

Formulation and Evaluation of Lip Balm using Tomato Extract to Select the Best Concentration of Base

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Abstract: *Solanum lycopersicum*, known as tomato, is a perennial plant with a weak body and can grow to a height of 1-3 m. It has a yellow flower that grows to be a tomato [1]. Tomato contains 93-95% water, and the remaining constituents include 5-7% inorganic compounds, sugars (glucose, sucrose, and fructose), organic acids (citric acid malic), solids insoluble in alcohol (proteins, pectin, cellulose, and polysaccharides), lipids and carotenoids[2]. Besides, phytochemicals such as alkaloids, flavonoids, glycosides, saponins, tannins, steroids, phlorotannins, and terpenoids were found in both aqueous and methanolic tomato extracts [3,4]. Tomato also contains antioxidants such as vitamins C and (, ù carotene, lycopene, lutein, and flavonoids [5].

Keywords: tomato extracts

I. INTRODUCTION

Solanum lycopersicum, known as tomato, is a perennial plant with a weak body and can grow to a height of 1-3 m. It has a yellow flower that grows to be a tomato [1]. Tomato contains 93-95% water, and the remaining constituents include 5-7% inorganic compounds, sugars (glucose, sucrose, and fructose), organic acids (citric acid malic), solids insoluble in alcohol (proteins, pectin, cellulose, and polysaccharides), lipids and carotenoids[2]. Besides, phytochemicals such as alkaloids, flavonoids, glycosides, saponins, tannins, steroids, phlorotannins, and terpenoids were found in both aqueous and methanolic tomato extracts [3,4]. Tomato also contains antioxidants such as vitamins C and (, ù carotene, lycopene, lutein, and flavonoids [5]. The red pigment comes from lycopene, which constitutes 75-83% of the total carotenoids in the tomato, while the yellow pigment originates from ù-carotene pigment and represents 3-7 % [6]. Lycopene is a linear, unsaturated hydrocarbon carotenoid and is the main red pigment in guava, watermelon, tomatoes, and grapefruit. Active ingredients like lycopene from tomatoes can protect against lipids, proteins, and DNA damage. According to Wehner[7], the risk of certain cancers such as pancreas, prostate, and stomach might be reduced by lycopene. The lycopene's biological and physicochemical properties have attracted special attention to its effect as an antioxidant [8]. This is mainly due to the lycopene from tomatoes exhibiting comparatively stronger antioxidants among the various carotenoids and could protect against UV [9]. Mature tomatoes are very easy to damage as the tomato's skin is very soft. However, this matured tomato has been proven to contain a high concentration of lycopene, a red pigment that has the potential to be applied in cosmetic formulations like lip balm as it could give a good appearance.



Fig no: 1

LIPS:

The 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 & 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 superiors and inferiors [10,11]. 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 Fig.2: Lips Anatomy 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 [11]. 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 that 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 submaxillary glands. The labial glands are in

LIP BALM:

Lip balms are formulations applied to 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 the application, adherence, and easy intentional removal[14]. Lip balm should not be considered equivalent to 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 butter, oils 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 health regulators must have a microscopic look at the ingredients that go into the lip balm. The dyes that contribute to the color of the lip balm are dangerous to humans on consumption[16].

Advantage of Natural Lip Balm

- a. Lip balms help to protect the natural health and beauty of the lips.
- b. Sun block lip balms are proven 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.
- d. 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 to protect the labial mucous susceptible to environmental factors such as UV radiation, dryness, and pollution.
- e. It refreshed and renewed and also addresses lip-related symptoms resulting from colds, flu, and allergies.
- f. The use of natural lip cosmetics to treat the appearance of the face and the condition of the skin

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 of moisturizing them.
- 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 flavors 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[15,17,19].
- g. Common Ingredients Used in Natural Lip Balm Formulation The list of materials used as key formulation ingredients for natural lip balm is given in Table No. 1 as described below.

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, oxidation, and bacteria.

There are four categories of waxes:

- (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 (50-100°C)[17]. 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 Cocoa butter is a natural fat that comes from cocoa beans 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 a melting point of 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 concentrations, it produces a dull way appearance and causes the balm to crumble during use. Candelilla wax has wax and beeswax is very good for making lip balm. If candelilla wax is used to a little in 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].

