

Formulation and Evaluation of Lip balm - An Ideal Decorative Cosmetic for Lips

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Abstract

Aims: For decades, cosmetics gained a lot of importance; a day, it would be indispensable for the mankind to maintain health and hygiene with appearance. In the category of cosmetic products, the present investigation focused on lip balm which is a type of lip cosmetics. The aim is to formulate and evaluate the novel lip balm. **Materials and Methods:** By using ingredients such as beeswax, shea butter, cocoa butter, coconut oil, almond oil, glycerin, orange oil, and a coloring agent. The beeswax was used as a base, and for glossiness, shea butter and cocoa butter as an emollient, coconut oil and almond oil as moisturizing agents, glycerin for a glossy and moisturizing agent, orange oil as a flavoring agent, and turmeric as a coloring agent. A total of 8 formulations were prepared with different compositions ranging from F1 to F8 to select the best formulation for the future scope of study. The prepared formulation for evaluated for suitable parameters such as determination of pH, skin irritation, perfume stability, spreadability, melting point, and breaking point. **Results and Discussion:** All the formulations show a yellow color appearance with a pleasant odor. The pH for F1 to F8 was in the range of 6.2–6.5, a melting point of 60°–66°C, and a breaking point of 28 g–32 g. All the formulations do not show any skin irritation and spreadability shows from average to very good. **Conclusion:** By considering the results of all the parameters, the F8 formulation was selected as the best formulation. Hence, the F8 formulation met the objective of the present study which may hold promise for future studies.

Key words: Almond oil, breaking point and skin irritation, cocoa butter, cosmetic, lip balms, lip cosmetics, melting point, perfumes, and moisturizing agents

INTRODUCTION

Cosmetics have been in their use for thousands of years. The same practice continues today, because of gaining or growing importance in personal body care and beauty care in many parts or countries of the world. A soaring passion among consumers in cosmetics has created the need for greater precision and scientific backup in the development and manufacturing processes of products. This has urged the pharmacists and made them focus on identifying pharmaceutical

technology as one of the relevant subjects for the future development of cosmetics. A large segment of the world

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population is showing a greater inclination toward natural cosmetics which seems to be the future hope.

Throughout the ages, human cosmetics have played a major role as tools of beautification for men and women alike. Medicinal and cosmetic arts were quite sophisticated in many civilizations and India was one among them. In fact, Sushruta, a pioneer in surgery (6th century A.D.), is also remembered for his suggestions on maintaining a healthy body, diet, hygiene, and exercise. India was the leader in medicinal and cosmetic arts during the Gupta period (3rd–5th century A.D.). The daily toiletries of ladies included many types of creams, oils, and pastes, such as allagash (Eagle Wood) costus, frankincense, myrrh, camphor, saffron, and sandalwood which are some of the oldest known aromatic substances from India. Makeup of many categories including hair dyes were used by men and women alike. Almond paste for the entire human adult and baby body, perfumes, and aromatics were used in all forms for religious rites and on social occasions, such as weddings and birthdays.^[1]

The beauty and attractiveness of a person are enhanced as lip cosmetics color the lips and protect them from the external environment. However, current lip care products not only emphasize esthetic value but also preferably have added medicinal value to the lips of consumers. This led to the emergence in the market of medicated lipsticks with active medicinal ingredients. The medicated lipsticks may provide protection against infections of bacteria due to the presence of an active medicinal ingredient in the formulation. This function adds on to the existing role of lipsticks, which provide moisture and emollient action to prevent cracking and chapping of the lips. The upper lip covers the anterior surface of the body of the maxilla. Its upper half is of the usual skin color and has a depression at its center directly under the nasal septum, called the philtrum which is Latin for lower nose, while its lower half is a markedly different, red-colored skin tone more similar to the color of the inside of the mouth, and the term vermilion refers to the colored portion of either the upper or lower lip. It is raised by the levator labii superioris and is connected to the lower lip by the thin lining of the lip itself, which can be seen by opening your mouth wide in front of a mirror. Thinning of the vermilion of the upper lip and flattening of the philtrum are two of the facial characteristics of fetal alcohol syndrome, a lifelong disability caused by the consumption of alcohol during pregnancy.^[2]

Lip cosmetics are one of the most widely used cosmetic products. Social, psychological, and therapeutic benefits can be attained from using lipstick.^[3]

