

Lip Cosmetics – A Formulator (OR) An innovator to Overcome a Challenge in Quest of Research with its Advances

P. Anitha¹, C. Ronald Darwin³, D. Vasavi Devi², A. V. S. Madhulatha⁴, G. Jaya Vasavi⁵, V. Sarovar Reddy¹, Sanisetty Ashok², D. Jeslin⁵, B. Bhargavi⁶, Gummalla Vijayamma⁷

¹Department of Pharmaceutics, Annamacharya College of Pharmacy, Rajampet, Andhra Pradesh, India, ²Department of Pharmaceutical Analysis, Annamacharya College of Pharmacy, Rajampet, Andhra Pradesh, India, ³Department of Pharmacology, School of Pharmaceutical Sciences, Vels Institute of Science Technology and Advanced Studies, Chennai, India, ⁴Department of Pharmaceutics, Chennupati Indo American School of Pharmacy, Jonnalagadda, Palnadu District, Andhra Pradesh, India, ⁵Department of Pharmaceutics, Faculty of Pharmacy, SBMCH, Bharat Institute of Higher Education and Research, Chrompet, Chennai, India, ⁶Department of Pharmaceutics, School of Pharmaceutical Sciences, Vels Institute of Science Technology and Advanced Studies, Chennai, India, ⁷Department of Pharmaceutical Analysis, Faculty of Pharmacy, SBMCH, Bharat Institute of Higher Education and Research, Chrompet, Chennai, India

Abstract

Cosmetics which are the Greek origin word have been used by people either knowing or unknowingly in their daily life since B.C for maintaining good hygiene, attraction, and beautifying purpose which from the materials or items available from natural or other forms of sources from nature. Various classifications on the term cosmetic have been emerged on its usage, form, and application available sources. The various types of cosmetics used for hair hair, skin, tooth, etc., are mostly available in the form of solid, liquid, gas and semisolids with various consistencies for longer duration of action and specific area of application. Face cosmetics especially lip cosmetics play a significant role in beautifying the entire human personality in orating the surrounding people on various occasions and in regular life. The lip balms, lip stains, lip liner, lip gloss, lipstick, lip oil, etc. are the lip cosmetics available in the market. To formulate a cosmetic, a great challenging task is to overcome by a researcher or scientist or formulator or innovator because the cost or price of cosmetics is higher than the cost of other needs of humans the product available or manufactured must win the user with its enrichment or articulate in appearance by the customer. The selection of ingredients and the method of preparation and its evaluation play an important role in their future marketed product life in its consistency and utility. All lip cosmetics must be formulated using a sufficient amount of waxes, oils, antioxidants, preservatives, coloring agents, perfumes, moisturizing agents, and other essential ingredients and must be properly evaluated for all tests specified such as test on softening point, melting point, stability study test, freedom from grittiness and greasiness, test on pH, stability test for perfume, test on surface anomalies and solubility, test on breaking point and thixotropy character, test on force of application and skin irritation, lead and other metals limit test, and aging stability test. The marketed products available on lip cosmetics with names of Carmex, Nivea, Blistex, Himalaya lip balm, Maybelline NY Super Stay Matte Ink Liquid, Revlon Ultra HD Matte Lip Mousse, SUGAR Cosmetics Smudge Me Not Liquid Lipstick, Zayn and Myza Liquid Lipstick, FACES Canada Ultime Pro Matte Crayon, Colorbar Sinful Matte Lipstick.

Key words: Cosmetic, lip balms, lip cosmetics, lip gloss, lip liner, lip stain, Maybelline NY super stay matte ink liquid, perfumes and moisturizing agents

INTRODUCTION

Cosmetics have been in 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

Address for correspondence:

Dr. V. Sarovar Reddy, Department of Pharmaceutics, Annamacharya College of Pharmacy, New Boyanapalli, Rajampet - 516 126, Andhra Pradesh, India.
Phone: 9493035229.
E-mail: sarovar.ancp@gmail.com

Received: 19-02-2024

Revised: 23-03-2024

Accepted: 31-03-2024

development and manufacturing processes of products. This has urged pharmacists and made them focus on identifying pharmaceutical technology as one of the relevant subjects for the future development of cosmetics. The ancient cultural beliefs and traditional regular practices have played a substantial role in the continued application of cosmetics, in the West as well as in the East. This made the scientists or associates of research carry out research in cosmetics, and as a result, more and more products are being developed and marketed. Body and beauty care products are likely to surpass the consumption of drugs in the future. A large segment of the world 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. Make-up of many categories including hair dyes were used by men and women alike. Attars and floral waters for bathing every day and a list of cosmetics exclusively for men also existed. Betel leaves were often used to darken lips and teeth, and vermilion and other colors with waxes were used as facial cosmetics. 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. Apart from the Indian civilization, there were many others that developed the art of cosmetics – Egyptian, Persian, Greek, Chinese, and Japanese. Travelers to and from India, China, Japan, and Tibet spread much knowledge of cosmetics worldwide. The Persians and the Arabs had improved methods of treating a condition of skin and hair. They had even enriched their mate – riamedica with plants brought from Asia. Perfumes were introduced in Rome first by barbers as solid unguents, oily liquids, and powders. Some perfumeries were even selling cosmetic appliances if we may call them so, useful in the manufacture of cosmetics.

