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Formulation and Evaluation of herbal lipstick from Beta-vulgaris

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ABSTRACT: -
Now a day's herbal lipstick gaining popularity. There are two types of cosmetics i.e. natural and synthetic cosmetic. The natural cosmetics are safe to use and easy to handle by women and synthetic cosmetic may cause allergic reaction and many side effects. The objective of the study was to formulate and evaluate herbal lipstick using natural beet root pigments. The aim was to prepare beet root powder and then formulate herbal lipstick using beet root powder and to evaluate the prepared lipsticks. Lipstick formulations are most widely used to enhance the beauty of lips and add glamours touch to the makeup. Herbal lipsticks offer advantages like they are non-toxicity, safe, cost effective, pigments used are from commonly available plants and vegetables. The preparation of herbal lipstick is done by using various natural ingredients like beet root, alkanet root, tomato, henna, red sandalwood, carrot etc. The effort was made to frame herbal lipstick by using colored natural pigments of beet root and the lipsticks were evaluated on parameters such as melting point, breaking point, pH parameter, spreadability, ageing stability, force of application and many others to obtain a satisfactory product. The preparation of these lipsticks includes natural ingredients like beet root, coconut oil, carnauba wax, castor oil and rose essence. The lipstick containing beet root was found to be satisfactory with desired properties such as color, smoothness and spreadability. The present work concluded that usesof herbal ingredients in the preparation of lipsticks have minimal or no side effects. This formulation has the potential to increase consumer acceptance because of the alternative natural ingredients and harmless colorant used.

Keywords: - Beta vulgaris, Extraction, Herbal Lipstick, Formulation, Evaluation

I. INTRODUCTION

Herbal lipsticks are prepared from pigments used from commonly available plants and vegetables. The most well-known coloring pigments are henna, beet root, alkanet root, indigo, amla hibiscus, tomato, carrot etc. using these pigments it is easy to create custom blends for your needs. The main ingredients of lipstick are pigments, oil, waxes and emollients. These are used for color, texture and protection of the lips. [1]

With the beginning of the civilization, Herbal cosmetic also known as "natural cosmetics". Peoples (men and women) had the magnetic dip towards impressing others with their looks was reported and there are number of wide ranges of herbal cosmetics products to satisfy your beauty regime, is very safe for the skin. The human beings have been using herbs for different purpose like food, medicine, beatifying with the advancement of science & technology was studied. [2]

Herbal cosmetics have growing demand in the world market and are an invaluable gift of nature. There are a wide range of herbal cosmetics products to satisfy your beauty regime, adding herbal in cosmetic is very safe for skin. Human beings have been using herbs for different purpose like food, medicine, beatifying with advancement of science and technology use of natural things including plant has been reduced except for food, vegetarian takes plant & plant only. However, there is resurgence of use of herbs both as drug and cosmetics. [3] Coloring lips in an ancient practice date back to prehistoric period. In present days the use of product has increased and choice of shades of colors textures, lusters have been changed and become wider. This can be observed from the facts that lipstick is marketed inhundreds of shades of color to satisfy the demand for the women. [4]

Beetroot (Beta vulgaris) is a plant in the Chenopodiaceae family that is now included in the Amaranthaceous family. It is best known for its

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many cultivated varieties, the best known of which is the root vegetable known as beets or garden beets. Beet root is the main source of natural red dye, known as "beet red". Beet roots and leaves have been used in traditional medicine to treat a wide variety of ailments. The ancient Romans used beets as a treatment for fever and constipation, among other ailments. The color of red/purple beets is due to a variety of Betanin pigments and is used industrially as a red food coloring and can be used as a coloring agent in lipsticks. [5]

According to D&C act 1940 & rules 1945, cosmetics means any article intended to be sprayed, poured, rubbed, or sprinkled on or introduced into, or applied to the human body or its any part for ablution, glamorize, promoting enchantment or reshape the appearance.' Lipstick gets their colors from diffusion of pigments and lake dyes however now not limited to Bromo acid. D&C Red No: 21. Calcium Lake which includes D&C Red 7 and D&C Red 34, and Orange No: 17 there are organic and inorganic pigments. [6]

1.1 BETA VULGARIS [7]:-

1. Source – It is obtained from ripe root of plant beet root.
2. Family - Amaranthaceae
3. Character – Beta vulgaris is an herbaceous biennial or rarely perennial plant up to 120 cm height. And the wild form of Beta vulgaris is distributed in southern and western.

