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"Formulation and Evaluation of Medicated Lipstick for the Treatment of Chapped Lips Using Beta Vulgaris as Natural Colouring Agent"

Pravin G. Kukudkar , Homeshwari P. Patle, Janvi S. Bisen, Dharmendra Pardhi, Dhanesh Kharole

Manoharbhai Patel Institute of Bachelor of Pharmacy Kudwa, Gondia MH (441601)
Mob. No. 7744850892

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ABSTRACT

Cosmeceuticals are the formulations which contain biologically active ingredients along with other excipients which acts as a beauty fix as well as personal care products. Bath soaps, serums, shampoos, lipsticks, creams etc. are some examples. Lipsticks are popularly used cosmetic right since ancient times, which contain different, waxes, oils,emollients and other synthetic and natural substances which moisturizes , protects and keeps the lips supple and hydrated. The objective of the present study involved the formulation and evaluation of herbal lipsticks using color matter from natural sources such as carrot and beetroot. Different natural ingredients such as beeswax, castor oil, white beeswax, Acacia, vitamin B12(almond oil), coconut oil, rose oil, mineral oil, and beetroot (Beta vulgaris) were used to formulate herbal lipstick. This formulation was prepared by pour molding method and was subjected to various evaluation tests. Prepared lipstick was evaluated for different evaluation tests such as color, texture, pH, melting point, breaking point, surface anomalies, aging, and perfume stability. Results have shown that different evaluation parameters of prepared herbal lipstick. It can be concluded that the use of natural colorants in lipstick formulations has fewer or no side effects.

KEYWORDS: Medicted lipstick, chapped lips, Cosmoceuticals, Beta vulgaris.

I. INTRODUCTION

In ancient times cosmetics were only used as a beauty fix. These were derived from various natural sources. In the present scenario beauty along with personal care is the trend. Cosmeceuticals combination of cosmetics and drugs has come into picture, which imparts decorative, attractive and eye appealing impressions along with therapeutic activity. These products not only add glamorous touch to an individual but also heal different pathological conditions such as inflammation, cracking, chapping and dryness of the skin. Face is the important part which is exposed to the environment and one must take a great care of it.

Fig1. Lipstick

Lips are the most important part in the face. It needs proper nourishment and hydration as it is the only part in our body which lacks pores. Cosmeceuticals like lip balms, lip serum, lip rouge, lip oils, lip masks, lip scrubs, lipsticks, and exfoliators have evolved which protects the lip skin from dehydration, hyperpigmentation, inflammation etc. Out of all lipsticks is the integral part of daily make up routine. Lipsticks are cosmetic formulations for the modification or accentuation of lip color and are prepared by molding a dispersion of colors in a waxy base, in the form of stick/crayon. Any preparations used in beauty treatments for lip make-up also known as sticks or more commonly known in beauty treatments by the name of lipsticks. When these preparations contain active ingredients, they are

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also known as medicated lipsticks or medisticks which may contain synthetic drugs or herbal dugs. Many medicated lipsticks, lip balms, micro sponges were formulated by using allantoin[8] benzoyl peroxide**,** terbinafine hydrochloride, flubiprofen, and natural antifungal ingredient curcumin acyclovir, etc. In the present study we tried to formulate a medicated lipstick using almond oil and beta vulgaris which is vitamin agent with mild antiseptic action. Salicylic acid[13] facilitates desquamation by solubilizing the intercellular cement that binds scales in the stratum corneum, thereby loosening the keratin. This keratolytic effect may provide an antifungal action because removal of the stratum corneum suppresses fungal growth; it also aids in the penetration of other antifungal agents. Instead of synthetically derived colors which may show side effects upon longer usage, we used naturally extracted colour from beetroot, which imparts orange red colour. Betacyanins and betaxanthin are the important chemical constituents which has betalain pigment.

