International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 3 May-June 2025, pp: 2159-2170 www.ijprajournal.com ISSN: 2456-4494

Formulation and Evaluation of Lipstick Made By Natural Colourant Bixa Orellana

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Date of Submission: 20-06-2025 Date of Acceptance: 30-06-2025

ABSTRACT:
The study presents the formulation and evaluation of lipstick through natural colour agents Bixa Orellana(annatto) and Beta vulgaris (beetroot). The primary objective was to create a lipstick that combines aesthetic appeal with functional benefits, using natural ingredients to ensure safety and environmental sustainability. In General the lipsticks use the colour extracted from Cochinea insects and it can be considered as animal harm and not skin friendly. The formulation process involved the careful selection of waxes, oils, and pigments to achieve the desired texture, color, and stability. The resultant lipstick was subjected to a series of rigorous evaluations to ensure quality and performance. Primarily, the pH test was conducted to ensure the lipstick's compatibility with the natural pH of the skin, resulting in an optimal pH level that avoids skin irritation. The melting point test confirmed the product's stability across various temperature ranges, ensuring that it remains solid in typical environmental conditions. Solubility test with water, ethanol and methanol which helps to ensure the resistance to water based removal, and uniform dispersion of pigment and compatibility in alcohol. Perfume stability test is conducted to ensure that the fragrance remain consistent safe and pleasant. skin irritation test was conducted with human volunteers, demonstrating that the lipstick does not cause adverse skin reactions. Surface anomalies test to detect any visual or textural imperfection on lipstick surface that could affect the product quality and user experience. The colour imparting test in lipsticks evaluates how effectively the product transfers its color onto a surface essentially measuring its colour payoff and application quality. All tests yielded results within the acceptable reference ranges, validating the formulation's success. This study contributes to the development of safe, natural colouring agent which ensure safety by incorporating natural colouring agent.

KEY WORDS: Bixin, Beta vulgaris, waxes, oils, cosmetics, lipsticks

I. INTRODUCTION:

LIPSTICKS:

Lipstick may be basically defined as dispersion of the coloring matter in a base consisting of a suitable blend of oils, fats, and waxes with suitable perfume and flavours moulded in the form of sticks to impart attractive glossy and colour , when applied on lips. Lipsticks provide moist appearance to the lips. Lipsticks are commonly composed of several different components, such as vegetable oils (castor oil, almond oil), mineral derivatives (Vaseline oil, white petrolatum), pigments and waxes, which are not only used for aesthetic purposes but can also act as bioactive agents in extreme weather, e.g., UV protection.

Lipsticks are one of the most widely used cosmetic products.

Social, psychological, and therapeutic benefits can be attained from using lipstick.

The beauty and attractiveness of a person are enhanced as lipsticks colour the lips and protect them from the external environment. However, current lip care products not only emphasize aesthetic value but also preferably have added medicinal value to the lip of consumers.

This led to the emergence in the market of medicated lipsticks with active medicinal ingredients. The medicated lipsticks may provide protection against infections of bacteria due to the presence of an active medicinal ingredient in the formulation. This function adds on to the existing role of lipsticks, which provide moisture and emollient action to prevent cracking and chapping

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of the lips Matte is a flat, stained look with no gloss. This is a long-lasting lipstick but can be drying. Matte lipsticks have more wax than other types of lipstick but fewer emollients. High gloss has a shimmery appearance and helps make lips appear fuller. High gloss lipsticks can be sticky and tend to wear off quickly.

Long-lasting lipsticks contain silicone oil. Silicone oil helps to keep the colour on the lips and allows the lipstick to stay on all day long. Only mineral oil takes it off. Most lipsticks have a satin finish. Satin is a combination of gloss and matte. Satin lipstick is creamy, which moisturizes the lips, but is not as greasy as other types of lipstick. Satin lipsticks are preferred by many women today. Frosted lipstick contain pearlized agents. Perlizings agents are generally bismuth compounds which add lustre to the lipstick . Lipsticks is a cosmetic product used to apply coloration and texture to lips, often made of wax and oil. Different pigment are used to produce colour, and minerals such as silica may be used to provide texture. The use of lipstick dates back to early civilizations such as Sumer and the Indus Valley Civilisation, and was popularized in the western world in the 16th century. Some lipsticks contain traces of toxic materials, such as lead and PFAS, which prompted health concerns and regulation.(1)