Fig. No.: -1 Beetroot

1.1.1 Health benefits of Beetroot[8]: -

1. Treats anxiety disorder
2. Lowers blood pressure
3. Anti-thrombotic and Anti-inflammatory properties
4. Improve athletic performance
5. Protects Liver
6. Prevents dementia
7. Anti-cancerous
8. Treat anemia
9. Good for pregnancy
10. Healthy heart
11. Prevents birth defects
12. Antidiabetic
13. Prevents respiratory infections

1.2 Extraction [9]: -

Extractions are a way to separate a desired substance when it is mixed with others. The mixture is brought into contact with a solvent in which the substance of interest is soluble, but the other substances present are insoluble.

1.2.1 Types of Extraction: -

1. Solid-phase extraction
2. Liquid-liquid extraction
3. Acid-base extraction
4. Supercritical fluid extraction
5. Ultrasound- assisted extraction
6. Heat reflux extraction

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7. Maceration
8. Microwave- assisted extraction

1.3 Lipstick: -

Lipstick is a cosmetic that applies color, texture and protection to the lips.

1.4 Ideal characteristic of Lipstick[11]:

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 human.
5. It should have required plasticity.

Lipstick definition:

Lipstick is a cosmetic product containing pigments, oils, waxes and emollients which is applied to the lips to provide color, moisturization and protection.

II. FORMULATION OF HERBAL LIPSTICK

2.1METHOD OF BEET ROOT EXTRACTION

Peel the beetroot and cut it into uniform-sized fine slices. Spread it over a butter paper, cover with a fine mesh and allow it to shade dry for a day. If there is any moisture left dry in it in an oven. Take the dried beetroot and grind it into a fine powder. Pass the powdered material through a fine sieve. Check for any grainy particles. Sieve it again if required. Weight the amount of powder and pack it.

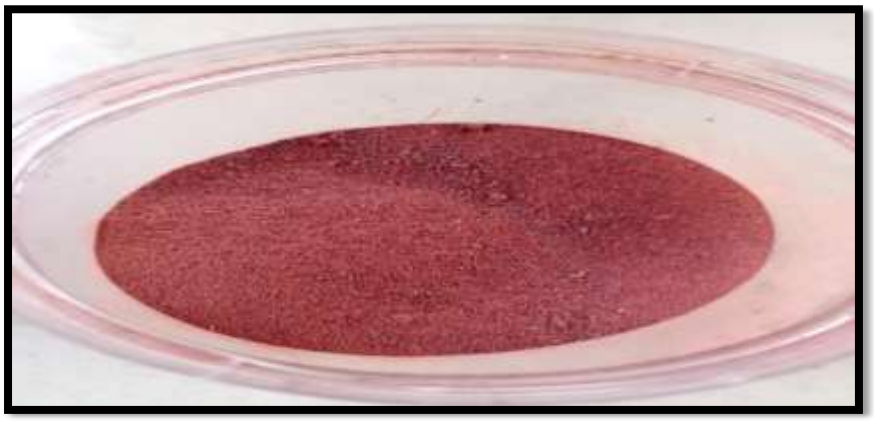

Fig. No: -2 Beetroot powder

2.2 METHOD OF PREPARATION

The herbal lipstick was formulated as per general method of lipstick formulation. In this formulation carnauba wax is melted in a beaker at 70°c on a heating mantle. Similarly, castor oil and coconut oil were taken in another beaker and melted at 70°c on a heating mantle in decreasing order of their melting point. The colored pigment of 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 rose essence was added. The molten mixture was poured into lipstick molds. Upon solidification it was separated from the molds and fitted in lipstick case.

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Fig. No. 3: - Formulation of Herbal Lipstick

III. FORMULATION TABLE OF HERBAL LIPSTICK: -

Table No. 3: - Formulation table of Herbal Lipstick

Sr.No.	Ingredients	L1	L2	L3	L4
1.	Carnauba wax	5gm	4gm	4.5gm	6gm
2.	Castor oil	2ml	4ml	3ml	3ml
3.	Coconut oil	4ml	3ml	3.5ml	2ml
4.	Beet root	4gm	4gm	4gm	4gm
5.	Rose essence	q.s.	q. s	q. s	q. s

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.

