



“FORMULATION AND EVALUATION OF HERBAL LIP-GLOSS FROM BEETROOT”

Ms. Aditi Sanjay Shinde ^{1st}, Ms. Rutuja Madhavrao Suroshe ^{2nd}
 Ms. Samiksha Bhaurao Gore ^{3rd}, Ms. Prerna Babanrao Gawande ^{4th}
 Guidance By: Asst Prof. Unnati T. Rathod ^{5th}

College Name: Ishwar Deshmukh Institute of Pharmacy, Digras

ABSTRACT:

The present study focuses on the formulation and evaluation of a natural and herbal lip gloss using beetroot as the primary source of tint. The aim is to develop a safe, eco-friendly, and effective lip care product by incorporating natural ingredients such as beeswax, cocoa butter, castor oil, and essential oils. Beetroot provides a vibrant natural color and antioxidants, making it a suitable alternative to synthetic dyes. The prepared lip gloss was evaluated based on its physical characteristics, stability, and cosmetic appeal.

The tint was extracted through a cold maceration method using glycerine, allowing for the retention of pigment quality without thermal degradation. The extracted tint was incorporated into the lip gloss formulation, and the final product underwent comprehensive **physicochemical and sensory evaluations**, including **organoleptic assessment, pH analysis, spreadability, stability studies**, and a **skin irritation (patch) test**. The formulation exhibited excellent **consistency, smooth texture, pleasant odour, and a natural red tint**. The pH value remained within the dermal safety range (5.5–6.5), and the product demonstrated good physical stability without signs of phase separation or microbial contamination under varying storage conditions.

The results support the feasibility of developing a **safe, effective, and visually appealing herbal lip gloss** using beetroot powder as a natural pigment. The study also highlights the role of **glycerine as a viable medium for pigment extraction** in oil-based cosmetic formulations. This research provides a foundation for future exploration of **plant-based, functional cosmetic products** and encourages the development of eco-conscious and skin-friendly alternatives in the cosmetic industry.

KEYWORDS: Beetroot Powder, Herbal Lip Gloss, Natural Colorant.

Introduction:

Cosmetic products play a vital role in personal care, but most commercial products contain synthetic chemicals that may cause adverse effects. As a result, there is an increasing demand for herbal and organic alternatives. Lip gloss is widely used for enhancing the aesthetic appearance of lips while also providing hydration. In this project, an herbal

lip gloss is formulated using beetroot, a natural source of color and antioxidants. The purpose is to develop a chemical-free formulation that is both functional and aesthetically pleasing.

In this study, we explore the formulation of an herbal lip gloss using beetroot powder as the primary source of colorant. The study aims to extract the betalain pigments from beetroot powder using glycerine as a mild solvent, preserving the natural properties of the pigment while creating an effective and safe cosmetic product. Glycerine is chosen as the extraction medium due to its ability to dissolve water-soluble pigments while providing additional moisturizing properties to the lip gloss.

The formulation of the lip gloss combines beetroot pigment extract with natural emollients and oils such as beeswax, paraffin wax, cocoa butter, and castor oil. These ingredients are selected based on their ability to provide hydration, enhance texture, and improve the spreadability of the final product.

Ultimately, this research aims to contribute to the development of natural, eco-friendly cosmetic alternatives that meet both the aesthetic and functional needs of consumers, while promoting the use of plant-based ingredients in the beauty industry.

Aim and Objectives:

1. Aim: To formulate and evaluate a herbal lip gloss using beetroot as a natural coloring agent.
2. Objectives:
 - To extract natural colour (tint) from beetroot powder.
 - To formulate a stable lip-gloss using natural ingredient.
 - To evaluate the physical and aesthetic properties of the prepared formulation.

Ideal Characteristics of Herbal Lip-gloss:

1. Natural Ingredients

- Herbal/Plant-based Components: The ideal herbal lip gloss should be made with natural ingredients such as plant oils (e.g., coconut oil, castor oil), beeswax, butters (e.g., shea butter, cocoa butter), and natural colorants (e.g., beetroot powder).
- Free from Harmful Chemicals: It should be paraben-free, phthalate-free, and synthetic fragrance-free to ensure safety for all skin types, especially sensitive skin.

2. Moisturizing and Hydrating

- Emollient Properties: The lip gloss should have the ability to moisturize and hydrate the lips. Ingredients like glycerine, cocoa butter, and castor oil are excellent humectants and emollients that help prevent dryness and chapping.
- Long-lasting Hydration: The gloss should not just provide an instant sheen but also retain moisture for an extended period of time, keeping the lips soft and nourished.

