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UTILISATION OF DRAGON FRUIT EXTRACT IN TINTED LIP BALMS : A REVIEW OF BENEFITS AND CHALLENGES

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ABSTRACT

The increasing demand for natural, herbal, and organic cosmetics has driven the exploration of innovative formulations that promote sustainability and wellness. This study focuses on the development and evaluation of a medicated lip balm incorporating red dragon fruit (Hylocereus polyrhizus) and honey as key ingredients. These natural components were chosen for their antioxidant, antimicrobial, and moisturizing properties. The lip balm formulation includes a blend of carnauba wax, beeswax, shea butter, lanolin, cetyl alcohol, castor oil, and fragrances, ensuring a balance of hydration, nourishment, and environmental protection for the lips. Key assessments were performed to evaluate sensory attributes, pH, spreadability, and melting point, ensuring safety and efficacy. The findings highlight the potential of dragon fruit and honey as effective ingredients in cosmetic formulations, addressing consumer preferences for plant-based and sustainable products. This innovation promotes healthier lips while reducing environmental impacts.

KEYWORDS: Dragon fruit, honey, lip balm, natural cosmetics, antioxidants, herbal formulation, sustainable beauty.

INTRODUCTION

Globally, the usage of cosmetics has been significantly impacted by the winds of societal change in the twenty-first century. The Greek word "kosmeticos," which means "to decorate," is where the word "cosmetics" originates. Cosmetics are preparations used for this purpose. External materials called cosmetics are applied to the skin, hair, and nails for a variety of

reasons, including coloring, covering, softening, cleaning, nourishing, shaping, styling, removing, preserving, and protecting. Any material that is rubbed, poured, sprayed, sprinkled, injected, or applied in any other way to the human body or bodily parts for the purposes of cleansing, improving appearance, or enhancing attractiveness is considered a cosmetic. Cosmetic science examines the effects of different components and combinations on body parts such the skin, hair, nails, and lips. Although regional definitions of cosmetics differ, they are usually understood to be any material or combination that is applied to the body's external surfaces—like the teeth or mucous membranes—with the intention of improving appearance.[1] Consumers today understand that health is more important than appearance. Because they value wellness, consumers of plant-based products are selecting plant-based substitutes over synthetic ones. Natural foods have become much more popular, particularly those produced without the use of chemicals or pesticides through organic or biological agricultural practices. In the worldwide cosmetics market, herbal cosmetics in particular are becoming more and more popular, and demand for them is rising significantly as well.[2] Since the lips are among the most delicate and appealing features on the face, it's critical to take good care of them to avoid a number of issues. In comparison to the rest of the face, which has 15–16 layers of skin, the lips' skin is significantly thinner and only has 3–4 layers. Moreover, the lips have less melanin cells, which highlights the blood vessels and gives them a pink hue. Because the skin of the lips lacks sweat glands and hair follicles, it lacks the natural oils that shield other body parts. This indicates that maintaining healthy and lovely lips requires careful lip care.[3] This kind of cream or ointment, which is typically sold in sticks or little containers, is used to maintain the softness of the lips. In addition to being multipurpose, the perfect lip balm should have appealing qualities including a nice texture and antioxidant qualities. Antioxidants are substances that can stop or reduce the harm that free radicals—unstable molecules the body produces in reaction to environmental stimuli—do to cells. Although the fruit is not widely used in lipsticks, its antioxidant properties help neutralize free radicals generated on the lips by external factors, potentially reducing the effects of aging and preventing unsightly wrinkles and chapped lip. Both men and women use cosmetics extensively to enhance their beauty and look. New cosmetics are continually being developed, and advancements that are superior to earlier iterations are made daily. Furthermore, people are adopting more sustainable lifestyles and are growing more conscious of the environmental impact of the chemicals used in everyday products. As a result, a lot of customers are searching for natural cosmetics to safeguard their health and avoid allergies and negative effects. Because they lack sebaceous glands, lips need extra hydration and

protection all day long. One cosmetic product that helps with cracked, dry lips and lip pain is lip balm.[4]

