



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Research Article

Formulation and Evaluation of Herbal Cosmetics

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ARTICLE INFO

Published: 10 Dec 2025

Keywords:

Herbal lipstick, waxes, oils, formulation, lip balm, skin care etc

DOI:

10.5281/zenodo.17876078

ABSTRACT

Lipstick and lip balm is an cosmetic product that are mainly used by women includes waxes, oils, pigments and dyes, antioxidants, fragrances, flavors and preservatives and other additives etc. which imparts the attractive color, texture and smoothness of lips. Now a day, herbal lipstick and lip balm has increased the demand because cosmetic industry uses many synthetic chemicals for skin care products to make formulation better and give quality standards, which become very harsh to lips because lips are very sensitive part of skin. It can damage due to prolonged use of synthetic lipstick. Herbal cosmetics contains all those natural ingredients require for formulation which has no side effect and chemically safe for use to keep lips healthy. In the present study, herbal lipstick and lip balm were prepared from the natural ingredients such as various extracts of beetroot, carrot and pomegranate fruits by using different extraction techniques, some other ingredients like oils, waxes, antioxidants, pigments etc. were used and prepared both formulation and evaluated by different evaluation tests which resembles the good results with standard values.


INTRODUCTION

According to D&C act 1940 & rules 1945, cosmetic means any article intended to be sprayed, poured, rubbed or sprinkled on or applied to the human body or its any part for glamorize, or reshape the appearance.^{1, 2} Cosmetics have become important aspects of everyone's life to look beautiful and glamorous, to achieve healthy and smooth skin by using various cosmetic

products. Cosmetics products are made to help nourish to skin and look beautiful but this contains synthetic chemicals that can be harsh to skin and it could be leave some undesirable conditions.⁶ Moreover, it is known that cosmetic industries uses dozens of synthetic chemicals in all skin care products from lipstick to creams and shampoos to hair oils to make formulation better and give quality standards.⁵ Now days, lipstick and lip balm is most popular beauty product used by women.

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



Lipstick and lip balm contains noxious mixture of petroleum based chemicals, many of them not been tested for safety. Some chemicals in lipstick and lip balm are easily absorbed through the lips and even each time it is ingested a small dose of toxic chemicals. Lips are sensitive part of skin (lacks hairs and sweat glands, which means they do not have same natural defense that other types of skin have) and easily absorbed through the thin layer of skin that covers them. For that instance, consumers always look for natural based cosmetics to prevent themselves from any sort of adverse reaction on skin.³

Herbal cosmetics has increased its demand worldwide because it contains naturally occurring phyto ingredients without contains synthetic and harsh chemicals which may give harsh effect to human skin such as allergy, dermatitis, skin discoloration, drying of lips. Most important chemicals are dye, which is added into the lipstick formulation for imparting color. A lot of lipstick and lip balm are made with synthetic dyes that come from aluminium or petroleum products. These dyes are stored in our body in the organs and fatty tissues. Coal tar one of the petroleum products that used is known as carcinogen. Some of the colors may even contain heavy metals.

Some of them are not approved as food colorants yet may be used in cosmetics. To avoid all this circumstances, herbal-based formulation contains natural coloring agent as a dye or pigments from leaves, fruits and flowering parts of plant sources, natural flavors, oils, wax and emollients, which provides color, texture, fragrance and protection to the lips. Therefore, there is tremendous boost in the use of herbal lipstick and lip balm so that consumers can take safe advantage of herbal lipstick.

It contain also wax, oil, pigments, essence, preservatives, & antioxidants. Wax gives smooth and glossy appearance, such as carnauba wax, white bees wax, honey bees wax. Oil that gives oily & translucent effect, such as castor oil, olive oil, coconut oil almond oil etc. pigment gives color or shade to the lipstick such as pomegranate, dragon fruit, carrot, beetroot, blue berries, purple cabbage, cocoa powder. Antioxidants increase its shelf life, such as vitamin C, vitamin E, and kiwi. Essence gives pleasant sent to the lipstick & mask the smell of other ingredients, such as vanilla, strawberry, rose etc.⁴

Components of herbal lipstick and lip balm:

TableNo.1 Components of herbal lipstick and lip balm

Sr. No.	Ingredients	% Used	Use
1	White bees wax	5-20%	Binds oil & it is higher melting point wax
2	Carnauba wax	1-3%	Impart rigidity and hardness
3	Castor oil	40-50%	Humectants
4	Almond oil	2-3%	Vitamin E
5	Lanolin	5-15%	Blender
6	Essence	q.s	Mask the smell of other ingredients
7	Extract	q.s	Gives color or shade to the lipstick

1. Bases: mostly waxes are used as a base for lipstick and lip balm formulation. This wax gives a stable texture to the lipstick and lip balm. The content of bases should be much

higher as compared to other components. All the ingredients required for making the lipstick and lip balm is dispersed between the wax phases. So that, the other ingredients must be

wax soluble. As per herbal formulation point of view, the wax which is being used that should be natural like white bees wax, yellow bees wax, carnauba wax, candeila wax, lanolin etc.

2. **Oils:** oils are also used as a part of lipstick and lip balm formulation, as wax gives texture and oil gives glossy and smooth structure to the texture. The content of oils is adjusted near to that of wax phase because the other natural ingredients being used for formulation must be soluble in oil as well. Many more herbal oils are used for lipstick and lip balm formulation like, castor oil, olive oil, almond oil, jasmine oil, rose oil, orange oil, lemon oil, coconut oil, cotton seed oil, palm oil, avocado oil etc. basically, almost all the oils having different property like every oil has different fragrance so that we have a many choices in terms of fragrance for herbal formulation.

3. **Natural Coloring agent:** the basic need of lipstick and lip balm formulation is to impart the color to the lips so that it covers any roughness or stain of lips as well as gives a beauty texture to the lips to look more beautiful than normal lips and to keep lips hydrated upto longer time. Different coloring agents give variety of shades. Solubility of color becomes challenging task in herbal formulation because the colors are obtained from natural sources especially from flowers and fruits. The naturally occurring colors are free from other chemical impurities, wax and oil soluble, non-toxic with no physiological activity.⁸

An ideal colorant should have following characteristics:

1. The colorant should be non-toxic and having no physiological activity.
2. The coloring power should be high enough so that only small quantities would be sufficient for use.
3. Colorant should be unaffected by light, temperatures, pH changes, hydrolysis, and microorganisms therefore they must be stable on storage.
4. It should compatible with other ingredients.
5. Colorants should not be affected by oxidizing or reducing agents.

Advantages of natural coloring agents to our lips:

1. Pomegranate is our favorite healthy breakfast fruit; pomegranate is another ideal solution for treating dark lips. It can nourish and moisturize lips as well as help restore give a natural looking pink color.
2. Beetroot has bleaching properties and is often added in lip balms to give you perfectly tinted lips. Apart from making your lips rosy pink, it will also moisturize and nourish your lips.
3. Carrot contains many essential vitamins and minerals and help increase blood circulation. You can also use beetroot paste or carrot pulp (which is the leftover part when you juice carrots) on your lips. It will help improve any dark spots or discoloration and make them look healthy and red rose petals nourish, soften and lighten your lips naturally. Together with milk, they work as a wonderful remedy for discoloration and repair dark, patchy lips.¹¹

Table No. 2 Naturally occurring colors from different plant and fruits

Sr. No.	Sources	Chromophore	Color
1	Grapes, Blueberry, Purple Cabbage, Blackberry	Anthocyanin	Purple Blue
2	Avocado, kiwi, Cucumber, Spinach, Broccoli	Chlorophyll	Green
3	Papaya, Pineapple, Pumpkin, Carrot, Orange	Carotenoids	Yellow Orange
4	Beetroot, Tomato, Strawberry, Watermelon, Pomegranate	Lycopene	Red
5	Cauliflower, Potato, Ginger, Onion, Banana	Anthoxanthines	White tan

4. Flavoring agent:

Flavors are selected based on the taste of the drug or other ingredients that need to be incorporated. Flavors used in a lipstick should not contain any ingredient, which may be irritating or toxic. These should have good taste and should be able to mask the fatty base of the base.

Flavoring agents are an essential component to mask the odor of the fatty or wax base as well as to impart an attractive flavor.

