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Formulation and Evaluation of Natural Pomegranate Lip and Cheek Tint

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ABSTRACT:

The Natural Pomegranate Lip and Cheek Tint is a plant-based cosmetic product designed to provide a soft, radiant color to both lips and cheeks while offering skin-nourishing benefits. Formulated with natural ingredients, including pomegranate extract—rich in antioxidants, vitamins A, C, and E—this multi-use tint helps to hydrate, protect, and rejuvenate the skin. Its lightweight, non-greasy formula ensures easy application and a buildable, long-lasting finish. Free from synthetic additives, parabens, and artificial fragrances, this tint is ideal for consumers seeking a clean, eco-friendly beauty solution that enhances natural beauty with a healthy glow.

Keywords: Pomegranate (*Punica granatum*) is a rich source of polyphenols, flavonoids, and vitamins, making it ideal for skincare applications due to its antioxidant, anti-inflammatory, and hydrating properties

Introduction:

In recent years, consumer interest has shifted toward natural and organic cosmetics that are free from synthetic additives. Pomegranate (*Punica granatum*) is a rich source of polyphenols, flavonoids, and vitamins, making it ideal for skincare applications due to its antioxidant, anti-inflammatory, and hydrating properties. This study focuses on developing a dual-purpose natural tint suitable for both lip and cheek application using pomegranate extract along with other natural ingredients.

Traditionally used in both culinary and medicinal practices, pomegranate has gained popularity in modern skincare and cosmetic formulations for its ability to hydrate, brighten, and protect the skin. Its seed oil and fruit extract are especially valued for their anti-aging, anti-inflammatory, and nourishing properties, making it a potent ingredient in natural and organic beauty products.[1]

Objectives:

1. To formulate a dual-purpose lip and cheek tint using natural ingredients, with pomegranate as the key active component.
2. To evaluate the antioxidant and skin-nourishing properties of pomegranate extract or seed oil in a cosmetic application.
3. To develop a safe, chemical-free, and skin-compatible alternative to synthetic tints using plant-based colorants and oils.
4. To assess the physical characteristics of the formulation, such as texture, spreadability, and stability over time.
5. To conduct sensory and user acceptability tests to determine consumer satisfaction and market potential.
6. To ensure the product meets safety standards by performing skin irritation and pH compatibility tests.[2-3]

THE ANATOMY OF LIPS:



Figure 1

Lip anatomy consist of the number of structures that affect both the function and appearance of the lip. Here is a brief summary of the lip structure

Skin:

The visible line dividing the vermilion- coloured portion of the lips from the surrounding skin is known as the vermilion border.

Vermilion Zone: It The term "vermilion zone" refers to the reddish area of the lips.it is crimson because it has more blood vessels than normal .

Philtrum: A philtrum is a vertical groove or indentation that extends from the base to the centre of the upper lip.

Cupi`s: The cupid`s bow is the double curve or V- shaped area in the middle of the top lip

Oral mucosa: The inner surface of the lips is protected by a thin, moist layer if tissue called the oral mucosa It helps to preserve the moisture of the lips and is distinct from the outer skin. To keep the lips moisturized and to facilitate speech and eating, lips include glands called labia.

Nerve ending: One of the many muscles that make up the lips and are in charge of their movement and expression is the orbicularis oris , which surrounds the mouth and facilitates smiling and puckering. Lips are extremely sensitive to touch, warmth, and pain due to their density of nerve endings.[4]

Drug profile:

Pomegranate:



Figure 2

Biological Name: Punica granatum Linn.

Kingdom: Plantae

Clade: Angiosperms

Clade: Eudicots

Order: Myrtales

Family: Lythraceae

Genus: Punica

Species: Punica granatum

Benefits of the Pomegranate:

1. **Rich in Antioxidants:** Contains punicalagins and anthocyanins, which help protect cells from damage.
2. **Anti-Inflammatory Properties:** Helps reduce inflammation in the body, which can benefit conditions like arthritis.