Beeswax (Cera alba) is a natural wax produced by honey bees of the genus Apis. The wax is formed into "scales" by eight wax-producing glands in the abdominal segments of worker bees, who discard it in or at the hive. The hive workers collect and use it to form cells for honey-storage and larval and pupal protection within the beehive. Beeswax is used in lip balm, lip gloss, hand creams, salves, and moisturizers; and in cosmetics such as eye shadow, blush, and eye liner. Beeswax is also an important ingredient in moustache wax and hair pomades, which make hair look sleek and shiny. In the preparation of lipstick beeswax is used as glazing agent for giving a glossy look to the lipstick and also it is used for the hardening of the final preparation of lipstick. Paraffin wax is a white or colourless soft solid derivable from petroleum, coal or oil shale that consists of a mixture of hydrocarbon molecules containing between twenty and forty carbon atoms. It is solid at room temperature and begins to melt above approximately 37 °C (99°F); its boiling point is >370°C (698°F), used as moisturiser in toiletries and cosmetics such as vaseline, though potentially comedogenic. In this case it is used as a glossary for the finished product. Castor oil is a vegetable oil obtained by pressing the seeds of the castor oil plant (Ricinuscommunis). The common name "castor oil", from which the plant gets its name, probably comes from its use as a replacement for castoreum, a perfume base made from the dried perineal glands of the beaver (castor in Latin).Castor oil is a colorless to very pale yellow liquid with a distinct taste and odor once first ingested. Its boiling point is 313°C (595°F) and its density is 961kg/m^3. It is a triglyceride in which approximately 90 percent of fatty acid chains are ricinoleates. Oleate and linoleates are the other significant components. Castor oil is not a drying oil, meaning that it has a low reactivity toward air compared to other oils such as linseed oil and tung oil. Dehydration of castor oil gives linoleic acids, which do have drying properties.Other excipients include beeswax, hard paraffin,almond oil, titanium oxide.

Merits

1.The medicated lipstick should protect lips from dryness and cracking.
2. Lipstick provides hydration as in it has ingredient like Aloe vera or vitamin E.
3. Lipstick defines your lip and brightens your smile, provided you choose the right shade.
4. The medicated lipstick provide anti-inflammatory effect as in it has ingredient like Turmeric.
5. It should be also protected from sores and swelling.

Demerits

1. They are the cause of several skin allergies.
2. It is not easy to remove.
3. It may does become a habit.
4. It can damage the skin.
5. Ingestion of chemicals may occur.

METHOD:

1. **Melting and Mixing:** First, the raw ingredients for the lipstick are melted and mixed separately because of the different types of ingredients used. One mixture contains the solvents, a second contains the oils, and a third contains the fats and waxy materials. These are heated in separate stainless steel or ceramic containers. The solvent solution and liquid oils are then mixed with the color pigment that is extracted from beetroot. After the pigment mass is ground and mixed, it is added to the hot wax mass until a uniform color and consistency is obtained. The fluid lipstick can then be strained and molded.

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2. **Moudling:** Once the lipstick mass is mixed and free of air, it is ready to be poured into the tube. The melted mass is dispensed into a mold, which consists of the bottom portion of the metal and a shaping portion that fits snugly with the tube. Lipstick is poured "up-side down" so that the bottom of the tube is at the top of the mold. Any excess is scraped from the mold. The lipstick is cooled and separated from the mold, and the bottom of the tube is sealed.

3. **Extraction of Colour:**The coloring agent used in the formulation is beetroot. It is extracted by first peeling and chopping the beetroot followed by drying it. The powder of dried beetroot is made by grinding it in the mixer.These powder is heated with ethanol solution and the ethanol solution is allowed to evaporate until the color is concentrated and then the color is extracted. The ethanolic solution is directly used for coloring.

II. LITERATURE REVIEW

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 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 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 value [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, lustre, have been changed and become wider. This can be observed from the facts that lipstick is marketed in hundreds of sheds of colours to satisfy the demand of the women.

4) **Rautela Sunil et al.** they worked on force of application – It is test for comparatively measurement of the force to be applied for application. A piece of coarse brown paper can be kept an a shade graph balance and lipstick can be applied at 450 angle to cover 1 sq. Inch area until fully covered.The pressure reading in an indication of force of application.

5) **D A. Bhagwat et al.** they evaluated. Aging stability –The product was stored at 400c at 1 hrs various parameters such as bleeding, crystallization on the surface and ease of application were observed.