Lip coloring has been used for generations to improve appearance, and in order to satisfy contemporary demands, the color, texture, and finish of lips are currently being expanded. In order to accommodate the wide range of consumer preferences, lip products such as lipsticks, lip balms, and lip jellies are now available in virtually infinite variety. Based on a thorough analysis of the literature on lip balm formulations and the significance of natural excipients, this study focuses on the creation of medicated lip balms. Lip balms are assessed for a number of attributes in this study, including as color, odor, spreadability, pH, melting point, skin irritation, and surface irregularities. The moisturizing and nourishing properties of tinted lip balms make them an excellent substitute for lipsticks. Lip balms' natural oils might help lessen dark spots, dullness, and pigmentation brought on by exposure to sunshine or inclement weather. People's interest in natural products is growing these days as they become more conscious of the harm that synthetic chemicals cause to the environment. As consumer demand for natural, herbal, and organic products rises, the cosmetics sector is adjusting to this trend toward sustainability. Because of its health benefits, many consumers have chosen herbal cosmetics, which have seen tremendous growth in the personal care industry. These plant-based drugs have long been known for their therapeutic benefits and frequently possess qualities like cytostatic, antibacterial, and anti-inflammatory activities.[3] According to studies, ripe dragon fruit has large concentrations of proteins, organic acids, and soluble solids. Hylocereus polyrhizus has gained more attention as an antioxidant source due to the presence of several phenolic compounds that have been linked to strong antioxidant qualities and the demonstration by that the fruit's betacyanins and betaxanthins have the ability to scavenge free radicals. The use of natural colors in cosmetics has been studied recently, and red dragon fruit (Hylocereus polyrhizus) has surfaced as a possible dye.[4] The two primary components of the medicinal lip balm used in this study are honey and dragon fruit (Hylocereus Costaricensis). China and Thailand are frequent places to find dragon fruit, also called pitahaya, which was brought to Indian home gardens in the 1990s. Because it contains vitamin E and SPF 15, which shield your lips from damaging UVA and UVB radiation, it also helps to calm your lips. Because pitaya contains a lot of water, it helps keep your lips hydrated, which is crucial for dry lips. Pitaya juice use might also improve your general health. The second essential component, honey, is a natural moisturizer that works well for

dark lips because it is high in antioxidants and magnesium. Honey softens and smoothes your lips in addition to making them more radiant.[3]

Dragon Fruit: An Overview

CULTIVATION

The ideal pH range for the plant is between 5.5 and 7, and it grows best in sandy loam to clay loam soils. The plant can withstand low soil conditions, although it prefers soil that is rich in organic matter. It can withstand short bursts of frost and thrives in temperatures between 20°C and 30°C, but extended exposure to cold temperatures is harmful. The plant also needs 40 to 60 cm of rainfall every year.[5]

Phytoconstituents of dragon fruit

Due to its abundance of plant components with possible therapeutic uses, dragon fruit has high nutritional and commercial value. Polyphenols, pigments, terpenoids, flavonoids, fatty acids, vitamins, carbohydrates, dietary fiber, and vital minerals like calcium, phosphorus, magnesium, salt, potassium, and iron are all abundant in it. lists the several therapeutic outcomes that these chemicals contribute to.

Therapeutic potential of phytoconstituents of dragon fruit

The medicinal properties of dragon fruit's phytoconstituents, which are described here, have drawn a lot of interest.

Figure 1: Dragon fruit (Hylocereus polyrhizus).

Antioxidant Activity

Betalains and other bioactive substances like vitamins, flavonoids, and phenolic compounds—all of which are known to have potential antioxidant qualities—are abundant in Hylocereus species, particularly H. polyrijus. With more flavonoids in the peel than in the pulp, the oil that is derived from H. undatus seeds and peel is a rich source of antioxidant chemicals. The strong antioxidant activity of H. Polyrhizus species is attributed to their high gallic acid phenol content, which is around 15.92 mg per gram. According to a study on pitahaya's antioxidant qualities, people with prediabetes and normocholesterolemia who ate red pitahaya had lower overall antioxidant level. In animal models, a study by Harahap and Amelia showed that fruit extracts could lessen oxidative damage. According to a different study, pitahaya pulp extract may lessen oxidative damage in diabetic rats given STZ. Putriet and associates. Red pitahaya consumption has also been shown to lower malondialdehyde levels in diabetic rats.[6]