Since the 16th century, cosmetics were completely separated from medicine and from the 17th century, cosmetic technology incepted developing its shape. Cosmetics were defined as the preparations but not devices such as shampoos, cleansing creams, lotions, shaving creams, creams, antiperspirants, face, hair, and lip products to be used on the human body. Today, a plethora of cosmetic applications, for every part of the body, i.e., hair, nail, face, lip, fingers, and skin is available in the world market. The evolution of cosmetics proves that there is a clear distinction between the earlier drama artist's make-up material and popular cosmetics for general usage.^[1]

The use of cosmetics as substances to enhance or protect the beauty of the human body dates back to the Vedic and Puranic periods. Earlier human face era used animal parts, vegetable leaves, flowers, colored stones, shells, etc. to adorn their bodies. The ancient Ayurvedic literature focused full of herbal cosmetic preparation. Nowadays cosmetics are considered to be one of the indispensable commodities of life. A subset of cosmetics is called make-up, which refers primarily to colored products intended to alter the user's appearance. Cosmetics include skin-care creams, lotions, perfumes, lipsticks, fingernail polishes, eye and facial makeup, permanent waves, hair colors, deodorants, baby products, bath oils, bubble baths, and many other types of products. Their use is widespread, especially among women In Western countries. These traditionally people used home-made preparations as cosmetics to gratify their senses. Three of our five senses smell, sight and touch find expression in cosmetic usage. The cosmetics were used extensively by the more privileged people. From beginning. There is a tendency to have flawless skin and enhance the sense of well-being through a beautiful outlook. Cosmetics are mainly used for two purposes, i.e., enhancing the personal appeal of human beings and caring for the body.^[2]

Cosmetic production and formula development have evolved over the years from the days of Galen (150 AD) to the present era of automation and computerization. Not only has the technology evolved but the concern for quality has also taken the front seat. The demand for cosmetic products, particularly in the urban population, is steadily rising owing to various reasons such as mall culture, better purchasing power, concern for looking better (by both men and women), nature of the job, development in advertising methods, and in general, availability of a wide range of cosmetic products (tailor-made for different skin types, hair types, etc.). The cosmetic and personal care industry according t has been growing at an average rate of about 15% for the last few years. This is mainly accounted for low and medium-priced category products, which comprise 90% of the cosmetic market, in terms of volume. The safety of cosmetic products is of prime importance for the general consumer.^[3]

The upper and lower lips are referred to as the “Labium suoeriusoris” and “Lbiuminferiusoris”, respectively. The juncture where the lips meet the sounding skin of the mouth area is the vermilion border, and the typically reddish area within the borders is called the vermilion zone. The vermilion border of the upper lip is known as the Cupid's bow. The fleshy protuberance located in the center of the upper lip is a tubercle known by various terms including the procheilon (also spelled prochilon), the “ruberculomlabiisuperoris,” and the “labial tubercle.” The demand for cosmetic products, particularly in the urban population, is steadily rising owing to various reasons such as mall culture, better purchasing power, concern for looking better (by both men and women), nature of the job, development in advertising methods and in general, availability of a wide range of cosmetic products

(tailor-made for different skin types, hair types, etc.). The cosmetic and personal care industry has been growing at an average rate of about 15% for the last few years. This is mainly accounted for low and medium-priced category products. The vertical groove trending from the procheilon to the nasal septum is called the philtrum. The skin of the lip, with three to five cellular layers, is very thin compared to the typical four skins, which have up to 16 layers. With light skin color, the lip skin contains fewer melanocytes (cells that produce melanin pigment, which gives skin its color). Because of this, the blood vessels appear through the skin of the lips, which leads to their notable red coloring, with darker skin color; this effect is less prominent, as in this case, the skin of the lips contains more melanin and thus is visually darker. The skin of the lip forms the border between the exterior skin of the face and the interior mucous membrane of the inside of the mouth.

