

FORMULATION OF RED BEET LIPSTICK

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Abstract

Lipsticks may be defined as a dispersion of the pigment in a base consisting with suitable perfume and flavours moulded in the form of sticks. The acceptance of lipsticks relies on its glossy nature and attractive colour. The safety, reliability and acceptability of natural products focused in the formulation of herbal cosmetics. Now a days the utilization of natural beauty care products in women proved the hike in cosmetics sales. Herbal lip beautifying products are made-up of natural plant extracts that rejuvenate and revitalize lip skin with new freshness. The objective of the present study involved the formulation of herbal lipsticks using a natural colour, extracted from beetroot. Different natural ingredients incorporated for the formulation. Different evaluation studies were carried out to select the ideal formulation. The selected formulation was compared with the marketed formulation for its acceptability. From the parameters it is concluded that the lipstick prepared from natural ingredient incorporated with the natural colourant have adequate texture and acceptable colour.

Key words : Cosmetics, Herbal lipstick, Natural Ingredients, Beetroot colour.

INTRODUCTION

A "cosmetic" is any substance used to clean, improve or change the complexion, skin, hair, nails or teeth. Cosmetics include beauty preparations and grooming aids^[1]. Cosmetics are the substance used to alter the appearance or fragrance of human body. Cosmetics word is obtained from the Greek word "kosmetikos" which means the power, arrange and skill in decorating. Herbal cosmetics are the cosmetics in which one or more herbal ingredients are used to form base.

Lipstick are most widely used cosmetics added in the make up to enhance the beauty of lips. Herbal Lipstick^[2] is a cosmetic product containing pigments, suitably incorporated in a fatty base for the protection of lips. Herbal lipsticks are gaining popularity because natural cosmetics are safe. It is easy to use and handle by a cosmetics loving person. The natural ingredients used in the herbal lipstick having minimum side effects. The herbal lipstick having natural ingredients or nutrients it is safe to use that keeps the lips healthy. The extracted colour from natural sources such as plants, insects, algae, may be utilized for the source of colour. Due to various adverse effects of available synthetic preparation, the present work was focused in formulating herbal lipstick using beetroot extract as the natural colourant. The formulation was undergone for a comparative evaluation with a marketed synthetic lipstick for its safety and stability. So the formulation may be utilised by the individuals who are very conscious in retaining the lip beauty. Some of the colorants from natural sources are listed in Table No:1.

Types of Lipstick

The lipsticks are divided [3] into following types:

- 1) Transparent lipstick
- 2) Liquid lipstick

- 3) Lip rouge
- 4) Matte lipstick
- 5) Creamy lipstick
- 6) Lip tint or stain
- 7) Lip crayon
- 8) Sheer lipstick
- 9) Glossy lipstick
- 10) Pearl lipstick
- 11) Moisturizing lipstick
- 12) Lip gloss lipstick

Ideal Characteristics of lipsticks^[4]

1. It should give shiny and smooth appearance free from sweating.
2. It should be non-irritant and nontoxic to the lips.
3. It should not dry on storage.
4. The container should operate easily.
5. It should impart uniform colour to the area of application.
6. It should be free from gritty particles.
7. It should not melt or harden within reasonable variation of climatic temperature.

MATERIALS AND METHODS

Materials

The preparation of the lipstick were carried out with the help of different ingredients as described in the Table No:2. The obtained / Purchased ingredients were documented and their corresponding figures are represented in Figure No: 1 to 6.

(1) White Bees Wax:^[5]

Synonym: Paraffin-wax

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

(2) Carnauba Wax:

Synonym: wax palm

Biological source: Carnauba wax is produced by the Brazilian palm Copernicia cerifera Martius

Family: Palmae

Chemical constituents: Carnauba wax consists of fatty acid esters (80-85%), fatty alcohols (10-16%), acids (3-6%) and hydrocarbons (1-3%). It is around 20% esterified fatty diols, 10% methoxylated or hydroxylated cinnamic acid, and 6% hydroxylated fatty acids.

Uses:Raises the melting point of gels, thus making it the preferred additives in lipsticks and lip balms.

(3) 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.

(4) 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 fragrance. It is used to create a more natural aroma. It is used to give a pleasant scent.

(5) 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 gives glossy appearance to lips. It also provides emollient action on lips. It also prevents cracking of lips.

