



Formulation and Evaluation of Watermelon Lip Balm

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ABSTRACT:

Watermelon lip balm is a specially formulated skincare product designed to provide deep hydration, nourishment, and protection for the lips. Infused with watermelon extract, this lip balm offers a refreshing and fruity aroma while delivering essential vitamins and antioxidants that promote lip health. The presence of natural emollients such as beeswax, Shea butter, and coconut oil helps to create a protective barrier that locks in moisture, preventing dryness and chapping. Additionally, watermelon extract is rich in vitamins A, C, and E, which contribute to the repair and rejuvenation of damaged lips by combating free radicals and reducing inflammation.

The lightweight and non-greasy texture of the balm ensures comfortable wear throughout the day, making it suitable for all seasons. It not only soothes and heals dry lips but also enhances their natural softness and suppleness. Some formulations may include SPF protection, adding an extra layer of defense against harmful UV rays.

Watermelon lip balm is an ideal choice for individuals seeking a natural and effective lip care solution with a delightful sensory experience. Its combination of hydration, nourishment, and protection makes it an essential addition to any daily skincare routine, ensuring healthy and well-moisturized lips in all weather conditions.

Keywords: Watermelon lip balm, lip care, hydration, nourishment, moisture-lock, natural ingredients, beeswax, Shea butter, coconut oil, watermelon extract, antioxidants, vitamins A C E, chapped lips, soft lips, lip protection, soothing, rejuvenation, fruity aroma, non-greasy, SPF protection, skincare routine.

Introduction:

Lip care is an essential part of skincare, as lips are prone to dryness, cracking, and environmental damage due to their delicate nature. Watermelon lip balm is a hydrating and nourishing product designed to keep lips soft, smooth, and protected. Infused with the refreshing essence of watermelon, this lip balm not only provides a delightful fruity aroma but also delivers essential nutrients that promote lip health.

Formulated with natural ingredients such as beeswax, Shea butter, coconut oil, and watermelon extract, it helps lock in moisture, preventing dryness and chapping. Watermelon extract is rich in vitamins A, C, and E, which have antioxidant properties that protect lips from free radical damage while soothing and rejuvenating them. Some formulations may also include SPF protection, offering defense against harmful UV rays.

With its lightweight, non-greasy texture, watermelon lip balm is ideal for daily use, ensuring that lips remain hydrated and healthy in all seasons. Whether used as a preventive measure or to restore moisture to dry lips, this lip balm is a perfect addition to any skincare routine, providing both nourishment and a refreshing sensory experience.

Objectives:

1. **Hydration & Moisturization** – To provide deep hydration and lock in moisture, preventing dryness and chapped lips.
2. **Lip Protection** – To create a protective barrier against environmental stressors such as wind, cold, and sun exposure.
3. **Nourishment** – To supply essential vitamins and antioxidants (such as vitamins A, C, and E) to promote lip health and rejuvenation.
4. **Healing & Soothing** – To help repair cracked, damaged, or irritated lips by using natural emollients like shea butter and beeswax.
5. **Enhanced Lip Softness & Smoothness** – To improve the texture of lips, making them feel soft, supple, and smooth.
6. **Natural & Safe Ingredients** – To offer a chemical-free, skin-friendly formulation using natural extracts and oils.
7. **Refreshing Sensory Experience** – To provide a pleasant watermelon fragrance and taste for an enjoyable lip care routine.
8. **Lightweight & Non-Greasy Formula** – To ensure a comfortable application that does not feel heavy or sticky.
9. **SPF Protection (if included)** – To shield lips from harmful UV rays, preventing sun damage and premature aging.

10. **Daily Lip Care Solution** – To serve as an easy-to-use, everyday lip balm suitable for all ages and weather conditions.

Material and Method:

Following are the ingredients used in Formulation:

1. Watermelon powder:



Watermelon powder is a fine, dehydrated form of watermelon fruit, created by drying and grinding the pulp, juice, or rind of the fruit. It retains the natural nutrients, flavor, and color of fresh watermelon while offering a longer shelf life and versatile applications in various industries, including food, cosmetics, and pharmaceuticals.