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 triglycerides. Fatty acids can be saturated or unsaturated, thereby determining the stability and properties 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 butter like shea butter, avocado butter, or cocoa butter are not true butter but natural fats. In general, natural butter 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]

The oil mixture is required to blend properly with the waxes to provide a suitable film on the applied lip skin. An ideal mixture 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 balms because of its good qualities,

though nowadays 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]. 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 the skin. Grapefruit essential oil is light and refreshing for dry lips[13,15]. Almond oil is a pale yellow oil with a slight characteristic odor. It consists of glycerides chiefly of oleic acid with smaller amounts of other acids namely, linoleic, myristic, and palmitic. It has emollient properties[18].

Colouring Agent:

Colorants or coloring agents are mainly used to impart a distinctive appearance to Cosmetic products[17,24,26]. Color has been used in cosmetics since early times. A desire to buy a cosmetic product is controlled by three senses namely sight, touch, and smell. As such, color is an important ingredient in 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 by 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 colorant derived from natural sources should be nontoxic with no physiological activity. It should be a definite chemical compound because then only its coloring power will be reliable, and 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 in storage[23,26]. Colorants should not be affected by oxidizing or reducing agents and pH changes and also should not interfere 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 odor and must be readily available and inexpensive[23,26]. Examples of natural colorants are obtained from beetroot, saffron, turmeric, etc. Saffron is a dried stigma of flowers of the plant *Crocus Sativus* Linn. It is a perennial plant and is grown in Kashmir India. It is also cultivated in Spain, France, Greece and Iran. The principal coloring agent in saffron is crocin. Crocin is a yellow powder, a glycoside in nature, and easily soluble in water[18].

Flavouring Agent:

Flavors or flavoring agents are usually required to mask the four basic taste sensations. Flavor 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 flavor industry, many artificial or imitation flavors have been created. The creation of an acceptable flavor is more of an art than a science. Flavourants are selected based on the taste of the drug or other ingredients that need to be incorporated. Flavors 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 the fatty odor of the base. Flavoring agents are an essential component to mask the odor 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. The flavor should be stable and compatible with the other constituents of the lip balm. The flavors should not be very strong 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. The commonly used flavors are apricot, strawberry, raspberry, cherry, honey, etc. Honey can serve as a natural food preservative

II. REVIEW OF LITERATURE

Munmun Dhakal, et al, Lipstick formulations are most widely used to enhance the beauty of lips and add glimmers to touch to makeup. With this aim and objectives, an attempt was made to formulate herbal lipstick b using coloring

pigments of solanum lycopersicum, and the lipstick was evaluated for its organoleptic properties such as hardness, solubility, etc. Due to various adverse effects of available synthetic preparation, the present work was conceived to formulate herbal lipstick having minimal or no side effects which will be extensively used by the women of our communication with great surely[25].

Jincy. V. Varghese et al.- According to the Drug and Cosmetics Act, 1940 cosmetics are defined as, any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any form, beauty, cleaning, promoting attractiveness, or alter the appearance and includes any article intended for use as a component of cosmetic. Cosmetics are constituted of a mixture of chemical compounds obtained from either natural sources or synthetically created ones. The cosmetics that are prepared using plant products have cosmetic actions. Recently the increased use of botanicals in cosmetics is mainly due to their mild action and non-toxic nature. In cosmetics, both phyto-ingredients and natural supplements are used. Natural products include oils, extracts, secretion, and phyto-ingredients including pure constituents obtained by various processes [19].

A. Shanmugapriya, et al. - Medicinal herbs have been used comprehensively against various diseases over a long phase of time. Nature has provided abundant plant wealth sources, which possess various medicinal values. The essential values of some medicinal plants have been known longer, but a large number of them remain unexplored. It is quite important to investigate the use to conduct experimental studies to describe their curative properties. The present study deals with phytochemical screening, and mineral, antioxidant, and antimicrobial activity of leaf extract of tridax procumbens[26].

