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### Review Article

### Review on Natural Lip Balm

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#### Abstract

Cosmetics are incredibly in demand since historical time. These days focus shifted more towards naturally derived cosmetic products. Among all cosmetic products, lip balm formulations are most widely used to enhance the beauty of lips and add glamour touch to the makeup. Lip balms offer a natural way to maintain and promote healthy lips. Current cosmetic lip products are based on use of enormous chemical ingredients with various side effects. Hence in this work, an attempt has made to study natural ingredients used to formulate natural lip balm. This article reviews on the essential ingredients used for natural lip balm along with their merits and limitations. The natural lip balm can made using naturally occurring base, oils, extract, color and flavoring agents which can be evaluated for their resistance to temperature variations, pleasant flavor, and smoothness during application, adherence and easy intentional removal, etc.

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**Key words:** natural lip balm; herbal cosmetics; natural ingredients

#### 1. Introduction

Cosmetic plays a significant role in today's life style. Moreover current trend is going green in almost all industries including cosmetics to adopt more natural way of life. The preferable choices are natural food, herbal medicines and natural curing practices for healthy life and also there is much demand for the organic vegetable products. The usage of herbal cosmetics has been increased to many folds in personal care system [1]. Natural products have been used for folk medicine purposes throughout the world for thousands of years. Many of them have pharmacological properties such as antimicrobial, anti-inflammatory and cytostatic effects. They have been recognized as useful for human medicine [2]. Herbal extracts are cultivated all over the world and is prime name in horticulture sector. Cosmetics made up of herbal extracts for skin care and hair-care are very popular for their reliability [3-5].

Herbal cosmetic products include various formulations. The word herbal indicates safety as compared to synthetic products which are having various adverse effects on human health [3-7]. Coloring lips is the ancient practice to enhance

the beauty of lips and to give glamour touch to the face make up. For this the choice for shades of color, textures, lusters have been changed and became wider. This can be observed from the lip jelly, lip balm, lipstick marketed in hundred of sheds of colors to satisfy the demand [8]. This work was intended for extensive study of natural lip balm. This was based on the comprehensive literature search of natural lip balm, significance of natural excipients along formulation and evaluation of lip balm. These products are evaluated for organoleptic properties like color, odor, spread ability, pH, melting point, skin irritation and product consistency [8-10]. The color of a product also provides an indication of product quality and freshness. Natural colors are however, less toxic compared to synthetic colors [11].

#### 2. Difference between lip and regular skin structure

The lips are more attractive than the regular skin. Generally the top corneum layer of regular skin has 15 to 16 layers mainly for protection purpose. The top corneum layer of the lip contains about only 3 to 4 layers and very thin compared to typical face skin. The lip skin contains very few melanin cells. Because of this, the blood vessels more clearly appear

through the skin of the lips that gives a lovely pinkish color of the lips. The lip skin has no hair follicle and no sweat glands. Therefore it does not have the sweat and body oil in protecting the lip from outside environment [9,10,12].

### **3. Anatomy of lips**

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 [10,12].

The areolar tissue or submucous 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 [12]. The superior labial or coronary vein begins as a plexus in the orbicular is 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 [9,10,12].

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 [12].

### **4. Lip Disorders**

**4.1 Swelling:** An allergic reaction can make the lips swell. The reaction may be caused by sensitivity to certain foods or beverages, drugs, lipstick, or airborne irritants. When a cause can be identified and then eliminated, the lips usually return to normal. But frequently, the cause of the swelling remains a mystery. A condition called hereditary angioedema may cause recurring bouts of swelling. Nonhereditary conditions such as erythema multiforme, sunburn, cold and dry weather, or trauma may also cause the lips to swell [13].

**4.2 Sun Damage:** Sun damage may make the lips, especially the lower lip, hard and dry. Red speckles or a white filmy look signal damage that increases the chance of subsequent

cancer. This type of damage can be reduced by covering the lips with a lip balm containing sunscreen or by shielding the face from the sun's harmful rays with a wide-brimmed hat [13].

