

# FORMULATION AND EVALUATION OF HERBAL LIPSTICK PREPARED FROM CROCUS SATIVUM AND BRASSICA OLERACEAE

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**Abstract:** Cosmetics are in higher demand since past times till now days as herbal care products are on great demand. Lipstick formulations are most widely used to enhance the beauty and appearance of lips and to add a highlighting effect on facial makeup. It is difficult to apply lipstick on dried, chapped, cracked, infected or diseased lips with sores and lesions. The use of herbal lipstick for the purpose of curing unwanted topical condition and improve appearance and beauty of lips with this aim and objectives an herbal preparation was made to formulate and evaluate herbal lipstick by using crocus sativum (saffron), Brassica oleracea (red cabbage), butter, honey, cinnamon, shikakai, watermelon, olive oil as naturally occurring excipients that substituted with synthetic excipients like lanolin, synthetic colourants and alcohol. Crocus sativus extract containing more than 150 volatile and aroma-yielding compounds mainly terpenes and esters and red cabbage containing cyaniding-3-glucoside and delphinidin-3-glucoside was selected for the local action on lips and used as colouring agent. The herbal lipstick were evaluated for their properties such as spreading, covering property, shining and glossiness and found to be a better and satisfactory product to give attractive beautification with therapeutic effect. Thus, the herbal lipstick with the natural ingredients can serve as economical and effectiveness to cosmetic herbal care and beauty product.

**Index Terms:** herbal care products, cosmetics, Crocus sativus, Brassica oleracea, natural, lipstick.

## INTRODUCTION

cosmetic are meant to be any substance 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 on the face or body. It also includes any articles or substance intended for use as a component of cosmetics. Now days the demand of herbal cosmetic products are high demand in the world market and included as highest growth marketing. Formulations and preparations of herbal cosmetics can be used to cure skin problems through a great healing effect. Lipsticks are cosmetic formulations for the modification or beautification of lip colour and appearance of facial makeup by molding a dispersion of colours in a waxy base, in the form of stick or crayon. Lipsticks provide a means of appearance and glow to the facial makeup by coloring or protection of lips from external environment. Lip problems caused because of infection or pollution are dryness of lips, chafed, chapped, cracked lips, sores and Lesions on lips, Sunburn, and wind-burned lips or any microbial infection on the surface of lips. An appropriate drug content for lipsticks are providing local action on lips, soothing, anti-irritant agent, skin protectant and anti-inflammatory agents. Crocus sativum and brassica oleracea was selected as a drug of choice for their non-irritating, moisturizing properties soothing and nontoxic agent naturally obtaining and used in the treatment of skin ulcers, wound, skin eruptions, fissures as an pharmaceutical active drug agent. Aim and objective of the present work was to formulate and evaluate herbal lipstick with other naturally occurring excipients that replaced synthetic excipients of lipsticks. Olive oil and butter or ghee provides a proper nourishment to the skin, watermelon promotes rich nutrients and fragrance, Honey promotes tissue regeneration, cinnamon shows antimicrobial property, vanilla essence provides preservative effect and vitamin E promotes anti-oxidant action. thus, they are highly effective for moisturizing, healing and protective for skin care.[1,2,3]

## ADVANTAGES OF LIPSTICK

1. Beautification effect no matter what style of lip color you prefer for sharp, bold and dramatic colors, or more natural and subdued shades that can be translucent, you will instantly feel more beautiful.
2. Hydration effect even though some older brands of lipsticks use ingredients that can intake moisture from lips, most of them are very conscientious about hydration and are made to preserve the natural state of your lips. New brands of lipstick can often contain some form of moisturizing additive, such as vitamin E.
3. Sunscreen protection effect it is important and that most people leave their sensitive lips. they are conscious about protecting the rest of the face. Lipstick manufacturers then added sun protection ingredients to their products, enabling you to protect your lips from external environment and aging effects.
4. Posture effect with long and steady tradition of standing in front of the mirror and keeping your posture and body shape in healthy conditions women in the high ages have significantly less problems with their posture and balance.[4]

## DISADVANTAGES OF LIPSTICK

1. Heavy Metals Studies have shown that lipsticks have concerning levels of chromium, cadmium and magnesium. This will result in increasing your risk to dangerous diseases and organ damage. High levels of cadmium can be stored in the kidney and finally result in renal failure.