Arun Kumar, et al.- A semi-solid product for enhancing skin tone is a moisturizing cream. Compared to synthetic creams, herbal creams provide several benefits. The majority of currently available creams provide more fairness to the face and are made from medications of synthetic origin, but they also have several undesirable side effects, including irritation and allergic reactions. These adverse effects are not present in herbal creams, which nourish the skin. The current study works objectives were to create and assess an herbal moisturizing cream that contains aloe vera gel, glycerine, rose water, and vitamin E capsules. The aforementioned herbal cream was assessed based on factors including PH, viscosity, greasiness, washability, appearance, and homogeneity by visual and tactile means. According to the study, the extract composition and the cream F2's base are both more secure and secure [27].

Pooja Dave et. al. Masoor dal exfoliates dead skin cells, giving a healthy glow. After regular usage, the lentil performs as an excellent cleaner, removing blackheads and skin patches. Promotes the skin's tone and moisturizes its scars of lightning and dark patches. Antioxidants remove dead cells and remove pollutants from the skin, making them smoother, cleaner, and more effective at treating blackheads and acne[28].

Siti Nurul Huda Mohammad et al: Nowadays, people are demanding naturally derived cosmetic products, including lip balms. However, there is a lack of studies on the physico-chemical properties of the formulated lip balms. Besides, there are few publications found on the use of beetroot as an active ingredient and colorant in lip balm formulation. Thus, this study aims to formulate a lip balm using beetroot; and test the physicochemical properties of formulated lip balms to get the three best formulations. The stability of these best lip balms was conducted for 4 weeks at room temperature and chiller conditions. Finally, a sensory evaluation was conducted to identify consumer acceptance of the best lip balms. Lip balms placed at room temperature were all stable while few changes occurred for the lip balms placed in a chiller. All panelists preferred the same lip balm in the sensory test. The result of this study can be extended to assess the potential of beetroot in the formulation of other cosmetic products[23].

Mayuri Kadu et al: Cosmetics have been incredibly in demand since historical times. These days focus shifted toward naturally derived cosmetic products. Among all cosmetic products, lip balm formulations are most widely used to enhance the beauty of lips and add a glamour touch to the makeup. Lip balms offer a natural way to maintain and promote healthy lips. Current cosmetic lip products are based on the use of enormous chemical ingredients with various side effects. Hence in this work, an attempt has been made to study natural ingredients used to formulate natural lip balm. This article reviews the essential ingredients used for natural lip balm along with their merits and limitations. The natural lip balm can made using naturally occurring bases, cals, extracts, 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

III. MATERIAL & METHODS

SOLANUM LYCOPERSICUM:

Tomato is a wonder fruit fortified with health-promoting phytochemicals that are beneficial in preventing important chronic degenerative disorders. Tomato is a good source of phenolic compounds (phenolic acids and flavonoids), carotenoids (lycopene, a, and b carotene), vitamins (ascorbic acid and vitamin A), and glycoalkaloids (tomatine). Bioactive constituents present in tomatoes have antioxidant, anti-mutagenic, anti-proliferative, anti-inflammatory, and anti-atherogenic activities. Health-promoting bioactivities of tomatoes make them useful ingredients for the development of functional foods. The protective role of tomatoes (lycopene as a potent antioxidant) in humans against various degenerative diseases is known throughout the world. Intake of tomatoes is inversely related to the incidence of cancer, cardiovascular diseases, aging, and many other health problems. The bioavailability of phytoconstituents in tomatoes is generally not affected by routine cooking processes making it even more beneficial for human consumption. The present review provides collective information on phytochemicals in tomatoes along with discussing their bioactivities and possible health benefits

SOLANUM LYCOPERSICUM:

Kingdom: Plantae

Class: Magnoliopsida

Order: • Family:

Genus: Solanum

Species: Solanales Solanaceae Solanum S.lycopersicum

Bionomical Name: Solanum Lycopersicuml.

Chemical constituents

Lycopene: is a main dietary carotenoid in tomato.

Beta-carotene: it has strong antioxidant properties.

Lipid: it is the key proximate composition of a food sample.

Folate: is present in significant concentration in tomatoes.

Uses and properties:

- 1) To treat skin and cardiovascular diseases.
- 2) Helps to lower blood pressure and the risk of heart disease.
- 3) Used in folk medicine and dietary supplements.
- 4) It is perennial in its native habitat but grown as an annual in temperate climate, usually growing about 3 m in height.

