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Formulation and Evaluation of Natural Lipstick from Coloured Pigments of *Beta vulgaris* Taproot.

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Research Article

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ABSTRACT

Lipstick is a cosmetic product containing pigments, oils, waxes, and emollients that apply colour, texture, and protection to the lips. Many varieties of lipstick exist as with most other types of makeup, lipstick is typically, but not exclusively, worn by women. The use of lipstick dates back to ancient times. The main aim of this work is to formulate and evaluate natural lipstick from coloured pigments of *Beta vulgaris* taproot by using natural colouring pigment and minimising the side effects of synthetic formulations. The objective of the present work is to extract the coloured pigments from *Beta vulgaris* taproot, optimize the formula for the preparation of lipstick and evaluate the prepared formulations.

INTRODUCTION

According to D&C act 1940 and rules 1945, cosmetic 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 cleansing, beautifying, promoting attractiveness or altering the appearance. It also includes any articles intended for use as a component of cosmetic. Cosmetics are substances used to enhance the appearance of the human body [1]. Cosmetics include skin-care creams, lotions, powders, perfumes, lipsticks, fingernail and toe nail polish, eye and facial makeup, permanent waves, coloured contact lenses, hair colours, hair sprays and gels. Deodorants, baby products, bath oils, bubble baths, bath salts, butters and many other types of products are in great demand in both developing and developed countries. Lipstick contains wax, oils, antioxidants and emollients. Wax provides the structure to the solid lipstick. Lipsticks may be made from several waxes such as beeswax, ozokerite and candelilla wax. Various oils and fats are also used in lipsticks, such as olive oil, mineral oil, cocoa butter, lanolin, and petrolatum. Lipsticks get their colours from a variety of pigments and lake dyes including, but not limited to bromo acid, D&C Red No. 21, Calcium Lake such as D&C Red 7 and D&C Red 34, and D&C Orange No. 17. There are organic and inorganic pigments [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 being have been using herbs for different purpose like food, medicine, beautifying 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.

Colouring lips in an ancient practice date back to prehistoric period. In present days the use of product has increased and choice of shades of colours textures, lustier, have been changed and become wider. The dyes that contribute to the colour of the lipstick are dangerous to humans on consumption. In a

mild form, the coal tars that are the basic ingredients from which synthetic dyes are formed can cause allergy, nausea, dermatitis, and drying of the lips. In a more severe form they can be carcinogenic and even fatal.

Advantages of Natural Lipsticks over existing Synthetic ones

- Herbal colours are non-toxic, highly lipophilic, antioxidant and anti-microbial anti-inflammatory and are used in leucoderma more particularly of lips.
- Colorant has different original shades of colours from purplish red, ruby red, beetroot purple, dark violet, pastel red, pale red, purplish red, rose red, deep majenta, dark purple, orange, deep violet.
- From these colours, by different combinations, further shades can be obtained.
- Colour may be changed to different shades with organic and inorganic acids and bases.

Natural Colouring Agent ^[3]

- The colouring agent is derived from the coloured pigments of Beta vulgaris taproots. The beetroot, also known in as the table beet, garden beet, red or golden beet, or informally simply as the beet, refers to any of the cultivated varieties of beet (*Beta vulgaris*) grown for their edible taproots. Beetroot is an excellent source of folate and a good source of manganese, and contains red coloured compound betaines which may function to reduce the concentration of homocysteine, a homolog of the naturally occurring amino acid cysteine as high circulating levels of homocysteine may be harmful to blood vessels
- The original betaine, *N,N,N*-trimethylglycine, was named after its discovery in sugar beet (*Beta vulgaris*) in the 19th century. It is a small *N*-trimethylated amino acid, existing in zwitterionic form at neutral pH. This substance is now often called *glycine betaine* to distinguish it from other betaines.