Anti-microbial activity

The rise in infectious illnesses and antibiotic resistance in recent decades has raised the need for new antimicrobial medicines. Because natural antibacterial medicines derived from fruits and vegetables have fewer adverse effects and are less prone to create medication resistance, current research is investigating their potential. Pitahaya has demonstrated antibacterial properties against a range of microbes. According to one study, while stored in a refrigerator, red pitahaya waste shown antibacterial action against ten Gram-positive and six Gram-negative microorganisms. The fruit's betacyanin content rose by 57.2% on the sixth day of storage at 4°C before starting to decline when the antibacterial activity was assessed using the minimum inhibitory concentration (MIC) method. The fruit's higher betacyanin level is correlated with its moisture content, which causes hydrolysis to produce betalanic acid. Because of its greater betacyanin content, pitahaya that had been refrigerated demonstrated superior antibacterial action compared to newly harvested fruit. Another study used the broth microdilution method to assess the antibacterial activity of methanol extracts from subfractionated red pitahaya pulp. Stronger antibacterial action was demonstrated by extracts with a greater betacyanin concentration. In a subsequent investigation, the pulp, peel, and entire extracts of red pitahaya were tested against two yeast strains, four molds, and thirteen bacterial strains to determine their antibacterial capabilities. While pulp and peel demonstrated high antibacterial action against all strains, whole fruit extract demonstrated very little activity. This was mostly due to the polyphenolic components in the pulp and peel.

Perhaps because Gram-negative bacteria have an extra layer of defense, Gram-positive bacteria were more vulnerable than Gram-negative bacteria. Using the disk diffusion assay, silver nanoparticles derived from pitahaya peel extract were also evaluated for antibacterial activity against pathogenic strains, including E. coli, S. aureus, and P. aeruginosa. The results demonstrated antibacterial activity against all strains. The plant components in the bark extract are responsible for the stability of the nanoparticles. Furthermore, both the red and white dragon leaf extracts shown antibacterial qualities when tested against meningitis-causing bacteria (Neisseria meningitidis, Listeria monocytogenes, and S. pneumoniae). The activity of the dragon extract was significantly higher. The flavonoids in the leaves are thought to have this antibacterial effect because they have the ability to combine with the bacterial cell wall to form complexes.[7]

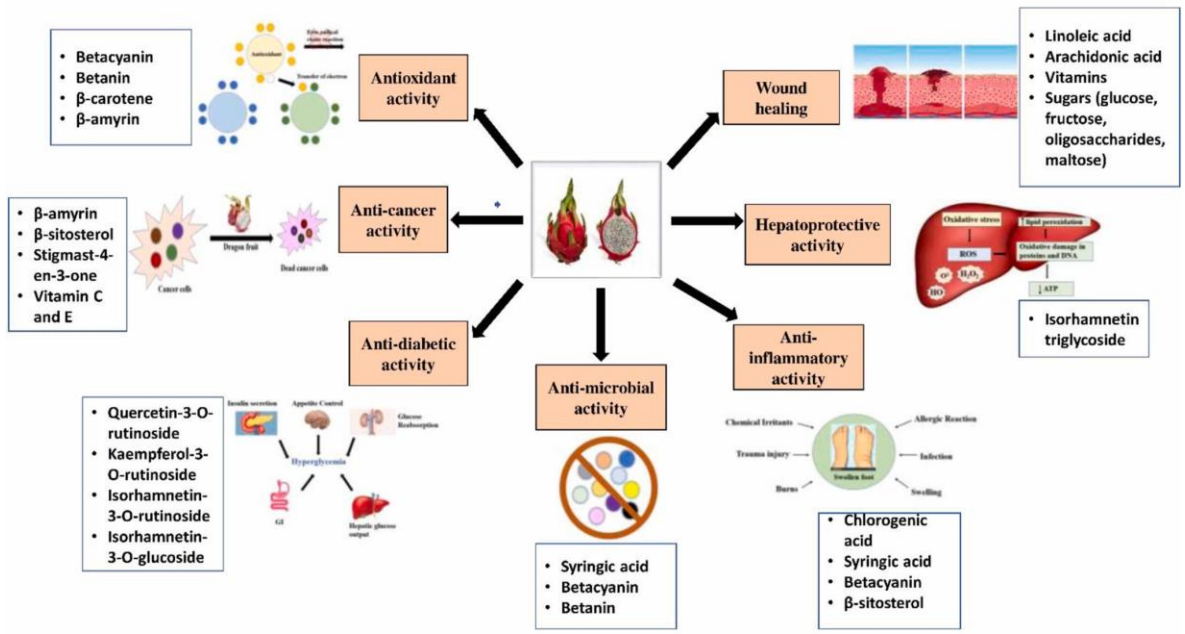

Figure 1: The different health advantages linked to the phytochemicals present in dragon fruit.