Phenolic Compound

Phenolic compounds are the class of plant secondary metabolites that possess one or more hydroxyl groups attached to a benzene ring. Structurally, they vary from simple phenolics to complex polymers (polyphenols) based on the number and position of hydroxyl groups attached and structural elements that link phenolic rings (Singh et al. 2017b). Polyphenols are known to reduce oxidative stress and thus counteract various health issues, including CVD and cancer (Singh et al. 2018). The phenolic compounds reported in tomatoes are phenolic acids (caffeic, chlorogenic, sinapic, p-coumaric, and ferulic acids) and flavonoids (quercetin, rutin, kaempferol, and naringenin). Flavonoid accumulation occurs during maturation in tomatoes with a decrease in chlorophyll content and ripening of peels. Quercetin and Fig. No 5: Solanum lycopersicum chlorogenic acid is the most abundant flavonoid in tomatoes (Sharma et al. 2017). Tomas et al. (2017) reported contents of chlorogenic acid, rutin (quercetin-3-O-rutinoside), naringenin chalcone, and naringenin as 17.9, 24.8, 2.45, and 0.12 mg/100 g DW, respectively in fresh tomato fruit. The chalconaringenin content decreases during the post-harvest stage (15 mg/100 g at harvest decreased to 0.41 mg/100 g after 3 weeks of storage) of tomatoes. Marti' et al. (2016) summarized the literature by giving ranges of different polyphenols in ripened tomatoes and enlisted naringenin chalcone as the major polyphenol with compounds from tomatoes along with these mutagens exhibited protective actions against them (Feng et al. 2010; Palozza et al.

2011; Lin et al. 2014). Srinivasan et al. (2007) treated rat hepatocytes with c-radiations along with lycopene at three different concentrations (1.869.31 and 18.62 IM) and reported lycopene as a radio-protectant as it reduces Health Benefits Carotenoids (lycopene) and vitamins (ascorbic acid and tocopherol) of tomatoes have a role in reducing oxidative stress and minimizing the risk of cancer and CVD (Tables 2, 3). Lycopene content in blood is known to be inversely proportional to the incidence of heart diseases (Sesso et al. 2004). The consumption of tomatoes is inversely correlated with the risk of inflammatory disorders such as atherosclerosis (Hazewindus et al. 2014). radiation-induced DNA damage.



Fig no 2: Tomato

Oxidative modulation of low-density lipoprotein (LDL) plays a major role in protection against atherosclerosis and CVD. Modulation of atherogenic processes in endothelial cells by the action of lipophilic compounds of tomato on LDLs prevents CVD (Viuda-Martos et al. 2014). Studies have shown the protective effects of tomato products against various cancers, including prostate and lung cancer (Hwang and Bowen 2004; Palozza et al. 2010a, b; Tan et al. 2010). Polyphenols and carotenoids in tomatoes are known to obstruct tumor formation by interfering with the initiation, promotion, or progression of cancer (Martí et al. 2016). Quercetin helps in the remodeling of chromatin and thus inhibits epigenetic alterations during cancer progression (Martí et al. 2016). Tomato is rich in carotenoids and high carotenoid intake in the human diet is known to be associated with low risk of chronic diseases. Carotenoids modulate the immune response, stimulate intercellular signaling (gap junction) pathways, possess pro-vitamin A activity, regulate cell cycle and apoptosis, and modulate many physiological processes, thus providing resistance to various diseases (Rao and Rao 2007). a and b carotene and b-cryptoxanthin act as precursors to vitamin A and a decrease in the content of these carotenoids in the blood leads to vitamin A deficiency (Fernández-García et al. 2012). Availability, absorption, breakdown, and storage of carotenoids are influenced by several factors. Mainly type, amount, and association of carotenoids with other compounds influence their bioavailability in the human body. Lycopene in tomato occurs in microcrystalline form making it difficult for the absorption as compared to other carotenoids. Studies have revealed that heating food items leads to disruption of the cell wall thus making the easy release of lycopene (Fernández-García et al. 2012). Also, factors like gender, human health, and age influence carotenoid absorption. Alternation of fat absorption and the presence of some drugs like aspirin in the human body directly influences carotenoid absorption. Carotenoids like b-Carotene and Lutein also interact and compete with each other during absorption. Considering the health benefits of tomatoes, various breeding strategies to increase the level of beneficial phytochemicals in tomatoes have been carried throughout the world (Saavedra et al. 2017).

