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Formulation and Evaluation of Lip balm Prepared Using Various Herbal Entities

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Abstract- Cosmeceuticals are the products of cosmetic that are biologically active ingredients that impersonates to medical or drug like benefits. The design, quality, formulation of lip balm made from natural ingredients was studied. In this study, lip balm has been made by using various ingredients like beetroot, almond oil, aloe vera, vitamin E and rose essence. Homogenous mixing method was used to produce the lip balm. The formulation of lip balm was tested by applying it on a glass slide. Various parameters such as chemical stability, pH melting point, and spreadability were carried out for the evaluation of lip balm. The pH was found to be 6.0 and the melting point was 63-65 °C. After performing stability studies at room temperature ($25.0 \pm 3.0^\circ\text{C}$), refrigerated condition ($4.0 \pm 2.0^\circ\text{C}$) and oven temperature ($40.0 \pm 2.0^\circ\text{C}$), it proved that prepared lip balm was uniform in nature, was perfectly applied, without any deformation at room temperature and refrigeration. Lip balm prepared from above ingredients could be a better option for treatment of various lip issues.

Keywords- Lip balm, Lips, Beetroot, Formulation, Natural ingredients.

1. Introduction-

Due to the presence of hazardous synthetic excipients in cosmetics, there has been a great public concern regarding the use of organic sources.^[1]Lips do not have any oil glands; thus, it is really important to provide that extra moisture and protection throughout the day.^[2] Conventional lip balm often contains petrolatum, synthetic waxes, alumina, paraben, hydrogenated oils and artificial fragrances and colours which are toxic. Often the lip balm is eaten by the user, thus it becomes major issue for health regulator.^[3]

Cosmeceuticals are the ingredients that have medicinal properties that benefits topical action and also provide protection against degenerative skin condition.^[4] The present work was carried out by using these ingredients that have less side effects.^[5] Products used to protect lips rather than to decorate them are well known as lip balms. They form an adherent, moisture resistant film of oily substances. Usually without any dye.^[6]

Beeswax is a natural compound secreted by female bees that is often used in cosmetics, particularly lip balm. This substance is very moisturizing, can help protect the lips from the harmful rays of the sun, and has a pleasant smell. Beeswax act as a natural emulsifier.^[7] Vitamin E is an antioxidant and a natural conditioner. Vitamin E helps to maintain the soft, youthful texture of the lips by reducing the signs of aging.^[8] Almond oil penetrates deep into the skin tissue and its fatty acids help to moisturize the lips. The anti-inflammatory properties of almond oil reduce redness and pain associated with chapped and sunburnt lips.^[9] Aloe vera has anti-inflammatory properties that fight irritation. It infuses the lips with antioxidants that fight

wrinkles and other forms of skin damage.^[10] Beetroot is rich in antioxidants that make the lips soft, supple and improve the elasticity of the skin.^[11]

Anatomy of lips-

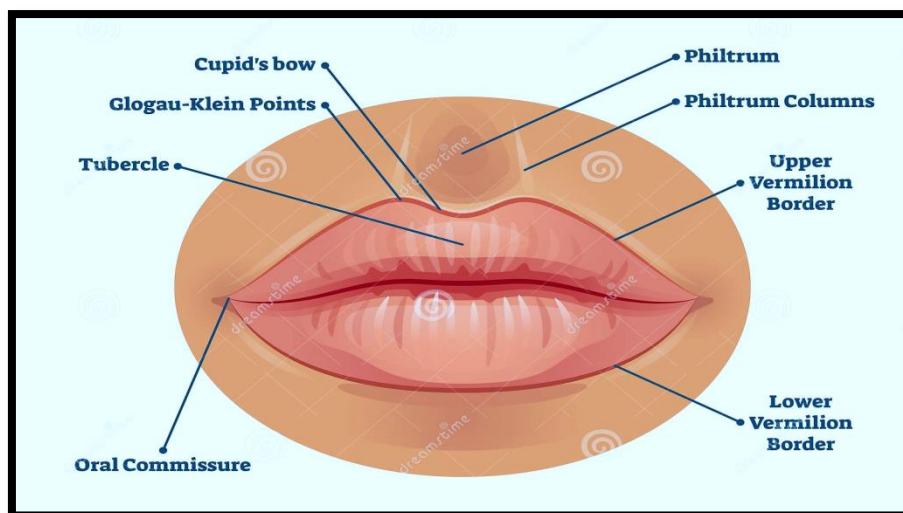


Figure 1: Anatomy of lips

2. Material and Methods-

Bees wax pure white was purchased from Loba Chemie Pvt. Ltd., Almond oil (Bajaj Almond drops®), Aloe vera juice organically extracted from *Aloe barbadensis*, Beet root juice from *Beta vulgaris subsp. Vulgaris*, Rose powder from Marc Flavours, Glycerol (98 % extra pure) from Loba Chemie Pvt. Ltd., Cap. Vitamin E (Evion® 400).