➤ Nutritional Composition

Watermelon powder is rich in essential vitamins, minerals, and antioxidants, including:

- **Vitamin C** – Boosts immunity and promotes skin health.
- **Vitamin A (Beta-carotene)** – Supports eye health and skin rejuvenation.
- **Lycopene** – A powerful antioxidant that protects against free radical damage.
- **Amino Acids (Citrulline & Arginine)** – Improve blood circulation and heart health.
- **Electrolytes (Potassium & Magnesium)** – Help maintain hydration and electrolyte balance.

➤ Benefits of Watermelon Powder

1. **Skin & Beauty Care** – Used in skincare products for hydration, brightening, and anti-aging benefits.
2. **Flavoring Agent** – Enhances food, beverages, smoothies, and desserts with a natural watermelon taste.
3. **Nutritional Supplement** – Provides essential vitamins and antioxidants for overall health.
4. **Hydration Support** – Helps replenish electrolytes and keep the body hydrated.
5. **Weight Management** – Low in calories and high in fiber, supporting digestion and satiety.

➤ Applications of Watermelon Powder

- **Cosmetics & Skincare:** Used in face masks, lip balms, lotions, and scrubs for hydration and nourishment.
- **Food & Beverages:** Added to smoothies, desserts, yogurt, and juices as a natural flavoring.
- **Nutritional Supplements:** Used in powders and capsules for its antioxidant properties.
- **Pharmaceuticals:** Incorporated into herbal formulations for its medicinal benefits.

2. Beetroot Powder:



1. Beetroot powder is a natural, chemical-free way to enhance lip health and appearance. It is widely used for making DIY lip balms, tints, and scrubs.
2. Beetroot powder is made by drying and grinding beets into a fine powder. It has a deep red color and a slightly sweet, earthy taste. People use it as a natural food color, a health supplement, or an ingredient in smoothies, soups, and baked goods.
3. It contains important nutrients like fiber, vitamins (especially vitamin C and folate), minerals (such as potassium and iron), and antioxidants. Beetroot powder is known for helping with blood circulation, energy levels, and heart health due to its natural nitrates.
4. It's easy to use—just mix it into water, juice, or food. Some people may notice red-colored urine or stool after consuming it, which is harmless

3. Shea butter



Shea butter is a fat extracted from the nuts of the **Shea tree (Vitellaria paradoxa)**, native to Africa. It is rich in vitamins and fatty acids, making it a powerful natural moisturizer and healer for skin and hair.

Benefits of shea butter:

1. **Deep Moisturization** – Rich in fatty acids and vitamins, shea butter provides intense hydration for the skin and lips.
2. **Heals Dry and Chapped Lips** – Acts as a natural emollient, making it ideal for soothing and repairing cracked lips.
3. **Anti-Inflammatory Properties** – Helps reduce redness, swelling, and irritation, making it beneficial for sensitive skin.
4. **Rich in Antioxidants** – Contains vitamins A and E, which help protect the skin from free radical damage and premature aging.
5. **Boosts Collagen Production** – Promotes elasticity and firmness, reducing the appearance of fine lines.
6. **Natural Sun Protection** – Provides mild UV protection, helping to shield the skin from sun damage.
7. **Speeds Up Wound Healing** – Aids in the repair of minor cuts, burns, and insect bites.
8. **Non-Comedogenic** – Does not clog pores, making it suitable for all skin types, including oily and acne-prone skin.
9. **Softens and Smoothens Skin** – Regular use improves skin texture and keeps it supple.
10. **Enhances Lip Balm Formulations** – Blends well with other natural ingredients like beeswax and oils to create a nourishing lip balm

4. Coconut Oil:



Fig. coconut oil

Role in Formulation:

Coconut oil serves as a key ingredient in beetroot lip balm, acting as a natural moisturizer, carrier oil, and protective barrier for the lips. It blends well with other ingredients like Shea butter, beeswax, and beetroot extract to create a smooth and nourishing formula.