Improving the content of bioactive compounds would have commercial benefits in the production of drug supplements from tomatoes. This review suggested that tomatoes are carriers of compounds beneficial in managing and preventing many important health problems.

BEES WAX:

Beeswax is a natural wax produced by honey bees of the genus *Apis*. The wax is formed into scales by eight wax-producing glands in the abdominal segments of worker bees, which discard it in or at the hive. The hive workers collect and use it to form cells for honey storage and larval and pupal protection within the beehive. Chemically, beeswax consists mainly of esters of fatty acids and various long-chain alcohols. Beeswax has been used since prehistory as the

first plastic, as a lubricant and waterproofing agent, in the lost wax casting of metals and glass, as a polish for wood and leather, as an



Fig no 3: Bees Wax

ingredient in cosmetics, and as an artistic medium in encaustic painting. Beeswax is edible, having similarly negligible toxicity to plant waxes, and is approved for food use in most countries and the European Union under the E number E901.

Production:

The beeswax is formed by the worker bees, which secrete it from eight wax production mirror glands on the inner sides of the sternites on abdominal segments 4 to 7. The sizes of these wax glands depend on the age of the worker, and after many daily flights, these glands gradually begin to atrophy. The new wax is initially glass-clear and colorless, becoming opaque after chewing and being contaminated with pollen by the hive worker bees, becoming progressively yellower or browner by incorporation of pollen oils and propolis. The wax scales are about three millimeters across and 0.1mm thick, and about 1100 are needed to make a gram of wax. Worker bees use the beeswax to build honeycomb cells. The temperature in the hive must be 33 to 36o c. Beeswax as a product for human use may come from cappings cut off the cells in the process of extraction, from old comb scrapped, or from unwanted burr comb and brace comb removed from a hive.

Its color varies from nearly white to brownish, but most often in shades of yellow, depending on purity, the region, and the type of flowers gathered by the bees. The wax from the brood comb of the honey bee hive tends to be darker than wax from the honeycomb because impurities accumulate more quickly in the brood comb. Due to the impurities, the wax must be rendered before further use. The leftover is called slumgum and is derived from old breeding rubbish bee droppings, propolis, and general rubbish.

RASPBERRY

Also contain vitamin C, which is vital to collagen production, a protein that makes up 75% of your skin. Which may also help to prevent and repair skin damage from the sun. It helps in fighting signs of aging. Raspberry can help to reduce the appearance of fine lines and wrinkles. Raspberry calms dryness and inflammation on the lips. The lip balm glides on your lips like a dream, providing tons of moisture and leaving them smooth, supple, and healthy. Raspberries protect your lips from damage and thus eliminate the chances of dark lips or pigmentation. Raspberries also possess anti-inflammatory properties that soothe irritation on the lips. It hydrates the lips and contains vitamin E, which helps remove pigmentation. This natural and safe lip balm helps damaged and chapped lips by creating a protective layer.



Fig No 4 : Raspberry

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HONEY

Honey is a natural humectant, which means it attracts and retains moisture, keeping your lips hydrated throughout the day. Honey also has anti-inflammatory properties to help soothe chapped lips. Honey's antibacterial properties help to prevent infection if the lips become cracked. Fig No 9: Honey The benefits of using honey lip balm are numerous. Honey has been known to moisturize and disinfect lips-related wounds. Lips balm made with honey can be purchased at stores or can be made at home. Honey helps lips retain moisture. It acts as a moisture barrier, protecting the lips from exterior factors that would strip the skin of its natural moisture. In this way, honey is a natural safeguard against dry and cracked lips. In addition to keeping lips moisturized, honey also can protect against. Honey has natural antibacterial properties to help treat wounds. For this reason, injuries or wounds on the lips might benefit from the application of honey. Honey lip balms commonly have other ingredients added to them. Mint, almond oil, and shea butter are a few of the ingredients that one can find in honey lip balms. Usually, extra ingredients are added to a honey lip balm to enhance the efficacy of the balm. Almonds oil, for example, can help keep moisture within