Table No. 3 Examples of masking flavors

Sr. No.	Taste	Masking Flavors
1	Salt	Butterscotch, Mapple
2	Bitter	Wild cherry, walnut, liquorice,
3	Sweet	Fruit, berry, vanilla
4	Acid	Citrus

Some of the advantages of using natural cosmetics that make them a better choice over the synthetic ones are as follows.

1. Safe to use
2. Compatible with body
3. Natural in nature
4. Affordable and non-expensive
5. Variety of products

6. No side effect

7. Not tested on animals

Ideal characteristic of Lipstick:

1. Smooth and easy to apply.
2. Non-irritant and non-toxic
3. Should have attractive color and shine
4. Free from grittiness and should be non-drying
5. It should have required plasticity
6. It should pleasant taste, odor, and flavor
7. Do not lose its smooth and shiny appearance during storage.
8. Stable during its shelf life-means free from bloom or sweating during storage.
9. It should not melt or harden within reasonable variation of climate temperature.

MATERIALS AND METHODS:

Three different fruit extracts viz. Pomegranate, beetroot and carrots were used for formulation of herbal lipstick and lip balm. All the fruits were collected from nearby areas. Other ingredients such as natural oils and waxes were purchased from Analab fine chemicals, Mumbai.



EXTRACTION, PREPARATION AND EVALUATION OF HERBAL LIPSTICKS:

concentration process and extract were kept in a dark.¹⁷

- 1. Extraction process of pomegranate :** firstly, washed pomegranate and peeled it. Then pomegranate blended and Collected Juice of Pomegranate. then, it was shaken and macerated with 100 mL solvents (aqueous ethanol 50:50) for 15 minutes under ice cooling condition. The aqueous mixture was centrifuged at 18,000 rpm and 4C° for 20 min followed by fast filtration on nylon mesh. The ethanol was completely removed after

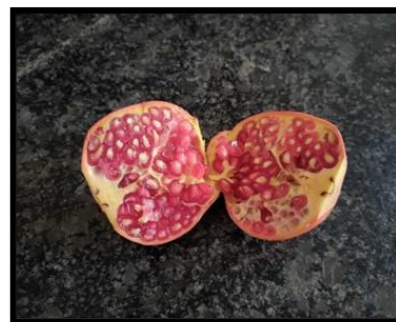


Figure 1: Pomegranate Fruit (*Punica granatum*) before extraction process



Fig. 2 peeled pomegranate



Fig. 3 pomegranate juice



Fig. 4 Maceration

Figure 2, 3 and 4: Preparation of Peeled Pomegranate extract and Maceration process

- 2. Extraction process of beetroot:** Extraction of pigment was achieved by homogenization of equal ratio of fruit pulp and solvents. 100 g of the peeled fruit was shaken and macerated with 100 mL solvents (aqueous ethanol 50:50) for 15 minutes under ice cooling condition. The aqueous mixture was centrifuged at 18,000 rpm and 4C° for 20 min followed by fast filtration on nylon mesh. The ethanol was completely removed after concentration process and sample kept in a dark vessel.^{6, 13,14}



Figure 5 Beet Root (*Beta vulgaris*) before extraction process



Figure 6 water bath



Figure 7 Boiled beetroot



Figure 8 Maceration

Figure 6, 7 & 8 Preparation of Peeled beetroot extract and Maceration process

3. **Extraction process of carrot:** Carotenoids were obtained from carrot by milling followed by pressing; filtration and evaporation resulted into juice. Then, a juice was shaken and macerated with 100 ml solvent (aqueous ethanol 50:50) and add rose petals for 15 minutes under ice cooling condition. The

aqueous mixture was centrifuged at 18,000 RPM and 4C° for 20 min followed by fast filtration on nylon mesh. The ethanol was completely removed after concentration process and samples were kept in dark vessels.¹⁹



Figure 9 Carrots (*Caucus carota*)