6) **Jaysingh A. Rajpurohit et al.** they worked on perfume stability – perfume stability can also be assessed by storing lipstick in oven at 400c and by making periodic comparison of perfume with fresh lipstick. pH parameter – The pH of formulated herbal lipstick was determined using standard pH paper

III. PLAN OF WORK

The work was executed as follows:
1. Literature review
2. Development of suitable formula.
3. Selection of excipient.
4. Procurement of drug and excipients
5. Extraction of beetroot.
6. Formulation of lipstick (solid state) using natural colouring agent.
7. Evaluation of lipstick

- Colour
- Melting point
- Breaking point
- Force of application
- Surface anomalies
- Aging stability
- Solubility Test
- PH parameters
- Skin irritation test
- Perfume stability

IV. AIM AND OBJECTIVE

AIM:-

Formulation and evaluation of medicated lipstck for the treatment of chapped lips using beta vulgaris as natural colouring agent.

OBJECTIVES:-

- For the purpose of beautification of lip.
- To use in treatment of different lips disease.
- To protect from sores & swelling.
- To protect lips from dryness &cracking
- To prevent chapping of lips due to presence of vitamin B12.

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V. INTRODUCTION TO INGREDIENTS USED

1) BEES WAX: -
Synonym: Paraffin-wax, Cranauba
Biological source: It is a product made from the honeycomb of the honeybee and other bees.
Family: Apidae
Chemical constituents: The main chemical constituents are carbon (73.3%), hydrogen (13.2%) and oxygen (7.5%).

Uses: - It offers a moisturizer that protects your lips from becoming dry and developing cracks. It is also used in lip-balm, lip-gloss, etc.

Fig 2 Beeswax

(2)WHITE SOFT PARAFFIN:
Synonym: White petroleum jelly, vaseline.
Source: It is obtained from the residues of petroleum distillation by the process of refining distillation and bleching.
Uses: White soft paraffin is an emollient that moisturizes the skin and used for treating dry skin. IT is used as a barrier cream by providing a layer of oil on the surface of the skin to prevent water evaporating from the skin surface. It is an emollient, sometimes known as skin lubricant. It is used to soothe, smooth and hydrate the skin.

Fig.3 White Soft Paraffin

(3) CASTOR OIL:
Synonym: Linseed oil, Ricinus oil
Biological source: - It is non-volatile fatty oil obtained from the seeds of the castor bean, Ricinus communis.
Family: - Spurges
Chemical constituents: It is mainly composed of fatty acids and neutral lipids.
Uses: - It is used as a laxative. It is used as a moisturizer. It may promote the healing of cracked lips. It promotes hydration.

Fig.4 Castor Oil

(4) ALMOND OIL:
Synonym: - Sweet almond oil
Biological source: Almond oil is a fixed oil obtained by expression from the seeds of Prunus amygdalus (Rosaceae) var. dulcis (sweet almonds).
Family: Rosaceae
Chemical constituents: It is composed mainly of triacylglycerols and contains small quantities of free fatty acids, glycerol, phosphatides, pigments, and sterols.
Uses: - It is used as superior hydration. It helps in relief from cracked and chapped lips. It gives natural SPF protection. It helps to keep your lips hydrated. It used to remove dead skin from lips and rejuvenate your skin. It nourishes the lips.

Fig.5Almond Oil

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(5) COCONUT OIL:

Synonym: - Copra oil, Coconut palm oil, Cocos nucifera oil

Biological source: - It is the oil expressed from the dried solid part of the endosperm of coconut, cocos nucifera.

Family: Palmae

Chemical constituents: It is composed of the fatty acids, caprylic acid C-8:0 (8%), capric acid C-10:0 (7%), lauric acid C-12:0 (49%), myristic acid C-14:0 (8%), palmitic acid C-16:0 (8%), stearic acid C-18:0 (2%), oleic acid C-18:1 (6%) and 2% of C-18:2 linoleic acid.

Uses: - It protects skin from UV Rays. It relieves irritation. It is used as a moisturizer.

Fig.6 Coconut Oil

(6)ACACIA:

Synonym: Acacia gum, Indian Gum and Gum Arabic.

Biological Source: Acacia is the dried gummy exuda-tion obtained from the stems and branches of Acacia senegal.