3. Safe and Non-Irritating

- Skin Compatibility: The lip gloss should be safe for sensitive lips and free from any ingredients that could cause irritation, such as harsh chemicals or artificial colorants.

- **Patch Test:** An ideal product should undergo skin irritation testing to ensure no allergic reactions or discomfort when applied to lips.

4. Smooth and Non-Greasy Texture

- **Non-sticky and Non-greasy:** A good herbal lip gloss should have a smooth texture that glides on easily without feeling sticky or greasy. The ideal product should provide a light, silky finish rather than a heavy, uncomfortable layer on the lips.
- **Optimal Viscosity:** The formulation should have just the right consistency—not too runny, yet not too thick, ensuring that it spreads well and provides an even layer.

5. Glossy Finish

- **Shiny and Glossy:** The main purpose of lip gloss is to provide a shiny, glossy finish that enhances the natural appearance of the lips. A high-quality herbal gloss should have an attractive lustre that doesn't appear dull or patchy.
- **Non-greasy Sheen:** While providing a glossy look, it should avoid a greasy or overly oily feel, ensuring comfort during wear.

6. Pigmentation and Tint

- **Natural Colorant:** The lip gloss should offer a natural tint or subtle pigmentation derived from herbal sources, such as beetroot powder, hibiscus, or other plant-based pigments. It should provide a gentle, buildable colour.
- **Non-permanent Staining:** While providing colour, the tint should not leave a long-lasting stain on the lips, making it suitable for regular use and easy removal.

7. Eco-friendly and Sustainable

- **Sustainable Sourcing:** The ingredients should come from sustainable sources, with a preference for organic or ethically sourced materials.
- **Packaging:** The lip gloss should come in eco-friendly packaging, such as recyclable or biodegradable containers, to minimize environmental impact.

8. Easy to Apply

- **Convenient Packaging:** The lip gloss should come in an easy-to-use, travel-friendly packaging format, such as a twist-up tube, squeeze tube, or pot.
 - **Precise Application:** It should allow for precise application on the lips, whether with an applicator wand or a finger.
-

Benefits of Herbal Lip Gloss:

1. Natural Moisturization
2. Safe for Sensitive Skin
3. Antioxidant Protection
4. Natural Tint & Glow
5. Healing and Soothing Effects

6. Breathable and Lightweight
7. Eco-Friendly and Sustainable
8. Multi-functional Use
9. Ethical Beauty Choice

Herbal Ingredients Used in Formulation:

1) Beetroot Powder:

Beetroot powder is a multifunctional, natural ingredient in herbal lip gloss. It provides a beautiful tint, delivers antioxidant protection, and supports the clean beauty movement. Its inclusion enhances both the aesthetic and therapeutic value of the product, making it an ideal choice for natural and herbal cosmetic formulations.



Fig 1: Beetroot Powder

➤ Use:

- 1. Natural Colorant
- 2. Antioxidant Properties
- 3. Anti-Inflammatory and Healing
- 4. Adds a Subtle, Natural Tint
- 5. Safe and Edible
- 6. Eco-Friendly and Sustainable

2) Bees Wax:

Beeswax is an essential ingredient in lip gloss formulation, especially in herbal or natural cosmetics. It offers structure, moisture retention, protection, and shine, while also acting as a natural preservative and stabilizer. Its multifunctional benefits make it a key component in creating an effective, soothing, and long-lasting lip product.



Fig 2: Bees Wax

➤ Use

- 1. Thickening and Structuring Agent
- 2. Emollient and Moisturizing Properties
- 3. Protective Layer
- 4. Enhances Gloss and Shine
- 5. Stabilizer and Binder
- 6. Natural and Non-Toxic
- 7. Contains Natural Healing Compounds

3) Cocoa butter:

1. Moisturizes and Softens Lips:
 - Rich in fatty acids, cocoa butter deeply hydrates and helps repair dry or chapped lips.
2. Improves Texture and Consistency:
 - Adds a smooth, creamy feel to the lip gloss, enhancing its spreadability and richness.
3. Natural Emollient:
 - Creates a protective barrier on the lips to lock in moisture and shield against environmental damage.
4. Rich in Antioxidants:

- Contains vitamin E and other antioxidants that protect lips from free radicals and help keep them healthy.
5. Adds a Mild Chocolate Scent:
- Naturally imparts a pleasant, subtle cocoa aroma to the lip gloss, enhancing the sensory experience.