Fig. No. 4: - Lipstick after flaming process

IV. EVALUATION OF HERBAL LIPSTICKS:

1. Melting point [14]: -

Determination of melting point is important as it is an indication of the limit of safe

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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 melted. 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.

2. Solubility test [14]: -

The formulation herbal lipstick was dissolved in various solvents like water and methanol to observe the solubility.

3. Determination of pH [15]: -

The pH of herbal lipstick was determined by using pH meter, the average result of each formulation was calculated and recorded.

4. Color [15]: -

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, ormay even include sunscreen for SPF protection. Lip color product safety is established by selection of ingredients that are safe and suitable for this intended use and purpose.

5. Aging stability [16]: -

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

6. Breaking point [17]: -

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.

7. Perfume stability [18]: -

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

8. Force of application [18]: -

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.

9. Surface anomalies [19]: -

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

10. Skin irritation test [19]: -

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

V. RESULT AND DISCUSSION: -

5.1 Preformulation study of Beet root:

1. Organoleptic properties: -

Physical appearance of beet root powder was examined for following Organoleptic properties shown in Table No. 4.

Table No. 4: - Organoleptic properties of Beet root powder

Sr.No.	Organoleptic properties	Observations
1.	Color	Reddish-brown powder
2.	Odor	Distinct odor
3.	Taste	Sweet earthy taste
4.	State	Solid

2. Melting point: -

The melting point of beet root powder is given in the Table No. 5 obtained melting point of Beetroot powder is in confirmation with reported literature.

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Table No. 5:- Melting point of Beet root powder

Sr.No.	Sample	Melting Range	
		Observed	Reported
1.	Beetroot powder	58-60°C	56-62°C

3. Solubility studies :-

The solubility of beetroot powder is examined in water and ethanol solventsare given in Table No 6.

Table No. 6 :- Solubility of Beetroot powder

Sr.No.	Solvents	Solubility (In concentration)
1.	Water	381.5mg/100gm
2.	Ethanol	253.7mg/100gm

4. Absorbance maxima: -

Solution of Beetroot was prepared in methanol. Absorbance maxima were determined by analyzing this solution using UV-Visible Spectrophotometer in the range of 200-600 nm.

Evaluation parameter: -

1. Organoleptic Properties: -

Physical appearances of Herbal lipsticks were examined for following organoleptic properties shown in Table No.7.

Table No. 7: - Organoleptic Properties of Herbal Lipsticks

Sr.No.	OrganolepticProperties	Observations			
		L1	L2	L3	L4
1.	Color	Deep Red	Deep Red	Deep Red	Deep Red
2.	Odor	Aromatic	Aromatic	Aromatic	Aromatic
3.	Texture	Smooth	Smooth	Smooth	Smooth

2. Melting Point: -

The melting point of Herbal Lipsticks was given in the Table No. 8 obtainedmelting points of Herbal Lipsticks were in confirmation with reported literature. Theperfect lipstick has a melting point of about 55-60°C so that it does not run at warm temperature and is so stable that it does not break off during application.

Table No. 8: - Melting Point of Herbal Lipsticks

Sr.No.	Sample	Melting Point Range			
		L1	L2	L3	L4
1.	Herbal Lipsticks	51-52°C	54-55°C	58-59°C	60-62°C

3. Solubility Test: -

The Solubility of Herbal Lipsticks in different solvents such as water, ethanoland methanol were given in the Table No.9.

Table No.9: - Solubility of Herbal Lipsticks

Sr.No.	Solvents	Solubility Test			
		L1	L2	L3	L4

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1.	Water	Soluble	Slightlysoluble	Soluble	Insoluble
2.	Acetone	Slightly soluble	Soluble	Insoluble	soluble
3.	Ethanol	Soluble	Insoluble	Slightlysoluble	Soluble

4. Determination of pH: -

The pH of Herbal Lipsticks was given in the Table No. 10 obtained pH of Herbal Lipsticks was in confirmation with reported literature. The pH of Lipstick maintains or even fortify the skin barrier and support the natural skin flora.

Table No. 10: - pH of Herbal Lipsticks

Sr.No.	Sample	pH Range			
		L1	L2	L3	L4
1.	Herbal Lipsticks	6.7	6.2	6.6	6.5

1. Ageing Stability: -

The Ageing stability of Herbal Lipsticks was given in the Table No. 11 obtained Ageing stability of Herbal Lipsticks was in confirmation with reported literature. The purpose of ageing stability to ensure that a lipstick meets the intended physical, chemical and microbiological quality standards as well as functionality.