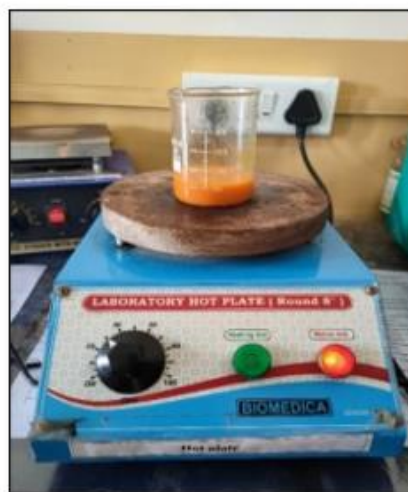


Figure 10 Maceration process

4. **Preparation of herbal lipstick of pomegranate, beetroot and carrot extract:**

1. Lipstick mould was cleaned and washed using detergent and water. Mould had

lubricated with liquid paraffin and kept in inverted position on ice to drain excess lubricant and to cool lipstick mould.

2. White bees wax, Lanolin, carnauba wax, with coconut oil or Almond oil were

weighed and transferred it to porcelain dish, then kept on water bath until it melts properly.

3. Acacia was added to above melted mixture and stirred well.
4. Pomegranate extract and lemon juice were also added.
5. Orange oil and essence was added and then final mixture was poured in the lipstick

mould in excess quantity until overfills and brought mould on ice for half an hour.

6. After solidification, mould was opened to remove lipstick using knife or blade and placed individual lipsticks in lipstick container.
7. Same procedure followed for other extracts as per formulation.^{9,15}

Figure 11, 12 & 13 Herbal lipstick as per given formulation



Figure 11 Ingredients melted



Figure 12 Lipstick from Pomegranate F3



Figure 13 Lipstick from Pomegranate F1

Figure 12 & 13 Herbal lipstick as per given formulation



Figure 14 Ingredients melted



Figure 15 Lipstick from beetroot F2

Figure 16 Herbal lipstick as per given formulation



Figure 16 Lipstick from Carrot F3

5. Evaluation parameter:

1. Melting point:

Determination of melting point is important part of stability testing. The melting point of formulated lipstick was determined by capillary tube method. The capillary was filled with lipstick and kept the capillary in melting point apparatus. Once liquid paraffin contained in apparatus starts boiling, that point has observed where lipstick starts to melt. After sometimes, product was completely melted. Procedure was repeated three times and the melting point ratio was observed in all formulation. The rising point of lipstick should be between 60 to 65 °C.¹⁰

2. Solubility test:

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

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

4. Color:

The colors and texture of all lipsticks were tested by applied on lips using a brush or other applicator.

5. Breaking point:

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

6. Force of application:

It is test for comparative measurement of the force to be applied for application. A piece of coarse brown paper kept on a shadow graph balance and lipstick was applied at 45° angle to cover a 1 sq. Inch area until fully covered. The pressure reading is an indication of force of application.^{4, 5, 12}

PREPARATION AND FORMULATION OF HERBAL LIP BALM FROM POMEGRANATE, BEETROOT, CARROT EXTRACTS:

The appropriate ingredients have selected for the formulation of lip balm. As per the formula, initially, accurately weighed the given quantity of waxes in hot water bath in descending order of their melting point with continuous stirring/heated till it melts completely. Then all three coloring agents dissolved in to the mixture of melted waxes as per the oil and water solubility. Finally flavoring agent such as rose water, vanilla were added and continuously stirred to get a homogenized mixture. The mixture should be stirred vigorously until a smooth emulsion form. Then, this mixture was poured into clean and lubricated mould or containers and allow them to cool to achieve contraction of the waxes to facilitate easy removal of the balm.¹⁰



Figure 17, 18 & 19 Herbal Lip balms from Pomegranate, Beetroot and Carrot extract