Benefits:

1. **Deep Hydration:** Penetrates deeply to keep lips soft and moisturized.
2. **Healing Properties:** Helps repair dry, cracked lips and soothes irritation.
3. **Antibacterial & Antifungal:** Protects lips from infections and environmental pollutants.
4. **Natural Gloss & Shine:** Enhances the lip balm's texture, giving lips a subtle shine.
5. **Rich in Nutrients:** Contains fatty acids (lauric acid), vitamins E and K, and antioxidants that nourish and protect the lips.

5. Almond oil :**1. Role in Formulation:**

Almond oil is a lightweight, nourishing ingredient in beetroot lip balm that enhances hydration, smoothness, and absorption. It works as a carrier oil, helping to dissolve beetroot extract evenly while providing deep Moisturization.

2. Benefits:

- **Deep Moisturization:** Rich in fatty acids, it keeps lips soft and prevents dryness.
- **Rich in Vitamin E:** Protects lips from environmental damage and premature aging.
- **Healing Properties:** Soothes chapped, irritated, and cracked lips.
- **Enhances Lip Tint:** Helps disperse beetroot pigments evenly for a natural, long-lasting color.
- **Non-Greasy Absorption:** Lightweight texture makes it easy to apply without feeling heavy.

3. Contribution to Beetroot Lip Balm:

- Enhances smooth application and improves lip balm consistency.
- Adds a natural shine and keeps lips supple.
- Works with beeswax and shea butter to lock in moisture for long-lasting hydration.

6. BEES WAX:

Beeswax is a natural wax produced by honeybees, commonly used in cosmetics and skincare products due to its protective, hydrating, and binding properties. It is a key ingredient in lip balms, creams, and lotions.

Acts as a Natural Emulsifier

1. Beeswax helps bind all the ingredients together, ensuring a smooth and stable lip balm formulation.
2. Prevents the separation of oils and beetroot extract, maintaining consistency.

Provides a Protective Barrier

1. Creates a protective layer on the lips to lock in moisture and prevent dryness.
2. Shields lips from environmental damage, such as wind, cold, and pollutants.

Enhances Texture and Application

1. Gives the lip balm a firm yet smooth texture, making it easy to apply.
2. Prevents the balm from feeling too greasy or runny.

Long-Lasting Hydration

1. Slows down moisture loss from the lips, keeping them hydrated for longer periods.

Natural and Skin-Friendly

1. Beeswax is non-toxic and gentle on sensitive skin, making it ideal for natural lip balm formulations.

Boosts the Stability of Beetroot Pigment

1. Helps hold the beetroot extract in place, ensuring even color distribution and longer-lasting tint.

7. Vitamin E Oil:

Vitamin E oil is derived from vitamin E, a fat-soluble antioxidant that helps protect the skin and body from damage caused by free radicals. It is commonly found in skincare and hair care products due to its moisturizing and healing properties.

Vitamin E plays a crucial role in enhancing the effectiveness of **Watermelon lip balm**, making it more nourishing and beneficial for the lips. Here's why:

Deep Moisturization & Hydration

Vitamin E acts as a natural **emollient**, helping to **lock in moisture** and keep lips soft. Prevents **dryness and chapping**, especially in cold or dry weather.

Acts as a Natural Preservative

Extends the shelf life of the beetroot lip balm by preventing oxidation of oils and butter in the formula.

Antioxidant Protection

Protects lips from **environmental damage** caused by free radicals (pollution, UV rays).

Formulation Table:

Ingredient	Function	Quantity (per 50 g)
Watermelon Powder	Natural Pigment	15g
Beetroot Powder	Coloring agent	1g
Coconut Oil	Hydration, nourishment	10 g
Almond Oil	Emollient, softens lips	5 g
Shea Butter	Moisturize, softens lips	10 g
Vitamin E Oil	Antioxidant, preservative	1 g
Bees Wax	Solidifying agent	8 g

