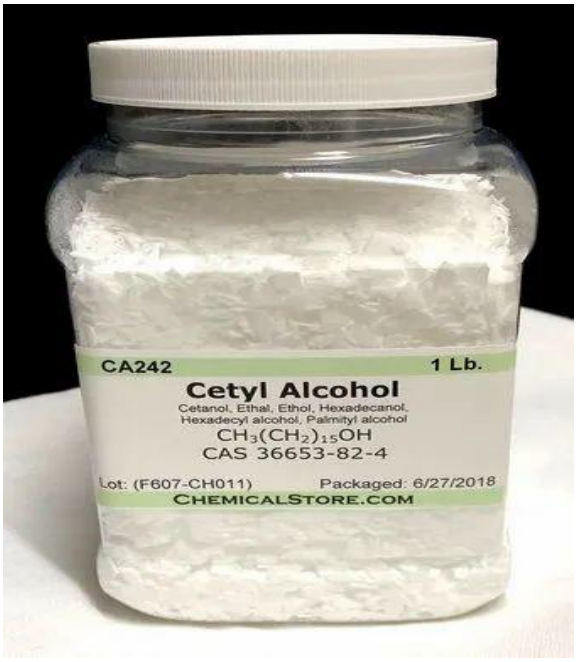


FIG NO: 7

FIG NO: 8

5)CASTOR OIL

Castor oil is a common ingredient in lipstick and lip balms, prized for its ability to moisturize, create a smooth texture, and provide a glossy finish. Its high concentration of ricinoleic acid helps to hydrate the lips, while its viscosity and solvent properties contribute to the product's structure and wear.

FIG NO:9

Why Castor Oil is Used in Lipstick:

1. Excellent Solvent for Dyes (Key Role)

Castor oil dissolves oil-soluble dyes and lakes better than most oils.

Gives bright, uniform, stable color to the lipstick.

2. Provides Gloss and Shine: Gives a glossy finish to the applied film.Improves aesthetic appeal.

3. Plasticizer / Softening Agent: Prevents the lipstick from becoming brittle.Improves flexibility and reduces cracking.

4. Emollient Action: Softens and moisturizes the lips.Leaves a smooth, non-greasy feel.

5. Dispersing Medium for Pigments: Helps disperse pigments uniformly.Improves color intensity and spreadability.

6. Enhances Spreading and Glide: Provides good slip during application.Makes the lipstick apply smoothly and evenly.

6) CANDELILLA WAX:

Candelilla wax is a plant-based, vegan alternative to beeswax that is used in lipsticks for its ability to add hardness, shine, and stability, ensuring the product maintains its shape and applies smoothly. It acts as a thickener, helping to bind other ingredients, and contributes moisturizing and emollient properties to the lipstick formula. The typical usage rate in lipsticks is between 3% and 15%.

Candelilla wax is a plant-derived wax obtained from the leaves of the candelilla shrub (Euphorbia antisyphilitica), which grows mainly in northern Mexico and the southwestern United States. In modern lipstick formulations it is valued for a combination of functional and aesthetic properties.

1. Physical and Chemical Profile

- Melting point: ≈ 68–72 °C (higher than many other natural waxes).
- Hardness: Moderately hard, giving structure without making the stick brittle.

- Colour: Pale yellow to amber; can be bleached to a near-white grade for colour-sensitive formulas.

- Solubility: Soluble in oils and organic solvents; insoluble in water, which helps maintain a moisture-proof film on the lips.

FIG NO:10

Source / Botanical Origin:
Candelilla wax is derived from the leaves and stems of Euphorbia cerifera (synonym Euphorbia antisyphilitica), a shrub in the Euphorbiaceae family.

7)OZOKERITE WAX:
Ozokerite wax is used in lipstick to provide structure, stability, and hardness. It acts as a thickener to increase viscosity and prevent the lipstick from becoming too soft, and it also adds strength to the stick itself, preventing it from breaking. This mineral or petroleum-derived wax improves the texture and consistency of the product.

FIG NO: 11

8)DYE (PERFUME):

Both dyes and pigments are used for color in lipstick, while perfumes are added for fragrance. Dyes (or lake dyes) are water-soluble and stain the lips for a more intense, long-lasting color, while pigments are insoluble and are ground into powders to create opaque color. Perfumes, often with floral or fruity scents, are used to mask the odor of other ingredients and add a pleasant aroma.

