

# Herbal Chapstick (Lip Balm) of Purple Cabbage and Pomegranate

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## Abstract

Cosmetics have been in great demand since history. Nowadays, the focus is shifting to natural cosmetics. Cosmetics play an important role in today's lifestyle and all cosmetics. Lip balm is one of the most commonly used cosmetics. Lip balm is a waxy product applied to moisturize the lips. Lip balms are designed to protect lips from other factors such as winter cold and prevent lips from drying and cracking. Lip balm prevents lip irritation and infection. It is widely used and comes in many forms. However, there are also disadvantages. For example, lip balms have side effects and have a short-term moisturizing effect. That's why we created a new lip balm concept that contains herbal ingredients that will reduce stains and preserve moisture for a long time. Most of them have a soft texture. Lip balm is a moisturizer used to prevent lips from drying out and protect them from the environment. Using herbal ingredients on the lips can reduce the negative effect. Therefore, in this study, an attempt was made to examine the natural ingredients used in the production of lip balm. This article reviews the main ingredients of lip balm, their benefits, and limitations.

**Keywords-** Pomegranate, Lip balm, vitamin-e, anthocyanin, chapstick

## 1. Introduction

Skin is the largest organ of the human body and covers the entire body. It serves to protect the body against heat, light, injury and infection. The skin also regulates body temperature, stores water and fat, protects against bad water and prevents bacterial entry. Skin is determined by genetics, but is also influenced by other factors and can change over time. There are five types of healthy skin based on these characteristics: normal, dry, oily, combination (oily and dry skin) and sensitivity. Cosmetics play an important role in today's day to day life. In today's world, where civilization is rapidly developing, the need to create natural products that are safe for the environment has increased the production of natural cosmetics. Moreover, the current trend is that almost all sectors, including cosmetics, are turning to green for a better lifestyle. The preferred options are natural foods, herbs and herbs for health, and organic products are also in high demand. The use of herbal cosmetics in personal care has increased many times. Natural products have been used for folk medicine around the world for thousands of years. Many of them have medicinal properties such as antibacterial, antiviral and cytostatic effects. They are thought to be useful in human medicine. Herbal extracts are grown worldwide and are leaders in the horticultural community. Skin and hair care cosmetics made from plants are popular due to their

reliability. Consumers pay more when choosing cosmetics. Manufacturers are competing to create cosmetics that are safe to use and beneficial to the environment. Global Business Analysts, Inc. (GIA) launched lip products due to increasing demand for organic and natural lip products, awareness about protecting lips from overexposure to the sun, and new product innovation. This market in the world is expected to reach 2 billion US dollars From 2020.

### Origin of Pomegranate

Pomegranate (*Punica granatum*) is a deciduous fruit shrub belonging to the *Punica* subfamily of the family *Punicaceae*, growing to 5 to 10 m (16 to 33 ft) in height. Pomegranate has many benefits for your lips, such as moisturizing, antioxidant protection, strengthening and health. Pomegranate juice and seeds contain three times the vitamins, potassium and antioxidants of green tea. Pomegranate contains many natural polyphenolic compounds such as anthocyanins, flavonoids, punicalagin and ellagitannins.

The nutritional value of raw pomegranate is 78% water, 19% carbohydrates, 2% protein and 1% fat (table). A 100-gram (3.5-ounce) serving of pomegranate peel provides 12 percent of the daily value (DV) for vitamin C, 16 percent of the DV for vitamin K, and 10 percent of the DV for folate (table). Pomegranate seeds are rich in dietary fiber (20% DV), all of which are found in edible seeds.

### Origin of Purple Cabbage

Purple cabbage (*Brassica oleraceae*) is a kind of cabbage belongs to family *Brassicaceae*.

Purple cabbage, also known as red cabbage or red pickle, is thought to originate from the Mediterranean Region, especially the Mediterranean. Ancient Rome or Greece. Purple cabbage, as its name suggests, has a bright purple or red colour and a slightly softer texture than green cabbage. Purple cabbage has a mild, earthy flavour that is slightly more bitter than green cabbage. Plants change colour depending on the pH of the soil due to pigments called anthocyanins. Anthocyanins are antioxidants found in red, blue, and purple fruits and vegetables. Eating a diet rich in these compounds can help prevent diseases such as inflammation.

Purple cabbage is low in calories but a good source of fiber like vitamins A, C, K and B6. It also contains small amounts of other vitamins and minerals.