3. **Heart Health:** May lower blood pressure, improve cholesterol levels, and reduce plaque build up in arteries.

. **Boosts Immunity:** High in vitamin C and other immune-boosting nutrients.

5. **Aids Digestion:** Contains dietary fiber, which helps with healthy digestion and bowel movement.[5]

Beetroot Powder:



Figure 3

Biological Name: Beta vulgaris.

Kingdom: Plantae

Clade: Angiosperms

Clade: Eudicots

Order: Caryophyllales

Family: Amaranthaceae

Genus: Beta

Species: Beta vulgaris

Benefits of Beetroot Powder:

1. Improves Blood Pressure:

Rich in nitrates, which convert to nitric oxide and help dilate blood vessels, leading to lower blood pressure.

2. Boosts Stamina and Athletic Performance:

Nitrates enhance oxygen use and endurance, making it popular among athletes.

3. Rich in Antioxidants:

Contains betalains and phenolic compounds that fight oxidative stress and inflammation.

4. Supports Heart Health:

Helps reduce blood pressure, improve circulation, and lower cholesterol levels. [6-7]

Aloe Vera:



Figure 4

Biological Name: Aloe barbadensis Miller

Kingdom: Plantae

Clade: Angiosperms

Clade: Monocots

Order: Asparagales

Family: Asphodelaceae

Genus: Aloe

Species: Aloe vera

Benefits of Aloe vera:

1. Deep Hydration:

Aloe vera gel deeply moisturizes dry and chapped lips without feeling greasy.

2. Soothes Cracked Lips:

Its anti-inflammatory properties calm irritation and heal painful cracks.

3. Heals Faster:

Aloe accelerates wound healing, making it effective for treating severely dry or damaged lips.

4. Natural Gloss:

Gives lips a healthy, subtle shine, perfect for natural lip tints and balms.

5. **Anti-Pigmentation:** With regular use, it may help reduce dark spots and pigmentation on the lips. [8]

Honey:



Figure 5

Biological Name: Apis mellifera.

Kingdom: Animalia
 Phylum: Arthropoda
 Class: Insecta
 Order: Hymenoptera
 Family: Apidae
 Genus: Apis
 Species: Apis mellifera

Benefits of Honey for Lips:

1. **Deep Moisturization:** Acts as a natural humectant—draws and retains moisture to keep lips soft and hydrated.
2. **Heals Cracked and Chapped Lips:** Its antibacterial and anti-inflammatory properties promote faster healing of cuts and dryness.
3. **Natural Exfoliator:** When mixed with sugar, it gently removes dead skin cells for smoother lips.
4. **Brightens Dark Lips:** With regular use, honey may help lighten pigmentation and restore natural lip color. [9]

Coconut oil:



Figure 6

Coconut oil is one of the best natural remedies for keeping your lips healthy, soft, and smooth. It's safe, effective, and easy to use.

Prevents dryness and keeps lips moisturized for hours.

Soothes and repairs chapped, cracked lips with its anti-inflammatory properties.

Works as a natural lip gloss for a healthy, glossy look.

Benefits of coconut oil:

1. **Moisturizing:** Rich in fatty acids (especially lauric acid) that deeply hydrate and nourish dry skin and lips.
Creates a barrier of defence to keep moisture in.
2. **Anti-inflammatory:** Soothes irritated or inflamed skin, making it ideal for sensitive areas like lips and cheeks.
3. **Antibacterial & Antifungal:** Naturally helps fight bacteria and fungi, which may help prevent lip infections or breakouts near application areas.
4. **Healing Properties:** Aids in wound healing and reduces the appearance of dry, cracked lips or skin.
5. **Rich in Antioxidants:** Contains vitamin E and polyphenols that help protect skin from free radical damage and premature aging. [10-11]

Beeswax:



Figure 7

Beeswax is a natural wax produced by honeybees (*Apis mellifera*) and is used by them to build honeycombs. It has a variety of uses and benefits. Worker bees generate beeswax in specialized glands located on their abdomen. They secrete the wax in the form of small flakes, which they mold into hexagonal cells to store honey and pollen. After bees form the honeycomb, the wax is harvested and purified for use by human.