The lower lip is formed from the mandibular prominence, a branch of the first pharyngeal arch. The lower lip covers the anterior body of the mandible. It is lowered by the depressor labii inferioris muscle and the orbicularis or borders it inferiorly.^[4]

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 protect against infections of bacteria due to the presence of an active medicinal ingredient in the formulation. This function adds 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.^[4]

Lip cosmetics are one of the most widely used cosmetic products. Social, psychological, and therapeutic benefits can be attained from using lipstick.^[5]

Lip balm is one such cosmetic which is used to increase the beauty of lips and add 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 bales are regularly applied to prevent chapped lips. When applied earlier to exposure to sun, wind, dry beat, 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, smoothness during application, easy intentional removal, etc. 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 organic-derived cosmetic products such as 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, cracks, and bleeding. In addition, the possibility of lip balm entering the body is very large, so 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 which are organic 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 is a wide range of organic cosmetics products to fulfill the beauty regimen, and adding organic substances to 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, and dryness of the skin. The face is the important part which 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, dry air, etc.) Lip balms are formulated to protect 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 the 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.^[43]

IDEAL PROPERTIES OF LIP COSMETICS^[44]

- It should be innocuous, both dermatologically and if unknowingly ingested
- It should make the lips soft
- It should be non-irritating to the skin of the lips
- It should be easy to apply, giving a film on the lips, which is neither greasy excessively
- It should be attractive in appearance
- It should produce uniform color
- It should 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
- It should have a desirable degree of plasticity without tendency to dry out or cumber
- It should have a pleasant odor and flavor.

Anatomy of lips

Lips serve as organs of prehension, suction, and speech. It is composed of the skin, superficial fascia, orbicular muscle, and the muscles inserted around it (areolar tissue and mucous membrane). The margins of the lips are covered with dry, red mucous membranes, 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 the median line forms two folds of superioris and inferioris. 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 arteria septi nasi. Compression of this, artery will sometimes control nasal hemorrhage. The superior labial or coronary vein begins as a plexus in the orbicular 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 drains 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 [Figure 1].

Lip disorders

Inflammation, swelling, sun damage, discoloration, and sores, etc., which lead to many diseases and act as symptoms for various dreadful diseases.^[4]

Classification of lip cosmetics^[4,43,44]



Application of lip balm

- Lip balms are preparations or formulations applied onto the lips to prevent drying and protect from adverse environmental effects
- The cosmetics formulation literature reported mitigated 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
- Lip balm should not be considered equivalent to lip gloss, with the former being a product intended for use by both men and women
- Many people seek weekly facials, daily skin scrubs, anti-aging lotions, and many other products to ensure they have healthy and glowing skin
- However, with all the attention being given to healthy skin, lip care is largely forgotten natural offers the natural way to maintain and promote healthy lips.

Types of lip balms

1. The UV filter lip balm: This sort of lip balm can be used all year long, but it is especially beneficial in the summer
2. The nourishing lip balm: This type works best in winter
3. The moisturizing lip balm: For dry lips, this kind of lip balm is beneficial
4. The medicated lip balm: It should be applied with care. It acts as a softening and medication
5. The Tinted lip balm: You can wear tinted lip balm year round.

Advantages and disadvantages of lip balm

- Lip balms help to protect the natural beauty of the lips and help nourish the lips and skin heal faster
- They are not gender-specific products both women and men can use them.
- Lip balm products help to protect lips affected by cold sores and dryness. Lip balms are proven to prevent ultraviolet rays
- Helping to heal and to prevent cracking of the lips
- They also contain organic nutrients that keep lips healthy.

Disadvantages of lip balm

- The same companies manufacture lip balms considering only the beauty aspect and ignoring the health benefits
- Homemade lip balm stays on the lips for a shorter duration of time
- Lip balm addiction is another disadvantage usually seen with the use of them
- Lip balms made of low-quality ingredients can harm the lips seriously, such lip balms may dry out the lips instead of moisturizing it.

Common ingredients used in natural lip cosmetics formulation^[43]

The common ingredients of cosmetics are wax, butter, flavoring agents, coloring agents and oils, *Aloe vera*, and vitamin E capsules.

Wax

Wax is one of the ingredients for the manufacture of cosmetic items because they are harder and more delicate than fats and very safe to oxidize and also bacteria. Waxes form an important group of ingredients for the manufacture of personal care items. Waxes are used in industries and products. There are four categories of waxes

- Animal waxes – beeswax and lanolin
- Plant waxes – carnauba and candelilla
- Mineral waxes – paraffin, microcrystalline, and ceresin
- Synthetic waxes – polyethylene and carbowax.

The most widely used waxes for cosmetic products are beeswax, candelilla wax, and carnauba wax. Beeswax is used as an ingredient; the cosmetic planning such as lip balm beeswax does not cause any issues, or problems or clog the pores, but brings a host of very positive properties, such as healing, softening, and emollient properties to cosmetic products. Beeswax is used in the production of emulsions for beauty care products that require a creamy consistency, and in the formulation of strong sticks such as cosmetic lipsticks, it gives structure to the stick, maintains the oil phase, and keeps it solid. Beeswax is an organic compound secreted by bees and is mostly used for dermatological products due to its numerous benefits.