- Dyes: These are often derived from ingredients like bromo acids and are known for creating intense, long-lasting color because they stain the lip surface.
- Pigments: These are insoluble inorganic or organic compounds, such as mineral compounds like mica, that are ground into fine powders to provide color.
- Examples: Carmine, a dye derived from cochineal insects, is a popular colorant for red lipsticks. Other pigments include titanium dioxide (for white) and ultramarine.

❖ Dyes and pigments:

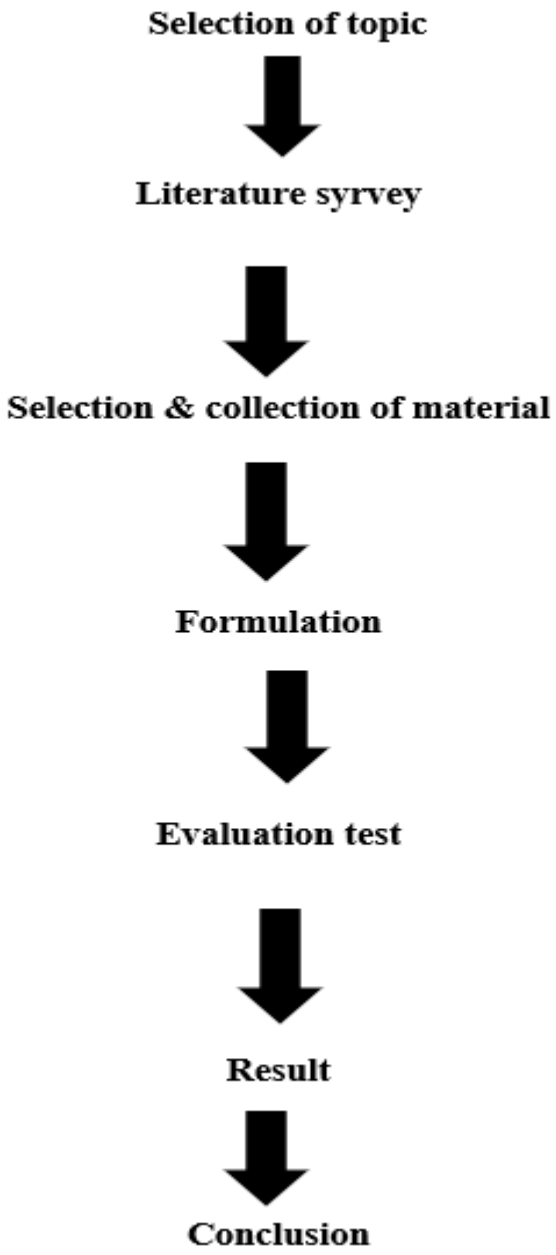
FIG NO:12

- AIM & OBJECTIVE:

A) AIM: To prepare & evaluate the lipstick

B) OBJECTIVE: To prepare lipstick. To evaluate the prepare lipstick.

IV. PLAN OF WORK



V. LITERATURE &REVIEW

The literature review includes several studies on herbal and cosmetic lipstick formulations. A study published in the Asian Journal of Medical and Publication by Pooja Mishra and Sumeet Dwivedi on 08-03-2020 focused on the formulation and evaluation of lipsticks containing herbal ingredients. The authors concluded that the formulated herbal lipstick offered a better option for women with minimal side effects. Another study, published on 17-07-2021 in the International Journal of Pharmacy & Pharmaceutical Science by Abhijeet A., Preeti T., and Pardeep K. et al., worked on the formulation and evaluation of herbal lipstick using color pigment from Bixa orellana. Their investigation indicated that the prepared herbal lipstick was a better option for women.Further, a study from the International Journal of Pharmaceutical Sciences Review and Research by Namrata B.U., Kranti K.R. et al., published on 02-03-2020, focused on the design, development, and assessment of herbal lipstick from natural pigments. The authors found that these lipsticks showed minimal side effects. Additionally, research published on 17-04-2019 in the International Journal of Cosmetic Science by M.S. Taylor and I.T. Norton explored the design and application of a water-in-oil emulsion for use in lipstick formulation. Their work concluded that the water-in-oil emulsion provided improved results in lipstick products.