Miscellaneous therapeutic potential

Wound healing activity

A sequence of coordinated molecular and cellular processes that restructure cellular structures and repair damaged tissue are involved in the wound healing process. Because of their anti-inflammatory and mitogenic properties, cytokines and proteases are important players in this process. Key biomarkers of wound healing include collagen and epidermal growth factor (EGF), which are crucial for cell proliferation and epithelialization, respectively. This impact

was ascribed to the fruit's flavonoids and phenols' anti-inflammatory qualities. While quercetin is known to improve wound closure by promoting angiogenesis and boosting the proliferation of epithelial cells and fibroblasts, flavonoids have been demonstrated to stimulate collagen production.[7] The actions of different cell types, growth factors, and cytokines are all part of the wound healing process, which consists of several processes intended to repair injured tissue. Extracts from pitaya, stems, and flowers have been found to improve fibroblast migration, which is crucial for wound healing. Flavonoids and phenolic chemicals, which are antioxidants that shield DNA and promote wound healing, are also included in the extract. Pitaya contains gallic acid, which may help with wound healing in both normal and hyperglycemic situations. Delays in wound healing are a major issue with diabetes. Gallic acid, a potent antioxidant that stimulates growth factors involved in wound healing, speeds up the migration of keratinocytes and fibroblasts.[6]

Anti-inflammatory activity

Compounds like squalene and betalains provide dragon fruit its anti-inflammatory qualities. The efficacy of betalains may be diminished by their instability under typical storage circumstances and their sensitivity to variables such oxygen, light, temperature, and pH. These substances' biological activity might be maintained by encasing them in a protective covering. Rodriguez et al. Maltodextrin-encapsulated polyrizois peel extract. Using the duck embryo chorion (CAM) experiment, their findings demonstrated that betalains in maltodextrin-pectin or maltodextrin-gum arabic matrices blocked vascular stimulation 5–6 times more efficiently than unencapsulated betalains. Since reactive oxygen species play a significant role in inflammation, betalains' strong antioxidant qualities are primarily responsible for their anti-inflammatory effects. Additionally, Eldin et al. discovered that betalains, which were present in H. undatus's peel and pulp, have anti-inflammatory properties by scavenging free radicals. Additionally, they discovered that squalene, a significant component of pulp (13.2%), blocked pro-inflammatory enzymes like 5-lipoxygenase, cyclooxygenase-2, and acetylcholinesterase. Through a variety of pathways, their study demonstrated pitahaya's ability to treat inflammation and associated neurological problems.[7]

Antiulcer Activity

The main substance that gives dragon fruit its antiulcer properties is quercetin, a flavonoid that is mostly present in the bark of Hylocereus polyrhizus. Studies have demonstrated that

quercetin can help; 90% of patients report full recovery in 4–7 days, and 35% report full recovery in 2-4 days. Additionally, it can ease minor symptoms and lower relapse rates. Studies have used immunohistochemistry, histopathology, and molecular approaches to show that dragon fruit extract has antiulcer benefits at different doses. The extract's protective benefits were ascribed to its inhibition of the COX-1 and COX-2 pathways, which aid in lowering oxidative stress, and it was demonstrated to be useful in healing ulcers caused by indomethacin. Furthermore, fruit extracts' carbohydrates aid in the treatment of gastrointestinal issues.[6]

Neuroprotective Activity

Another important characteristic of dragon fruit is its neuroprotective function. The fruit's seeds contain a wealth of bioactive substances, including essential fatty acids, which have neuroprotective properties and aid in the prevention of neurological illnesses such as ALS, Parkinson's disease, and Alzheimer's disease. It is well known that the Hylocereus polyrhizus species can help prevent and lessen the harm that lead-induced poisoning causes to the brain. Phytochemicals like flavonoids, phenols, and anthocyanins found in fruit flesh may offer protection against neurodegenerative illnesses. Depending on demographic or geographic conditions, various bioactive chemicals can have different impacts.[6]

HISTORY OF LIP-BALM

People have traditionally looked for solutions to treat chapped lips and cracked skin. This requirement has existed since 40 BC, when the Egyptians employed a beeswax, olive oil, and animal fat concoction to moisturize their lips.