HISTORY OF LIPSTICKS:

Men began using colours for adornment in approximately 3000 BC in order to attract the animals they wanted to hunt. Generally, the concept and construct of “cosmeceuticals” was first articulated by Raymond Reed (1961), the founder of the US Society of Cosmetic] Chemists. It originated from the Greek term “kosm tikos”, which means “decorating talent”. Later, in 1984, Albert Kligman used the word “cosmeceuticals” referring to the compounds that have both cosmetic and medicinal properties.

Many herbs and floras have been used in the manufacture of cosmetics for the purposes of beauty and protection from external influences. The natural chemicals in cosmetics do not harm the human body; instead, they provide it with nutrients and minerals (2). Lipsticks, in particular, have been used by humans for over 500 years . Lipstick was first discovered as a rough fragment of brick in ancient Mesopotamia. Colouring lips is an ancient tradition that dates to the prehistoric period . Lipstick was first introduced in France in 1869 as a cosmetic product made from animal fat and beeswax .(3)

The availability of lipstick in the form of cylindrical metal tubes was introduced in 1915 (4)

Presently lipsticks have become an essential product for many consumers. There is an extensive choice of colour shades and textures. This can be observed from the fact that lipstick is being marketed in hundreds of shades of colours to satisfy the increasing demand.

DECODING LIPSTICKS FORMULATION:

Selected ingredients that determine not only the shade and texture but also the overall performance and benefits of the product. Here’s what typically goes into crafting these beauty essentials:

- **Waxes**: These provide structure and form, ensuring that the lipstick holds its shape. Beeswax, carnauba wax, and candelilla wax are commonly used.
- **Oils & Emollients**: Ingredients like castor oil, jojoba oil, and even silicone derivatives help in achieving a smooth application, while also imparting hydration.
- **Pigments**: These are the color agents. They can range from natural mineral-based pigments to synthetic dyes, offering a vibrant and long-lasting hue.
- **Active Skincare Ingredients**: Modern formulations often include vitamins (like Vitamin E), hyaluronic acid, and antioxidants to care for the lips, making your makeup truly multi-functional.
- **Binders & Emulsifiers**: These ensure all ingredients mix well and maintain a consistent texture, preventing the product from separating.(5)

TYPES OF LIPSTICKS:

There are different types of lipsticks they come in different variety of finish and formulas, each of them offering a unique look and feel. Each type has its own benefits depending on the occasion and personal preferences.

- **Matte Lipstick** – Highly pigmented with a flat, non-shiny finish. Long-lasting but can be drying.
- **Cream Lipstick** – Smooth and hydrating with a soft texture, offering a balance between matte and glossy.
- **Gloss Lipstick** – Adds shine and makes lips appear fuller, but requires frequent reapplication.

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- **Satin Lipstick** – A mix between matte and gloss, providing a subtle sheen and comfortable wear.
- **Liquid Lipstick** – Comes in a liquid form and dries to a matte or glossy finish, often long-wearing.
- **Lip Stains** – Lightweight and long-lasting, providing a natural tint that stays put.
- **Metallic Lipstick** – Shimmery and reflective, perfect for bold, eye-catching looks.
- **Frosted Lipstick** – Contains shimmer particles for a pearlescent effect.
- **Sheer Lipstick** – Light coverage with a hint of colour, great for a natural look.
- **Transfer-Resistant Lipstick** – Designed to stay put without smudging or transferring.(6)

CHARACTERISTIC OF LIPSTICKS:

Lipsticks is composed of colouring materials dispersed in blend of olis and waxes. The blend of oils and waxes is adjacent to design melting point and viscosity through the body temperature varies between 36°C to 38°C. But the product is expected to withstand hot climate, therefore lipstick must have a melting point a pressure up to 55° to 75°C.