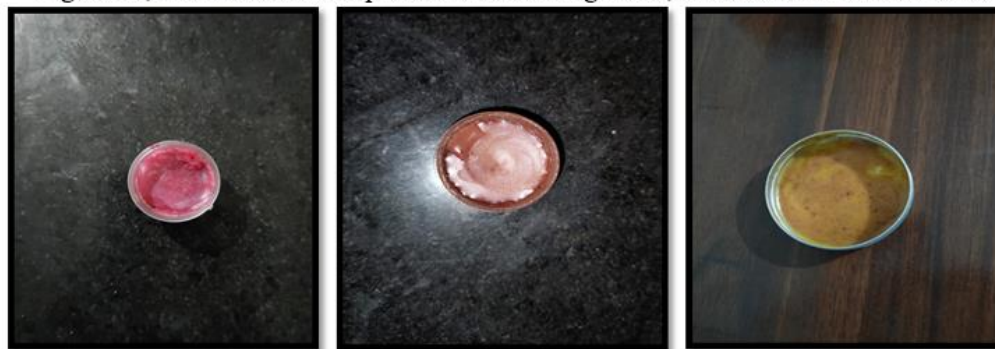


Figure 17 Pomegranate

Figure 18 Beetroot

Figure 19 Carrot

Evaluation parameters for lip balm:

The spread ability of lip balm was tested by applying the formulated lip balm on glass slide at room temperature to observe uniformity in the formulation of protective layer and whether the stick fragmental deformed or broke during application for appropriate results of different formulation.

The melting point and pH of lip balm are also commonly evaluated by capillary method and pH meter respectively.

Skin irritation test was performed by applying the product on skin for 30 min.

The product needs to study for the surface anomalies such as formation crystals on surfaces or contamination by mould fungi etc. There should not be sign of any surface defects.

The lip balm product was evaluated for perfume and aging stability over 30 day period in room

temp. 25°C in refrigerator at 5°C and oven temperature 40°C^{10, 12}

RESULT AND DISCUSSION

The present work displayed the results of herbal formulation of lipstick and lip balm carried out on various extract of pomegranate, beetroot and carrot. The fruits were selected on the basis of literature survey.

Preparation of extract: The extracts were prepared by using maceration and extraction technique from the juice of Pomegranate seeds, beetroot, and carrots. The extracts were evaporated to dryness to get the powder of that extract.

Formulation of Herbal lipstick of Pomegranate seeds: As per the table no. 4, the formulas were prepared for the herbal lipstick of pomegranate. The herbal lipsticks of pomegranate were prepared by using F1, F2 and F3. However, out of three formulations F3 has shown best results. The entire formulated lipstick shown color but two were not imparting color on skin except F3.

Table 4 Formulation of Pomegranate Extract

Ingredients	Quantity (gm.)		
	F1	F2	F3
White bees wax	2 gm.	2 gm.	2 gm.
Carnauba wax	0.3 gm.	0.3 gm.	0.5 gm.
Castor oil	4.5 ml	2 ml	-

Coconut oil	1 ml	-	-
Vitamin C	4 -5 drops	-	-
Vanilla essence	2 – 3 drops	-	-
Pomegranate extract	1 gm.	2 gm.	3 gm.
Glycerine	-	0.5 ml	0.5 gm.
Lanolin	-	1 gm.	-
Gum acacia	-	0.2 gm.	1.5 gm.
Orange oil	-	1 ml	1 ml
Almond oil	-	1 ml	1 ml
Rose essence	-	-	2 -3 drops

Formulation of Herbal lipstick of Beetroot: As per the table no. 5, the formulas were prepared for the herbal lipstick of pomegranate. The herbal lipsticks of pomegranate were prepared by using

F1, F2 and F3. However, out of three formulations F3 has shown best results. The entire formulated lipstick shown color but two were not imparting color on lipstick except F3.

Table 5 Formulation of Beet Root Extract

Ingredients	Quantity (gm)		
	F1	F2	F3
White bees wax	2 gm	2 gm	2 gm
Carnauba wax	0.3 gm	0.3 gm	0.5 gm
Castor oil	4.5 ml	2 ml	-
Coconut oil	1 ml	-	-
Vitamin C	4 -5 drops	-	-
Vanilla essence	2 – 3 drops	-	-
beetroot extract	1 gm	2 gm	3 gm
Glycerine	-	0.5 ml	0.5 gm
lanolin	-	1 gm	-
Gum acacia	-	0.2 gm	1.5 gm
Orange oil	-	1 ml	1 ml
Almond oil	-	1 ml	1 ml
Rose essence	-	-	2 -3 drops

Formulation of Herbal lipstick of Carrot: As per the table no. 6, the formulas were prepared for the herbal lipstick of pomegranate. The herbal lipsticks of pomegranate were prepared by using

F1, F2 and F3. However, out of three formulations F3 has shown best results. The entire formulated lipstick shown color but two were not imparting color on lipstick except F3.