### Chemical Structure of Anthocyanin

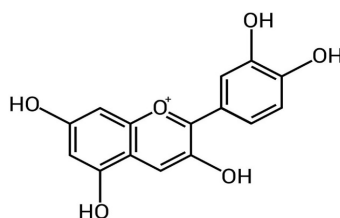


Figure 1: Structure of Anthocyanin

Anthocyanins are belonging to the phenolic group and they are water soluble pigment. Fruits and vegetables contain red, purple and blue anthocyanins. Berries, currants, grapes and some tropical fruits are rich in anthocyanins. Among anthocyanin pigments, anthocyanin-3-glucoside is the major anthocyanin found in most plants. Anthocyanins and anthocyanins have antioxidant and antibacterial properties, improve vision and the nervous system, and prevent many non-infectious diseases.

Anthocyanins are considered natural sunscreens and have antioxidant and anti-inflammatory properties. Many studies have demonstrated the ability of anthocyanins to protect skin from UV damage.

## 2. Lip Balm

Lip balm is a cosmetic product similar to lipstick that is used to prevent lips from drying out and protect them from environmental problems. This study includes the production and safety analysis of lip balms with natural or herbal ingredients: melting point, olfactory evaluation (colour, odour and appearance) and performance evaluation (test transfer). Occlusive Lip Balm Protects the saliva on the back of the skin. It can also reduce the pain of chapped lips. The ingredients used in the preparation of lip balm preserve the moisture of the lips and support the healing of chapped lips. Unlike lipstick, lip balm is gender neutral. Most of them have a soft texture. When making lipstick, the amount of basic ingredients such as cream, oil and wax should be balanced so that the melting point of the final product is 65-75 °C. Depending on the wax and oil the formula will have many qualities, proportions and colours. A high percentage of wax and pigment is used to create long-lasting products, while different materials and colours make the lipstick more smooth or lip balm-like.

## 3. Characteristic of Lip Balm

- (1) Resistance to temperature variation
- (2) Pleasant flavour
- (3) Smoothness during application
- (4) Innocuousness
- (5) Adherence and easy intentional removal.

## 4. Lips Disorder

- **Swelling:** Allergies can cause your lips to swell. These reactions may be caused by sensitivity to certain foods or drinks, medications, lipstick, or airborne irritants. When the cause is found and eliminated, the lips usually return to normal. However, in most cases the cause of the swelling is still unknown. A condition called hereditary angioedema can cause recurring swelling. Non-genetic conditions such as erythema multiforme, heat, cold, dry weather, or injury can also cause swelling of the lips.
- **Sun Damage:** Sun damage can cause hardening and drying of the lips, especially the lips. You can reduce such damage by covering your lips with lip balm or protecting your face from sunlight with a wide-brimmed hat. Purple cabbage contains sulforaphane, which can help with swollen and inflamed lips.
- **Discoloration:** Freckles and irregularly shaped brown (blackheads) occur around the lips and can last for many years. These characters have nothing to worry about. Many small scattered brown-black spots may be the result of a genetic condition called Peutz-Jeghers syndrome, which causes polyps to form in the stomach and intestines. Kawasaki disease is an unexplained condition that usually occurs in infants and children ages 8 and under and can cause dry, cracked lips and a rash in the mouth.
- **Sores:** Puffy areas or hard skin on your lips may be a type of cancer. Other sores may occur along with symptoms of other diseases, such as oral herpes simplex virus infection or syphilis. By applying a good lip balm and without damaging your lips, you should be able to easily get rid of them without needing medical treatment.

- **Inflammation:** When the lips become inflamed (cheilitis), the corners of the mouth will be painful, swollen, red, cracked and scaly. Deficiency of vitamin B2 in the diet can cause cheilitis. Red cabbage, which is known to be good for many diseases, will help in recovery.
- **Allergic Contact Chelitise:** Common causes of contact cheilitis include the use of high levels of antibiotics, essential oils, and hygiene products such as toothpaste and mouthwash that contain antibiotics.

## 5. Advantages of Lips Balm

- **Protects Lips against Sun Rays:** Constant exposure to the sun's strong UV rays strips our lips of moisture. Containing natural ingredients derived from orange and UV protection, the lip balm protects your lips from the sun, moisturizes them, and makes them soft and plump.
- **Heal Chapped Lips:** Enriched with essential nutrients from macadamia, castor and almond oil, the lip balm soothes the skin and heals chapped lips.
- **Excellent Exfoliates:** Lip balm contains some ingredients that gently exfoliate dead skin and can repair and renew lips.
- **Add a Dash of Colour:** Most lip balms contain dyes to add a pop of colour to your lips. Tinted lip balms are a great alternative because they hydrate, condition, and add colour to your lips.
- **Heal pigmentation:** Benefits of lip balm include improving the red colour of the lips with regular use. Natural oils on the lips can reduce pigmentation, dullness, and dark spot caused by exposure to sunlight or extreme cold.