- In her 1800 book The American Frugal Housewife, Lydia Maria Child suggested earwax as a useful remedy for painful lip sores, noting that it frequently worked when other treatments didn't. It may sound strange, but it was very helpful to her.
- Robert Chesebrough created and patented a product in 1865 called "Wonder Jelly," which gained popularity in 1872 after being renamed "Vaseline."
- The first lip balm was made by Charles Brown Fleet in the 1880s. It looked like a candle without a wick and was wrapped in thin tin foil. At first, the product, called "Chapstick," did not become popular, and Fleet did not make any money off of it.
- Early in the 20th century, nations like Sweden and Japan started creating their own lip care products using components like beeswax, camellia oil (tea seed oil), and "yuzu" (a Japanese citrus fruit).

- John Morton paid $5 for Fleet's lip balm recipe in the 1920s. In order to allow the balm to solidify into sticks, his wife proposed melting the components and then pouring them into tiny molds. Chapstick's growth and profitability were attributed to this redesigned packaging.

To heal cold sores, Alfred Woelbing developed Carmex lip balm in his house in the 1930s. He started selling his product out of the trunk of his car before establishing Carma Laboratories.

Charles Arch established Blistex in the 1940s and marketed it as a medicated lip balm that contained a numbing chemical to treat pain in addition to preventing dryness.

- The first flavoured lip balm was released by Bonne Bell in 1973 under the name Lip Smackers. Later, in 1975, the company worked with companies like Dr. Pepper to provide a variety of flavoured lip balms.
- They introduced Labello Med in 1978 to address severe lip issues, and Labello Sun the following year to shield skin from the sun's damaging rays.
- Labello Chamomile, the brand's first product with natural ingredients and scent, was introduced in 1984. They released Labello Rose two years later.
- Roxanne Quimby developed Burtâ Bees Lip Balm in 1991 by refining a recipe she discovered in an old farm magazine. The lip balm swiftly became a bestseller, but the company first marketed candles.
- For people who require immediate lip hydration, the Lip Balance range was introduced in 1992.
- The company's first fruit-flavoured lipsticks, which included Apricot Cream, Lemon Twist, Tangerine Vanilla, Orange, Sweet Melon, and Tropical Cocktail, were introduced in 1999.
- Flavors like Cherry, Strawberry, Pomegranate, and Pink Guava are now part of the collection. For more severe lip disorders like herpes, Abreva was the first over-the-counter lip cream to receive FDA approval in the 2000s.
- The brand made its first foray into the cosmetics industry in 2001 when Labello Pearl & Shine, a lip balm and gloss designed particularly for ladies, was introduced. Three years later, the "Care Gloss & Shine" lip gloss range was introduced, with clear glosses and fashionable colours.

- In 2009, Labello released a limited-edition "Labello Classic" to commemorate its 100th anniversary.
- The first lip balm in a compostable Ecotube was introduced by Canada's Sweet Leaf Bath Company in the 2010s, emphasizing eco-friendly and skin-beneficial ingredients.
- EOS transformed the packaging of lip balms in 2011 by substituting a spherical ball for the conventional tube. EOS patented the distinctive design once it gained popularity.
- Businesses started adding cannabis to their lip balms in 2018 as the drug became more widely permitted and utilized for medical purposes. While some utilized CBD oil for its anti-inflammatory, antibacterial, and anti-aging qualities, others added low-dose THC to relieve pain.[3]

ANATOMY OF LIPS

The mouth hole is surrounded by the lips, which are muscular folds that are pliable and moveable. They house the superior and inferior labial blood arteries, nerves, and the orbicularis oculi muscle. Mucous membranes line the lips on the inside as well as the outside. The layers of soft tissue that comprise this basic anatomical structure are visible when a sagittal section is taken through the lips. They consist of the skin, mucous membrane, orbicularis oculi muscle, superficial fat layer, and deep fat layer, in order of innermost to outermost. Speaking, removing food from the mouth, sucking liquids, gripping food, and regulating the size of the mouth opening are just a few of the many tasks performed by the lips. The vermilion border, a crimson skin covering the lips' margins, is home to sensory nerve endings. The area between the inner mucosa and the hairy outer skin is known as the vermilion border. With three to five layers of cells, the red border skin is thinner than the rest of the face, which typically has sixteen layers. Newborns have a thicker inner surface with sebaceous glands and tiny projections called papillae.