- You should miss smooth and easy to apply, leaving a thin film on the lips.
- It should have a good degree of in edibility.
- It should have a high retention of colour intensity.
- It should be free from grittiness
- You should have required plasticity.
- It should not lose its smooth and shiny appearance during storage.
- It should remain free from blossom or sweating during storage.
- It should remain firm and stiff within reasonable variation of climatic temperature and conditions.
- It should have a pleasant Odour and flavour(7)
- There are three formulations had been prepared

All the three formulations had following ingredients

Bixa Orellana:

Bixa Orellana with a common name “lipstick tree” is an ornamental plant mainly found in South America, Central America, Caribbean islands and in some parts of Asia. In India plant is traditionally known as ‘Sinduri’ or ‘latkan’ and is used in traditional medicine, dye, cosmetics and food industries. The plant shows significant genetic diversity and is either cultivated or occurs wild. The plant seeds are of commercial importance as they yield a natural colorant bixin a carotenoid, used in colouring dairy products, and in preparing “sindur” and “lipstick”, and also possess a good calorific value. The present study focuses on morphological and ecological features and uses of Bixa orellana. The study demonstrated the importance of this plant in food, cosmetic, textile and drug industries along with detail investigation for its use in developing new medicines of natural origin along with its conservation.

Figure 1: Bixa Fruit

Figure 2: Bixa Seeds

The use of medicinal plants for curing ailments has been in practice since ancient times and presently 28,187 plant species are recorded as being of medicinal uses and nearly 50% of the drugs are obtained from natural compounds.

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Bixa Ornella belonging to family bixaceae commonly known as annatto or lipstick tree native to south America central America caribbean islands tropical ornamental plant with traditional uses.in Asia plant is mainly grown in India Philippines and Sri Lanka. In India the plant is popularly known as Sinduri or latkan and its English name is annatto while in german it is called as orlean.

USES:

Medicines:

The plant and its parts are widely used in the traditional medical system in various parts of world. This plant is used from colonial times and used as a colorant and spice also used to treat infections of microbial orgin. It is also used to treat internal inflammation and gastric ulcer in Malaysia. In India it is used to treat fever and gonorrhoea phlegm, and blood diseases, headache. . In Gabon leaf decoction is used against vomiting, in DR Congo used as a gargle for sore throat and tonsillitis and treating itches, in Seychelles and Mauritius as a bath against muscular pain and headache in Trinidad and Tobago to treat diabetes, jaundice and hypertension . In Mauritius the leaves are used against headache and in Ethiopia applied as a wound dressing. In Paraguay and Mexico mixture of seeds and sap are used against mouth disorder.

FOOD INDUSTRY:

The natural bio colorants yellow and red are obtained from bixin which are safer and can be used in food exempted from certification category of FDA and EU. This are used dairy and bakery products. The dye is nontoxic and had a traces of vitamin A content and soluble in lipids hence used in colour margarine, ice cream, candy, cheese, butter, bakery products and oils.

COSMETIC AND TEXTILE INDUSTRIES :

Annatto is a natural dye yielding plant and has applications in textile and cosmetic industries, leather, solar cells and other industries. Artificial neural network (ANN) shows high degree of potentiality in optimizing the dye extraction from seeds of the plant. Annatto dye has significant uses in cosmetic and leather industry. It is used in the cosmetic industry in the production of lipstick, hair oil, nail gloss, soap and in household products like furniture polish, floor wax, brass lacquer, shoe polish, and wood stain. In textile industry annatto has been used for dyeing wool, cotton and silk, giving an orange-red colour and when mixed in dye-bath with wood-ash or sodium carbonate and treated with tartaric or citric acid, turns yellow. According to some reports the woolen yarn dyed with annatto seeds shows decrease in lightness value on treatment with ammonia . The dye fades in sun light but resistant to soap, acids and alkalis. The dye is also used to colour wood, rattan and bamboo. (8)

BEETROOT EXTRACT:

Figure 3: Beetroot Extract

Uses of Beetroot in Lipstick Preparation

1. **Natural Colorant**: Beetroot contains betanin, a red pigment from the betalain family, which imparts a rich pink to deep red hue to lipsticks. It's a safer alternative to synthetic dyes, especially for products that may be ingested.
2. **Antioxidant Properties**: Rich in polyphenols and flavonoids, beetroot helps protect lips from oxidative stress and environmental damage.
3. **Moisturizing Agent**: When used in powdered or juice form, beetroot can be combined with oils like coconut, castor, or olive oil to create a hydrating base that soothes dry or chapped lips.
4. **Emollient Action**: It contributes to the smooth texture of the lipstick and helps prevent cracking by maintaining lip moisture.
5. **Gloss and Aesthetic Appeal**: Beetroot adds a natural sheen and enhances the visual appeal of the lipstick without the need for artificial glossing agents.
6. **Safe and Non-Toxic**: As a plant-based ingredient, beetroot is generally well-tolerated and free from harmful chemicals like parabens, phthalates, and synthetic dyes.(9)

CASTOR OIL:

Figure 4: Castor Oil

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Uses in Lipstick Preparation

•Moisturizing Agent: Castor oil helps keep lips hydrated by preventing moisture loss.
•Texture Enhancer: It contributes to the smooth and creamy consistency of lipsticks.
•Pigment Carrier: The oil helps disperse color pigments evenly, ensuring a uniform application.
•Gloss & Shine: Lipsticks containing castor oil often have a glossy finish, enhancing their aesthetic appeal.
•Long-Lasting Wear: It improves the longevity of lipsticks by forming a protective barrier on the lips.

Uses: - It is used as a laxative. It is used as a moisturizer. It may promote the healing of cracked lips. It promotes hydration.(10)

LANOLIN:

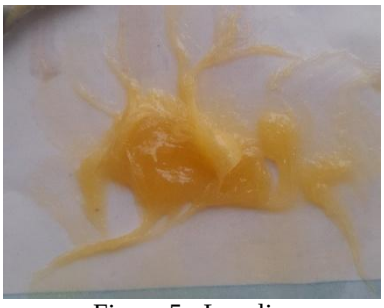

Figure 5 : Lanolin

Lanolin is a popular ingredient in lipsticks due to its unique properties. Here are some of the uses and benefits of lanolin in lipsticks:

1. Moisturizing and Emollient Properties
Lanolin helps to lock in moisture, soothe, and protect dry, chapped lips.

2. Texture and Consistency
Lanolin adds a smooth, creamy texture to lipsticks, making them more comfortable to wear.

3. Emulsification
Lanolin helps to emulsify and stabilize the mixture of oils, waxes, and pigments in lipsticks.
4. Shine and Gloss
Lanolin can enhance the shine and gloss of lipsticks, giving them a more attractive appearance.

5. Protection
Lanolin provides a barrier on the lips' surface, protecting them from environmental stressors, wind, and cold weather.

6. Stability and Shelf Life
Lanolin can help to extend the shelf life of lipsticks by preventing the growth of microorganisms and stabilizing the formula.

7. Skin Compatibility
Lanolin is generally considered hypoallergenic and non-comedogenic, making it suitable for sensitive skin and lips.

Typical Concentration

The typical concentration of lanolin in lipsticks ranges from 5% to 20%.
Combination with Other Ingredients
Lanolin is often combined with other ingredients, such as:
- Waxes (e.g., beeswax, carnauba wax)
- Oils (e.g., coconut oil, olive oil)
- Humectants (e.g., hyaluronic acid, glycerin)
- Pigments (e.g., iron oxides, titanium dioxide)

By incorporating lanolin into lipstick formulations, manufacturers can create products that are not only visually appealing but also provide long-lasting moisturization and protection for the lips.(11)

BEES WAX

Figure 6: Bees Wax

Beeswax is a natural, renewable product. This means it is a sustainable alternative to synthetic, mineral oil-based waxes and other products.
•Moisturizing and Protective:
Beeswax forms a protective barrier on the lips, helping to seal in moisture and shield them from harsh environmental factors like wind and cold.

•Natural and Gentle:
Beeswax is a natural product of honey bees, making it a gentle and often preferred alternative for those seeking natural skincare options.

•Smooth Texture and Gloss:
Beeswax can contribute to a smoother, more luxurious texture and a subtle gloss in lipsticks.

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•Other Benefits:

Some studies suggest beeswax has antibacterial and anti-inflammatory properties, potentially aiding in healing and reducing irritation.

•DIY Lipsticks:

Beeswax is a common ingredient in homemade lipsticks, allowing for customization of color, texture, and added benefits.