**4.3 Inflammation:** With inflammation of the lips (cheilitis), the corners of the mouth may become painful, irritated, red, cracked, and scaly. Cheilitis may result from a deficiency of vitamin B2 in the diet.

**4.4 Discoloration:** 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.

**4.5 Sores:** A raised area or a sore with hard edges on the lip may be a form of skin cancer. Other sores may develop as symptoms of other medical conditions, such as oral herpes simplex virus infection or syphilis. Still others, such as keratoacanthoma, have no known cause [13].

### **5 Application of Lip Balm**

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 [14]. 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 [14 &15].

To formulate lip balms, it is necessary to balance the concentration of the main ingredients including butters, oils and waxes and other excipients [15]. Many people seek weekly facials, daily skin scrubs, anti-aging lotions, and many other products to ensure they have healthy and glowing skin. But with all the attention being given to healthy skin, lip care is largely forgotten. Natural lip balms offer a natural way to maintain and promote healthy lips [15]. Lip balms are often eaten away by the user and hence it is imperative that health regulators have a microscopic look at the ingredients that go in to the lip balm. The dyes that contribute to the color of the lip balm are dangerous to humans on consumption [16].

### **6. Advantages and Disadvantages of Natural Lip Balm**

#### **6.1. Advantages of natural lip balm**

- a. Lip balms help to protect the natural health and beauty of the lips.
- b. Sun block lip balms are proved to prevent ultraviolet rays from hurting the lips.
- c. They are not gender specific products and both men and women can use them.
- d. Lip balm products help to protect lips affected by cold sores, chapping and dryness.
- e. Contact of the product with the skin will not cause a sensation of friction or dryness, and should allow the forming of a homogeneous layer over the lips in order to protect the labial mucous susceptible to environmental factors such as UV radiation, dryness and pollution.
- f. It refreshed, renewed and also addresses lip-related symptoms resulting from colds, flu and allergies.
- g. The use of natural lip cosmetic to treat the appearance of the face and condition of the skin [15,17-21].

### 6.2. Disadvantages of natural lip balm

- a) Lip balms made of low quality ingredients can harm the lips seriously. Such lip balms may dry out the lips

- instead moisturizing it.
- b) Lip balm addiction is another disadvantage usually seen with the use of them.
- c) Compared to commercially-prepared lip balms, homemade lip balms tend to stay on the lips for a shorter duration of time. Thus need to reapply often.
- d) Some companies manufacture lip balms considering only the beauty aspect, ignoring the health benefits and soft character of the skin. Such products will gradually damage the natural color, softness and glow of the lips.
- e) The naturally derived colors and flavours are more difficult to obtain and also have issues related to stability in the products
- f) Natural oils have other disadvantages such as greasier, comedogenic, and less spreadability [15,17-21].

### 7. Common Ingredients used in Natural Lip Balm Formulation

The list of materials used as key formulation ingredients for natural lip balm given in the Table no.1 as described below

**Table No.1** List of Natural Ingredients

Base [15,17-19]	Oils [3,15,17-19]	Coloring Agent [15,17-21]	Flavouring Agent [16-19,23]
Cocca butter	Coconut oil	Beet root	Strawberry
Bees Wax	Olive oil	Pomegranate	Honey
Shea Wax	Almond Oil	Marigold	Orange
Shea butter	Vitamin E oil	Tomato	Saffron/Kesar
White bees wax	Peanut Oil	Jabul	Raspberry
Yellow bees wax	Tea tree oil	Watermelon	Vanilla
Carnauba wax	Glycerin	Honey	Mango
Candelilla wax	Castor oil	Saffron	Rose oil
Mango butter	Jojoba oil	Turmeric	Sandalwood
Avocado butter	Corn oil	Capsicum	Jasmine
Olive wax	Arachis oil	Cherry	Cherry
Jojoba wax	Lemon oil	Orange	Apple
Olive butter	Avocado oil	Strawberry	Lemon
Sweet Almond butter	Sesame oil	Mango	Apricot
Sweet almond wax	Sunflower oil	Carrot	Rosemary
Raspberry butter	Grape seed oil	Lemon	Pineapple