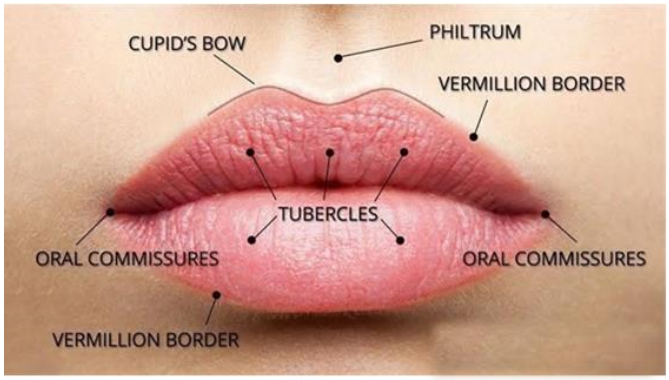

Figure 2: Structure of Lips.

A. Oral Communication

The oral commissure is the sideways meeting point of the upper and lower lips. A line that extends from the oral commissure may develop around this region as a result of normal aging.

B. The red border

The red area of the lip that is covered by a unique layer of stratified squamous epithelium and joins the oral mucosa in the gingival-labial groove is known as the vermilion border.

C. Red border

The distinct line separating the lips from the surrounding skin is called the vermilion border, or vermilion area. The oral mucosa is the sole area of the face that is continuously exposed to the outside world.

The Upper Lip

The "Labium Suprius Oris" is another name for the upper lip, which is situated between the nose and the oral cavity. The superior labial nerve, a branch of the infraorbital nerve, a significant branch of the maxillary nerve of the trigeminal nerve, provides it with sensory innervation.

i. The Bow of Cupid

The upper lip's twofold curvature is known as Cupid's Bow. This characteristic aligns with the philtrum, the groove that connects the mouth and nose.

ii. Philtrum

The philtrum, which runs from the top of the lip toward the nose, is a vertical groove in the middle of the upper lip. It is believed to give the upper lip more skin to spread during oral movements.

iii. Nodules

The lips contain tiny, elevated patches known as cusps. The lower lip has two, and the upper lip has three. The cusp is the fleshy region beneath the lower margin of the philtrum, which produces the Cupid's bow.

The lower lip

The lower lip is situated between the lower lip and chin and the labial groove, which divides the mouth. The "Labium Inferius Oris" is the name of this region. The mental foramen, which is often found close to the mandibular premolars, is where the mental nerve, a branch of the inferior alveolar nerve, leaves the body after starting in the mandibular canal.

D. Blood Supply

The facial artery is the source of the superior and inferior labial arteries. These arteries are situated 1 mm behind the mucocutaneous junction, which is the point where the lips' mucosa and skin connect. An arterial ring is formed by the connections between the sphenoid arteries, which extend deep into the orbicularis oculi muscle.[3]

Lip functions include

1) Eating

Food and liquids are held inside the mouth by the lips closing tightly.

2) Chewing

When food is being chewed, the lips assist in positioning it between the upper and lower teeth.

3) Swallowing

Food is moved into the mouth by the lips during swallowing, which promotes spontaneous digestion before it enters the stomach and small intestine.

4) Tactile organs

Because of their abundance of nerve endings, the lips are extremely sensitive to pressure, temperature (cold or warm), and touch.

5) Articulation

A variety of sounds, including labial and bilabial noises, are produced by the lips. It is also necessary for playing wind instruments like the flute, clarinet, and trumpet as well as for whistling and rounding vowels.

6) Words

As demonstrated by the curvature of the lips, the lips are crucial for conveying emotions through facial expressions including frowning and smiling.