Table 1: Formulation ingredients of lip cosmetics^[17-24]

Bases/Waxes/Butter	Oils	Moisturizer	Preservatives and Antioxidants	Flavoring agents/ Fragrance	Pigments/dyes
Olive oil	Coconut oil	Candelilla wax	Methylparaben	Orange	Calcium, barium, and aluminum lakes
Candelilla wax	Almond oil	Carnauba wax	Propylparaben	Sandalwood	Bromo mixture
Carnauba wax	Glycerine	Alkenones wax	Propyl-p-hydroxybenzoate	Raspberry	Titanium dioxide
Alkenones wax	Tea tree oil	Coconut oil	Vitamin E	Apricot	Beetroot juice
Coconut oil	Jojoba oil	Pitaya (Hylocereuspolyrhizus) seed oi	Lemon oil	Rosemary	Theobroma cocoa
Pitaya (Hylocereuspolyrhizus) seed oi	Avocado oil	Coconut oil	Vanilla essence	Pineapple	<i>Punica granatum</i> from pomegranate
Microcrystalline wax	Sunflower oil	Ghee	Mangosteen rind (<i>Garcinia mangostana</i> L.)	Kesar	<i>Amaranthus cruentus</i> L.
Ozokerite wax	Grape seed oil	Honey	Benzoic acid	Strawberry	Jati leaves (<i>Tectona grandis</i> L.f.)
Ceresin wax	Vitamin E oil	Olive oil	Phenoxyethanol, BHT	Jasmin	Iron oxide

Beeswax has special characteristics

1. Gives the skin protective action of a non-occlusive type, expanding the defensive action of sun creams. Its flexibility and plasticity improve allowing thinner films and giving a greater permanence to skin and lips
2. Does not provoke unfavorable susceptible allergic reactions.

Oils

Oils and fats are chemically glycerol esters composed of glycerol and greasy acids and are also called triglycerides. Greasy acids can be saturated or unsaturated, subsequently determining the stability and properties of the oil. Oils with a high degree of unsaturated greasy acids (oleic and linoleic acid) are canola oil, olive oil, corn oil, almond oil, sunflower oil, and avocado oil. Immersed oils are more stable. In any case, unsaturated oils are smoother, less greasy, and better absorbed by the skin. The lip balm contains potential sensitizers such as lanolin, coconut oil, almond oil, peppermint oil, and vitamin E. Virgin coconut oil is wealthy in lauric acid and monolaurin.



Flavouring agent

Flavors refer to a mixed sensation of use, touch, scent, locate, and sound, all of which include a combination of physio-chemical and physiological activities that impact the perception of substances flavors are ordinarily required to cover the four fundamental sensations. Flavor refers to a mixed sensation of taste, smell, sight, and sound. In the flavor industry, numerous artificial flavors have been made. Flavors used in lip balm should not contain any ingredient which may be irritating. These should have great taste and a basic component to mask the odor of the greasy or wax base

as well as to give an attractive flavor. The commonly used flavors are apricot, strawberry, cherry, nectar, etc.



Coloring agent

Coloring lips are an ancient practice to improve the beauty of lips and to give a glamour touch to the face makeup. Color is an important ingredient of cosmetic formulations. Colorants provide different shades of color from purplish red, ruby red, beetroot purple, dark violet, red, pale red, purplish red, rose red, deep magenta, dark purple, orange, and deep violet to lip balm. Coloring agents are basically utilized to impart an unmistakable appearance to the lip balms and cover the lips with a colored layer which serves to cover up any skin harshness and allow a smooth appearance and desire to buy a cosmetic item which is controlled by three senses (sight, touch, and scent). In organic lip balm, organic colorants are obtained from beetroot, saffron, turmeric, etc. Colorants should not be influenced by oxidizing or reducing agents and also should not interfere with the tests and assay beetroot (*Beta vulgaris*) is one such natural ingredient that has received attention nowadays. It is an organic red dye, known as beetroot red, which is cheap and has no known unfavorable susceptible allergic side effects It is famous for its juice value and medicinal properties; and is known by several common names such as beet, chard, spinach beet. Several parts of this plant are used in a medicinal system such as anti-oxidant, anti-depressant, anti-microbial, antifungal, anti-inflammatory, diuretic, expectorant, and carminative. There is growing interest in the use of natural food colors because synthetic dyes are becoming more and more critically assessed by the consumer. *Beta vulgaris* used in India organic dyeing agent imparts a red or purple color to the formulation.

Table 2: Ingredients according to quantity

Ingredients	Quantity	Work done	Reference
Beeswax	3–10 g	Lipsticks History, Formulations, and Production: A Narrative Review	[25-37]
Almond oil	1%	Preparation and Evaluation of Herbal Lip Balm	[17]
Vitamin E	2.5 g	Formulation And Evaluation Of Lip Balm By Using Honey And Sesame Oil To Lighten The Dark Lips	[38-40]
Titanium dioxide	1–40	Formulation of tinted lip gloss from lotus flower and date seed oil and Lipsticks History, Formulations, and Production: A Narrative Review	[41,42]
Rosemary	2 drops	A Review on Herbal Lip Balm	[18-24]



A. vera gel

The leaves of *A. vera* were collected and 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.



Vitamin E capsule

Vitamin E is a fat-soluble antioxidant with anti-inflammatory properties and is often added to various skin care products such as creams, oils, and lip balms lipsticks for effective free radicle production, hydration, and smooth skin.