Fig no 5 : honey

CASTOR OIL

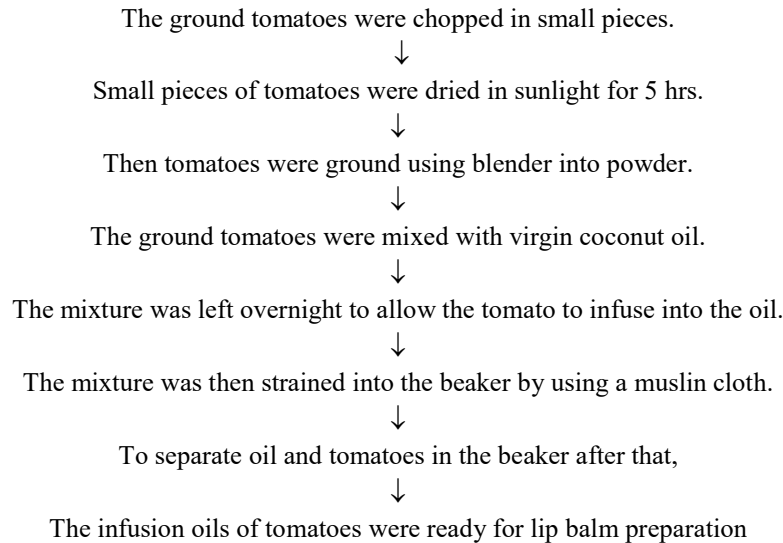
Rich in fatty acids, vitamins, and proteins, castor oil is a magic ingredient to treat your chapped and dry lips. You can prepare a lip balm using castor oil and some other ingredients to prepare a nourishing lip balm. The skin on your lips is more sensitive than the skin on the rest of your body. Also, your lips don't have their melanin, so they have some extra TLC. With the weather changing every few months, the natural barrier from the skin can get stripped off and allow water to escape, causing dry flaky, and chapped lips. This is why it's always better to protect your lips from getting too dry or sore by using some natural ingredients. And the most effective one that we're going to talk about is castor oil for lips. When it comes to the benefits of castor oil for lips, you will be surprised at how much this oil can do. Since the skin on your lips is very different from the skin on the rest of your body, it requires great attention. Cold winds and harsh weather can dry out your lips and cause soreness, chapping, etc. Castor oil for lips works effortlessly as it is a humectant, which means that it promotes hydration by preserving the moisture of the upper layer of your skin.



Fig no 6 : Castor oil

IV. EXPERIMENTAL WORK

Procedure :



V. METHODOLOGY:

Vitamin C Tomato was purchased from the local market. The tomato was cleaned under a running tap to remove all residues and impurities before it was cut into small pieces. The tomato was dried in the sunlight for 5 hours. The dried tomatoes were then ground blender into a powder.

Extraction method for solanum lycopersicum:

1. Infusion method: Infusion method is the process of extracting a chemical compound or flavor from plant material in a solvent such as water, oil, or alcohol, by allowing the material to remain suspended in the solvent over time. An infusion is also the name for the resultant liquid.

Procedure for lip balm for castor oil:

- All ingredients were weighed accurately.
- Bees wax and castor oil were melted using double boiling method.
- The mixture was stirred periodically until the beeswax was completely melted.
- After that the tomato infused, oil was added to the mixture and stirred to mix well.
- Honey and Raspberry juice were added to the mixture.
- The mixture was removed from the hot plate and poured into the lip balm container.
- It was left to be cooled and harden at room temperature.
- The formulated lip balm was labelled and stored at room temperature for further analysis.
- Three lip balm of castor oil were prepared.