Benefits of Beeswax:

1. **Natural Emollient:** Softens and conditions the skin and lips, helping to keep them smooth and supple.
2. **Moisture Barrier:** Provides the skin with a protective, breathable layer that retains moisture without clogging pores.
3. **Stabilizer & Thickener:** Provides structure and firmness to lipsticks, tints, and balms; helps maintain consistency and texture.
4. **Anti-inflammatory:** Soothes irritation and reduces inflammation, ideal for sensitive or dry skin.
5. **Antibacterial Properties:** Contains natural antibacterial agents that can help protect minor wounds or cracked lips. [12]

Glycerine:

Glycerine is a colorless, odorless, sweet-tasting, and viscous liquid derived from plant oils (vegetable glycerine) or animal fats. It's widely used in skincare and cosmetic formulations due to its excellent moisture-retaining properties.

Chemical Info:

IUPAC name: Propane-1,2,3-triol

Molecular formula: $C_3H_8O_3$

Nature: **Hygroscopic** (absorbs moisture from the air) [13]

Benefits of Glycerine:

1. Powerful Humectant:

Attracts water from the environment into the skin, keeping lips and cheeks hydrated.

2. Improves Skin Smoothness:

Helps maintain a soft, plump texture—especially useful for dry or chapped lips.

3. Non-Irritating & Gentle:

Suitable for all skin types, including sensitive skin.

4. Enhances Product Spreadability:

Gives a smooth glide during application, making tints easier to blend.

5. Soothes Dryness & Irritation:

Calms minor irritation and flakiness, especially in cold or dry weather.

6. Natural Preservative Booster:

Inhibits microbial growth, supporting shelf life when used with preservatives. [14-15]

Essential Oil:

Rose Oil:



Figure 8

Rose oil is a luxurious and aromatic essential oil often added to lip and cheek tints—not for colour, but for its therapeutic, aromatic, and skincare benefits.

1. **Natural Fragrance:** Adds a gentle, floral scent that enhances the tint's sensory appeal.
2. **Skin-Soothing:** Anti-inflammatory and calming, great for sensitive or irritated skin.
3. **Antioxidant Properties:** Helps protect lips and skin from environmental damage.
4. **Gentle Astringent:** Brightens and evens out cheek skin [16]

Benefits of Rose Oil:

1. Deep Hydration:

Rose oil leaves skin and lips feeling silky and soft after moisturising dry, chapped areas.

2. Soothing & Calming:

Reduces redness, irritation, and inflammation—great for sensitive skin and cheeks.

3. Natural Antibacterial:

Helps prevent acne or minor infections with its gentle antibacterial properties.

4. Rich in Antioxidants:

Protects skin from free radicals, supporting youthful and healthy-looking skin. [17]

Formulation Table:

Sr No.	Ingredients	Quantity (15 gm)	Uses
1	Pomegranate juice	2gm	Natural colourant, Antioxidant.
2	Beetroot Powder	1gm	Natural Colourant.
3	Aloe vera gel	3gm	Hydrating, Soothing.
4	Coconut oil	2gm	Carrier oil, Nourishes skin.
5	Honey	0.25gm	Antibacterial and Healing properties.
6	Beeswax	4gm	Thickener, Gives structure.
7	Vitamin E Oil	0.25gm	Antioxidant, Prolong shelf life.
8	Glycerine	1gm	Natural Humectant.
9	Red Iron Oxide	0.5gm	Mineral pigment.
10	Essential Oil (Rose oil)	1-2 Drops	Fragrance, Mild preservative effect.