Fig 3: Cocoa Butter

4) Castor Oil:

Castor oil is a key ingredient in lip gloss formulation thanks to its ability to provide high shine, deep moisturization, and smooth application. It is especially valued in herbal and natural cosmetic products for being plant-based, skin-friendly, and effective at dispersing pigments. Whether used alone or with other oils, castor oil plays a vital role in enhancing both the function and aesthetic of lip gloss products.

➤ Use:

- 1. Provides Shine
- 2. Acts as a Natural Emollient
- 3. Carrier Oil for Pigments and Actives
- 4. Enhances Texture
- 5. Natural and Skin-Friendly



Fig 4: Castor Oil

5) Glycerin:

Glycerin acts as an effective solvent for extracting natural tint from beetroot due to its water-soluble nature. It helps retain the colour while also adding moisturizing properties to the lip gloss, making it both functional and skin-friendly.

➤ **Use:**

- Solvent for Natural Colorants:
- Moisturization:
- Enhances Gloss Texture:
- Preserves the Tint:
- Boosts the Effect of Other Ingredients



Fig 5: Glycerin

6) White Rose Essence:

White rose essence adds a gentle fragrance, soothing effect, and light hydration to lip gloss, making it ideal for sensitive lips and natural formulations. Its mild floral scent and calming properties enhance the overall feel and appeal of herbal lip care products.



Fig 6: White Rose Essence

- **Formulation Table:**

Sr. no	Ingredients	Functions	Quantity
1	Beetroot Powder	Natural Colorant, Antioxidant	2gm
2	Bees wax	Binder, Base	0.5gm
3	Cocoa butter	Moisturizer	1gm
4	Castor oil	Glossy Finish	2ml
5	Glycerin	Humectant, Solvent (for natural tints)	15ml
6	White Rose Essence	Fragrance	q. s

Table no.1: Formulation

Method of preparation:

➤ Extraction procedure for tint from beetroot:

1. Take 2gm of beetroot powder and mixed with 10 to 15 ml of glycerin (add if it required) in glass beaker.
2. Allow the mixture to stand for 3 days in a cool, dark place and stir it through once a daily.
3. After completion of 3 days strain it through fine cloth and store in a closed container.

**Fig 7: Tint extract from beetroot**

➤ Preparation of lip-gloss:

1. Weight accurately the required quantity of bees wax, cocoa butter, and castor oil transfer into a clean china dish.
2. Heat the mixture gently using water bath until all the ingredients melt and form a uniform liquid.
3. Then slightly cool the mixture and add beetroot tint as per required quantity depending on a desired colour intensity and mix well.
4. Then add few drops of white rose essence for fragrance mix well until they are completely incorporated with the base.
5. Transfer the prepared lip-gloss into the lip-gloss container.



Fig 8 Herbal Lip-Gloss

Evaluation Tests:

1. Organoleptic (Sensory) Evaluation

Purpose: To assess the appearance, colour, smell, texture, and feel on lips.

Parameter	Method
Colour	Visual inspection for uniform beetroot tint
Odor	Smell to ensure a pleasant, non-offensive aroma
Texture	Feel the gloss between fingers or on lips
Consistency	Check for smoothness (not too runny or hard)

2. pH Determination

Purpose: To ensure the product is safe and non-irritating for lips.

- Method:
 - Dilute a small amount of lip gloss with distilled water (if needed).

- Use a digital pH meter or pH paper.
- Ideal Range: pH 5.5–6.5, close to the skin's natural pH.

3. Spreadability Test

Purpose: To check how easily the lip gloss spreads on application.

- Method:
 - Place a fixed amount of gloss between two glass slides.
 - Apply light pressure and measure the area covered.
- Good Spreadability: Indicates ease of use and smooth texture.

4. Melting Point Test

Purpose: Ensures product maintains shape at room temperature but melts slightly at body temperature for smooth application.

- Method:
 - Fill a small capillary tube with lip gloss.
 - Place in a melting point apparatus or water bath.
 - Record the temperature at which it starts to melt.
- Ideal Range: 35–45°C