Material and Method:**Ingredients:**

- **2 tbsp beeswax** (creates a protective layer and locks in moisture)
- **2 tbsp shea butter or cocoa butter** (nourishes and softens lips)
- **2 tbsp coconut oil or almond oil** (provides hydration and smooth texture)
- **1 tsp watermelon seed oil or watermelon powder** (adds antioxidants and hydration)
- **1 gram beetroot powder** (acts as a natural flavoring and coloring agent)
- **1 tsp vitamin E oil** (acts as a natural preservative and nourishes lips)

Equipment:

1. Double boiler or heat-safe bowl and saucepan
2. Stirring spoon or spatula
3. Fine sieve or cheesecloth (for filtering beetroot powder if necessary)
4. Lip balm containers or tubes
5. Measuring spoons

Formulation of Lip Balm:**1. Melt the Base Ingredients:**

- i. In a double boiler, melt the beeswax, shea butter (or cocoa butter), and coconut oil over low heat. Stir occasionally until fully liquefied.

2. Add Watermelon and Beetroot Extracts:

- i. Remove from heat and quickly mix in the watermelon seed oil and beetroot powder. Stir thoroughly to ensure even distribution.
- ii. If a smoother texture is preferred, strain the mixture through a fine sieve or cheesecloth to remove undissolved beetroot particles.

3. Enhance with Flavor & Nutrition:

- i. Add the watermelon essential oil or flavoring and vitamin E oil. Stir well.
- ii. If using mica powder for additional tint, mix it in at this stage.

4. Pour into Containers:

- i. Carefully pour the warm mixture into lip balm containers or tubes.
- ii. Let them sit undisturbed at room temperature until fully solidified (about 30–60 minutes).

5. Final Touches:

- i. Once cooled and hardened, cap the containers and store them in a cool, dry place.

6. Storage & Shelf Life:

- i. Store in a cool, dry place to prevent melting.
- ii. Shelf life is 6–12 months due to the natural ingredients.

Evaluation of Lip Balm:

1. Melting Point-

The sample of lip balm is taken in a glass capillary whose one end was sealed by flame. The capillary containing Drug dipped in liquid paraffin inside the melting point apparatus. Melting was determined and melting point was reported.

2. Organoleptic properties –

The formulation was studied for physical appearance, colour and odour. The presence of coarse particles and Consistency were used to evaluate the texture and homogeneity of the formulation.

3. Measurement of pH

The pH of lip balm was determined in order to investigate the possibility of any side effects. The pH study was carried out by dissolving 1gm of sample into 100 ml water. The pH measurement was done using pH meter. pH of lip was near to neutral.

4. Skin Irritation test-

It is carried out by applying lip balm on the skin for 10 min.

5. Test of spreadability-

The test of spreadability consisted of applying the product repeatedly onto a glass slide to visually observe the uniformity in the formation of the projective layer and whether the stick fragmented, deformed or broke during application. Prepared lip balm, initially has shown G- Good: uniform, no fragmentation, perfect application, with any deformation at room temperature.

6. Stability studies-

Prepared lip balm was placed for accelerated stability studies at room temperature (25.0+/-3.00C), refrigeration (4+/-2.00C) and oven temperature (40.0+/-2.00C) for 30 days. After 30 days it was again characterized for organoleptic properties, melting point, spreadability and pH.

7. Effectiveness test on papers –

Finally, after taking out the lip balm from chiller, it was tested by applying the lip balm on a piece of paper. This process is important to determine colour obtained from different sources. It also can determine the effectiveness of the colour product.

8. Skin Sensitivity-

It was carried out by applying the product in the form of a patch on the skin for 30 min and observe the reaction as-

N -No reaction

R-Redness of the skin

I-I tching, swelling, inflammation.

Result and Discussion:

I. Melting point :

Melting point of lip balm was found to be in the range of 680C- 690C, which matches the appropriate melting point of between 650-750C.

II. Organoleptic Properties:

Prepared lip balm has shown pink colour with pleasant odour.

Sr.No	Parameters	Observation
1	Colour	Pink
2	Appearance	Excellent, smooth
3	Odour	Pleasant

III. Test of Spreadability:

Prepared lip balm has initially shown G- Good : uniform, no fragmentation, perfect application without any deformation at room temperature.