The Tables 1-3 represents the formulation of ingredients used in lip cosmetics, range of quantity of ingredient category in formulations and the marketed lip cosmetic products available.

METHOD OF PREPARATION

Preparation of lip balm

Weigh the ingredients according to ascending order. Introduce the ingredients such as beeswax into a clean evaporating dish first and melt it in a water bath (not exceeding the temperature range of 50–64°C). Then, add the given Sesame oil and castor oil, respectively, stir vigorously and note it as A. Take honey and vitamin E into another evaporating porcelain dish mix thoroughly and note it B. Add the contents of porcelain dish B into dish A at the uniform temperature of both dishes and add it drop by drop with vigorous stirring.

Finally, add perfume, i.e., Rose oil, etc. to the formulation and lastly pour the liquid lip balm into a clean wide-mouth container. Keep the lip balm for cooling at room temperature for good consistency [Figure 2].^[6]

Preparation of lipstick

The preparation and production of lipstick varies very slightly depending upon the type of ingredients or raw materials used. The finest molding method could be preferred as a standard procedure for the preparation of lipsticks. The ingredients used in lipstick preparation are categorized as phase A, phase B, and phase C. Waxes were represented in phase A, dyestuff and other oils were represented in phase B, and preservatives, and other additives were represented in phase C. The author heated up phase A to 80°C, then phase B ingredients were added one by one to phase A. The mixture of phases A and B was removed from heat, and phase C was added and then poured into the lipstick molds. On a different occasion, the same method was used to prepare organogel-based lipstick. The only difference was that phase A was heated to 200°C, phase B was heated separately to 100°C, and the pigment was dispersed well in phase B and then added to phase A. Typically, the wax phase (phase A) is created by melting the waxes in a water bath in decreasing order of the melting point. A suitable temperature should be used depending on the melting points of those waxes. The highest melting point of any wax constituent should be used to determine the water bath temperature used in the lipstick preparation [Figure 3].^[7,10-15]

Method of preparation of lip gloss

The formulation of tinted lip gloss using the colorant from a natural source was prepared in liposomal form. Cholesterol and mannitol (pre-treated in an ultrasonicator to remove moisture) were accurately weighed and added to a round bottom flask. Drops of liquid lecithin were added. Date seed oil and olive oil were added. The mixture was slightly heated in a water bath to prevent coagulation of lecithin. Chloroform was added as a solvent. The RBF was placed onto an agitator for approximately an hour and a layer was formed. A mixture of specific ratios of alcohol: fragrance:color was added. The RBF was again kept for agitation and removed after an hour. The contents were poured into a Petri plate and kept and stored in a freeze dryer for more than 10 days.^[16]

EVALUATION OF LIP BALM^[5-9,43]

Test on softening point

The prepared or to-be-tested lip balm could be placed with protruded salve in a tube having a flat bottom. A thermometer is introduced and placed in such a way that it touches lip balm salve. The entire arrangement is made of a beaker of 1 L capacity and a beaker filled with water above the lip balm

Table 3: List of marketed lip cosmetics formulations^[4,43,45]

S. No	Name of the product	Manufacturer	Uses
1	Nivea	Beiersdorf AG	Moisturizer
2	Carmex	Carma laboratories, Inc.	Cold sores
3	Aquaphor lip repair	Aquaphor	Dry lips
4	Vaseline	Unilever	Dry, chapped lips
5	Blistex	Arch family	Itching, dryness
6	Neutrogena lip moisturizer		Protective
7	Himalaya lip balm	Himalaya	Moisturizer
8	Khadi herbal lip balm	Khadi natural	Heals skin and relieves from dry lips
9	Beardo naturals	Beardo hemp lip balm	Dry, chapped lips and moisturizer
10	Lakme Absolute Precision lip paint	Lakme	Protective
12	Lakme matte liquid lipstick	Lakme	Beautiness
13	Maybelline NY Super Stay Matte Ink Liquid	Maybelline	Protective
14	Colorbar sinful matte Lipstick	Color bar	Protective
15	FACES Canada Ultime Pro matte crayon	Faces Canada Ultime	Decorative
16	L'oreal Paris Color Riche lipstick	L'oreal Paris	Protective
17	Zany and Myza Liquid Lipstick	Zany and Myza	Ornate
18	Wet n Wild Mega Last Matte Lipstick	Mega Last Matte Lipstick	Protective
19	Sugar cosmetics smudge me not liquid lipstick	Sugar cosmetics	Beautiness
20	Sugar cosmetics nothing else matters long wear lipstick	Sugar cosmetics	Protective
21	Revlon Ultra HD Matte Lip mouse	Revlon ultra	Protective