(6) Honey:^[6]

Synonym: Madhu, Honey purified, Mel

Biological source: Honey is a viscid and sweet secretion stored in the honey comb by various species of bees, such

as Apis mellifera, Apis dorsata, Apis florea, Apis indica and other species of Apis.

Family:Apidae

Chemical constituents: It consist of 80–85% carbohydrates, 15–17% water, 0.3% proteins, 0.2% ashes and minor quantities of amino-acids, phenols, pigments and vitamins.

Uses: Used as a preservative in herbal cosmetics because it contains natural antioxidant properties.

(7) Lanolin:^[7]

Synonym: wool fat, wool grease

Biological source: Lanolin is the fat-like purified secretion of the sebaceous glands which is deposited into the wool fibres of sheep, Ovis aries Linn.

Family: Bovidae

Chemical constituents: It consist of lanolin alcohols, lanolin acids and lanolin hydrocarbon.

Uses: Lanolin is widely used as an ingredient for lipsticks, for gloss, thickness, and as a pigment dispersant.



FigureNo1: Beetroot



FigureNo2: Beeswax



Figure No 3: Carnauba Wax



Figure No 4: Coconut Oil



Figure No 5 : Rose Oil



Figure No 6: Honey

Methodology

Preparation Of Beetroot Extract:^[8]

The purchased Fresh beetroot were thoroughly washed in running tap water to remove the mud and other materials adhered to it and kept in a tray. The washed beetroot were undergone for removing excess amount of water attached with them during washing. The ripe beets (1000g) were selected and peeled carefully. The peeled beets were crushed with the help of an extractor and the extract was collected in a glass vessel. The extraction process started with crushing the beets without adding water. The obtained extract was collected and filtered through a muslin cloth to avoid the debris present in the extract. The collected extract was kept aside for some times and an amount of 50 ml was taken .The extract was evaporated in a china dish to get a concentrated product. It was then kept aside for getting the product cool. The obtained product was weighed, packed in a well closed container

for further use. The different methods in obtaining red beet extract were described in Figure No- 7a,7b and 7c.

Preparation of Herbal Lipstick:^{[9][10]}

Herbal lipstick was prepared by fusion method. Different batches were prepared as per the formulation chart. According to the differences in concentrations of the ingredients the formulations were identified as F1 to F8. For the formulation of the product F1, accurately weighed white beeswax and carnauba wax were taken and grated to get a reduced size. These were mixed thoroughly and taken in a china dish. This mixture was slowly heated with the help of a waterbath. The temperature was kept as 70 °C. Once the wax was in molten stage, lanolin and cetyl alcohol were added according to geometric dilution method. Stirring was done occasionally. To this added the specified quantity of coconut oil and stirred slowly. After getting an uniform oily phase, the mixture was allowed to cool. When the temperature reaches 60°C, one by one of the red beet extract was added and mixed well. After proper mixing, another half part was added and the mixing was continued. After this, the remaining part also added and stirred well to get the uniform distribution of colour.

Then the mixture was cooled to 40°C and vitamin E and honey were added and mixed well. To this added one or two drops of rose oil to get a palatable odour. The mixture was stirred well. Then the molten mixture was poured into lipstick moulds which was previously lubricated with coconut oil. The filled mould is placed in the refrigerator for few minutes to set completely. Upon solidification it was separated from the moulds and fitted in lipstick case. Each lipstick mould having the capacity of 4g. This formulation was denoted as F1. Such a way, all other (F2 to F8) were done as per the quantity specified in the formulation chart. The formulated preparations were kept in lipstick case and stored in a cool place for the evaluation studies. The formulation chart is represented in Table No:3 and the prepared formulation was represented in Figure No:8.



(a) Beetroot Extract

(b) Evaporation Procedure

(c) Concentrated Product

Figure No:7 Figure showing to get a concentrated product



Figure No:8 Prepared red beet Lipstick



Figure No:9 Determination of Melting Point of the herbal lipstick



Figure No: 10 Determination of pH of the herbal lipstick

Table1 :Common Natural Colour and Plant Sources

COLOUR	CHROMOPHORE PLANT	SOURCES
Purple, Blue	Anthocyanin	Grapes,blueberry,plum,black berry
Green	Chlorophyll	Avocado,cucumber,broccoli, spinach, kiwi
Yellow, orange	Carotenoids	Papaya,carrot,orange,pineapple,pumpkin
Red	Lycopene	Beetroot,tomato,strawberry, watermelon, pomegranate
White-tan	Anthoxanthins	Potato, cauliflower, banana, ginger

