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Formulation and Evaluation of Lip Balm by Using Moringo Oleifera

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ABSTRACT

Lip balm is one of the most well-liked cosmetics. Its main function is to moisturise the lips, relieve chapped lips, and prevent dryness. Although it has many variations and is widely used, it also has considerable disadvantages. Consider the unpleasant side effects and transient moisturising impact of chemical -based lip balm. Thus, we create a brand-new formulation of lip balm that not only incorporates herbal ingredients to reduce side effects but also maintains its moisturising properties for a long period. The ingredients in common lip care products include heavy metals and preservatives. The heavy metals harm the lips; they seep through their pores and may mistakenly result in internal consumption. Lead and its substitutes are harmful heavy metals that impair cardiac and neurological function, and cadmium and chromium may result in cancer in a variety of vital organs. The novel approach to cosmetic formulation was developed in response to the rising demand for natural products whose production is safe for both the environment and human health. The perception of an environmentally friendly composition is one of the main appeals of organic or herbal cosmetics. Lip balm, a cosmetic product akin to lipstick, moisturises the lips, prevents dry lips, and provides protection from the weather. Lip balm is resistant to environmental factors and temperature changes. Anyone can use lip balm because it is a cosmetic and is not gender-specific. The current lip balm formulas satisfy every requirement for the nourishing and safeguarding of lips.[1]

Keywords: Herbal, organic, lip, lipbalm, Moringo oleifera

INTRODUCTION

The visible bodily portion at the mouth of both humans and many animals, the lips, are flexible and supple and act as an aperture for ingesting food as well as in sound and speech articulation. Lip colouring has been a long-standing tradition since antiquity. Cheap, simple, and quick to create and get synthetic lip colourants can damage the skin around the lips. Additionally, lips lack an oil gland and require hydration and protection throughout the year. Today, there are more people using lip balm, and the colour options and other factors have changed. The applied lipbalm is frequently consumed, thus it is necessary for the health authorities to authorise them with caution. Lipbalms can be used for colouring as well as moisturizing the lips. Herbal, is a sign of safety, satisfaction and surety of less or no harm to the users and so herbal lipbalm can be made without the colours being compromised on [2].

The public is becoming more and more interested in herbal cosmetic formulas. Technologies and tactics have been put in place to use organic raw materials in the formulation of these new approaches.[3] These ingredients and goods that have been certified as organic are selected from the raw materials that are grown and cared for in a systematic way to make lip balm. It is preferred that these ingredients be free of dangerous chemical pesticides or manures, and they are stored using natural methods rather than modern ones under suitable conditions.[4] Chapped, dry lips can crack and get dry patches, especially in extreme weather. The absence of oil glands in the anatomical structure of the lips necessitates more care, moisturization, and protection during the day. There is a huge population which have problem of dryness of lips in winters and some of these problems are continued to summer seasons also. The synthetic lip balms contain petrolatum, synthetic waxes, parabens, alumina and artificial fragrances and colours which are toxic. The lip balms may accidentally be eaten by the people and should a detailed study on the ingredients used to formulate the lip balms to avoid any acute or chronic effects due to these ingredients.[3] The lipsticks and lip balms have significant differences regarding the function of both of the formulations that the lipsticks have the function of imparting the colour to the lips while the lip balms have the function of nourishment and protection to the lips.

Moringo oleifera seeds are high in nutrition value as well as it is also a promising crop. Though the extracted colour pigments are susceptible to light and air, its stability could be maintained by keeping them in low temperatures ($\leq 14^{\circ}\text{C}$) and also devoid from light and air. These can then be a potent organic colour pigment which can be used in food as well as cosmetic industries stating the stability conditions [6]. The beeswax could retain the moisture necessary for healing the dried chapped scaly lips and to maintain its quality [7].