2. Lead has been revealed that most of the lipsticks have a dangerously high amount of lead. Lead is a neurotoxin and can affect the nervous system. It can also cause brain damage. This is one of the reasons for hormone imbalance and infertility. Even if it's taken in small quantities, it can have drastic effects on the body.
3. Formaldehyde and Mineral Oil Formaldehyde is a preservative, which is also known as human carcinogen. Wheezing, coughing, irritation of the eyes and skin are other effects of formaldehyde. Mineral oil is another ingredient which is used in lipstick to block the pores. Many of the harmful effects of lipsticks are due to these chemicals.
4. Parabens and Bismuth oxychloride are two ingredients that are used in the manufacturing of lipsticks. The harmful effect of lipsticks is due to the carcinogenic property of these two ingredients. The parabens act as preservatives just like the formaldehyde.[4]

### IDEAL CHARACTERISTICS OF LIPSTICK

1. It should non-toxic.
2. It should be stable both physically and chemically.
3. It should not dry on storage.
4. It should be free from greatly particle.
5. It should maintain lip color for longer period after its application.
6. It should give shiny and smooth appearance free from sweating.
7. It should have pleasant taste, odour and flavor.
8. It should not melt or harden within reasonable variation of climatic temperature.
9. It should be non – irritant.
10. It should have required plasticity.[5]

### ANATOMY OF LIPSTICK

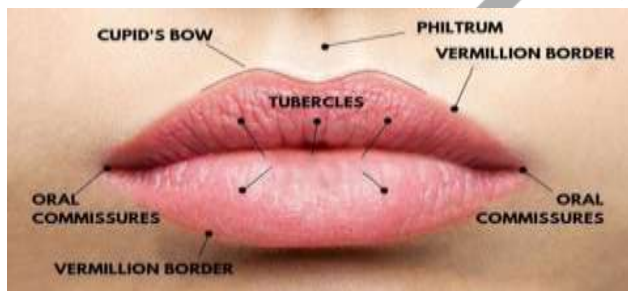


Fig.1: Anatomy of lips

The anatomy of lips includes upper and lower lips are referred to as the *Labium superius* and *Labium inferius*, respectively. The junction where the lips meet the surrounding skin of the mouth area is the vermilion border, and the typically reddish area within the borders is called the vermilion zone. The vermilion border of the upper lip is known as the Cupid's bow. The vertical groove extending from the procheilion to the nasal septum is called the philtrum. 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 color, the lip skin contains fewer melanocytes (cells which produce melanin pigment, which give skin its color). Because of this, the blood vessels appear through the skin of the lips, which leads to their notable red coloring. With darker skin color 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 lower lip is formed from the mandibular prominence, a branch of the first pharyngeal arch. It is raised by *labius superioris* and is connected to the lower lip by the thin lining of the lip itself, which can be seen by opening your mouth wide in front of a mirror. Thinning of the vermilion of the upper lip and flattening of the philtrum are two of the facial characteristics of fetal alcohol syndrome, a lifelong disability caused by the consumption of alcohol during pregnancy. [6]

### TAXONOMICAL CLASSIFICATION OF CROCUS SATIVUS

<b>Kingdom</b>	Plantae
<b>Clade</b>	Tracheophytes
<b>Order</b>	Asparagales
<b>Family</b>	Iridaceae
<b>Genus</b>	<i>Crocus</i>
<b>Species</b>	<i>c. sativum</i>

Table no.1: Taxonomical classification of *crocus sativum*

### PLANT DESCRIPTION CROCUS SATIVUM

*Crocus sativum* is a golden-coloured natural occurring agent with pungent stigmas and pollen-bearing structures of the autumn *crocus sativum* looks yellow to orange coloured thread like in appearance, which are dried and used as a spice, taste

and flavour for food products and as a colour dye food and other products. It has a strong characteristic exotic aroma and a bitter taste. It is mainly known as saffron.



Fig.2: *Crocus sativum* (saffron)



Fig.3: Flower of *Crocus sativum* (saffron)

#### CHEMICAL CONSTITUENTS OF CROCUS SATIVUM

*Crocus sativum* contains crocin, which characterizes for the yellow pigmentation from the pollen stigma spirocrocin, which gives the rusty, bittersweet flavor and safranal, which lends the earthy fragrance to the spice. The non-volatile components include crocin,  $\alpha$ -crocin, carotenoids that include lycopene, zeaxanthine, and both alpha- and beta- carotenes, crocetin, and picrocrocin. The volatile components include terpene, terpene alcohol, and terpene esters. Safranal is also a major volatile component formed from picrocrocin as a result of the interaction of heat and enzymes during the drying process. Thus, they are naturally occurring ingredients occurred in saffron and provides pharmacological action.