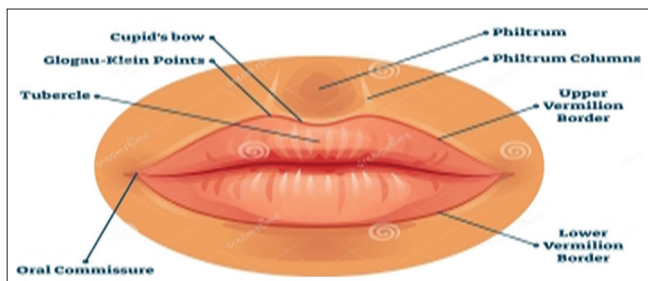


Figure 1: Lips and its surface parts

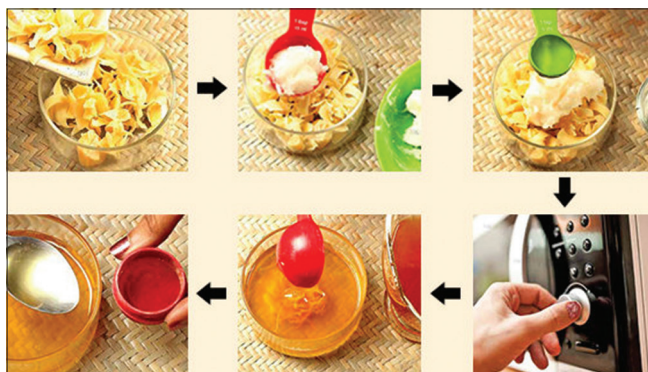


Figure 2: Steps involved in the preparation of lip balm

salve around 1 cm above the upper tip. Then, place the beaker in water bath and heated at a slow rate so that the temperature rises at 2°C/min up to 45°C and later temperature rises at 1°C/min rate. Finally, the salve starts to lose its shape and bends recorded as a softening point.

Test on melting point

Select five capillary tubes having both sides open end with a sufficient amount of lip balm introduced into a cylindrical tube about 1 cm and inside the capillary tube apparatus allow the capillary tube to stand for an estimated time and at a prescribed temperature. The temperature at which the balm melts is taken as the melting point. Repeat the operation for the rest capillary tubes.

Stability study

The stability of a product means the time it prepares for its chemical degradation at prescribed levels. Stability testing was carried out at refrigeration temp (4°C) R.T. (25°C) and oven temperature (40°C) for 30 days and observed if any chemical degradation occurred.

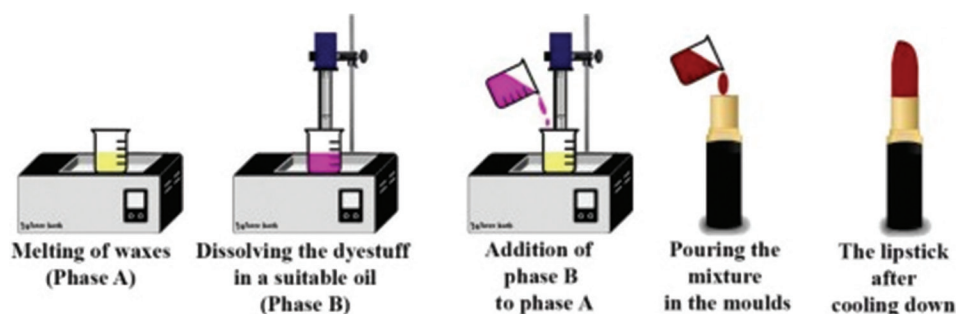


Figure 3: Steps involved in preparation of lipstick

Test on freedom from grittiness

Around 0.5 g of lip balm was taken and spread on a butter paper on a HMHD sheet and the balm was tested by pressing with a finger along the length for the presence of harder sharp edge particles which is differentiated readily.

Test on greasiness

To determine the quantity or amount of oil available in formulated lip balm, the specified amount of prepared balm was placed on filter paper and allowed to leave for 24 h. at R.T. The obtained diameter of the oily ring produced was measured and recorded.

Test on pH

The pH meter is calibrated using acidic or basic buffer solution from a tablet or capsule or standard solution and later continues the pH measurement of lip balm. The pH value of the balm was measured.

Stability test for perfume

Perfume stability testing is carried out by storing lip balm for 30 days and after 30 days recording the fragrance.

Test on surface anomalies

This test determines surface defects in crystal form and also molds and fungi attacks.

Solubility test

The fabricated lip balm was dissolved in variously referred solvents to check the solubility behavior.

Test on breaking point

Lipstick hardness is an important determinant of the physical characteristic properties of lipstick. It was carried out by placing the lipstick horizontally in a socket 1/2 inch away

from a support edge. At a 30 s interval, the weight of a fixed value of 10 g was progressively increased. The breaking point was observed when the lipstick broke.

Test on thixotropy character

The thixotropy test is used to determine the uniformity in the viscosity of a base. It is important to identify lipstick with good texture, using penetrometer to determine the thixotropic properties of lipstick.

Test on force of application

A force of application test is used to evaluate the force required for lipstick application on the lips. The test was carried out by placing a piece of coarse brown paper on a shadowgraph balance. Then, the lipstick was applied at a 45° angle to cover a 1 square inch area until fully covered.