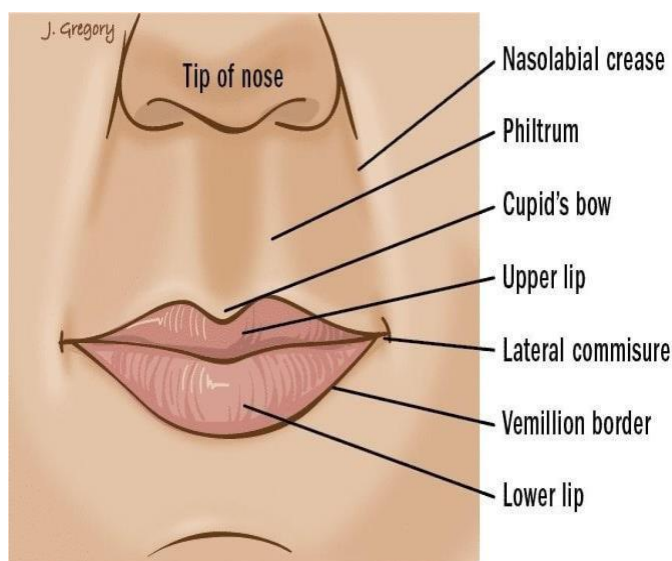
Moringa Oleifera Lam. (Moringaceae) is one of the 14 species of the family moringaceae, native to India, Africa, Arabia, Southeast Asia, South America, and the Pacific and Caribbean Islands. Because M. oleifera has been seen in many tropic and sub-tropic regions worldwide. The plant is referred to by a number of names such as horseradish tree, drumstick tree, ben oil tree, miracle tree, and "Mother's Best Friend". This plant grown and widely cultivated in the northern part of Nigeria and many countries in tropical Africa. Moeingaoleifera can be grown in a variety of soil conditions preferring well-drained sandy or loamy soil that is slightly alkaline. Almost every part of M. oleifera can be used for food.[8-10]

Scientific classification:

- Kingdom- plantae
- Order- Brassicas
- Family- Moringaceae
- Genus- Moringa
- Species- M.Oliefera

Benefits of Moringo oleifera:[12]

1. Anti inflammatory
2. Antioxidant
3. Improves wound healing
4. Improve the skin health
5. Humectant moisturizer
6. Reduces darkness
7. Emollient
8. Provide nourishment
9. Occlusive agent

ANATOMY OF LIP[19]

The **upper lip** lies between the nose and the orifice of the oral cavity. Laterally the lips are separated from the cheeks by the **nasolabial grooves** that extend from the nose and pass approximately 1 cm lateral to the angles of the mouth. These grooves or folds are easier to observe when smiling. The upper lip has an infranasal depression, the **philtrum** (Greek for love-charm), that extends from the external nasal septum, separating the nostrils, to the **vermillion border** – the sharp demarcation between the coloured edge of the lip and surrounding skin. The **lower lip** lies between the mouth and the **labiomental groove**, which separates the lower lip from the chin [12].

The lips serve as organs of prehension, suction and speech. It is composed of the skin, superficial fascia, orbicularis muscle and the muscles inserted around it (areolar tissue & mucous membrane). The margins of the lips are covered with dry, red mucous membrane, continuous with the skin and containing numerous vascular papillae and touch corpuscles. The mucous membrane internally is reflected from the upper and lower lip upon the gums, and in the median line forms two folds of superioris and inferioris. The areolar tissue or sub-mucous layer contains the coronary vessels which completely encircle the buccal orifice near the free margin of the lips. The coronary vessels are the superior and inferior coronary arteries which arise from the facial.

The superior coronary is larger than the inferior, and anastomoses with its fellow of the opposite side and gives off a small artery to the septum arteriaseptinasi. Compression of this artery will sometimes control nasal hemorrhage.

The superior labial or coronary vein begins as a plexus in the orbicularis muscle of the upper lip, passes with the coronary artery and drains into the facial vein a little below the alae of the nose of the veins which drain the lower lip the inferior coronary empties into the facial a little below the superior labial; but the chief branch from the lower lip descends as a rule to the submental vein, thence to the facial or often to the anterior jugular. The nerves supplying the lower lip are derived from the mental which emerges from the bone through the mental foramen and sends large twigs to the mucous membrane, the integument and the fascia of the lip and chin.