IV. Measurement of pH:

pH of lip balm was near to neutral pH i.e. 7.2, this would not cause any irritation to lips.



Conclusion:

The present study aimed to create a lip balm with as many natural elements as feasible. The main coloring and flavoring ingredients were watermelon powder, beetroot powder, rose water, vitamin E capsules, and almond oil. Almond oil served as the moisturizing agent. Researchers looked examined how these components affected the formulation's physical features, including spread ability, uniformity, and organoleptic characteristics. It may be said that using these natural components helped create a great lip balm composition. Findings of numerous studies suggested that the recipe was safe to use and cleared various physical tests. According to stability information, the mixture should be stored at room temperature. In the future, natural bases like Shea butter, paraffin wax, etc. could take the place of the beeswax that was employed as a base for the existing formulation.

References:

1. Ithape D, Pooja M. A Review on Recent Scenario of Cosmetics. *International Journal of Pharmaceutical Sciences Review and Research*. 2021 May 15;68(01):190–7. Available from: <https://doi.org/10.47583/ijpsrr.2021.v68i01.030>.
2. Mali D, Kamlesh. Formulation and Evaluation of Herbal Lip Rouge. *International Journal of Pharmaceutical Sciences Review and Research*. 2019 Mar 6;55(01):13–7.
3. Gaikwad S. Extraction and Isolation of Fruit Pigment of Dragon Fruit (*Halcereus polyrhizus*), Beet Root (*Beta vulgaris*), Lemon Fruit (*Citrus limon*) and Formulation of Herbal Lipstick. *International Journal Research and Analytical Reviews*. 2021 Mar;8(01):92–9.
4. Kadu M. Review on Natural Lip Balm. *International Journal of Research in Cosmetic Science*. 2014 Aug 3;5(01):1–7.
5. Kotekar D. Formulation and Evaluation of Herbal Lipstick Using Natural Colorants. *World Journal of Pharmaceutical Research*, 2022 Mar 18, 11(4).
6. Sankpal M, Rushikesh. Natural Lip Balm. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, 2022, 2(01). Available from: <https://doi.org/10.48175/IJARSCT-4617>.
7. Mawarn D. Formulation and Characterization of Lip Balm Made from Beeswax, Almond Oil, Virgin Coconut Oil and Honey. 2020 Sep, 2255(01). <https://doi.org/10.1063/5.0014367>. Available from:
8. Paithankar S. Formulation of Natural Lip Balm. *International Research Journal of Engineering and Technology (IRJET)*. 2023 Jan;10(01):1009–1014.
9. Panchal C. Formulation and Evaluation of Herbal Lip Jelly Using Pigments of *Butea Monosperma* Flower. *International Journal of Institutional Pharmacy and Life Sciences*, 2015 Jan 8, 5(01).
10. Permatananda PA, Kasih N. Lip Balm Formulation Based on Balinese Grape Seed Oil. *International Journal of Current Science Research and Review*. 2021 Jul;4(7):633–9. Available from: <https://doi.org/10.47191/ijcsrr/V4-i7-03>.
11. Kore S, Prathamesh M. Formulation and Evaluation of Natural Lip Balm by Using Rose Petals. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, 2022, 2(2).
12. Vitnor S. A Review on Herbal Lip Balm. *Ijariie*, 2022, 8(22).
13. Sudha R. Formulation and Evaluation of Herbal Lipstick from Beetroot (*Beta vulgaris*) Extract. *Research Journal of Pharmacognosy and Phytochemistry*, 2019 Nov 3, 11(03). Available from: 4385.2019.00034.7. <https://doi.org/10.5958/0975>
14. Deshmukh S. Formulation and Evaluation of Natural Lipsticks Prepared from *Bixa orellana* Seeds and *Beta vulgaris* Root Extract and Their Comparative Study. *International Journal of Pharmacy and Pharmaceutical Sciences*, 2013 Jun 20, 5.
15. Jadhav V. Formulation and Evaluation of Organic Lip Balm. *Indo American Journal of Pharmaceutical Research*, 2019 May 3, 9(4).