Test on skin irritation

Human models were utilized in certain studies on skin irritation tests for lipstick. The prepared lipstick was applied to the skin (lip). Any symptoms such as itching, irritation, and redness were observed for a duration of 10-min. A mouse model was also suggested to be used for the skin irritation test of the lipsticks.

Lead and other metals limit test

Using the flame atomic absorption spectrophotometry method, the levels of lead, nickel, copper, zinc, and iron were analyzed and detected. The determination of lead in the lipstick and hair dyes was assessed using a novel microwave-assisted dispersive liquid-liquid microextraction (MADLLME) technique and graphite furnace atomic absorption spectrometry (GFAAS).

Aging stability test

Stored the products in 400 C for 1 h and observed various parameters such as bleeding, crystallization of on surface, and application characteristics.

Topical test

The lip balm preparation should deserve a good topical effect provided that the lip balm surface can moisturize the skin of the lips. This can be done on the back of the hand skin 3 times, which shows the smoothness and the moisturizing agents to be added if further for increasing smoothness.

CONCLUSION

Since the inception of mankind, cosmetics have become an integral part of maintaining natural beauty through naturally available materials from nature while regular day activities which could eradicate some diseases associated with improper hygiene. The usage of cosmetics could be encouraged to the extent of improving the look of goodness but not in such a way as it causes side effects. The encouraged products in the market must be from natural sources from plant or animals or their products in low concentrations for greater results.

REFERENCES

- Vimaladevi M. Textbook of Cosmetics. New Delhi: CBS Publishers & Distributors; 2005. p. 1.
- Nema RK, Rathore KS, Dube BK. Textbook of Cosmetics. New Delhi: CBS Publishers & Distributors; 2009. p. 3.
- Nanda S, Nanda A, Khar RK. Cosmetic Technology. New Delhi: Birla Publications Pvt. Ltd.; 2010. p. 1.
- Pund Kiran L, Shinde SB. A Review on Cosmetic Product: Lipstick. *Int J Res Public Rev* 2022;3:1047-1051.
- Mawazi SM, Redzal NA, Othman N, Alolayan SO. Lipstick history, fomulations, and production: A narrative review. *Cosmetics* 2022;9:25.
- Waykule N, Bagewadikar P, Kale S. Formulation and evaluation of lip balm by using honey and sesame oil to lighten the dark lips. *World J Pharm Res* 2022;11:710-22.
- Kadu M, Vishwasrao S, Singh S. Review on natural lip balm. *Int J Research Cosmet Science* 2015;5:1-7.
- McIntosh K, Smith A, Young LK, Leitch MA, Tiwari AK, Reddy CM, *et al.* Alkenones as a promising green alternative for waxes in cosmetics and personal care products. *Cosmetics* 2018;5:34.
- Esposito CL, Kirilov P. Preparation, characterization and evaluation of organogel-based lipstick formulations: Application in cosmetics. *Gels* 2021;7:97.
- Lwin T, Myint C, Win H, Oo W, Chit K. Formulation and evaluation of lipstick with betacyanin pigment of *Hylocereus polyrhizus* (Red Dragon Fruit). *J Cosmet Dermatol Sci Appl* 2020;10:212.
- Bhagwat D, Patil ND, Patel GS, Killedar SG, More HN. Formulation and evaluation of herbal lipstick using lycopene extracted from *Solanum lycopersicum* L. *Res J Pharm Technol* 2017;10:1060.
- Rasheed N, Rahman S, Hafsa S. Formulation and evaluation of herbal lipsticks. *Res J Pharm Technol* 2020;13:1693.
- Sunil R, Rautela T, Ashutosh B. Formulation and evaluation of a herbal lipstick: A new approach. *Int J Pharm Erud* 2013;3:26-30.
- Patil CD, Kadam R, Bedis SP. Formulation and evaluation of sugar cane wax based lipstick. *Int J Trend Sci Res Dev* 2019;3:827-9.
- Kamairudin N, Gani SS, Masoumi HR, Hashim P. Optimization of natural lipstick formulation based on pitaya (*Hylocereus polyrhizus*) seed oil using D-optimal mixture experimental design. *Molecules* 2014;19:16672-83.
- Tijare RB, Wargantiwar SS, George S, Shastri DR, Watkar MR, Bodhankar MM, *et al.* Formulation of tinted lip gloss from lotus flower and date seed oil. *Magna Sci Adv Biol Pharm* 2022;6:1-10.
- Shubham V, Vishal G. A review on herbal lip balm. *Int J Adv Res Innov Ideas Educ* 2022;8:1301.
- Gholap CD, Vitnor SJ, Pagire DM. Preparation and evaluation of herbal lip balm. *IJIRMP* 2023;11:5-6.
- Sharma PP. Cosmetics- Formulation, Manufacturing and Quality Control. 4th ed. India: Vandana Publications Pvt. Ltd.; 2008.
- Mittal BM, Saha RN. A Handbook of Cosmetics. 1st ed. New Delhi, India: Vallabh Prakashan; 2000.
- Denavarre MG. The Chemistry and Manufacture of Cosmetics. 2nd ed. Orlando, USA: Continental Press; 1975. p. 699.
- Sharma AV, Sharma PV. Flavouring agents in pharmaceutical formulations. *Ancient Sci Life* 1988;8:38-40.
- Basha BN, Prakasam K, Goli D. Formulation and evaluation of gel containing fluconazole antifungal agent. *Int J Drug Dev Res* 2011;3:4.
- Mundo MA, Padilla-Zakour OI, Worobo RW. Growth inhibition of foodborne pathogens and food Spoilage organisms by select raw honeys. *Int J Food Microbiol* 2004;97:1-8.
- Li Y, Guo C, Yang J, Wei J, Xu J, Cheng S. Evaluation of antioxidant properties of pomegranate peel extract in comparison with pomegranate pulp extract. *Food Chemistry* 2006;1:254-60.
- Ghongade K, Bodake V, Badadare S, Magdum M, Gawande N, Kate S, *et al.* Formulation and evaluation of some cosmetic preparations using novel natural colorant from *Ixora coccinea*. *Asian J Res Pharm Sci* 2021;11:22-8.
- Bhagwat D, Patil ND, Patel GS, Killedar SG, More HN. Formulation and evaluation of herbal lipstick using lycopene extracted from *Solanum lycopersicum* L. *Res J Pharm Technol* 2017;10:1060.
- Deshmukh S, Chavan M, Sutar M, Singh S. Preparation and evaluation of natural lipsticks from bixa Orellana seeds. *Int J Pharm Bio Sci* 2013;4: 139-144.