## 6. Disadvantages of natural Lip Balm

- It is more difficult to obtain colour and taste from natural products and there are also problems with product stability.
- Using lip balm made from bad ingredients may damage your lips. This type of lip balm dries out your lips instead of moisturizing them.
- Addiction to lip balm is another disadvantage mostly seen in the user.
- Other disadvantage of natural oil are they are greasier, and comedogenic etc.

## Other Ingredient used in the Formulation

**Table 1: List of Ingredients**

Base	Oils	Colouring Agent	Perfuming Agents	Anti-oxidants
Olive Oil/ Petroleum Jelly	Castor Oil/Sesame Oil	Pomegranate/ Purple Cabbage	Rose Oil/ Lavender Oil	Vitamin E

## Petroleum Jelly

Today, petroleum jelly is frequently used as an ingredient in cosmetics and lotions or as a beauty aid to provide a variety of skin care and protection by reducing friction or reducing moisture. Petroleum jelly (also known as vaseline) is a mixture of mineral oil and beeswax that creates a product that looks like half jelly. The product has not changed much since its discovery by Robert Augustus Chesebrough in 1859. Chesenberg noted that oil workers would use the adhesive to treat wounds and burns. He then packaged the jelly as vaseline. Although it was long thought to be merely an occlusive agent, recent research shows that it has the ability to penetrate the stratum corneum to aid the absorption of other makeup products. Vaseline is often used as a personal lubricant because it does not dry out and has a

special "feel" that is different from K-Y and methylcellulose products. It is also used to treat dry skin and dandruff.

Vaseline is widely used by otolaryngologists (ear, nose and throat specialists) to treat nasal congestion and nosebleeds and to prevent nasal crusting. A large study found that applying Vaseline to your nose for a short time had no serious side effects.

Here are some benefits of Vaseline:

- (1) Treat minor skin abrasions and burns.
- (2) Used as moisturizer.
- (3) Used in pet paw.
- (4) Reduce rash due to diaper.

## **Oil**

Oils and fats have different physical properties; In general, the latter are products of room temperature. Fats and oils are chemical compounds of glycerol and fatty acids, also known as triglycerides. Fatty acids can be saturated or unsaturated, which determines the stability and properties of the oil.

Natural butters are excellent emollients and thickeners and can have many additional properties depending on their type (for example, shea and avocado are antioxidant and soothing due to the property of phenolic compounds). The oil mixture should be mixed with wax to create a suitable film on the skin. The best mixture is one that allows the material to spread easily and forms a film with good hiding power.

## **Castor Oil**

Castor oil is an oil obtained from the seeds of castor (*R. commis*), which is widely grown in India, East Africa, tropical and warm temperate regions around the world, and contains insecticides against various pests. Castor oil has been used for thousands of years. The heat treatment deactivates the toxic enzyme ricin, making it safe to use. Castor oil is used in many lipsticks due to its properties, but some oils or solvents are also used.

Refined castor oil has good colour, is odourless and tasteless. Castor oil is a very good plasticizer. Antioxidants are added to castor oil to prevent rancidity, but it is not as prone to rancidity as other vegetable oils such as olive or almond oil.

Benefits of castor oil:

- (1) It is used for constipation.
- (2) It is also used in induced labor.
- (3) Used as anti-inflammatory.
- (4) Helps in wound healing.
- (5) It is used as moisturizer for skin.

## **Sesame Oil**

Sesame oil is obtained from the seeds of the sesame plant (*Sesamum indicium*). It belongs to the family Pedaliaceae. Sesame oil contains vitamin E, which may help protect skin cells against damage from the environment, such as UV rays, pollution and toxins. Sesame oil is also used as salad or cooking oil,

shortening and margarine, and in the production of soaps, medicines and lubricants. Sesame oil is used as an ingredient in cosmetics. The remaining press cake after oil extraction has good nutritional value.

Here are some benefits of sesame oil:

- (1) **Antioxidants:** It prevents the damage of free radicals or unstable molecules on the cellular structure of the skin.
- (2) **Antibacterial:** It kills bad bacteria or prevents them from growing.
- (3) **Anti-inflammatory:** It can reduce pain and swelling.

### Colouring Agent

Colorants are often used to provide special cosmetic products. Colour has been used in cosmetics since ancient times. Basically, the desire to buy cosmetics is controlled by our senses of sight, touch and smell. Therefore, colour is an important ingredient in cosmetic formulations.

Lip colour can be done in two ways:

- (1) Painting the skin with a dye that penetrates the outer layer of the lips.
- (2) By covering your lips with a layer of colour, you can hide all the imperfections on the skin and give it a beautiful appearance.

### Purple Cabbage

The plant belongs to the Brassicaceae family. It is a very large variety of cabbage.

