

Formulation and characterization of lip balm from beetroot

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Abstract: Lip balm or lip salve is a wax-like substance applied topically to the lips to moisturize and relieve chapped or dry lips, angular cheilitis, stomatitis, or cold sores.

Lip balm often contains beeswax or carnauba wax, camphor, cetyl alcohol, lanolin, paraffin, and petrolatum, among other ingredients. Some varieties contain dyes, flavor, fragrance, phenol, salicylic acid, and sunscreen.

Design, formulation and quality improvement of lip balm made from natural ingredients for tropical lip health use was studied. In this study, lip balm have been made by beeswax (2.5 g), almond oil (5 mL), virgin coconut oil (VCO) (5 mL), honey (2.5 mL), and distilled water (1 mL). The lip balm was produced by mixing method until homogeneous.

The effect of temperature was also observed from 25 to 100 °C to obtain a lip balm with a homogeneous texture and safe. The parameters such as formulation, chemical stability, pH, melting point and irritation tests were carried out to obtain the best lip balm products and are suitable for use in the tropical regions.

The lip balm formulation was tested by applying lip balm to a glass slide. The pH of lip balm of 5.6 and melting point of 65°C were obtained. Based on the results of irritation test, the lip balm showed no reaction to erythema, papules, or edema, indicating that it is safe to skin of the lips.

Finally, the natural ingredients in this study can be used for the formulation and composition of lip balms for tropic to cool regions.

The primary purpose of lip balm is to provide an occlusive layer on the lip surface to seal moisture in lips and protect them from external exposure. Dry air, cold temperatures, and wind all have a drying effect on skin by drawing moisture away from the body. Lips are particularly vulnerable because the skin is so thin, and thus they are often the first to present signs of dryness.

Keywords: Beetroot, lipbalm, stability studies.



Fig. no.01

Introduction :

Lip balm is a product which is put on lips so they will not dry when a person is outdoors in the sun and wind. Lip balm is usually made from petrolatum. Some types of lip balm also include sunscreen to protect the lips from sunburn. Lip balm comes in tubes and small pots with screw-on lids. Lip balm is often used during the winter, because the cold winter winds can dry out a person's lips so that they are cracked and hurting (this is called having "chapped" lips).

What is the purpose of lip balm?

The purpose of all lip balms, even those called salves or butters, is to protect the lips. They contain a moisturizing ingredient (such as petroleum jelly, shea butter, or lanolin) that prevents water loss. Wax is added to help lip balm stick to lips.

What is the history of lip balm?

Lip balm was first marketed in the 1880s by Charles Browne Fleet, though its origins may be traced to earwax. More than 40 years prior to the commercial introduction of lip balm by Fleet, Lydia Maria Child recommended earwax as a treatment for cracked lips in her highly-popular book, *The American*

Botanical Identification of Beetroot:

1. Beet, (*Beta vulgaris*), also called beetroot, common beet, or garden beet, one of the four cultivated forms of the plant *Beta vulgaris* of the amaranth family (*Amaranthaceae*), grown for its edible leaves and taproot.
2. Beetroots are frequently roasted or boiled and served as a side dish. They are also commonly canned, either whole or cut up, and often are pickled, spiced, or served in a sweet-and-sour sauce.
3. The leaves of garden beets can be cooked like spinach or eaten fresh if picked young. Beetroots are a good source of riboflavin as well as folate, manganese, and the antioxidant betaine.

Nomenclature:

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Order: Caryophyllales
Family: Amaranthaceae
Genus: *Beta*
Species: *B. vulgaris*



fig.no.02

Role of ingredients:

1. Beetroot:



fig no.03

The beetroot extracts present in the lip balm moisturize and hydrate your lips to restore balance and good health for your lips. Vitamin-E & essential oils present in the lips form a protective base for your lips to avoid damaged lips.

2. coconut oil:



Fig.no.04

The primary benefit of coconut oil is its moisturizing effects. This makes it ideal for chapped lips. Your lips are particularly sensitive to moisture loss because the skin is thin, and they're exposed to the elements more so than other parts of your skin.

3. beeswax:



Fig.no.05

Beeswax is perhaps the most essential ingredient in our lip balms. This is because it contains natural moisturizers that lock in moisture from the air and help keep the skin looking firm and plump.

4. vitamin E:



Fig.no.06

Vitamin E can also help to close up those painful cracks in the skin that are caused by dryness and cold weather. By applying the award-winning AM/PM Tinted Lip Balm with Vitamin E, you can seal up these cracks and keep the skin of your lips soft, supple.

5. Cocoa butter:



Fig.no.07

Cocoa butter is an emollient that is a great source of natural antioxidants. It adds a protective hydrating layer to lips, helping protect them from extreme temperatures and indoor heat that can leave your lips dried out. Vitamin E is known for its restorative skin properties and healing ability.

Chemical constituents:

Beetroot is consist of multiple biologically active phytochemicals including betalains (e.g., betacyanins and betaxanthins), flavonoids, polyphenols, Saponins and inorganic Nitrate (NO₃); it is also a rich source of diverse minerals such as potassium, sodium, phosphorous, calcium, magnesium, copper, iron, zinc .

Sr.no.	Ingredients	Quantity	Source
1.	Beetroot	60ml juice	Plant beetroot
2.	Coconut oil	30gm	Coconut meat or dried coconut meat called copra.
3.	Beeswax	5.5 gm	Bee's hives by honeybees <i>A. mellifera</i> .
4.	Vitamin E	3 capsule	Sunflower, soya, corn and olive oil.
5.	Cocoa butter	5.5 gm	Cocoa beans.