MATERIALS AND METHODS ^[4-14]

Table 1: General Formulation

S.No	Excipient	Category/Importance
1	Bees wax	Glossy and Hardness
2	White soft paraffin	Glossiness
3	Olive oil	Blending
4	Pigment-Betaine	Colouring agent
5	Acacia	Surfactant
6	Vitamin E	Anti-oxidant
7	Lemon juice	Anti oxidant
8	Vanilla essence	Preservative

Pigment Extraction Procedure

Extraction of pigment was achieved by homogenization of equal ratio of fruit pulp and solvents (1/1 w/v). Typically 100 g of the peeled fruit, of watery consistency, was shaken and macerated with 100 mL solvents (EtOH, aqueous ethanol 50:50) for 15 minutes under ice cooling condition.

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

General Manufacturing procedure

- 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 colour pigments.
- After the pigment mass is prepared, it is mixed with the hot wax.
- The mixture is agitated to free it of any air bubbles. Then it is poured into tubing moulds, cooled, and separated from the moulds.

- After final touch-up and visual inspection, the lipstick is ready for packaging.
- Mixture is ground using a mill, grinding the pigment to avoid a "grainy" feel to the lipstick.
- After the pigment mass is ground and mixed, it is added to the hot wax mass until a uniform colour and consistency is obtained. The fluid lipstick can then be strained and moulded, or it may be poured into pans and stored for future moulding.

RESULTS

The present study was undertaken to formulate natural lipstick from coloured pigments of *Beta vulgaris* taproots. The study involves formulation of different lipsticks along with their evaluation.

Preparation of Different Formulations

Formulation1-This formulation is prepared as per the optimized formula given in Table No.2 using the general method of preparation and subjected for evaluation tests.

Formulation-1

Table 2: Ingredients used in Formulation-1 along with their respective quantities.

S.No	Ingredient	Quantity
1	Bees wax	14g
2	White soft paraffin	6g
3	Olive oil	6ml
4	Pigment	0.7g
5	Acacia	-
6	Lemon juice	1ml
7	Vitamin E	1ml
8	Vanilla essence	1ml
9	Perfume	q.s.



Figure 1: Formulation F1

Formulation-2

Table 3: Ingredients used in Formulation-2 along with their respective quantities.

S.No	Ingredient	Quantity
1	Bees wax	14g
2	White soft paraffin	6g
3	Olive oil	5ml
4	Pigment	1g
5	Acacia	1g
6	Lemon juice	1ml
7	Vitamin E	1ml
8	Vanilla essence	1ml
9	Perfume	q.s.



Figure 2: Formulation F2

Formulation-3

Table 4: Ingredients used in Formulation-3 along with their respective quantities.

S.No	Ingredient	Quantity
1	Bees wax	14g
2	White soft paraffin	6g
3	Olive oil	5ml
4	Pigment	2g
5	Acacia	-
6	Lemon juice	1ml
7	Vitamin E	1ml
8	Vanilla essence	1ml
9	Perfume	q.s.

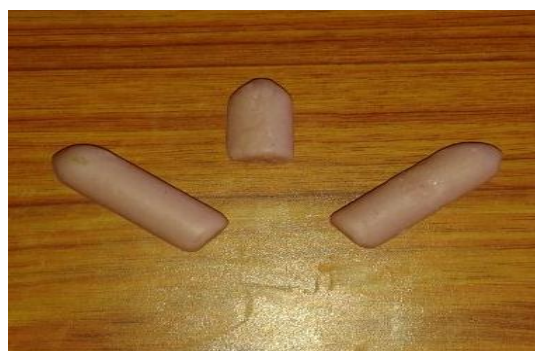


Figure 3: Formulation F3

Formulation-4

Table 5: Ingredients used in Formulation-4 along with their respective quantities.

S.No	Ingredient	Quantity
1	Bees wax	14g
2	White soft paraffin	6g
3	Olive oil	3ml
4	Pigment	3g
5	Acacia	1g
6	Lemon juice	1ml
7	Vitamin E	1ml
8	Vanilla essence	1ml
9	Perfume	q.s.