For those looking for a natural, moisturizing, and protective lipstick option, beeswax is a valuable ingredient to consider.

Characteristics

Beeswax is a fragrant solid at room temperature. The colors are light yellow, medium yellow, or dark brown and white. Beeswax is a tough wax formed from a mixture of several chemical compounds. Beeswax has a relatively low melting point range of 62 to 64 °C.(12)

ISOPROPYL ALCOHOL:

Figure 7: Isopropyl Alcohol

Uses of Isopropyl Alcohol in Lipstick

- **Solvent:** It helps dissolve waxes, pigments, and other ingredients, ensuring a smooth, uniform mixture during production.
- **Quick-Drying Agent:** In liquid or long-wear lipsticks, it speeds up drying time after application, giving a matte or smudge-resistant finish.
- **Antimicrobial Function:** It can act as a mild preservative by reducing microbial contamination during formulation.
- **Degreasing Agent:** It helps remove excess oils from surfaces or tools during manufacturing, maintaining product purity.
- **Fragrance carrier:** IPA can act as a carrier for fragrance components helping distribute scent evenly throughout the product.

Benefits in Lipstick Formulations

- **Improved Texture:** By helping blend ingredients evenly, it contributes to a smoother, more consistent texture.
- **Enhanced Wearability:** In long-lasting formulas, it helps lock in color and reduce transfer.
- **Better Pigment Dispersion:** It ensures that colorants are evenly distributed, improving color payoff and stability.

That said, it's typically used in **very low concentrations** to avoid drying out the lips.(13).

TWEEN 80:

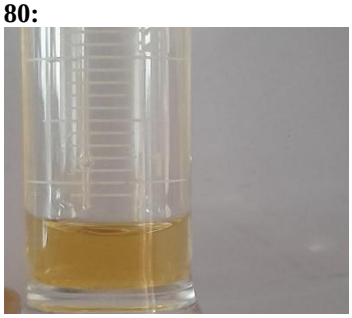

Figure 8: Tween 80

Polysorbate 80, also known as Tween 80, is a synthetic nonionic surfactant commonly used in food, cosmetics, and drug formulations as a solubilizer, stabilizer, or emulsifier. Recent data have indicated that polysorbate 80 is a biologically and possibly pharmacologically active compound and consequently may alter the pharmacologic properties of the drug it is formulated with or may itself directly mediate adverse events . Consequently, polysorbate 80 has been implicated in some of the adverse reactions associated with drugs formulated with this vehicle.(14)

Properties

Polysorbate 80 is a nonionic surfactant and emulsifier often used in pharmaceuticals, foods, and cosmetics. This synthetic compound is a viscous, water soluble yellow liquid.

Surfactant and Emulsifier:
Tween 80 is an effective emulsifier, particularly for oil-in-water emulsions, due to its amphiphilic nature (having both hydrophilic and hydrophobic parts).

Solubility:
It's soluble in water, alcohol, and some oils, but insoluble in mineral oil.

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Viscous Liquid:
Tween 80 is a viscous, yellow to amber-colored liquid.

Pharmacological Effects:
Studies suggest Tween 80 can affect cell membrane permeability, potentially impacting drug delivery and cellular responses. It can also influence microbial growth and biofilm formation, with species-specific effects.

Other Uses:
It's used in various applications, including:
Pharmaceuticals: As a solubilizer, stabilizer, and emulsifier in drug formulations.
Cosmetics: As an emulsifier in creams, lotions, and other products.
Foods: Approved for use in certain foods, typically at low concentrations (e.g., 1% in the US).
Laboratory Work: Used in identifying lipase-containing mycobacteria and in microbial culture media.(15)

GLYCERYL MONOSTEARATE:

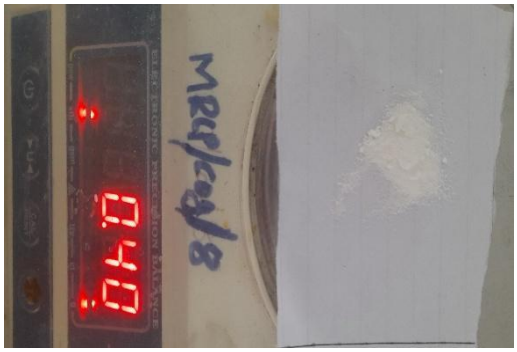

Figure9:Glyceryl Monostearate

Glyceryl monostearate (GMS) is a versatile compound widely used across the food, pharmaceutical, and cosmetic industries. Chemically, it is a monoglyceride formed by the esterification of glycerol with stearic acid, giving it the formula $C_{21}H_{42}O_4$.