Table 2 : List of Ingredients used for the preparation of Herbal lipstick

SL.No.	INGREDIENTS	MANUFACTURER
1)	Beeswax	Isochem Laboratories,Cochin
2)	Carnauba Wax	Chemdyes Corporation,Calicut
3)	Coconut Oil	Kera Natural Coconut Oil
4)	Lanolin	Isochem Laboratories,Cochin
5)	Cetyl Alcohol	Isochem Laboratories,Cochin
6)	Beetroot	Purchased From A Local Market
7)	Rose Oil	BiosurPharma,Sagar
8)	Vitamin E	Procter And Gamble,India
9)	Honey	Dabur India Ltd,India

Table No:3 Formulation chart of lipsticks

Ingredients	Formulation Identity and Concentrations (in Percentage)							
	F1	F2	F3	F4	F5	F6	F7	F8
White Beeswax	1.5	1.5	2	2	2	2	2	2
Carnauba Wax	1	1.5	0.5	1.5	1.5	1.5	1.5	1.5
Coconut Oil	5.5	4	4	4	2.5	3.5	3.5	2
Lanolin	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cetyl Alcohol	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Beetroot Extract	1	1	2	2	2.5	2.5	2.5	2.5
Rose Oil	0.01	0.01	0.01	0.01	0.3	0.3	0.3	0.3
Vitamin E	qs	qs	qs	qs	qs	qs	qs	qs
Honey	qs	qs	qs	qs	qs	qs	qs	qs

Table No: 4 Results of different evaluation parameter of the herbal lipsticks.

Formulation Identity	Evaluation Parameter*			
	Melting Point (in °C)	pH	Breaking point (in grams)	Thixotropic Character
F1	56±0.18	6.4±0.09	23±0.09	7.9±0.13
F2	70±0.09	6.8±0.21	29±0.18	8.6±0.09
F3	62±0.13	6.3±0.11	27±0.07	8.2±0.21
F4	65±0.21	6.3±0.18	27±0.13	7.8±0.13
F5	67±0.11	6.9±0.07	30±0.17	8.5±0.11
F6	68±0.07	6.9±0.17	31±0.11	9.1±0.18
F7	59±0.17	6.4±0.13	23±0.21	8±0.17
F8	61±0.13	5.9±0.09	22±0.18	7.8±0.07

*Three Observations ±SD

Table No:5 Observation of ideal formulation(F5)

SL NO	PARAMETERS	INFERENCE
1	Colour	Brownish red
2	Melting point	67±0.11°C
3	pH.	6.9±0.07
4	Breaking Point	30±0.17gm
5	Thixotropy Character	8.5±0.11
6	Perfume Stability	Acceptable and long lasting
7	Surface Abnormalities	Not observed

EVALUATION OF RED BEET LIPSTICK

For every formulation development, the selection of an ideal product is depends on the acceptable results in comparison with a standard formulation. To find out the ideal formulation, various evaluation parameters were carried out. The following are the evaluation parameters to be analysed.

Melting Point:^[11]

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 tube was filled with the prepared formulation of each identity and keep in the capillary apparatus and found out the melting point of all the formulations. The results are tabulated in Table No:4 and corresponding figure represented in Figure No: 9.

Determination of pH :^[12]

For every cosmetic preparation, determination of pH plays an important role. This is mainly determined in detection of skin irritation or allergic reaction on behalf of difference in pH. The pH of formulated herbal lipstick was determined using digital pH meter. 1gm of lipstick was added in 100ml distilled water and kept aside for 10 min. Electrode was completely dipped into the liquid lipstick formulation and pH was noted. The results are tabulated in Table No:4 and corresponding figure represented in Figure No: 10.

Determination of uniformity of Color distribution: ^[13]

Beautifying the glow of lips, different colors are employed now a days. But uneven distribution of color may adversely affect the acceptability of the product. To identify the uneven distribution of color, this test was conducted. Lip colors are products that apply color,

texture, and/or shine to the lips using a brush or other applicator. Lip colours contain ingredients that apply colour to the lips in a precise and controlled manner. Lip colours can also have multi-functional benefits, such a moisturizing or may even include sunscreen for SPF protection. Lip colour product safety is established by selection of ingredients that are safe and suitable for this intended use and purpose. The obtained results were reported in Table No:4.