Lip balm is one such cosmetic that is used to increase the beauty of lips and adds an attractive touch to the makeup. Lips are a part of the human body that is very thin as compared to face skin. It consists of three to four layers of the skin. Lips are susceptible to various lip disorders such

as inflammation, swelling, and cracking. Inflammation occurs when the corners of the lips become cracked and irritated. Lip balm is a cosmetic product similar to lipstick whose purpose is to prevent dryness and protect against adverse environmental factors. A “lip balm” is a semisolid composition for application to the lips that has protective and moisturizing properties: Lip balms may contain medicaments and ingredients that promote lip health. Lip balms are regularly applied to prevent chapped lips. When applied earlier to exposure to sun, wind, dry heat, or other extraordinary conditions, the lip balm can give suitable protection to the skin on and around the lips. Even when applied after the skin on the lips is chapped, the lip balm can avoid any further damage from happening, in either case, by giving a defensive layer of lip balm, the risk of an infection developing in the balm skin is minimized. Lip balms are currently sold as emulsions, liquids, gels, or solids. Lip balms offer a natural way to maintain and promote healthy lips. Current cosmetic lip products are based on the use of huge chemical ingredients with various side effects. The organic lip balm is made using naturally occurring base, oils, color, and flavoring agents, which can be evaluated for their resistance to temperature variations, pleasant flavor, and smoothness during the application and easy intentional removal. Consumers are searching for organic-based cosmetic products to avoid allergic reactions and any side effects of materials used in the preparation of cosmetic products demand for such organic-derived cosmetic products like lip balms is increasing day by day. The use of fragrances, alcohol, and synthetic dyes on lip balm can damage the skin layer of the lips and cause inflammation, dryness, cracked, and bleeding. In addition, the possibility of lip balm to enter the body is very large; hence, it needs serious attention to the contents contained in the manufacture of lip balm to be free of toxic heavy metals that exist in synthetic dyes.

These days, products that are organically derived or have natural constituents are mostly preferred, organic or natural extracts that are used in beauty care products for skin care are in much demand as people trust and rely on them, because the skin of the lips is basically different than the other parts of the body. The highest defensive layer called the stratum corneum is much thinner on the lips. The lips moreover have small to no oil-producing organs and are prone to dryness and cracking buyers always look for organic-based cosmetics to avoid allergic reactions and any sort of side effects. There are a wide range of organic cosmetics products to fulfill the beauty regime, and adding organic substances in cosmetics is very safe for the skin. The word organic indicates safety as compared to synthetic products which have different adverse impacts on human health. The lip skin has no hair follicles and no sweat glands. Organic lip balm does not contain harmful or poisonous ingredients and is full of fatty acids to hydrate, relieve, and nourish your lips These items not only add a glamorous touch to an individual but also heal distinctive pathological conditions such as irritation, cracking, chapping,

Table 1: Formulation and composition of lip balm

S.No	Ingredients in lip balm	F1	F2	F3	F4	F5	F6	F7	F8
1.	Beeswax	24 g	24 g	23 g	23 g	22 g	22 g	21 g	21 g
2.	Shea butter	10 g	10.5 g	11 g	11.5 g	12 g	12.5 g	13 g	13.5 g
3.	Cocoa butter	9 g	8.5 g	9 g	8.5 g	9 g	8.5 g	9 g	8.5 g
4.	Coconut oil	28 mL	28.5 mL	29 mL	29.5 mL	30 mL	30.5 mL	31 mL	31.5 mL
5.	Almond oil	10 mL	10 mL	10 mL	10 mL	10 mL	10 mL	10 mL	10 mL
6.	Glycerin	6 mL	5.5 mL	5 mL	4.5 mL	4 mL	3 mL	3 mL	2.5 mL
7.	Orange oil	11 mL	11 mL	11 mL	11 mL	11 mL	11 mL	11 mL	11 mL
8.	Coloring agent	2 g	2 g	2 g	2g	2 g	2 g	2g	2g

and dryness of the skin. The face is the important part that is exposed to the environment and one must take incredible care of it. Lips are the most susceptible to dryness and cracking of any portion of the skin. Lips are continuously moving and subjected to repeated stress (ultraviolet radiation). Lip balms are formulated to provide protection from these types of stress; ideal characteristics and advantages of lip balms are mentioned below. A few examples of organic lip balms that are available in market are Nature's Essence lip balm, Lotus Herbals lip balm, Nyah lip balm, Himalaya Sun Protect Orange lip care, Tvam lip balm, Shahnaz Husain's Shashine lip balm, Biotique bio fruit whitening lip balm, Vaadi herbals lip balm, SOS organic lip balm and Khadi herbal lip balm.^[4]