### 7.1 Base

Waxes form an important group of ingredients for the manufacture of personal care products and decorative cosmetics. Waxes are used in different industries and products. They are predominately used in candles, but also find important applications in food, cosmetics and pharmaceutical industries as thickeners/emulsifiers. Chemically, waxes are complex mixtures of hydrocarbons and fatty acids combined with esters. Waxes are harder, less greasy and more brittle than fats. They are very resistant to moisture, oxidization and bacteria. There are four categories of waxes as: (a) Animal Waxes: Beeswax, lanolin,

spermaceti; (b) Plant Waxes: Carnauba, candelilla, jojoba; (c) Mineral Waxes: Ozokerite, paraffin, microcrystalline, ceresin; (d) Synthetic Waxes: Polyethylene, carbowax, acrawax, stearon. The most widely used waxes for cosmetic products are beeswax, carnauba and candelilla wax[17]. Waxes are esters of a fatty acid and a fatty alcohol. Jojoba oil is therefore a wax, not oil. Physically, waxes are characterized by a high melting point (50-100oC). The most used wax is beeswax which is a good emollient and thickener. Two other natural waxes often used in cosmetics are carnauba and candelilla wax. Both are harder and have a higher melting point making them more stable and suitable for dry products e.g. lip balm [17].

Cocoa butter is a natural fat that comes from cocoa bean and it gives a creamy softness to the lip balm. It will nourish and moisturize lips and help heal chapped and dry lips because it contains antioxidants [17&18]. Another important and useful component of lip balm is white beeswax with melting point 62°-64°C. It usefully binds oils and high melting point waxes. It is used in 3 to 10% of the total formula. It shrinks on cooling and thus helps preparation of molded products. At higher concentration it produces a dull way appearance and causes the balm to crumble during use.

Candelilla wax has a melting point 65°-69°C and can be used in 5-10% of formulation. A mixture of candelilla wax and beeswax is very good for making lip balm. If candelilla wax is used to a little in a excess than beeswax the product gets a smooth and glossy appearance. On the other side carnauba wax increases the melting point of the base and hardens the lip balm therefore used in very small amounts. It brings an attractive luster to the products [19].

## 7.2 Oils

Oils and fats are differing in their physical forms; generally the latter are solid at room temperature. Both fats and oils are chemically glycerol esters composed of glycerol and fatty acids and are also called as triglycerides.

Fatty acids can be saturated or unsaturated, thereby determining the stability and property of the oil. Oils with a high degree of saturated fatty acids (lauric, myristic, palmitic and stearic acids) include coconut oil, cottonseed oil, and palm oil. Oils with a high degree of unsaturated fatty acids (oleic, arachidonic, linoleic acid) are canola oil, olive oil, corn oil, almond oil, safflower oil, castor oil and avocado oil. Saturated oils are more stable and do not become rancid as quickly as unsaturated oils. However, unsaturated oils are smoother, more precious, less greasy, and better absorbed by the skin. Natural butters like shea butter, avocado butter or cocoa butter are not true butters but natural fats. In general, natural butters are excellent emollients and thickeners and dependent on the type may have various additional properties (e.g. antioxidant & and soothing properties in shea and avocado butter due to phenolic compounds) [17 &18].

The oil mixture is required to blend properly with the waxes to provide a suitable film on the applied lip skin. An ideal mixture is one which enables the product to spread easily and produces a thin film with good covering power [18]. Sunflower or olive oil, both oils will give a great gloss to lips [17]. Castor oil is used in many lip balm because of its good qualities, though now days some other oils or solvents are being used. A refined grade castor oil is of good color and is odorless and tasteless. Castor oil is a very good plasticizing agent. An antioxidant is to be added to the castor oil against rancidification though it is not as prone to rancidification as other vegetable oils like olive oil or almond oil [19].