Purple cabbage (*Brassica oleracea*) is the best source of food colour. The leaves are dark red/purple. However, plants change colour depending on the pH of the soil due to pigments called anthocyanins. In acidic soil, the leaves become redder, in neutral soil the leaves become more purple, and in alkaline soil the leaves become yellow-green.

### Pomegranate

Pomegranate (*Punica granatum*) belongs to the family of Lythraceae.

Anthocyanins are water-soluble pigments that are responsible for the attractive pink-red colour of pomegranate juice. Punicalagin contains important components such as punicalagin, gallic acid and ellagic acid, it also contains alkaloids such as iso-piperine. Pomegranate dye and many other natural dyes are reported to be effective disinfectants due to their high tannin content.

### Fragrance Agent

Fragrance oil is a great way to scent your lips while providing many benefits to your lips. Aromatic oils not only provide a pleasant scent but also have many benefits, such as soothing and moisturizing properties. There are many different types of essential oils, so there is something to suit everyone's taste.

Here are the four benefits of using fragrance oils for lip balms:

- **Aromatherapy:** Essential oils can help you relax and improve your mood. Aromatherapy is known to have a calming effect on the body and helps reduce stress and anxiety.
- **Moisturizing:** Essential oils are often mixed with natural oils such as jojoba, almond or coconut oil to help moisturize the lips.

- **Moisturizing:** Essential oils can help seal moisture in your lips, keeping them hydrated and preventing lips from drying out or cracking.
- **Long-lasting:** Fragrance oils stay on the lips longer than lip balms, making them a good choice for those who want a long-lasting scent.

### Lavender Oil

Lavender oil obtained from *Lavandula angustifolia* flowers. Family: Lamiaceae

Lavender oil is the scent of choice as a lip softener due to its soothing and calming properties. Its scent has sweet, floral and herbal notes that relax the mind and body. Lavender extract also has antibacterial and antifungal properties, making it a good choice for people with colds.

### Rose Oil

Rose oil is obtained from the flowers of various *Rosa* species, especially *Rosa centifolia* and *Rosa Damascena*. Family: Rosaceae.

Rose essential oil is very popular among people who love floral scents. It has a sweet, romantic and feminine scent that adds a rich, luxurious touch to your lip balm. Rose oil is also known for its moisturizing properties and helps soften and moisturize dry lips.

## Methodology

### Hot Pour Method

**Table 2: Ingredients used in Chapstick**

S. No.	Ingredients	Quantity	Uses
1	Petroleum jelly	12%	Glossiness and hardness
2	Castor oil/ Sesame oil	5%	Moisturizing agent
3	Purple cabbage/ Pomegranate	11%	Colouring agent
4	Vitamin E	1.5%	Anti-oxidant, and maintain the stability
5	Lavender oil/ Rose oil	2%	Fragrance agent

All of the above information is accurately measured on a digital scale with an accuracy of close to 0.1 gram. The preparation of herbal lip balm stick is heating the raw material at a certain temperature. The petroleum jelly was put in a 50 ml beaker after melting on indirect fire at a maximum temperature of 90°C, and all the other ingredients were mixed very gently the like vitamin E, pomegranate and purple cabbage, extracted rose oil/lavender oil and castor oil etc, are added to the mixture and stir constantly until you get a homogeneous mixture and pour it into the silicon balm moulds.

Place the mould in an ice cube in a cool place, dry it out of direct sunlight for about an hour until it solidify and store it in a room temperature for 48 hours before use for safety and analytical testing.





Figure 2: Purple Cabbage Lip Balm



Figure 3: Pomegranate Lip Balm

### Evaluation of Lip Balm

- (1) **Organoleptic Properties:** Basic characteristics of lip balm such as colour, smell, taste and appearance were examined.
- (2) **Test for Spreadability:** Use samples on a glass slide (at room temperature) to see the consistency of the protective layer and whether the stick is fermented, deformed or broken during applying process.
- (3) **pH:** In this study, a pH meter model HI-2211-01 was used to measure the pH of all lip balms. Before measuring the pH of lip balm, the pH meter was tested with a buffer solution. The lip balm sample was measured and recorded. It was determined that the prepared lip balm was placed at room temperature ( $25.0 \pm 3.0$  °C) and in the refrigerator ( $4 \pm 2.0$  °C). The average melting point is  $69$  °C and the average pH is 7.2, which corresponds to a near-neutral pH.

### Conclusion

The Herbal Chapstick (lip balm) was prepared using hot pour method and lip balm was successfully made and evaluated using different methods and it came out as – smell of the lip was as expected according the perfuming agents used. Spreading of the lip balm was as smooth as silk.

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