Requirements of lip cosmetics^[5]

It should make the lips soft, innocuous, both dermatologically and if unknowingly ingested, attractive in appearance, non-irritating to the skin of lips, easy to apply, giving a film on the lips, which is neither greasy excessively, produce uniform color, pleasant odor, and flavor and have a desirable degree of plasticity without tendency to dry out or crumble and could not produce defects during its usage by the customer. It should not exude oil, or develop a bloom, flake, cake, or harden over a range of temperatures.

MATERIALS AND METHODS

Materials

Bees wax as glossiness and base (SD fine chemicals), coconut oil and almond oil (Marico India) as a moisturizing agent, orange oil (India Aroma Oils and Company) as a flavoring agent, glycerin for glossy effect and moisturizing agent (SD fine chemicals), shea butter and cocoa butter as an emollient (Reagent shine Pvt. Ltd), and turmeric as a coloring agent.

Preparation of lip balm^[6]

Initially melt the accurately weighed amount of waxes in a hot water bath in descending order of their melting point with



Figure 1: Preparation of lip balm by using various ingredients



Figure 2: The prepared formulations of lip balm ranging from F1 to F8

continuous stirring till it melts completely. Then, coloring agent is dissolved in oil, depending on the solubility, and added to the mixture of melted waxes. Finally, add a flavoring agent like orange oil which also acts as a preservative and continuously stir to get a homogenized mixture. The mixture should be stirred vigorously until a smooth emulsion is formed. Then this mixture could be poured into clean and lubricated molds and allowed them to cool to achieve contraction of the waxes to facilitate easy removal of the lip balm. The composition of lip balm is shown in Table 1 and the preparation of lip balm is shown in Figure 1. The prepared formulations are shown in Figure 2. The initial melting of waxes at different melting point is shown in Figure 3.

Evaluation of lip balm^[6-12]

Physical appearance/visual inspection

The formulation was prepared and observed for color, odor and appearance, and stability.

- Color: The prepared lip balm was evaluated for its color. The color was checked visually
- Odor: Odors were found by smelling the product
- Stability: The product was maintained in different temperature conditions to check its stability

Determination of pH

2 g of lip balm taken in 50 mL beaker, take the pH paper and put the sample on pH paper to determine the pH. The checking of pH is shown in Figure 4.

Skin irritation

It is carried out by applying lip balm on the skin for 10 min. The application of prepared lip balm on the skin is shown in Figure 5.

Perfume stability

After 30 days, the natural lip balm underwent testing to record its fragrance.

Spreadability test

Good consistent: if prepared lip balm does not leave pieces and flawless application does not cause the lip balm to deform.

Intermediate consistent: if few fragments are left behind, proper application, and minimal lip balm deformation.



Figure 3: The initial melting of waxes at different melting points



Figure 4: Determination of pH for the prepared formulations

Bad: If lip balm is severely deformed, application is difficult or improper, and there are numerous fragments left behind. The test performance is shown in Figure 6.

Melting point

The substance was made molten to fill capillaries to ascertain the melting point. The capillaries were connected to a thermometer-equipped device and submerged in a vial of water that was kept at a set temperature. The melting point of a lip balm sample was defined as the temperature at which melting occurred. The test using a thermometer and melting point apparatus is shown in Figure 7.

Breaking point

The strength of lip balm was assessed using the breaking point method. The lip balm was positioned an inch from the edge of the support and held horizontally in a sachet. The weight was increased progressively by a predetermined amount (10 g) at predetermined intervals of 30 s, and the weight at which it broke was regarded as the breaking point. The determination of breaking point is shown in Figure 8.

RESULTS AND DISCUSSION

The aim of the present work is to prepare the lip balm using ingredients such as beeswax, shea butter, cocoa butter, coconut oil, almond oil, glycerin, and orange oil, by various combinations. The prepared lip balm was evaluated for physical appearance, pH, melting point, perfume stability, skin irritation, breaking point, and spreadability.