29. Tirunagari M, Nerella N, Koneru A, Baig AN, Begum A. Formulation and evaluation of medicated lipstick using natural coloring agent. *Res J Top Cosmet Sci* 2020;11:20-3.
30. Chaudhari NP, Chaudhari HA, Chaudhari NU, Premchandani LA, Dhankani AR, Pawar SP. Formulation and evaluation of herbal lipstick from beta vulgaris taproot. *Indian J Drugs* 2019;7:14-9.
31. Mishra P, Dwivedi S. Formulation and evaluation of lipstick containing herbal ingredients. *Asian J Med Pharm Res* 2012;2:58-60.
32. Karanje P, Doijad R, Bhosale R. Formulation and evaluation of herbal lipstick containing *Amaranthus cruentus* linn. *Int J Res Anal Rev* 2020;7:246-55.
33. Panda S, Dalapati N, Kar PK. Preparation and evaluation of herbal lipstick. *Environment* 2018;5:6.
34. Maru AD, Lahoti SR. Formulation and evaluation of lipstick containing sunflower wax. *Int J Pharm Res* 2018;10:126-30.
35. Naughton FC. Castor oil. In: *Kirk-Othmer Encyclopedia of Chemical Technology*. Vol. 1. New Jersey: Wiley; 2011. p. 1-20.
36. Dwivedi S, Dwivedi SN, Patel PC. Formulation evaluation and antimicrobial activity of herbal lipstick. *Recent Adv Prosp Potent Med Plants* 2009;4:39-43.
37. Bogdanov S. Beeswax: Uses and trade. In: *Beeswax Book*. Bee Product Science: Bern, Switzerland; 2009. p. 1-16.
38. Pratiwi D, Nurmaliza N, Bakhtiar T. The use of natural color turmeric (*Curcuma domestical*) and chocolate seeds (*Theobroma cacao* L.) in lipstick formulation. *Glob Conf Ser Sci Technol* 2021;5:6-12.
39. Juma'at N, Rahmat NA, Hamidi SA, Adnan N. The production and stability evaluation of natural lipstick. *Multidiscip Appl Res Innov* 2021;2:220-5.
40. Tran A, Pratt M, DeKoven J. Acute allergic contact dermatitis of the lips from peppermint oil in a lip balm. *Dermatitis* 2010;21:111-2.
41. Orrea Light. Lip Gloss Composition. Pub. No.: US 2003/0095936A1; 2003;22:1.
42. Dario M, Fernandes AR, Pinto C, Kaneko TM, Baby AR, Velasco MV. Stability evaluation of organic Lip Balm. *Braz J Pharm Sci* 2013;49:293.
43. Bali T, Chaudhary K, Sharma D. Organic lip balms: A review. *World J Pharm Pharm Sci* 2021;10:850-9.
44. Sampath K. *A Concise Book of Cosmetic*. New Delhi: Birla Publications Pvt. Ltd.; 2017. p. 74-5.
45. Jadhav RD, Mogal N, Dhamne S. Review on lip balm prepared with natural waxes. *World J Pharm Pharm Sci* 2022;11:608-19.

Source of Support: Nil. **Conflicts of Interest:** None declared.