Figure 4: Formulation F4

Formulation-5

Table 6: Ingredients used in Formulation-5 along with their respective quantities.

S.No	Ingredients	Quantity
1	Bees wax	12g
2	White soft paraffin	4g
3	Olive oil	3ml
4	Pigment	7g
5	Acacia	1g
6	Lemon juice	1ml
7	Vitamin E	1ml
8	Vanilla essence	1ml
9	Perfume	q.s.



Figure 5: Formulation F5

Formulation-6

Table 7: Ingredients used in Formulation-6 along with their respective quantities.

S.No	Ingredient	Quantity
1	Bees wax	14g
2	White soft paraffin	6g
3	Olive oil	1ml
4	Pigment	5g
5	Acacia	1g
6	Lemon juice	1ml
7	Vitamin E	1ml
8	Vanilla essence	1ml
9	Perfume	q.s.

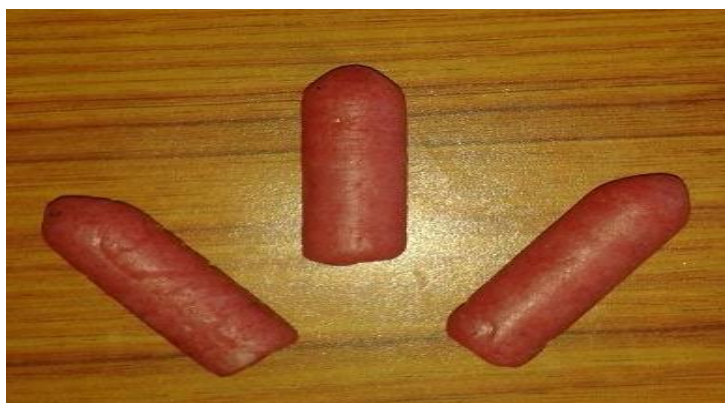


Figure 6: Formulation F6

- F1 had a good consistency but no coloured pigment retained in the formulation.
- F2 had good consistency but the coloured pigment retained was of light colour.
- F3 had a bad consistency but the coloured pigment retained was upto an appropriate extent.
- F4 had good consistency but the coloured pigment retained was with a better colour.
- F5 had a very bad consistency but the coloured pigment retained was very high.
- F6 had consistency and coloured pigment retained was the best.

Table 8: Evaluation test results

S.NO	Parameter	F1	F2	F3	F4	F5	F6
1	Colour	White	Pale pink	Pale pink	Pink	Deep red	Pinkish red
2	Melting point(°C)	55-60	60-61	50-60	59-61	50-60	60-63
3	Breaking point(gm)	30	30	32	31	30	30
4	Surface anomalies	No defect	No defect	No defect	No defect	No defect	No defect
5	Ease of application	Good	Good	Poor	Easy	Poor	Easy
6	Aging stability	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth
7	pH parameter	6	5	6	6	6	6
8	Perfume stability	++	+	++	++	++	+++
9	Solubility test	CHCl ₃	CHCl ₃	CHCl ₃	CHCl ₃	CHCl ₃	CHCl ₃
10	Skin irritation	No	No	No	No	No	No

The study was undertaken with an aim to develop herbal lipsticks from the coloured pigments of Beta vulgaris. To overcome the adverse effects of the synthetic lipsticks, these natural lipsticks were prepared by optimized formulas. In order to improve the consistency and colour of the formulation various attempts were made.

The main problem encountered was the precipitation of coloured pigment which was then overcome by addition of surfactant and also by changing the formula of the preparation.

Further the formulated lipsticks were subjected to quality control tests as per guidelines

The following conclusions were drawn from the experimental results

- Out of the six formulations prepared, consistency was uniform in four formulations.
- Different formulations were prepared so as to optimize the drawback which was seen in the previous formulation.
- Evaluation tests were performed to all formulations
- From both consistency and quality control tests point of view Formulation-6 (F6) was found to be the best formulation out of the six lipsticks that are formulated.

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