Physical appearance

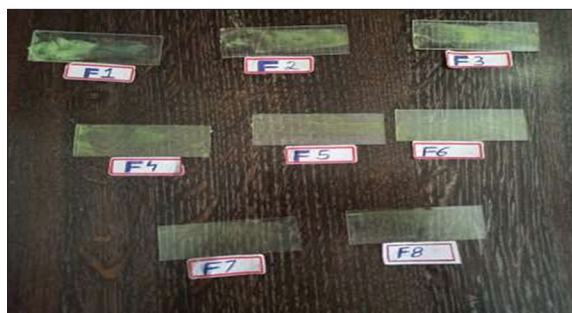
The formulations prepared were appeared in yellow color [Table 2 and Figure 2].



Figure 5: Performing the skin irritation test for the prepared lip balm

Table 2: Evaluation of formulation for physical appearance, odor, pH, spreadability, melting point, and breaking point

S. No.	Formulation	Physical appearance	Odor	pH	Spreadability	Melting point (°C)	Breaking point (grams)
1.	F1	Yellow color	Pleasant	6.3	Average	66°C	32
2.	F2	Yellow color	Pleasant	6.2	Average	66°C	32
3.	F3	Yellow color	Pleasant	6.3	Above average	65°C	31.5
4.	F4	Yellow color	Pleasant	6.4	Above average	64°C	31.5
5.	F5	Yellow color	Pleasant	6.2	Good	63°C	30.5
6.	F6	Yellow color	Pleasant	6.3	Good	63°C	30.5
7.	F7	Yellow color	Pleasant	6.3	Good	62°C	29.5
8.	F8	Yellow color	Pleasant	6.5	Very Good	60°C	28

**Figure 6:** Spreadability test performed on slides for prepared formulations**Figure 7:** The melting point test performed for the prepared formulation by using the melting point apparatus

Determination of pH

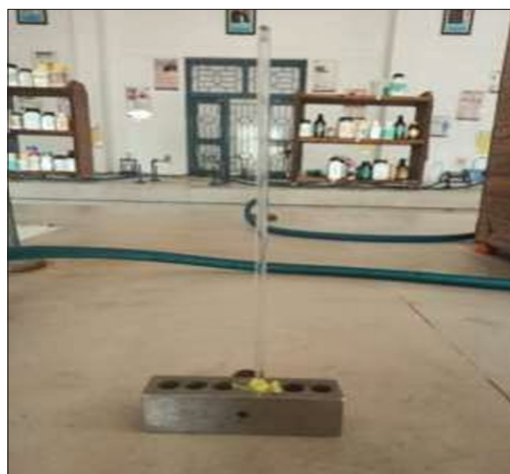
The pH of the formulated lip balms was determined and found to be in the range of 6.2–6.5 [Table 2 and Figure 4].

Melting point

The melting point of lip balm was determined and found to be in the range of 60°C–66°C [Table 2 and Figure 7].

Breaking point

The Breaking point of lip balm was determined and found to be in the range of 28 g–32 g [Table 2 and Figure 8].

**Figure 8:** Determination of breaking point

Spreadability

Formulation shows from average to very good spreadability. The formulation (F8) shows a very good spreadability nature compared to other formulations [Table 2 and Figure 6].

Skin irritation

All the prepared formulations do not show any skin irritation when applied to the skin and observed for more than 10 min [Figure 5].

SUMMARY AND CONCLUSION

In the present work, efforts have been made to prepare and evaluate the lip balm using ingredients such as beeswax, shea butter, cocoa butter, coconut oil, almond oil, glycerin, and orange oil, in various combinations.

A total of eight formulations were prepared coding from F1 to F8. All the prepared formulations were evaluated for various tests and the results obtained for all were in acceptable range. Among all the formulations, the spreadability for the

F8 formulation obtained is very good compared to other formulations. The values of pH obtained for the formulation 8 are similar to lip compatibility with an ideal melting point and breaking point for easy collecting of lip balm from the container to apply as a cosmetic. By considering the results of all the parameters the F8 formulation was selected as the best formulation which has met the objectives of the present study, which may hold promise for further studies.

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