Joboba oil is known for its skin-softening properties which can prevent lips from dehydrating. While wolfberry seed oil

is renowned for its moisturizing and skin conditioning properties. Rosehip oil is excellent for maintaining then natural moisture balance in skin. Vitamin E is a well-known antioxidant that plays an essential role in the lip balm base. Peppermint essential oil energizes and revitalizes skin. Cinnamon essential oil is an excellent antioxidant. Lavender essential oil is soothing and nourishing to skin. And grapefruit essential oil is light and refreshing for dry lips [13-15]. Almond oil is pale yellow oil with slight characteristic odour. It consists of glycerides chiefly of oleic acid with smaller amounts of other acids namely, linoleic, myristic and palmitic. It has emollient properties [18].

## 7.3 Coloring Agent

Colorants or coloring agents are mainly used to impart a distinctive appearance to the Cosmetic products [17, 24-26]. Color has been used in cosmetics since early times. Basically, a desire to buy a cosmetic product is controlled by three senses namely sight, touch and smell. As such as, color is an important ingredient of cosmetic formulations [18]. The color is imparted to the lips in two ways; (a) By staining the skin with a solution of dyestuff which can penetrate the outer layer of the lip skin, (b) By covering the lips with a colored layer which serves to hide any skin roughness and give a smooth appearance. The first requirement is met by soluble dyes and the second one is met is insoluble dyes and pigments which make the film more or less opaque. Modern lip balms contain both to achieve the combined effect. The colors should be from the list of certified dyes under the drugs and cosmetics act [19]. The naturally occurring colors from different plant and fruit sources are listed in Table number 2.

The colorant derived from natural source should be nontoxic with no physiological activity. It should be a definite chemical compound because then only its coloring power will be reliable, its assay will be practicable and easier. Its tinctorial (coloring) power should be high enough so that only small quantities would be sufficient for use. Colorants should be unaffected by light, tropical temperatures, hydrolysis and micro-organisms and therefore they must be stable on storage [23-26].

Colorants should not affected by oxidizing or reducing agents and pH changes and also should not interferes with the tests and assays. Water soluble colorants are equally desirable with oil-soluble and spirit-soluble colors. The most important characteristic of colorants is compatibility with other ingredients and medicament. It should be free from objectionable taste and odour and must be readily available and inexpensive [23-26]. The examples of natural colorants are obtained from beet root, saffron, turmeric, etc. Saffron is dried stigma of flowers of the plant *Cross Sativuslinne*. It is a perennial plant and is grown in Kashmir in India. It is also cultivated in Spain, France, Greece and Iran. The principle coloring agent in saffron is crocin. Crocin is yellow powder, a glycoside in nature and easily soluble in water [18].

**Table No.2** Common Color and Associated Food [21]

Color	Chromophore	Plant sources	Nutrients
Purple-blue	Anthocyanins	Eggplant, blackberry, purple, cabbage, plum, blueberry, raisins, prunes, purple grapes, figs	Lutein, zeaxanthin, resveratrol, Vit. C, flavanoid, ellagic acid, Quecetin
Green	Chlorophyll	Avocado, cucumber, spinach, kale, broccoli, snow pea, zucchini, artichoke, lettuce, kiwi	Lutein, zeaxanthin, Vit. C, calcium, folate, carotene
White-tan	Anthoxanthins	Cauliflower, mushrooms, parsnip, potato, ginger, onions, jicama, banana, garlic, onions	Ancillin, Potassium, Selenium
Yellow-orange	Carotenoids	Papaya, pineapple, apricot, pumkin, peach, peach, carrot, orange, corn	carotene, zeaxanthin, flavanoid, vitaminC, Potassium
Red	Lycopene or Anthocyanins	Cranberry, beet, tomato watermelon, strawberry, pomegranate	Ellagicacid, quecetin, Hesperidin , etc.