Determination of Breaking Point: ^[14]

The tensile strength of lipstick is another evaluation parameter to withstand the pressure during the application. This test is performed to determine the strength of the lipstick. The lipstick is placed in a horizontal position in a socket away from the edge of the support. The lipstick was then subjected to number of weights hanging from the support. This weight was gradually increased by a specific value (10gm) at time interval of 15secs and the weights at which the lipstick breaks is considered as the breaking point. The results are tabulated in Table No:4

Determination of Thixotropy character: ^[15]

The thixotropic character was determined by using penetrometer. Here, a standard needle of specific diameter is allowed to penetrate into the lipstick for 5secs under certain load. The depth of the penetration of the needle is a measure of thixotropic character of the herbal lipstick. Results were recorded in Table No:4

Determination of Surface Abnormalities: ^[16]

Surface abnormalities such as cracks, entrapment of air, unfilled space during molding were identified with this test. This was studied for the surface effects for non-formation of crystals on the surfaces. The results were recorded in Table No:4.

Determination of Perfume Stability: ^[17]

Palatability is another parameter to be evaluated. If the odour is not pleasant, the acceptability of the product is not fulfilled. So this parameter is also considered. The formulated herbal lipstick was tested after 30 days, to record the fragrance.

All the evaluation parameters were considered for selection of an ideal formulation. According to the parameters the product F5 met all the evaluation test results and selected as the ideal product. The individual results were tabulated in Table No: 5

RESULTS AND DISCUSSION

Melting Point:

Melting point of all formulation were done and found to be between $56 \pm 0.18^\circ\text{C}$ and 70 ± 0.09 which was similar to standard melting point. Thus, all the formulation having adequate melting point.

pH:

pH of formulated lipsticks was evaluated using digital pH meter. It was observed that the formulations having pH in the range of 5.9 ± 0.09 and 6.9 ± 0.17 . Since the observed pH was exact to pH of lips.

Color:

The prepared formulations was evaluated and it was found that the lipstick has good texture, color, shiny and glossy in nature. By performing the evaluation, and observations, no leaching issues were found from the formulations. Among these the formulation F5 satisfies the good acceptable color.

Breaking point:

The breaking point of the all formulation was determined and evaluated. The breaking point was 22 ± 0.18 and 31 ± 0.11 g, which demonstrated that the strength of lipstick was quite good. It was found that the F5 formulation have the adequate strength as compared with other formulations.

Thixotropy character:

Thixotropy character of prepared formulations was determined by using penetrometer. The prepared formulation was evaluated and the thixotropic character was found to be between 7.8 ± 0.07 and 9.1 ± 0.18 . It indicates that F5 formulation met the adequate thixotropic character as compared with other formulations.

Perfume Stability:

Perfume stability of formulation was performed and it was observed that formulated lipstick has good and long-lasting fragrance.

Surface Abnormalities:

Surface abnormalities were also evaluated for all the formulations and the products F2, F5 and F8 does not have any microscopical imperfections.

From the results, all the formulations met the different evaluation parameters. It revealed the selection of ideal formulation. With reference to the parameters the product F5 met all the evaluation test and selected as the ideal product. Thus the formulation of herbal lipstick with beet extract color is ideal as compared with the marketed synthetic lipstick, which fulfils the aim of work.

CONCLUSION

The use of herbal cosmetics has been increasing to many fields in personal care system and there is a great demand for the herbal cosmetics. Herbal lipstick is used to rejuvenate the lip muscles maintain the elasticity of the skin and a protective cover to the lips. The benefits of herbal based cosmetics are their non-toxic and bio compatible in nature. It nourishes the lip skin. This lipstick supplies vital nourishment to the lip. It helps in the

elimination of wrinkles, cracking, dryness and folds on lips.

Lipstick containing herbal ingredients was successfully formulated by using eight different batches (F1 – F8). The various parameters of lipstick were evaluated to arrive at the ideal formulation. Among all the eight formulations, F5 formulations exhibited good results. F5 formulation lipstick containing herbal ingredients was found to be in compliance with all the evaluations tests. Likewise, even all the other formulations also exhibited satisfactory results, but when compared with all the formulations F5 formulation exhibited good results regarding in all the aspects. The evaluation parameters like pH, melting point, breaking point and thixotropic character were helped to select the ideal formulation.

Lipstick containing herbal ingredients was prepared successfully. Study concluded that herbal lipstick can be successfully formulated using natural color pigment such as beetroot will be better option for synthetic coloring agents which may cause side effects. It is an effective attempt to formulate the herbal lipstick containing natural ingredients.

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