The literature review includes a study published in the International Journal of Research and Analytical Reviews. The research was conducted by Pallavi S., Rohit R., and Rajendra, focusing on the formulation and evaluation of herbal lipstick containing Amaranthus cruentus Linn. This study, published on 06-03-2020, aimed to perform evaluation tests on lipstick prepared using colour pigments in two different quantities and at three different time intervals. The pigments used in the formulation were obtained through ultrasonication extraction.

1) Anuj Vargheae et al. they concluded that there is the wide range of herbal cosmetics are safe on human health. Natural cosmetics are suitable for the all skin types. No matter if you are dark or fair, you will find natural cosmetics like foundation, eye shadow, and lipstick which are appropriate irrespective of your skin tone women's with oily or the sensitive skin condition.

2) M. Sainath et al. they conducted studied on Breaking point of prepared lipstick- Breaking point test is to determine the strength of lipstick place lipstick horizontally in a socket inch away from the edge of support. Increase the weight by a specific values [10gm] at a specific interval of 30 second and weight at which breaks in considered as the breaking point.

3) Richa Kothari et al. they concluded that use of product has increased and choice of shades of colour,

textures, luster, have been changed and become wider. This can observe from the facts that lipstick is marketed in hundreds of sheds of colours to satisfy the demand of the women.

VI. FORMULATION METHODS

The herbal lipstick was formulated as per general method of lipstick formulation. In brief, all hard and soft waxes were melted in China dish on water bath or heating Mantle with decreasing order of their melting point. Concentrated colouring's pigment was mixed and Castor oil heated, both phases were mixed at some temperature. Rose oil, Lemon juice, eugenol, shikia powder, vanilla essences were added at 400 c, then mixture was poured into lipstick mould in excess amount and mould were kept on ice bath. After solidification surplus amount was scrapped with blade, lipsticks were removed from mould and flamed, prepared lipsticks were fitted in lipsticks container and used for further evaluation (6)

Manufacturing of lipsticks: Involves 4 distinct operations:

1) Colour dispersion
2) Mixing
3) Moulding
4) Flaming

1)COLOUR DISPERTION:

Agglomerates of colour pigments broken down and mixed with oil. If a solvent is used for the preparation of solution of bromo acids, it is prepared and set aside.Lake colours when used are dispersed in suitable amount of oil to make a paste. This paste can be passed through triple roller mills.The colour mix is then mixed with bromo acid mixture.Lower melting point waxes melted and added to the colour mix. Then additives are dissolved in remaining oil and mixed. But higher melting point waxes are melted at the end. The mixture should be finally milled. Triple roller mill is used for colour dispersion.

FIG NO:13

2)MIXING:

• After milling, the material is transferred to a steam-jacketed kettle and is heated.
• Over-heating and rapid mixing should be avoided.
• After the mixture is melted completely and blended, perfume is added and blended thoroughly.
• Next the molten mixture is strained through fine mesh screen and transferred to moulds

or storage containers.
• If the material is to be stored for a longer period, storage containers should be inert.• SS steam jacketed kettle is used for mixing.

❖Key Components Mixed in Lipstick
•□Waxes:
o Provide structure and shape.
o Common examples: beeswax, carnauba wax, candelilla wax.
•□Oils: Add smoothness and spreadability.
o Examples: castor oil, mineral oil, lanolin, cocoa butter.
•□Pigments & Dyes :
o Give color.
o Pigments (like iron oxides) provide opacity, while dyes (like Red 7 Lake) give
brightness.

•□Emollients
o Keep lips soft and prevent dryness.
o Often overlap with oils and butters

FIG NO:14

3) MOLDING:
• For moulding, operation moulds are used.
• Moulds are made up of metals like brass, aluminium.
• Molten lipstick mixture is run on the seat of the mould and the speed of pouring should be
appropriate.
• The moulds are allowed to stand without movement until surplus material has congealed
over the surface.
• The surplus material is then scraped off and moulds are transferred to chilled metallic
plates.
• Over-cooling should be avoided.
• Then moulds are unclamped and lipsticks are pushed out.
• When large production is required, semi-automatic or automatic moulding machines are
used for this operation.

FIG NO:15

4)FLAMING:

• The sticks are inserted in lipstick containers and the free end is reheated for a very short time.