**Table No.3** List of Flavour

Taste	Masking Flavour
Salt	Butterscotch, maple
Bitter	Wild cherry, walnut, chocolate-mint, licorice
Sweet	Fruit, berry, vanilla
Acid	Citrus

#### 7.4 Flavouring Agent

Flavours or flavouring agent are usually required to mask the four basic taste sensations. Flavour refers to a mixed sensation of taste, touch, smell, sight and sound, all of which involve a combination of physiochemical and physiological actions that influence the perception of substances. With the expansion of technology in the flavour industry, many artificial or imitation flavours have been created. The creation of an acceptable flavour is more of an art than a science [23]. Flavourants are selected on the basis of the taste of the drug or other ingredients need to be incorporated. The following Table number 3 shows the masking flavor with respect to different taste.

Flavours used in lip balm should not contain any ingredient which may be irritating or toxic. These should have good taste and should be able to mask fatty odour of the base [18]. Flavouring agents are an essential component to mask the odour of the fatty or wax base as well as to impart an attractive flavor. They are normally used in the concentration range of 2-4% of total formulation. Flavour should be stable and compatible with the other constituents of the lip balm. The flavours should not be very strong as to clash with or overpower other flavors that may be used concurrently with the lip balm. Perfumes of the fruit flavor type have been advocated as well. Also something edible can be used [19]. The commonly used flavours are apricot, strawberry, raspberry, cherry, honey, etc. Honey has the capacity to serve as a natural food preservative [20].

#### 8. Method of Lip Balm Preparation

The details of general method of lip balm preparation are described in this section. Select appropriate ingredients for lip balm formulation from Table number 1. Initially melt the accurately weighed amount of waxes in hot water bath in descending order of their melting point with continuous stirring/heated till it melts completely [24]. Then coloring agent dissolved in oil or water depends on solubility and add to the mixture of melted waxes. Finally add flavouring agent like honey, vanilla which are also act as a preservative and continuously stirred to get a homogenized mixture. The mixture should be stirred vigorously until a smooth emulsion form. Then, this mixture could be poured into clean and lubricated moulds and allow them to cool to achieve contraction of the waxes to facilitate easy removal of the balm [24 & 25]. Recently the work also patented on the preparation of botanical butter stick lip balm cosmetics [27].

#### 9. Evaluation parameters for lip balm

Quality of a lip balm product can be assessed by the product performance. Therefore significance of evaluation parameters of any product is abundant. It helps to maintain the stability along with the purity and uniformity of product. The main evaluation parameters of lip balm products are described in this section. The appearance of cosmetics products plays paramount role from consumer's perspective. This includes color, odor and texture of the product [17]. By visualizing in 10x magnification under microscope color and appearance can be characterized, while odor can be compared by the

group of evaluators.

The spreadability of lip balm can be tested by applying the formulated lip balm on glass slide at room temperature to observe uniformity in the formulation of protective layer and whether the stick fragmental deformed or broke during application for appropriate results of different formulation.

The melting temperature and pH of lip balm are also commonly evaluated by capillary method and pH meter respectively. *Ex-vivo* and *in vivo* tests should be performed for skin irritation test. The product need to study for the surface anomalies such as formation crystals on surfaces or contamination by moulds, fungi etc. There should not be sign of any surface defects. The lip balm products are evaluated for perfume and aging stability [18].

#### 10. Conclusion

Due to tremendous demands of beauty enhancing products cosmetics industry is flourishing. This work has reviewed the current status of natural lip balm products. This also studied all aspects of natural lip balm including natural ingredients, formulation methods, evaluation and applications. Hence it can be concluded that the extensive literature study has been performed on the natural lip balm products and shown wide scope for such products in future.

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