Table: 1 Formulation Table**Material And Method :****Tools Needed:**

Mortar and pestle.

Fine strainer.

Double boiler. (over hot water)

Small container.

Extraction & Tint-Making Process:*Figure 9***1. Juice Extraction:**

Pomegranate seeds should be crushed to extract the juice.

Strain the juice using a fine mesh to separate the liquid from pulp.

2. Oil & Wax Infusion:

In a double boiler, melt the coconut oil and beeswax together.

Once melted, remove from heat and stir in the pomegranate juice slowly.

Add vitamin E oil and honey.

Add beetroot powder and Alovera gel.

Add red iron oxide for a deeper shade.



Figure 10

3. Blend & Set:

Stir the mixture well until fully blended.

Remove from heat. Let it cool and solidify at room temperature then stir in essential oil.

Pour into lip balm container.

Set aside for one to two hours at room temperature. [18-19]

Evaluation Parameter:

1. Organoleptic Properties

Color: Uniformity, intensity, and visual appeal.

Odor: Natural, pleasant scent.

Texture: Smoothness, absence of grittiness.

Appearance: Solid, (depending on desired finish).

2. Melting Point Test

Purpose: Ensures stability at room temperature and comfort during application.

Ideal Range: 50–60°C for lip products.

Method: Use a melting point apparatus or water bath to determine softening temperature.

3. Spreadability

Purpose: Evaluate how smoothly the balm applies on lips.

Method: Apply on skin; observe drag and evenness.

Result: Smooth, even application with no clumps.

4. Hardness / Consistency Test

Purpose: Ensures proper balance of wax and oils.

Method: Use a penetrometer or manually press with finger or spatula.

Result: Should be firm yet soft enough to glide on lips.

5. Smudge or Transfer Test

Purpose: Check if tint stays in place.

Method: Apply to lips, press with tissue after 5–10 min.

Observation: Minimal transfer indicates good staying power

6. pH Test (if water or juice is used in preparation)

Ideal pH: 4.5–6.5 (safe for lips)

Note: Mostly skipped for solid oil/wax-based formulas unless water is added

8. Irritation/Sensitivity Test

Method: Patch test on behind ear

Observe: Redness, itching, or swelling over 24 hours. [20]

Physical Parameter:

Sr No.	Parameter	Testing Result
1.	Colour	Deep reddish-pink
2.	Odour	Soft floral scent
3.	Texture	Smooth
4.	State	Solid
5.	Melting point	50–60°C
6.	Spreadability	Smooth ,No clumps
7.	Hardness /Consistency	Soft ,Creamy texture
8.	Smudge Test	No smudge
9.	pH	5.5
10.	Irritation Teat	No Irritation

Table 2: Physical Parameter

Result:



Figure 11

The natural pomegranate lip tint produced a smooth, reddish-pink colour when applied to the lips. The formulation had a lightweight, non-sticky texture and provided a moisturizing effect due to the inclusion of natural oils. It gave a subtle glossy finish and left a light stain on the lips that lasted for approximately 2–4 hours. The tint was easy to apply and showed good adherence to the lips without causing dryness or irritation. The natural pomegranate extract also added a mild fruity scent and antioxidant benefits.

Discussion:

This natural lip tint is safer for regular use, especially for individuals seeking chemical-free, eco-conscious cosmetics. However, the colour intensity and staying power may be lower than commercial alternatives due to the absence of synthetic dyes or fixatives. Future improvements could include natural preservatives for better shelf life and slight formulation adjustments for improved colour retention.

Conclusion:

The natural pomegranate lip tint was effective in delivering a safe, nourishing, and aesthetically pleasing lip colour. The use of pomegranate provided natural pigmentation along with added skin benefits, such as hydration and antioxidant protection. This suggests that pomegranate is a viable natural ingredient for use in eco-friendly and chemical-free cosmetic products. The final product is suitable for daily use and aligns well with the growing demand for clean beauty alternatives.

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