Table no.01

Method of preparation:

- 1.To prepare this lip balm we need pure beetroot.Then grate it using a greater with small holes.After grating squeeze out the juice through a cheese cloth.
- 2.TPake 60 ml of beetroot juice. Add 30gm of Coconut oil to the juice. Give flame to the mixture.Make sure to mix occasionally.
3. When we notice that the beetroot juice starts to caramelize, reduce the heat to low so that it does not burn.
4. At this stage,take the flame off . Immediately pour the mixture into a beaker or a heat resistant cup.
5. Add 5.5 gm of beeswax and cocoa butter. Then melt the wax and butter using the double boil method.
6. When the wax and butter is melted, remove from water bath and let it cool a little.
7. When it cools down , add in it vitamin E capsule . Mix for some few seconds.
8. Then keep in the fridge for 30 min for the mixture to solidify.
9. After 30 min, mix well till it get a smooth consistency. When it mixed well , transfer it into a clean container.
10. This can be used as a lipbalm and also as a substitute for a lipstick. Make sure your hands are clean when using this lipbalm.



Fig.no.08



Fig.no.09

Evaluation of lipbalm:**Texture:**

The formulated lip balm sample was placed on the base of the AMETEK Brookfield CT-3 Texture Analyzer. Cylinder probe (TA39) was attached to the load cell since it is the most suitable probe for cosmetic products.

Colour:

The colour analysis of lip balms was evaluated using the Konica Minolta CR-400 chroma meter. This chroma meter has three indicators which contributing to lightness , redness and yellowness of the tested sample.

PH:

In this study, the pH meter model HI-2211-01 was used to measure the pH value for all formulated lip balm. The pH meter was calibrated using a buffer solution before continuing the pH measurement of the lip balm. The pH value for the lip balm sample was measured and recorded.

Greasiness:

Greasiness test was examined to identify the amount of oil in the formulated lip balm.

In this study, 4 g of lip balm was placed on the filter paper, and the sample was left at room temperature for 24 hours.

Stability testing:

Three best formulations that showed the nearest values of all physicochemical properties with the commercial lip balm were selected and scrutinised for their stability.

The stability test for lip balms was conducted for 4 weeks to evaluate the sustainability of them when placed at two different temperatures (chiller, $4 \pm 1^\circ\text{C}$ and room temperature, $27 \pm 1^\circ\text{C}$). The other physicochemical tests, including pH, colour and texture of the lip balm were conducted for every week of the stability test period.

Comparison of formulated and commercial lip balms

Texture, colour, pH and greasiness tests were measured for all formulated lip balm in this study. The commercial lip balm also was tested and measured for all the criteria to compare the value with the expressed lip balm values. The physicochemical properties of the commercial lip balm were used as a benchmark to find the best formulation of lip balm made up from beetroot.

Here's how to apply lip balm for the best protection:**Step One: Uncap the container.**

If the balm is in a tube, you only need to raise it about a half centimeter. If it's in a container, apply a pea-sized amount to your finger.

Step Two: Apply to the bottom lip.

Rub the balm on your bottom lip, just along the outside.

Step Three: Apply to the top lip.

Rub the balm on your top lip, just along the outside.

Step Four: Rub your lips together.

Rub your top and bottom lip together. This helps spread the balm evenly over your entire mouth.



Fig.no.10

How Often Should You Apply Lip Balm?

According to dermatologists, you should only put on lip balm a few times throughout the day. Most experts recommend that you apply it in the following situations:

1. When you wake up in the morning
2. After eating or drinking
3. When you go to bed at night

Conclusion:

Cosmetics chemists choose from thousands of ingredients when they create new products, but they are always careful to select ones with chemical properties that enhance the look, feel, and use of the product they are making. For instance, no one wants lip balm to be too hard, which is why most homemade lip balm recipes call for some type of oil or butter. Oils are generally thick, viscous liquids at room temperature and are usually emollients, meaning that they soften and smoothen the skin. Butters are another kind of emollient; they are soft, but not liquid, at room temperature. On the other hand, a super soft, runny lip balm would be too messy, so waxes, like beeswax, which are solids at room temperature, are added to thicken the recipe. The “perfect” product means getting just the right ratio of emollients to waxes.



Fig.no.11

Result and discussion:

Some lip balm sticks create complete coverage in one rub, while others need several rubs. Some sticks seem to last forever, while others are used up quickly. These are important characteristics of lip balm, and hard to quantify with home equipment. Why is it so hard to measure them scientifically? They depend on how you apply your lip balm: whether you press firmly or softly on your stick, or whether you rub fast or slowly over your lips. This test will compare the yield when one specific pressure is applied. Do your best to keep rubbing speed constant as well.

The physicochemical properties of each lip balm were tested; hence, the best formulations were identified. The relationship between the factors (ingredients) and responses (physicochemical properties) had been studied. It showed that each of the ingredients affects the physicochemical properties of the lip balm. Besides, the stability assessment for the best formulations was conducted for 4 weeks to identify any changes occur towards the lip balm. Three best formulations gave almost similar physicochemical properties values (hardness, colour, pH and greasiness) as compared with the commercial lip balm. The colour, pH and greasiness of the best lip balms were within the range of the retail lip balm values. In the stability assessment for 4 weeks, all lip balms placed in room temperature were standard in hardness, pH, colour and had good spreadability.

The lip balm formulation was tested by applying lip balm to a glass slide. The pH of lip balm of 5.6 and melting point of 65°C were obtained. Based on the results of irritation test, the lip balm showed no reaction to erythema, papules, or edema, indicating that it is safe to skin of the lips. Finally, the natural ingredients in this study can be used for the formulation and composition of lip balms for tropic to cool regions.

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