7) Material organs

Tastes including heat, cold, bitterness, and sweetness are detected by sensory sites in the lips.[3]

Dragon Fruit Lip Balm Formulation

LIP-BALM COMPOSITION

1. Carnauba Wax

Known as the "King of Waxes," carnauba wax is typically found as a solid yellow-brown flake in its pure form. It is a perfect addition to lip balms because of its exceptional emulsifying and oil-binding qualities, which also raise its melting point. Because of its emollient and hypoallergenic qualities, it gives a glossy finish and is frequently used as a thickening in cosmetics.

2. Beeswax

This natural wax made by bees is particularly beneficial for chapped, dry lips. It is safe to use in cosmetics like lipsticks and lip balms because it is non-toxic and edible. Beeswax's primary advantage is its capacity to serve as a barrier of defense, keeping lips hydrated and nourished. It is frequently found in medicinal lip balms for this reason.

3. Shea Butter

Rich in fatty acids and vitamins, shea butter is a fantastic cosmetic component that works wonders for lip smoothing. It has great moisturizing properties, is nutrient-rich, has anti-inflammatory properties, and cures chapped lips fast. Shea butter reduces lip swelling without being sticky, has a light texture, and contributes extra nutrients.

4. Lanolin

This waxy material, which has a high fat content, helps to keep the skin hydrated. It functions similarly to human sebum and is secreted by sheep's sebaceous glands. Lanolin is the perfect moisturizer for sensitive lips because it can retain up to 400 times its weight in water.

5. Alcohol Cetyl

Lip balms, lipsticks, and other cosmetics employ cetyl alcohol as an emulsifier and thickening to help keep their consistency and texture smooth. Additionally, it offers skin-friendly qualities that give lips, skin, and hair softness, hydration, and conditioning.

6. Leather Fruit

Betacyanins, an antioxidant that combats free radicals and guards against premature aging and lip cell damage, are found in the fruit, particularly the red types. Natural anthocyanins, which give the peel its red hue, may be a safer substitute for artificial dyes. Fatty acids like omega-3 and omega-9, as well as vitamins, minerals, polyphenols, and carotenoids, are all found in the seeds.

7. Refined Honey

A natural humectant, honey draws and holds onto moisture to keep your lips moistened throughout the day. Additionally, it works as a mild exfoliator to help get rid of dead, dry skin. Antioxidants like flavonoids and phenolic acids, which are abundant in honey, have antibacterial, antifungal, anti-inflammatory, and wound-healing qualities and aid in the prevention of infections. Additionally, it has natural whitening agents and magnesium, which assist to balance out skin tone and lighten imperfections.

8. Castor Oil

A popular component of skin care products, castor oil is high in ricinoleic acid, a fatty acid that acts as a humectant to keep the skin moisturized by halting water loss. Because omega fatty acids help to lighten the lips, it works well for dark lips. Using castor oil on a regular basis might have a big impact on your lip health.

9. Fragrances

In lip balms, perfume is used to cover up the odour of substances like fats and waxes and to provide a pleasing scent. Essential oils like peppermint, grapefruit, sweet orange, and vanilla are common choices for a long-lasting, non-irritating aroma.

Sr.no.	Ingredient	Quantity	Function
1.	Carnauba wax	1.0g	Base, Emulsifier and Glossiness
2.	Bees wax	5.0g	Glossiness and Hardness
3.	Shea butter	5.0g	Emollient and Lip healing property
4.	Lanolin	5.0g	Moisturizer and Emollient
5.	Cetyl alcohol	5.0g	Stabilizer and Co emulsifier
6.	Dragon fruit	10.0g	Anti-oxidant, protection from UVA-UVB rays
7.	Purified Honey	1 to 5g	Preservative, Lighten up the darker lips.
8.	Castor oil	5 to 15g	Emulsifier
9.	Perfume	q. s.	Flavouring

EXTRACTION OF DRAGON FRUIT (FLESH)

The mature fruits of H. polyrhizus (Red Dragon Fruit) were gathered and verified from Market. To avoid any potential contact between the fruit's acidic chemicals and metal or steel cutlery, the fruits were washed and peeled using a ceramic knife after verification. After that, the fruit pulp was manually crushed after being sliced into little bits. A three-day cold maceration process employing 50% ethanol was used to extract the betacyanin pigment. Two muslin cloth filters were used to filter the resultant extract. After using a freeze dryer to concentrate the extract, the concentrated solution was kept for later use at 4°C in a refrigerator.[8]