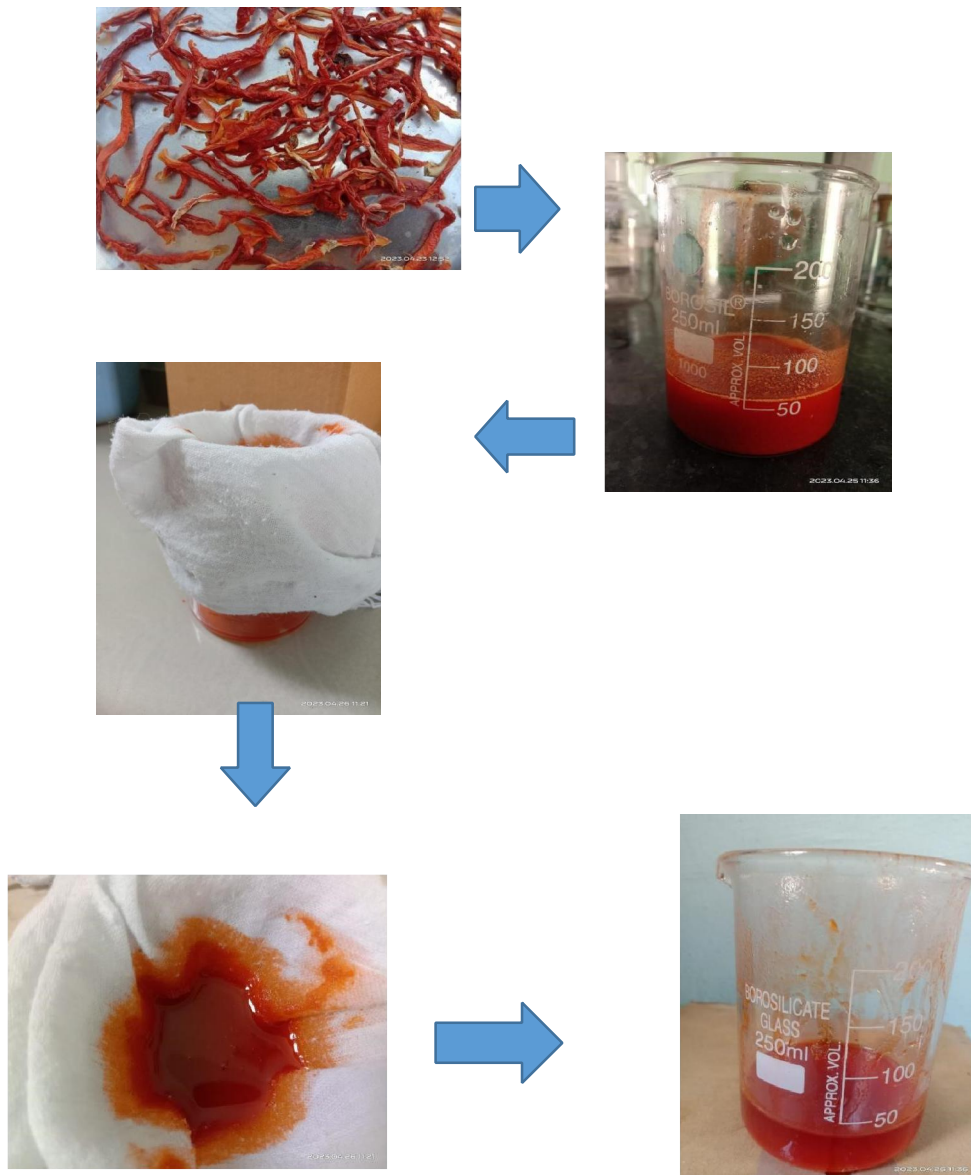


Fig. No 7: Extraction of solanum lycopersicum



Fig no 8: Formulation Using Castor Oil

EVALUATION TEST

Heavy metal testing:

This analysis was conducted as the Bedasa method with slight modifications. The tomato was dried using a BioChef food dehydrator at 55°C for 2 hours. The dry samples were then crushed using a Panasonic MX-900M blender. The tomato powder was then digested by weighted 0.5 g into an acid-washed porcelain crucible and was placed in a Carbolite high-temperature box furnace for 4 hours at 500°C. After it was taken out from the furnace and cooled, 10 ml of 6 M hydrochloric acid (HCl) was added, covered, and then heated in a steam bath for 15 min at 115 °C. After 15 minutes, 1 ml A stability test was conducted to analyze the quality of formulated lip balm. This test was done for a month at two different temperatures, which are 4 °C and 27 °C as discussed by Fernandes et al., with a slight modification. The evaluation, including texture analysis (hardness), color, pH, and spread-ability, was performed weekly for two months. of nitric acid (HNO₃) was added, and it was evaporated to dryness by continuous heating for 1 hr to dehydrate the silica and completely digest organic compounds. Finally, 10 ml of distilled water and 5 ml of 6 M HCl were added, and the mixture was heated in a steam bath to complete dissolution. The mixture was let to cool and filtered through Whatman No.41 filter paper and syringed using 0.45 nm into a 50 ml volumetric flask. Finally, the distilled water was added until it made up to the mark.

Stability test:

A stability test was conducted to analyze the quality of formulated lip balm. This test was done for a month at two different temperatures, which are 4 °C and 27 °C as discussed by Fernandes et al., with a slight modification. The evaluation, including texture analysis (hardness), color, pH, and spread-ability, was performed weekly for two months.

Hardness Analysis:

Hardness analysis for this study was conducted using AMETEK Brookfield CT3 Texture Analyser. This test was performed to analyze the hardness of lip balm. Probe TA 39 was used because it is the most suitable probe to measure the hardness of lip balm.

Colour analysis

It was conducted using a Konica Minolta CR-400 Chroma Meter. This instrument measures lightness with an L* sign, red/green coordinate with a* sign, and blue/yellow coordinate with the b* sign. Based on these three indicators, lip balm formulated from tomato focused more on a yellow color, which is a b* sign.

Determination of PH:

The pH of the lip balm was determined using the pH meter model HI-2210-02. Firstly, the lip balm was melted to measure its pH value. After that, the pH meter was dipped into the melted lip balm container, and the reading was taken. All tests were carried out at room temperature.

Spread ability test:

Spread-ability analysis was conducted by spreading lip balm on a glass slide, and any deformation and breakdown were evaluated as elaborated by Fernandes et al.

VI. RESULT

the scientists used a variety of fruites to create a unique lip balm. like tomato, raspberry . In order to assess the clip balm quality, we looked at its thickness, feel, and potential for causing irritation. We also examine the lip balm thickness, ease of washing, and potential for irritation. We examine the lip balm physical attributes.

VII. SUMMARY AND CONCLUSION

Heavy metal ability and compared with the commercial lip balm. The result found that the properties of formulated lip balm are almost similar to those of commercial lip balm. Solanum lycopersicum extract was prepared by using the infusion method. It contains chemical constituents like flavonoids, Saponin, and vitamin C. Lip balm was formulated on trial and error basis by using solanum lycopersicum extract vitamin E oil, and lip balm was stable throughout the stability period formulation. It was observed that vitamin E oil lip balm was better than the castor oil lip balm. Our optimized formulation is F6 because it passed all evaluation tests. The abundance of natural and homemade cosmetic products is increasing. However, these products do not undergo any tests for safety to the users. The usage of perishable

plants, yet very high in a beneficial active compound like a tomato in the cosmetic product formulation, is very beneficial. Hence, this study focuses on the stability evaluation of tomato lip balm. Before the extraction of tomato starts, heavy metal analysis was conducted on the tomato sample to ensure that the plant source is free from any heavy metal contamination. Among all cosmetic products, lip balm formulations are most widely used to enhance the beauty of lips and add a glamour touch to the makeup. Lip balms offer a natural way to maintain and promote healthy lips. Current cosmetic lip products are based on the use of enormous chemical ingredients with various side effects. Hence in this work, an attempt has been made to study natural ingredients used to formulate natural lip balm. Thus, tomatoes could be applied as one of the plant sources in lip balm formulation.

VIII. FUTURE SCOPE

1. The abundance of natural and homemade claimed cosmetic products is increasing.
2. Lip balms are formulations applied onto the lips to prevent drying and protect against adverse environmental factors
3. To formulate lip balms, it is necessary to balance the concentration of the main ingredients, including butter, oils, waxes, and other excipients.
4. Natural lip balms offer a natural way to maintain and promote healthy lips.
5. Lip balms offer a natural way to maintain and promote healthy lips.

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