Some of the lymphatic vessels of the lips pass to a gland just above the body of the hyoid bone, while others pass to the sub maxillary glands. The labial glands are in the submucous layer of the lips around the orifice of the mouth. They secrete a mucous fluid. Mucous retention cysts develop when the ducts of these glands become occluded.[13]

Disease related to lips:

Lip swelling might result from an allergic reaction. Sensitivity to particular foods or drinks, medications, cosmetics, or airborne allergens may be to blame for the reaction. The lips typically revert to normal if a cause is found and subsequently removed. However, the reason for the swelling is typically unidentified. Hereditary angioedema is a disease that can lead to recurrent swelling. Lip swelling can also result from nonhereditary disorders such as trauma, erythema multiforme, sunburn, cold, and dry weather. The lips, particularly the lower lip, may become dry and hard from sun exposure. Damage that raises the risk of later cancer is indicated by red flecks or a white filmy appearance. This kind of damage can be minimized by using sunscreen-containing lip balm to the lips or by wearing a wide-brimmed hat to protect the face from the sun's harmful rays. The corners of the mouth may become uncomfortable, inflamed, red, cracked, and scaly as a result of lip inflammation (cheilitis). A diet that is deficient in vitamin B2 might cause cheilitis. The freckles and irregularly shaped brownish areas (melanotic macules) are common around the lips and may last for many years. These marks are not cause for concern. Multiple, small, scattered brownish black spots may be a sign of a hereditary disease called Peutz-Jeghers syndrome, in which polyps form in the stomach and intestines. Kawasaki disease, a disease of unknown cause that usually occurs in infants and children 8 years old or younger, can cause dryness and cracking of the lips and reddening of the lining of the mouth.[14-15]

Lip balms are formulations applied onto the lips to prevent drying and protect against adverse environmental factors. Numerous lip balms of chemical origin are currently available in the market from companies like The Body Shop, Nivea, Himalaya, Blistex, etc. The cosmetic literature reports limited data on this type of formulation, although references related to lipstick apply because it is a cosmetic form similar to lip balm. This similarity extends to include organoleptic and stability requirements such as resistance to temperature variations, pleasant taste, innocuousness, smoothness during application, adherence and easy intentional removal. Lip balm should not be considered equivalent to the lip gloss, with the former being a product intended for use by both men and women. Lips contain melanin, which provides some protection against harmful sunrays. But then usage of ingredients like Ghee, Honey, Vitamin E, etc. keep the lips hydrated for long time. Lips contain melanin, which provides some protection against harmful sunrays. But then usage of ingredients like Ghee, Honey, Vitamin E, etc. keep the lips hydrated for long time. The bees wax is base of the formulation which is obtained from natural origin which mainly acts as natural emulsifier, Sesame Oil is used as a remedy for burning sensation, nourishment of tissues and facilitating debridement, protection from UV radiation, Sesame oil is also one among the agents that are currently used to treat burns; it has shown different effects on wound healing. Sesame oil was reported to be effective in reduction of cholesterol and blood glucose and it has antioxidant effect. In traditional medicine, olive oil has been considered to be effective in skin healing; however, this issue has not been studied in advanced medicine. Unfortunately, very few studies have been done on sesame oil, olive oil, and their effects in healing wounds, while some studies have shown their beneficial effects. However, the effect of honey has been studied in animal and human subjects. Combining honey with olive oil and sesame oil may increase their beneficial effects in healing wounds. Also, this combination may reduce bacterial wound colonization; however, no study has been conducted to examine this idea.

While castor oil penetrates into deep skin and acts as moisturizer for lips, used in the treatment of dry and chapped lips. Honey lightens up the dark lips that it acts in repigmentation to the lips, it also protects lips from UV radiation. Recently, some studies have investigated the use of honey to prevent infection and treat burns; they used honey as a remedy for the prevention of infection in bedsores and burns. It has been reported that honey can facilitate removing necrotic tissues, increase the granulation and epithelialization speed, and reduce scars. The antimicrobial power of honey prevents the growth of bacteria on the moist environment of skin surface. The factors that make honey a useful remedy for burns are: Acidic environment (pH= 3.4–6.1), high osmotic properties, avoids dressing from sticking to the wound, and decreases the dislodgement of granulation tissues at the time of dressing.[16]