Family: Fabaceae

Chemical Constituents: Acacia gums are polysaccharides and composed of L-arabinose, D-galactose, L-rhamnose and D-glucuronic acid in the approximate molar ratio of 3:3:1:1

Uses: Acacia gum is a safe and natural stabilizer and thickener in cosmetics

Fig.7 Acacia

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(7) TOCOPHEROL

Synonym: - Vitamin E

Biological source: - It is a group of compounds found in a wide variety of foods.

Chemical constituents: - It refers to a group of eight different compounds: α-, β-, γ-, and δ-tocopherols and the corresponding four tocotrienols.

Uses: - It is used as a preservative and treating fine lines and wrinkles. It makes lips softer.

Fig.8 Tocopherol (soft gel tablets)

(8) BEETROOT

Synonym: Beta vulgaris rubra, Chukandar

Biological source: It consists of fresh root of Beta vulgaris.

Family: Amaranthaceae

Chemical constituents: It consist of multiple biologically active phytochemicals including betalains, flavonoids, polyphenols, saponins and inorganic nitrate, it is a rich source of diverse minerals such as potassium, sodium, phosphorous, calcium, magnesium, copper, iron, zinc.

Uses: - It is used as colouring agent. It is used as a binder. It gives glossy appearance to lips. It also

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provides emollient action on lips. It also prevents cracking of lips.

Fig.9 Beetroot

(9) ROSE OIL:

Synonym: - Rose otto, Attar of rose

Biological source: It is obtained from the petals of different Rosa species especially Rosa centifolia and Rosa damascena mill.

Family: Rosaceae

Chemical constituents: The most common chemical compounds present in rose oil are: citronellol, geraniol, nerol, linalool, phenyl ethyl alcohol, farnesol, stearoptene, limonene and eugenol, etc.

Uses: It is used as perfume. It is used to create a more natural aroma. It is used to give a pleasant scent.

Fig.10 Rose Oil

VI. INGREDIENTS AND THEIR ROLE

SR.NO.	INGREDIENTS	ROLE
1.	Bees Wax	Lubricating agent Waterproofing agent Thickening agent
2.	White Soft Paraffin	Lubricating Agent
3.	Castor Oil	Humectants moisturizer
4.	Almond Oil	Emollient Vitamin B12
5.	Coconut Oil	Hydrating agent Moisturizing agent Rejuvenate
6.	Acacia	Stabilizer Thickener
7.	Tocopherol	Antioxidant
8.	Beetroot	Colouring agent Anti-infflammatory
9.	Rose oil	Perfume Flavourng agent

Table No.1 Ingredients And Their Role

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VII. MATERIAL AND INSTRUMENTS

MATERIAL

The various chemicals used throughout experimental work are summarized in following table:

SRNO	CHEMICALS
1	Bees wax
2	White soft paraffin
3	Castor oil
4	Coconut oil
5	Almond oil
6	Rose oil
7	Acacia
8	Tocopherol
9	Beet root extract
10	Methanol
11	Diethyl ether
12	Ethanol

Table No.2 List of chemicals used

INSTRUMENTS

The instruemnts used throughout the experiment are summarized as follows:

SR NO	INSTRUMENTS	BRAND NAME
1	Analytical Weighing Balance	Contech
2	pH METER	Globe
3	Heating Mantle	Biotechnics India
4	Hot Air Oven	Tempo
5	Mixer And Grinder	Jyoti
6	Rectagular Water Bath	Labline

Table No. 3 List of Instruments and their brand name

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VIII. PREPARATION OF MEDICATED LIPSTICK

The folowing procedure was followed dusring formulation

- The medicated lipstick was formulated as per general method of lipstick formulation.
- In this formulation bees wax is melted in a beaker at 70°c on a water bath.
- Similarly white soft paraffin, castor oil, coconut oil, rose oil and almond oil were taken in another beaker and melted at 70°c on a water bath in decreasing order of their melting point. The colored pigment (beet root) was added to the oil phase until a homogenous mixture was obtained.
- Then it was added to the wax phase at the same temperature.
- The mixture was cooled to 40°c and tocopherol (vit E) was added.
- The molten mixture was poured into lipstick moulds.
- Upon solidification it was separated from the moulds and fitted in lipstick case.