Table No. 11: - Ageing Stability of Herbal Lipsticks

Sr.No.	Sample	Ageing Stability			
		L1	L2	L3	L4
1.	Herbal Lipsticks	Smooth	Smooth	Smooth	Smooth

2. Breaking Point: -

The Breaking point of Herbal Lipsticks was given in the Table No. 12 and was done to determine strength of lipstick. The Breaking point of lipsticks should be evaluated for confirming strength of lipsticks.

Table No. 12: - Breaking Point of Herbal Lipsticks

Sr.No.	Sample	Breaking Point			
		L1	L2	L3	L4
1.	Herbal Lipsticks	23gm	25gm	24gm	28gm

3. Perfume Stability: -

The Breaking point of Herbal Lipsticks was given in the Table No. 13 andwas done to record the fragrance of lipstick. The Perfume stability is an important evaluation parameter to determine fragrance of lipstick is long time or short time.

Table No. 13: - Perfume Stability of Herbal Lipsticks

Sr.No.	Sample	Perfume Stability			
		L1	L2	L3	L4
1.	Herbal Lipsticks	Good	Very Good	Good	Excellent

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1. Force of Application: -

The Force of Application of Herbal Lipsticks was given in the Table No. 14 and was done to determine force of application. The Force of application of lipstick is used to evaluate the value of force apply to surface.

Table No. 14: - Force of Application of Herbal Lipsticks

Sr.No.	Sample	Force of Application			
		L1	L2	L3	L4
1.	Herbal Lipsticks	Poor	Easy	Easy	Good

2. Surface Anomalies: -

The Surface Anomalies of Herbal Lipsticks was given in the Table No. 15 and was done to check the surface defects and contamination by molds and fungi. The Surface anomalies that affect the fatigue life of product which are surface cracking, tearing, cavities, tearing and adhesion of foreign material.

Table No. 15: - Surface Anomalies of Herbal Lipsticks

Sr.No.	Sample	Surface Anomalies			
		L1	L2	L3	L4
1.	Herbal Lipsticks	No defect	No defect	No defect	No defect

3. Skin Irritation Test: -

The Skin Irritation Test of Herbal Lipsticks was given in the Table No. 16 and was carried out by applying product on skin for 10 min. The Skin Irritation Test is used to evaluate the potential of a product to cause skin irritation.

Table No. 16: - Skin Irritation Test of Herbal Lipsticks

Sr.No.	Sample	Skin Irritation Test			
		L1	L2	L3	L4
1.	Herbal Lipsticks	No	No	No	No

8.2 Evaluation of formulated herbal lipstick using Beta Vulgaris: -

Table No.17: - Evaluation of Formulated Herbal Lipstick using Beta Vulgaris

Evaluation Parameter	Formulations of Lipsticks			
	L1	L2	L3	L4
Color	Deep red	Deep red	Deep red	Deep red
Odor	Aromatic	Aromatic	Aromatic	Aromatic
Texture	Smooth	Smooth	Smooth	Smooth
Melting point	51-52°C	54-55°C	58-59°C	60-62°C

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Spreadability	Fragments	Smooth with no fragments	Smooth with no fragments	Smooth with no fragments
Breaking point	23gm	25gm	24gm	28gm
Force of application	Poor	Easy	Easy	Good
Ageing stability	Smooth	Smooth	Smooth	Smooth
pH meter	6.7	6.2	6.6	6.5
Skin irritation	No	No	No	No
Perfume stability	Good	Good	Good	Good
Surface Anomalies	No defect	No defect	No defect	No defect

CONCLUSION: -

In the present work, Lipstick containing herbal ingredients was prepared successfully according to the given formulations.

The following are the conclusions drawn:

1. Lipstick containing herbal ingredients was successfully formulated by using four different formulations (L1-L4).
2. Among all the four formulations, L4 formulations exhibited good results.
3. L4 formulation of lipstick containing herbal ingredients was found to be in compliance with all the evaluations tests.

Also, study concluded that herbal lipstick can be successfully formulated using different natural ingredients such as white bees wax, carnauba wax, castor oil, coconut oil, olive oil, vanilla & rose essence, beetroot powder and lemon will be better option than synthetic coloring agents which may arise harmful side effects. Consumers can take safe and effective advantage of this herbal lipstick after thorough clinical trials.

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