Table 6 Formulation of Carrot Extract

Ingredients	Quantity (gm)		
	F1	F2	F3
White bees wax	2 gm	2 gm	2 gm
Carnauba wax	0.3 gm	0.3 gm	0.5 gm



Castor oil	4.5 ml	2 ml	-
Coconut oil	1 ml	-	-
Vitamin C	4 -5 drops	-	-
Vanilla essence	2 – 3 drops	-	-
carrot extract	1 gm	2 gm	3 gm
Glycerine	-	0.5 ml	0.5 gm
Lanolin	-	1 gm	-
Gum acacia	-	0.2 gm	1.5 gm
Orange oil	-	1 ml	1 ml
Almond oil	-	1 ml	1 ml
Rose essence	-	-	2 -3 drops

Formulation of Herbal lip balm of Pomegranate, Beetroot and carrot: As per the table no. 7, the formula was prepared for the herbal lip balm of pomegranate, beetroot and carrot. The herbal lip balm of pomegranate, beetroot and carrot were shown attractive color giving smooth and glossy texture to the lips.

Table 7 Formulation of Herbal Lip Balm of Pomegranate, Beetroot and Carrot Extract

Ingredients	Quantity
White bees wax	0.5 gm.
Ghee	1 gm.

Almond oil	1 ml
Pomegranate, Beetroot, Carrot Extract.	1.5 ml
Rose, vanilla, pineapple Essence	Q.S.

Evaluation of Herbal lipstick: the formulated herbal lipsticks were evaluated as per given parameter. All three formulations shown different colors and textures as per small change in formulation. The melting point of all formulation has evaluated which was in between 60 to 65°C. pH has measured for each formulation which is in mention table no.8. Breaking point of formulations was obtained between 28-32.

Table 8 Evaluation of Herbal Lipstick

Sr. No	Extract used	Color	Spreadability	Avg. M.P.(°C)	pH	Breaking Point
1	Pomegranate Seed	Pink	Good	60-65	6.7±0.2	32
2	Beetroot extract	Light Wine	Good	61-63	6.5±0.2	31
3	Carrot	Orange red	Good	60-62	6.5±0.2	28

Evaluation of Herbal lip balm: The formulated herbal lip balms were evaluated as per given parameters. All the formulation of lip balm

showed good stability and vibrant color and good Spreadability.

Table 9 Evaluation of Herbal Lip Balm

Sr. No	Extract used	Color	Odour	Spreadability	Skin irritation Test	Stability
1	Pomegranate Seed	Pink	Pleasant	Good	No	No deformation Stable
2	Beetroot extract	Reddish brown	Pleasant	Good	No	Stable
3	Carrot	Yellowish orange	Pleasant	Good	No	Stable



CONCLUSION:

Different natural or herbal ingredients were used for the formulations of the herbal lipstick and lip balm like Beeswax, lanolin, castor oil, Beet root extract obtained from *Beta vulgaris*, carrot extract *Daucus carota* subs, pomegranate extract from *Punica granatum* used as coloring pigment. The lipsticks were evaluated for various criteria. From the above evaluation criteria, it was concluded that F3 formulation was found to pass all those criteria and it shows no side effects, showing maximum local effects and good properties like shining, spreading and smoothness of lip, hence F3 formulation was considered as the optimized formulation. The research finding also provides guidelines on effect of herbal ingredients towards the properties of lipsticks and lip balm and consumer acceptance of the herbal lipstick formulations.

ACKNOWLEDGEMENTS: We are very grateful to whom supported this work to accomplish this project with the encouragement and guidance.

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HOW TO CITE: Neelam Bhagdevani*, Sonali Devne, Smita Waghmare, Pratibha Shelke, Meenal Kubde, Pramod Ingale, Formulation and Evaluation of Herbal Cosmetics, Int. J. of Pharm. Sci., 2025, Vol 3, Issue 12, 1766-1779 <https://doi.org/10.5281/zenodo.17875682>