#### USES OF CROCUS SATIVUM

*Crocus sativum* is used as anti depressant, alzheimer disease and other neuro disorders. Women use saffron for menstrual cramps and pre and post menstrual disorders. Men use saffron for early orgasm and infertility. Saffron can be directly apply to the scalp for alopecia or baldness treatment. In foods, saffron is used as a spice, flavor, taste and yellow food coloring agent. In manufacturing, saffron extracts are used as fragrance in perfumery and as a dye for textile industries.

<b>Kingdom</b>	Plantae
<b>Unranked</b>	Angiosperm
<b>Unranked</b>	Eudicots
<b>Order</b>	Brassicales
<b>Family</b>	Brassicaceae
<b>Genus</b>	Brassica
<b>Species</b>	<i>B. oleracea</i>

#### TAXONOMICAL CLASSIFICATION OF BRASSICA OLERACEA

Table no.2: Taxonomical classification of *Brassica oleracea*

#### PLANT DESCRIPTION

*Brassica oleracea* is also known as purple cabbage. Its leaves are colored dark red or purple. The plant changes its color according to the pH value of the soil due to a pigment belonging to group anthocyanins. In acidic environment soil the leaves grow more reddish and in neutral soil they will grow more purple while in alkaline soil they will produce greenish-yellow coloured cabbages as it is known for his higher amount of nutrients and nutraceutically active drug agent.

#### CHEMICAL CONSTITUENTS OF BRASSICA OLERACEA

The major constituents of *brassica oleracea* or red cabbage contains isothiocyanates (glucosinolate), vitamins A, B, C, anthocyanins, cyaniding-3-glucoside and delphinidin-3-glucoside and high source of nutrients.



Fig.4: Plant of *brassica oleracea*



Fig.5: *Brassica oleracea* (red cabbage)

#### USES OF BRASSICA OLERACEA

*Brassica oleracea* is nutrient-rich vegetable with a wide range variety of health benefits. These includes reduced inflammation, a healthier heart, stronger bones, improved gut function, and perhaps even a lower risk of certain cancers. It is used as colouring pigment and raw form for salads. Thus, a highly potent ingredient for treating heart, bones, muscles and tissues disorders.

## MATERIALS AND METHOD

Crocus sativum, brassica oleracea, Honey, butter, ghee, cinnamon, shikkai powder, olive oil, watermelon was purchased from local market Bhopal, Madhya Pradesh. Waxes and other excipients used were provided by Lakshmi narain college of Pharmacy, Bhopal (M.P.)

### EXTRACTION OF BETANIN FROM BETA VULGARIS AND BRASSICA OLERACEA

Extraction of pigment was done by homogenization of equal ratio of fruit pulp and solvents (1/1 w/v). Take 100 g of the sample, of watery consistency, and macerate it with 100 mL solvents (EtOH, aqueous ethanol 50:50) for 15 minutes under water bath. Centrifuge the aqueous mixture at 18,000 rpm, 4°C for 20 min, and filter immediately through nylon mesh. By using rotary evaporator concentrate the extract in vacuum at 35°C, to 3–4 ml. completely remove the alcohol through concentration process and keep the samples in a dark vessel. [7]

### PREPARATION OF LIPSTICK

Herbal lipstick base ghee and butter heat at 40°C with Crocus sativum and brassica oleracea extract and weighed amount of bees wax was melted at 60°C. Color phase was added to molten wax phase to 40°C, followed by addition other excipients. The mixture was stirred vigorously till a smooth emulsion was formed. Slowly, this mixture was added with continuous stirring at 500 rpm using over head stirrer (Universal motor). The mixture was poured into clean and lubricated moulds



Fig.6: Formulation and preparation of herbal lipstick.

S.no.	Ingredients	Property	Formulation - I	Formulation - II
1.	Olive oil	Blending agent	14ml	18ml
2.	Bee wax	Hardness	20gm	24gm
3.	Butter and ghee	Glossy and nourishment	5gm	7gm
4.	Ripe fruit of Shikkai powder	Surfactant	2gm	2gm
5.	Crocus sativum (saffron)	Colouring agent	15ml	18ml
6.	Brassica oleracea (Red cabbage)	Colouring agent	22ml	25ml
7.	Watermelon	Flavouring agent	1ml	2ml
8.	Vanilla essence	Preservative	q.s.	q.s.
9.	Vitamin E	Antioxidant	1.5ml	2ml
10.	Cinnamon powder	Antimicrobial agent	q.s.	q.s.
11.	Honey	Tissue regeneration	2ml	3ml