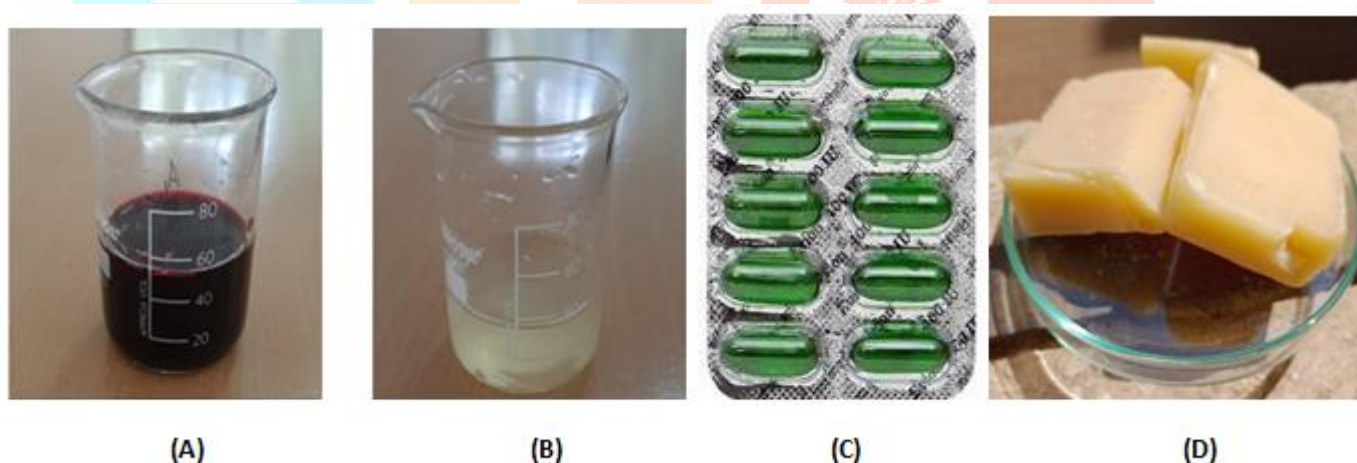


Figure 2:(A)-Beetroot Juice; (B)-Aloe vera Extract; (C) Cap. Evion® 400; (D)Bees Wax Pure White

2.1 Preparation of the ingredients:

2.1.1. Aloe vera gel- The leaves of Aloe vera were collected, washed with water, the thick epidermis was selectively removed and the inner gel-like pulp in the center of the leaf was separated with a spoon, minced, and homogenized in a mixer.^[12]

2.1.2. Beet root extract- Washed beet roots were peeled and chopped. The chopped beets were blended well and further filtered through a clean muslin cloth. The extracted beetroot juice was used.^[13]

2.1.3. Rose water- Two grams of Rose powder from Marc Flavours was taken and diluted with 100ml of distilled water to make 2% solution of rose water.^[14]

2.2 Method of preparation of lip balm:

All the above materials were weighed accurately on a digital balance nearest accuracy to 0.1 gm. Preparation method opted for the preparation of herbal lip balm stick was of heating solid raw ingredients at consistent temperature with indirect flame bees wax was crude and grinded into small uniform size and was melted in 50 ml beaker in indirect flame with an highest temperature of 90°C and all other ingredients like vitamin e beetroot juice rose essence almond oil were mixed vigorously and add to the mixture and mixture was stirred continuously till homogenous mixture was obtained and was poured into balm stick moulds just before pouring glycerine was applied over the mould with cotton and the moulds were kept in ice bath aside for about an hour in cool and dry place indirect to sunlight till it solidifies and was used after 48 hours after keeping at room temperature for stability and analytical testing.^[5,15]