LIP-BALM PREPARATION METHOD

a) Depending on the kinds of ingredients employed, medicated lip balm is made in slightly different ways.
b) Phase A, Phase B, and Phase C are the three stages in which the ingredients required to make lip balm are divided.
c) Waxes including carnauba wax, beeswax, shea butter, lanolin, and dragon fruit extract (betacyanin) are part of Phase A, and they are also part of Phase B, along with preservatives like honey. Phase C includes oils and other additions, such as castor oil and fragrances.
d) After heating Phase A to 80°C, the author gradually added each Phase B item to Phase A. After that, the mixture of Phases A and B was taken off of the heat source.
e) The mixture was then poured into lip balm containers once Phase C was introduced.
f) The temperature need to be suitable for the waxes' melting points.
g) The greatest melting point of any wax ingredient should be used to determine the water bath temperature for making the lip balm.[3]

LIP-BALM APPLICATION

i. A substance called medicated lip balm is applied to the lips to keep them from drying out and shield them from the elements.
ii. The purpose of medicated lip balm is to accommodate both genders.
iii. The concentration of the primary ingredients, such as oils, waxes, and other excipients, must be balanced while creating lip balms.
iv. Because people frequently consume lip balms, it's critical that regulatory bodies closely inspect the components that go into making them.
v. Therapeutic lip balms support the preservation of the lips' inherent health and beauty.

vi. The purpose of this product is to avoid dry and chapped lips.
vii. Natural lip cosmetics are applied to enhance facial skin tone and attractiveness.
viii. It should provide a smooth and even coating on the lips to shield them from external elements including pollution, dryness, and UV radiation. It should also not produce friction or dryness on the skin when applied.
ix. It revitalizes and invigorates the lips while eliminating cold and allergy symptoms.
x. It is a medicinal lip balm that gently exfoliates the lips of dead skin cells.
xi. Using lip balm on a regular basis helps lessen dark patches, dullness, and hyperpigmentation on the lips.
xii. Applying lip balm at night softens and nourishes the lips.[3]

ASSESSMENT OF LIP BALM

1. Melting Point

A Veego Melting Point Tester (Model VMP-AD(CFT)) was used to determine the lip balm's melting point. The sample of lip balm was put in a glass capillary that was flame-sealed. After that, the capillary was submerged in liquid paraffin within the apparatus that included a magnetic stirrer. The temperature at which the sample melted was noted and the melting point was visually observed.

2. Sensory Characteristics

Colour, taste, odour, and appearance were among the sensory attributes of the product that were assessed.

3. Spreadability Test

To see how uniformly the protective layer formed, the product was put to a glass slide many times at room temperature. Additionally, if the lip balm cracked, shattered, or distorted while being applied was noted.

4. Measurement of PH

To evaluate any possible negative effects, the lip balm's pH was evaluated. Because acidic or alkaline pH levels might irritate the lips, the objective was to maintain the pH as close to neutral as feasible. A pH meter was used to assess the sample's pH after 1 g was dissolved in 100 ml of water.[3]

RESULT

It includes the following components: cetyl alcohol, lanolin, shea butter, beeswax, and carnauba wax. Castor oil is used as a flavoring, honey is used as a preservative, and pitahaya powder extract is utilized as a colorant. The findings of the extract specification test further demonstrated that the viscous extract made from red dragon fruit did not have any negative effects when mixed with natural herbal substances.

CONCLUSION

The development of the dragon fruit and honey-based medicated lip balm demonstrates the effectiveness of natural ingredients in creating sustainable and therapeutic cosmetic products. The unique properties of dragon fruit, including its antioxidant and UV-protective qualities, combined with honey's moisturizing and antibacterial benefits, offer an innovative solution for lip care. The lip balm not only addresses common issues such as dryness, pigmentation, and aging but also caters to the growing consumer demand for eco-friendly and herbal cosmetics. Evaluations of its sensory attributes, pH balance, and spreadability confirm its safety and usability. This study underscores the potential of incorporating plant-based ingredients into cosmetic formulations, paving the way for healthier, more sustainable alternatives in the personal care industry.

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