Table no.3: Formulation of herbal lipstick

### EVALUATION PARAMETERS OF LIPSTICK

- Melting point:** -Take both ends open glass capillary tubes. Introduce into each of 5 capillary tubes a sufficient amount of the lipstick, about 10mm high and allow the tubes to stand for the appropriate time and at the prescribed temperature in capillary tube is taken as the melting point. Repeat the operation 3 times using other 4 capillary tubes and calculate the result.
- Breaking point:** - Value (10gm) at specific interval of 30 second and weight at which breaks Breaking point test is to determine the strength of lipstick. Place lipstick horizontally in a socket inch away from the edge of support. Increased the weight by a specific is considered as the breaking point.[9]
- Force of Application:** - It is test for determine the force to be applied for application. Keep a piece of coarse brown paper on a shadow graph balance and apply lipstick at 45°c angle to cover a 1 sq. Inch area until fully covered. The pressure leading is an indication of force of application.
- Surface anomalies:** -This test is for determining the surface defects, such as no formation crystals on surfaces, no contamination by molds, fungi etc.
- Aging stability:** -Store the product in 40\*c for 1 hour and observing the various parameters such as application characteristics, crystallization of wax on surface and oil bleeds.[10]
- Solubility test:** - Dissolve the lipstick in different solvents and observe the solubility in each solvent.



7. **PH parameters:** - Determine the PH of the lipstick by using PH meter.
8. **Skin irritation test:** - Apply the lipstick on the skin for 10min and observe.
9. **Perfume stability:** -Perfume stability can also be assessed by storing lipstick in oven at 40\*c and by making periodic comparison of perfume with fresh lipstick.[11]
10. **Thixotrophy character:-** It is the indication of thixotropic quality and was done by using penetrometer. A standard needle of specific diameter was allowed to penetrate for 5 seconds under 50gm load at 25\*c. the depth of penetration was measurement of the thixotropic structure of lipstick.

#### DEFECTS IN LIPSTICK

1. **Sweating:** - It is the most common problem of lipstick formulation due to high oil content or inferior oil binding. It may rise in any climate or temperature range.
2. **Bleeding:** - This refers separation of colored to the liquids from the waxy base.
3. **Streaking:** - A thin line or band of a different color or substances appears on the finished product. Molding Related Problems
4. **Laddering:** -Lipstick does not look smooth or homogenous after congealing and setting but instead has a multi-layered appearance.
5. **Deformation:** -This is a molding problem where the shape of the lipstick looks deformed .It is noticeable and appears on both sides of the lipstick.
6. **Cratering:** -This appears in split molding and it shows up flaming when stick develops dimples.
7. **Mushy Failure:** - This is a problem in which the central core of the lipstick lacks structure and breaks.[12]

S.no.	Evaluation parameters	Formulation - I	Formulation - II
1.	Colour	Reddish	Reddish
2.	Texture	Smooth	Smooth
3.	Odour	Aromatic	Aromatic
4.	Melting point	58-60	62-65
5.	Determination of pH	6.9 + 0.2	6.5 + 0.5
6.	Force of application	Easy	Good
7.	Perfume stability	++	+++
8.	Breaking point	24	26
9.	Skin irritancy	No irritancy	No irritancy
10.	Thixotrophy character	7.6	8.2
11.	Softening point	56-58	57
12.	Surface anomalies	No defect	No defect

**Table no.4: Evaluation parameters of formulated herbal lipstick.**

#### RESULT AND DISCUSSION

Different natural ingredients were used for formulation natural lipsticks that contain colouring agent which is a natural colorant obtained from herb *Crocus sativum* and *Brassica oleracea*, the effect of different natural ingredients on different evaluation parameters in the formulation have been investigated. The prepared lipstick (table 1) were evaluated (table 2) and it was found that effective and efficient herbal natural lipstick. 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

This research provides guideline on the use of herbal ingredients on the preparation of lipsticks having minimal or no side effects. The natural ingredients like Olive oil, ripe fruit powder of Shikakai, honey, butter, ghee, watermelon, etc. were used in the preparation of natural lipstick along with *Crocus sativum* and *Brassica oleracea* as coloring agent. The prepared lipsticks were show excellent properties like shining, spreading and smoothness and pharmaceutically active for lip action. The research finding provides effects of ingredient towards the physical properties, pharmaceutical or cosmetics industries and consumer acceptance of the herbal lipstick formulations.

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