Sr. no.	Ingredients	Quantity	Uses
1.	Bees Wax	12%	Impart Glossiness and hardness
2.	Beetroot	11%	Colouring Agent
3.	Almond Oil	5%	Moisturizing agent
4.	Aloe-vera	4%	Antioxidant, anti-inflammatory
5.	Vitamin-E	1.5%	Antioxidant, maintain the stability
6.	Rose water	2%	Flavouring agent
7.	Glycerol	2 to 10%	Glossy effect

Table 01: Composition of Lip balm



Figure 3: Prepared lip balm from natural ingredients

2.3 Evaluation of Lip balm-

1. Melting point-For melting point, the sample of lip balm was taken in a glass capillary whose one end was sealed by flame. The capillary containing drug was dipped in liquid paraffin inside the melting point apparatus which was equipped with magnetic stirring facility. Melting was determined visually and melting point was reported.^[16]
2. Organoleptic properties-The lip balm was studied for the basic organoleptic characters such as colour, odour, taste and appearance.^[17]
3. Test of spread ability-The product was applied (at room temperature) repeatedly onto a glass slide to visually observe the uniformity in the formation of the protective layer and whether the stick fragmented, deformed or broke during application.^[18]



Figure 4: Spreadability of lip balm at room temperature

G - Good: uniform, no fragmentation; perfect application, without deformation of the lip balm.

I - Intermediate: uniform; leaves few fragments; appropriate application; little deformation of the lip balm.

B - Bad: not uniform; leaves many fragments; difficult or inappropriate application, intense deformation of the lip balm.

- pH measurement- The pH study was carried out by dissolving 1 gm of sample into 100 ml water. The pH measurement was done using pH meter.^[19]
- Stability studies-Prepared lip balm was placed for accelerated stability studies at room temperature ($25.0 \pm 3.0^\circ\text{C}$), refrigeration ($4 \pm 2.0^\circ\text{C}$) and oven temperature ($40.0 \pm 2.0^\circ\text{C}$) for 30 days. After 30 days, it was again characterized for organoleptic properties, melting point, spreadability, and pH.^[20,21]

3. Result-

Sr. No.	Evaluation Parameter	Observed Value
1.	Melting Point	$63^\circ\text{C} - 65^\circ\text{C}$
2.	Organoleptic properties	-
2.1.	Colour	White
2.2.	Odour	Pleasant
2.3.	Appearance	Smooth
3.	Test of spread ability	-
4.	pH measurement	6.0
5.	Skin irritation	No
6.	Breaking point	29gm

Table 3: Evaluation of lip balm

Test of spreadability- It was observed that the lip balm at room temperature ($25.0 \pm 3.0^\circ\text{C}$) and refrigerator ($4.0 \pm 2.0^\circ\text{C}$) showed; Good: uniform, no fragmentation; perfect application, without deformation of the lip balm, but Intermediate: uniform; leaves few fragments; appropriate application; little deformation of the lip balm at oven temperature ($40.0 \pm 2.0^\circ\text{C}$).

Stability studies-

Parameters	Temperature Conditions		
	$25.0 \pm 3.0^\circ\text{C}$	$4.0 \pm 2.0^\circ\text{C}$	$40.0 \pm 2.0^\circ\text{C}$
Colour	White	White	White
Odour	Pleasant	Pleasant	Pleasant
Melting Point	63°C	65°C	64°C
Spreadability	Good	Good	Intermediate
pH	6.0	6.0	6.2

Table 4: Stability studies of lip balm at different temperature

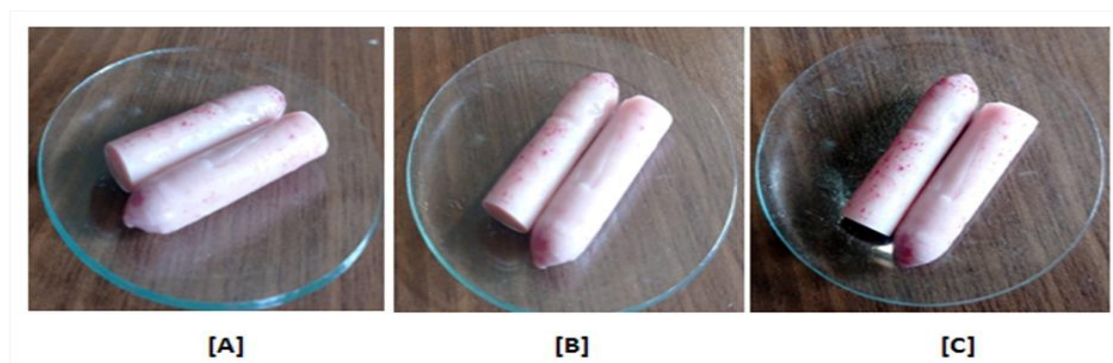


Figure 5: Stability study of lip balm [A] Day 1, [B] after 15 days, [C] after 30 days