Extraction of *Moringa oleifera*:



The above figure shows the Soxhlet apparatus used for solvent extraction (SE) where 10 grams of powder of *Moringa oleifera* was treated with 210 ml of ethanol or hexane during 6 hours. The solvent was eliminated in a rotavapor and the yield was calculated as grams of extract divided by grams of original powder in a dry basis.[17]

Material and Methods:

The ingredients which are use in formulation of lipbalm as follow:

Ingredients	Manufacturer
Extract	Lab scale
Bees wax	Arjun beeswax
Sesame oil	Lab scale
Castor oil	Lab scale
Honey	Dabur pharmaceuticals
Vitamin E (Evion 400 mg capsules)	Merck pvt ltd
Rose oil	Herbo neutral extract pvt ltd

FORMULATION

Weigh accurately all the required ingredients as per Table 1. In a clean evaporating dish, take Bees wax firstly and melt it on a water bath (not exceeding the temperature range of 50-64°C). Then add the Sesame oil and castor oil respectively and stir vigorously and label it as A. Then in another evaporating porcelain dish, take formulated extract Honey and Vitamin E (pour the capsule content into Honey) and mix thoroughly and label it as B. Pour the contents of porcelain Dish B into Dish A by observing the uniform temperatures of both the dishes and adding it drop by drop with vigorous stirring. Finally add Rose oil to the Formulation and lastly pour the liquid lipbalm into a clean wide mouth container. Keep the lip balm for cooling at room temperature.[20]

Sr no.	Ingredients	Importance	F1	F2	F3
1	Extract	Antiseptic and Natural Moisturiser	1ml	1ml	1ml
2	Bees wax	Glossy and Hardness	2.5gm	2.5gm	2.5gm
3	Sesame oil	Protect skin damage	2ml	2ml	2ml
4	Castor oil	Humectant	1.5ml	1.5ml	1.5ml
5	Honey	Anti-Inflammatory and Anti Bacterial	q.s	q.s	q.s
6	Vitamin E	Smoothner and Softner	2.5gm	2.5gm	2.5gm
7	Rose oil	Fragrance	q.s	q.s	q.s

EVALUATION OF LIPBALM[21-24]

Organoleptic properties

The organoleptic characters such as colour, odour, taste and appearance of lip balm was studied.

Measurement of PH

To check for any negative effects, the lip balm's pH was measured. It was decided to keep the formulation's pH as close to neutral as possible because an acidic or alkaline pH may irritate lips. 1gm of the material was dissolved in 100ml of water to study the pH value. A pH metre was used to measure the pH.

Stability studies

For testing and to speed up research, prepared lip balm was examined for 30 days at various temperatures, including room temperature (25°C), refrigeration (5°C), and over temperature (40°C), and its spreadability, PH, and organoleptic characteristics were assessed.

Melting point

Melting point apparatus melting point of lip balm was determined as the melting point sample of lip balm was taken in a glass capillary whose one was sealed by using a flame. The capillary containing the formulation was dipped in liquid paraffin inside the melting point apparatus which was equipped with magnetic stirring facing. Melting was determined visually and melting point was reported.

Test of spreadability

The test of spreadability is carried out by applying the product at room temperature repeatedly on the glass slide to visually observe the uniformity in the formation of the protective layer and it is observed that whether the stick fragmented, broke or deformed during the application. For this test following criteria were established by analyst:

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

I – Intermediate: uniform, leaves few fragmentation, appropriate application, few deformation of lip balm. B- Not uniform, leaves many fragments, inappropriate application, intence deformation of the lip balm

Skin irritation test

A small amount of the specially prepared substance is applied for 10 minutes to the left-hand dorsum of the 56 voluntarily participating applicants. Then the skin is inspected for any type of irritation, rash, erythema, or edoema.

Perfume stability

The formulated herbal lipbalm was stored in standard condition of cool temperature then it was tested for its fragrance after 30 day.

RESULT [25]

Organoleptic characteristics

Prepared lip balm has shown faint yellowish coloured with pleasant odour. All results are presented in in Table 2 and fig.