IDENTIFICATION TEST FOR COLOURED MATTER BEETROOT

To the extract, addition of few drops of diethyl ether will give violet colour that turns to yellow

Fig. 11 Prepared Formulation

Table No.4 Preparation of Medicated lipstick

SR NO	INGREDIENTS	QUANTITY TAKEN (F1)	QUANTITY TAKEN (F2)
1	BEES WAX	6 gm	6 gm
2	WHITE SOFT PARAFFIN	8 gm	8 gm
3	CASTOR OIL	4 gm	4 gm
4	ALMOND OIL	4 gm	4 gm
5	COCONUT OIL	3 gm	3 gm
6	ACACIA	0.5gm	0.5 gm
7	TOCOPHEROL	1 gm	1 gm
8	BEETROOR EXTRACT	2 gm	2 gm
9	ROSE OIL	q.s.	q.s

IX. EVALUATION OF MEDICATED LIPSTICKS:

1 .COLOUR:

Lip colors are products that apply color, texture, and/or shine to the lips using a brush or other applicator. Lip colors contain ingredients that apply color to the lips in a precise and controlled manner. Lip colors can also have multifunctional benefits, such as moisturizing, or may even include sunscreen for SPF protection. Lip color product

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safety is established by selection of ingredients that are safe and suitable for this intended use and purpose.

2. MELTING POINT:

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

3. 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.

4. 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 45º angle to cover a 1 sq. Inch area until fully covered. The pressure reading is an indication of force of application.

5. SURFACE ANOMALIES

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

6. AGING STABILITY

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

7. SOLUBILITY TEST

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

8. PH PARAMETERS

The pH of formulated herbal lipstick was determined using pH meter

9. SKIN IRRITATION TEST

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

10. AGING STABILITY

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

11. PERFUME STABILITY

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

X. RESULT AND DISCUSSION

RESULT

The result of evaluation parameters of lipstick are as follows:

SR NO	EVALUATION PARAMETERS	F1	F2
1	Colour	Rose Red	Rose Red
2	Melting Point	65°C	64°C
3	Breaking Point	24	23
4	Force Of Application	Easy	Easy
5	Surface Anomalies	No Defect	No Defect
6	Aging Stability	Smooth	Smooth

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7	Solubility Test	Soluble In Methanol	Soluble In Methanol
8	PH Parameter	6.8	6.9
9	Skin Irritation Test	Non Irritating	Non Irritating
10	Perfume Stability	++	+++

Table No. 5 Result Of Evaluation Of Medicted Lipstick

Discussion

The present work formulation and evaluation of medicated lipsticks was aimed to formulate a lipstick using herbal ingredients with a hope to minimize the side effects as produced by the available synthetic ones. The prepared formulation (Table - 6.1) was evaluated (Table 6.2) and it was found that the herbal lipstick, F2 formulation was best among the both formulations in terms of color and smoothness. However the lipsticks were hard to apply in comparison to other formulations. None of the formulations produced any skin irritation. No surface anomalies were found in any formulation. Aging stability was smooth for both formulations. Perfume stability was best in F2 formulation containing rose oil among all seven formulations. F1 formulations also showed adequate perfume stability upon storage. Solubility of the prepared herbal lipsticks was checked in different solvents like methanol, ethanol, chloroform and petroleum ether. Both the formulations were found to be soluble in methanol. Hence, from present investigation it was concluded that this formulated lipsticks has better option to women with minimal side effects though a detailed clinical trials may be done to access the formulation for better efficacy.

XI. CONCLUSION

A lipstick formulation was attempted to prepare using a natural coloring agent and a drug. The attempt was proved to be successful as the prepared formulation passed all the required evaluations of stability, consistency of color, good withstand towards the temperature and also the color consistency of the lipstick was really good as it was tested for this for about a month and the formulation was able to produce good color with the use of natural coloring agent, Beta vulagaris (beetroot) color. The use of tocopherol and almond oil which fulfills the vitamin defiency topically treats the chapped, cracked ad dry lips. The lipstick was found to be better cosmeceutical for the treatment of chapped and cracked lips which enhances appearance and also acts as solution for chapped lips.Consumers can take safe and effective adnatage of medicated lipstick after thorough clinical trials.

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