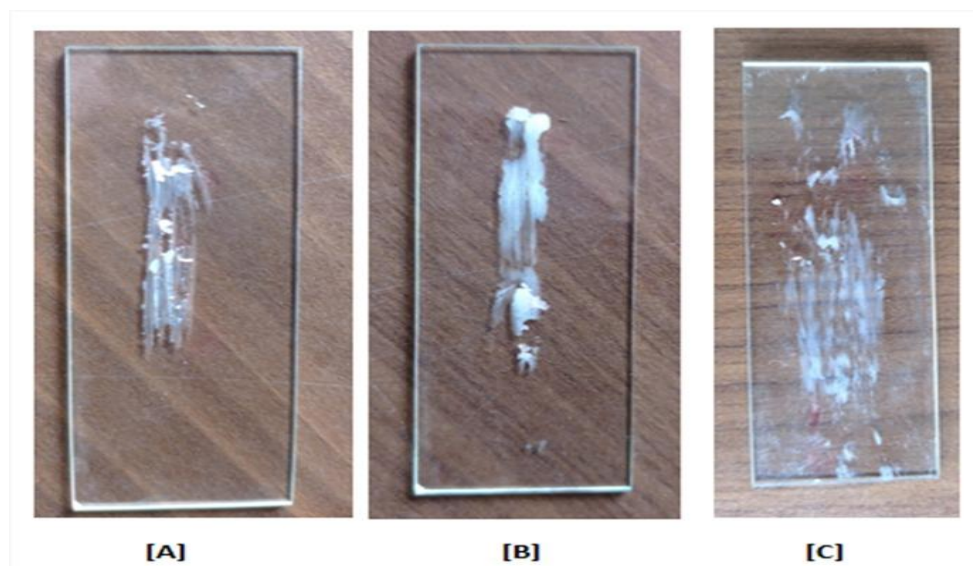


Figure 6: Spreadability of Lip Balm [A] at $25.0\pm 3.0^{\circ}\text{C}$, [B] at $4.0\pm 2.0^{\circ}\text{C}$, [C] at $40.0\pm 2.0^{\circ}\text{C}$

4. Discussion-

As, conventional lip balm often contain petrolatum, synthetic waxes, alumina, parabens, hydrogenated oils, artificial fragrances and colours which are toxic, the main motive behind the formulation was to incorporate as many natural ingredients to retain the natural properties of lip balm. The use of beetroot provided natural colour which are moreover less toxic compared to synthetic colours.

Evaluation of prepared lip balm was done for melting point, pH measurement, test for spreadability and stability studies. The melting point was found to be $63-65^{\circ}\text{C}$ and the pH was found to be 6.0. Test of spreadability was found to be G- Good: uniform, no fragmentation; perfect application, without any deformation of the lip balm.

After performing the Stability studies for the lip balm at different temperatures, it was observed that the lip balm at room temperature ($25.0\pm 3.0^{\circ}\text{C}$) and refrigerator ($4.0\pm 2.0^{\circ}\text{C}$) showed; Good: uniform, no fragmentation; perfect application, without deformation of the lip balm, but Intermediate: uniform; leaves few fragments; appropriate application; little deformation of the lip balm at oven temperature ($40.0\pm 2.0^{\circ}\text{C}$).

5. Conclusion-The formulation stored at room temperature and refrigerator showed same stability behaviour. The organoleptic characteristics were stable and spreadability was found to be "Good". Storage under these conditions was considered to be adequate, because the product functionality was maintained. During the stability test, the lip balm made from natural ingredients showed an appropriate melting point (mean of 64°C). According to the test of spreadability, the storage condition of oven ($40.0\pm 2.0^{\circ}\text{C}$) is not recommended because of loss of product functionality when compared with the normal stability test. It was concluded that lip balm made from natural ingredients is safe to use and this combination proved to be a better option in formulation of a lip balm. By alteration of the excipients or further combinations of the excipients can result in a new formulation with a different and enhanced quality. From the current studies it was predicted that the formulation will remain stable.

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7. Conflict of interest- We, authors declare that we have no known competing financial interest or personal relationships that could have appeared to influence the work reported in this paper.

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