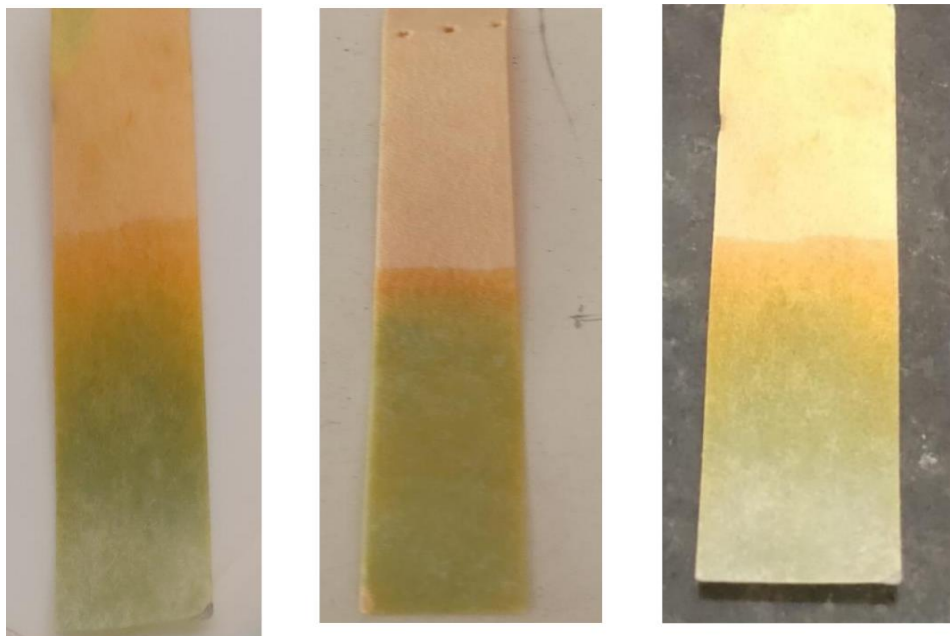


Table no. 2: Organoleptic characteristics of lip balm.

Parameters	Observations
Colour	Faint yellowish
Odour	Pleasant
Appearance	Excellent, Smooth

Measurement of PH

The pH of lip balm, was near to neutral pH i, e 7.2 this would not cause any irritation to lips.[26]



○ STABILITY STUDIES

Stability study of formulation can be defined as time from date of manufacture and the packaging of the formulation, until its chemical or biological activity is not less than predetermined level of labeled potency and its physical characteristics have not changed appreciably, The main aim of stability study is to provide evidence on how the quantity of drug or drug product varies with the time under the influence of the variety of environmental factors

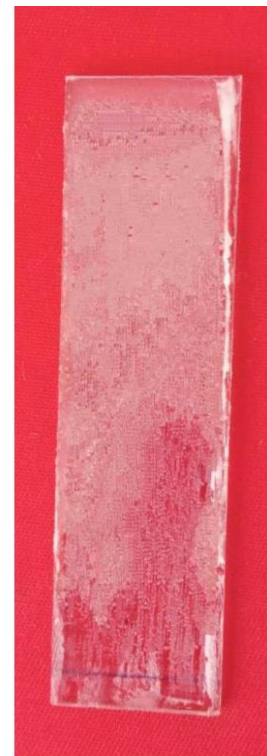
such as temperature, light, humidity. Stability studies were carried out for 1 month / 30 days at room temperature ($25\pm 3^{\circ}\text{C}$), refrigeration ($5\pm 2^{\circ}\text{C}$) and temperature ($40\pm 2^{\circ}\text{C}$).

- MELTING POINT

Melting point of lip balm was found to be in the range of 66°C - 68°C , which matches with the appropriate melting point of between 65 and 75°C . [27-28]

- 1) TEST OF SPREADABILITY

Prepared lip balm was tested for its ability of spreading which initially has shown G – uniform, no fragmentation perfect application, without any deformation at room temperature as given in figure no 2.



- i. SKIN IRRITATION TEST:

Prepared lipbalm does not show any skin irritation, any kind of inflammation, rash, erythema,

- PERFUME STABILITY:

The stability of perfume in lipbalm is stable for 1 to 30 days.

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