• This makes the surface of the stick smooth and glossy.

• This process is usually done by passing the lipstick through gas flame.

•Finally, the stick and containers are examined for visual defects.

Formulation and Evaluation of Herbal Lipstick from the Extract of Papaya The pigments used in lipstick formulation include Synthetic as well as Natural. In current scenario lipsticks create of much health-related problem because of their harmful chemical.

It also becomes the lips blackish in colour. It is very dangerous to consume this kind of synthetic dye by the user. It may cause cancer in a very severe form. Because of this kind of adverse effect in the present investigation we can formulate an herbal lipstick from papaya

extract which may create very less or zero side effects (9). Papaya (Carica papaya L.) is widely cultivated in tropical and subtropical environments. The two major papaya fruit flesh colours, red and yellow. High level

of lycopene contains in Red fleshed papaya fruit contain high levels of lycopene, whereas yellow-fleshed fruit contains minimal level (10-13).

FIG NO:16

VII. EVALUATION TEST

A) Colour & Texture:

Formulated lipsticks were checked for colour, glossy and smooth texture.

Lipstick colors are created using a variety of organic and inorganic pigments and dyes. The final shade is influenced by your natural lip color and skin undertone (warm, cool, or neutral).

Lipsticks offer a wide array of colors determined by pigments, and diverse textures (finishes) which depend on their oil and wax content.

B) pH :

pH (for water-containing formulations) What: Compatibility with lip skin, stability of actives. Method: pH meter on aqueous extract. Acceptance: Typically near skin pH but depends on formula.

C) Determination of Melting Point:

Determination of melting point is an important parameter for lipstick formulation; as it is an indication of the limit of safe storage. It was determined by capillary tube method. Melt approximately 50mg sample of lipstick and filled into glass capillary tube opened at both ends. Capillary was cooled with ice for 2h and fastened with thermometer. Thermometer with capillary was deep in the beaker containing full of water which was placed on heating plate with magnetic stirrer. Heating and stirring was started slowly at fixed speed. The temperature at which material moves along the capillary tube was considered as melting point.

D) Breaking Point:
This test was carried out to find out the value of maximum load that lipstick canwithstand before it breaks. This test gives strength of lipstick. It was checked by held lipstick horizontally in a socket inch away from the edge of support. Gradually the weight increases by a specific value 10gm at specific interval of 30 secs. The weight at which breaks was considered as the breaking point.

E) Perfume stability:
The prepared herbal formulation was tested after 30 days, to record perfume stability.Force of application: It tests the relative strength of the application. A piece of dark brown paper kept in the balance of the shadow graph and lipstick was placed at an angle of 45º to cover an area of 1 sq. M. Inch until completely covered. Pressure reading is an indicator of working capacity.

F) Dye/Colour Stability
- Method: Spectrophotometric measurement of the colour intensity before and after exposure to light (UV) and heat (accelerated stability). Purpose: Confirms that the colour does not fade or change hue under normal use and storage.

VIII. PROCEDURE

• 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 1litre beaker filled with water to a level 1cm 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 min.
• When the temperature reaches about 45°C, raise the temperature at the rate of 1° C per min. Constantly watch the lipstick salve.
• Record the temperature when the salve starts bending and losing its shape .
• Colour: In this colour imparting on the lip surface is observed
• Film: Type of film formed is observed
• Spread ability: spread ability of formulation is observed.

IX. RESULT & CONCLUSION

In the last few decades, the use of cosmetics has been tremendously increased, and the chemical involved for formulating these cosmetics causes hazards to user health. However, the aim of present research work was formulation and evaluation of herbal lipstick, with a goal to minimize the side effects of the available synthetic lipstick in the market. Hence, from the result obtained in the present investigation shows that the herbal formulation has a better option with minimum side effects though detailed clinical trials may be done to access the formulation for better efficacy.

X. CONCLUSION

Study concluded that herbal lipstick can be successfully formulated using different natural ingredients such as white bees wax, butter, castor oil, coconut oil, olive oil, vanilla & rose essence, papaya extract and lemon. It is also concluded the use of natural colorants in lipstick formulation having very less or no side effect. Thus, the prepared lipstick can take safe and effective after thorough clinical trials.

XI. ACKNOWLEGDMENT

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