5. Viscosity Test

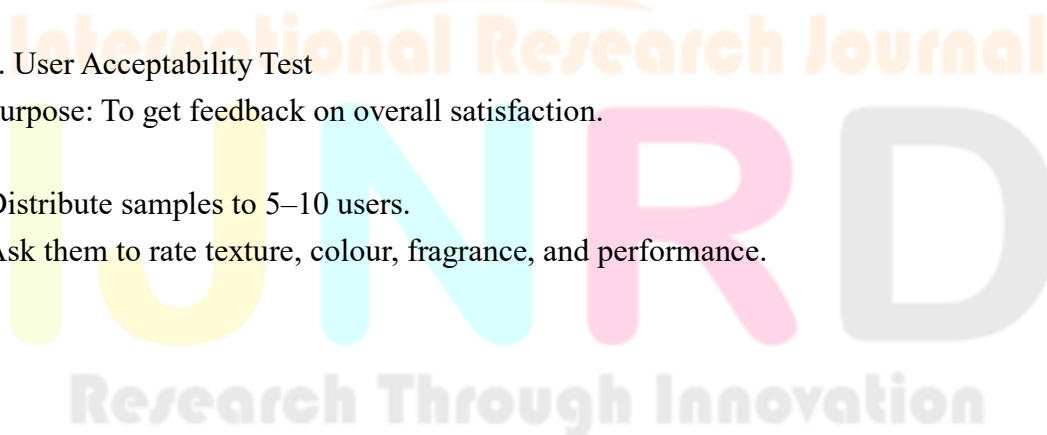
Purpose: Measures thickness and flow behavior of the lip gloss.

- Method:
 - Use a Brookfield viscometer or perform a simple flow test.
 - Observe the flow when the gloss is dispensed or applied.
- Ideal: Neither too thick (hard to apply) nor too runny.

6. User Acceptability Test

Purpose: To get feedback on overall satisfaction.

- Method:
 - Distribute samples to 5–10 users.
 - Ask them to rate texture, colour, fragrance, and performance.



The final product showed the following characteristics after evaluation:

Test	Purpose	Ideal Outcome
Organoleptic	Appearance, smell, feel, colour	Pleasant, smooth, uniform tint, dark reddish-brown colour
pH	Safety for lips	6.1
Spreadability	Application ease	Easy, even spread
Melting point	Physical stability	37°C
Viscosity	Texture and consistency	Smooth, not runny or thick
Stability	Shelf life	No separation or spoilage
Irritancy test	Skin safety	No redness or reaction
Microbial test	Hygiene/safety	No harmful growth

Table no.2**Results and Discussion:**

The formulated herbal lip gloss showed desirable cosmetic properties such as smooth texture, pleasant aroma, and appealing natural color. The beetroot extract provided a rich pink tint without the need for artificial coloring agents. The product remained stable during the evaluation period, with no separation or change in consistency. The use of natural butters and oils improved moisturization and enhanced user satisfaction.

Summary:

The herbal lip gloss was successfully formulated using natural ingredients, with beetroot extract serving as a natural tint and active component. Other ingredients like castor oil, beeswax, cocoa butter, glycerin, and white rose essence were incorporated for their moisturizing, soothing, and texturizing properties.

The final product exhibited a smooth texture, pleasant fragrance, and a natural pinkish tint. Evaluation tests confirmed that the lip gloss had an appropriate pH (6.1), good spreadability, stability under various conditions, and no signs of irritation or microbial growth.

Overall, the herbal lip gloss was found to be safe, effective, and suitable for regular cosmetic use, offering a natural, skin-friendly alternative to commercial lip products.

Conclusion:

The study successfully demonstrates the formulation of a natural and herbal lip gloss using beetroot powder. The final product is cost-effective, skin-friendly, and free from synthetic chemicals. It serves as a sustainable alternative to conventional lip products and encourages the use of herbal formulations in cosmetic industries.

References:

1. Kaur, H., & Singh, R. (2019). Formulation and Evaluation of Herbal Lipstick. *International Journal of Pharmacy and Pharmaceutical Sciences*.
2. Paliwal, S., et al. (2012). Herbal cosmetics: A safe way for skin protection. *Journal of Pharmaceutical Science and Research*.
3. Natural colorants and antioxidants from beetroot. (Journal source if applicable).
4. Indian Pharmacopoeia – Guidelines for cosmetic formulations.
5. Talreja, S., Tiwari, S., Rawat, S., & Bharti, A. (2023). The development and evaluation of a herbal lipstick formula utilizing various extracts. *Journal of Pharmaceutical and Biological Sciences*.
6. Jain, S., Jain, S., Pillai, S., & Namdev, N. (2022). Formulation and evaluation of herbal lipstick by using beet root extract. *ResearchGate*.
7. Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2008). *Pharmacognosy* (45th ed.). Nirali Prakashan. – For information on natural ingredients like beetroot, rose, and cocoa butter.
8. Barel, A. O., Paye, M., & Maibach, H. I. (2014). *Handbook of Cosmetic Science and Technology* (4th ed.). CRC Press.
9. Kumar, P., & Bhowmik, D. (2010). Traditional and Medicinal Uses of Beetroot. *Journal of Pharmacognosy and Phytochemistry*.