USES : glyceryl monostearate is a versatile compound which is used as a stabilizer and emulsifier thickener and lubricant an in various sectors:
1.Food industry: it is used in texture and volume and shelf life of bread, cakes and pastries by preventing staling and maintaining moisture. It is also used as fat replacement and thickening and stabilizing agent.
2.Pharmaceutical industry: it is used as an excipient and stabilizer.
3.Cosmetic and personal care: it is used in sunscreen for homogeneity and ensuring even application.
Used as moisturizer and helping in hydrating and softening the skin.
GMS plays a subtle but essential role in lipstick formulation here's how it contributes:

Emulsifier: GMS helps blend oil and wax components with any water-based ingredients, ensuring a smooth, uniform texture.
Thickener & Stabilizer: It gives lipsticks their firm yet spreadable consistency and prevents ingredient separation over time.
Emollient: GMS adds a moisturizing effect, helping lips feel soft and hydrated.
Pigment Dispersant: It aids in evenly distributing color pigments, enhancing color payoff and consistency.
Opacifier: GMS can increase the opacity of the formula, giving lipsticks a richer, more vibrant appearance2.
Because of its **mildness, compatibility with other ingredients**, and **natural origin** (often derived from plant oils), GMS is a go-to ingredient in both conventional and natural lipstick lines(16).

STRAWBERRY ESSENCE:

Strawberry essence is a concentrated flavoring agent used to impart the sweet, fruity aroma and taste of strawberries to a wide range of products. It's typically made from a blend of natural and artificial ingredients, including esters, alcohol, and other volatile compounds that mimic the characteristic scent of fresh strawberries.

This essence is commonly available in liquid form and is used in culinary applications like cakes, candies, ice creams, and beverages. It's also popular in cosmetics and personal care products such as lip balms, shampoos, and body washes for its pleasant fragrance.

Strawberry essence is a versatile flavoring agent which is prepared through a process of maceration and extraction, where strawberry's are soaked in a high proof, neutral alcohol like vodka or everclear. This allows the alcohol to draw out the fruit's aromatic compound, creating a concentrated flavoring agent.
(17)

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METHYL PARABEN:

Methylparaben (methyl 4-hydroxybenzoate) is a synthetic preservative widely used in cosmetics, pharmaceuticals, and food products. It belongs to the paraben family—esters of p-hydroxybenzoic acid—and is valued for its antimicrobial and antifungal properties. It helps extend shelf life by preventing microbial contamination.

Uses of Methylparaben in Lipstick Preparation

- Antimicrobial Agent: Methylparaben inhibits the growth of bacteria, yeast, and molds, which can contaminate lipsticks during use or storage.
- Shelf-life Extension: It helps maintain the integrity of the product over time, especially in warm or humid environments.
- Compatibility: Methylparaben is chemically stable and compatible with a wide range of ingredients used in lipstick bases, such as waxes, oils, and pigments.
- Consumer Safety: Its inclusion ensures that the product remains safe for use throughout its intended lifespan, reducing the risk of skin infections or irritation.(18)

MATERIALS REQUIRED AND METHODS:

Materials required:

Soxhlet extraction apparatus
Weighing balance
Beakers
Thermometer
Stirrer

Table1 : Ingredients and Uses

Ingredients	F1	F2	F3
Castor oil	3ml	2.5ml	2ml
Beeswax	0.5gm	0.75gm	1gm
Lanolin	1.25gm	1.25gm	1.25gm
Isopropyl alcohol	0.2ml	0.2ml	0.2ml
Tween 80	0.5ml	0.5ml	0.5ml
Glyceryl monostearate	0.4gm	0.4gm	0.4gm
Bixa extract	0.6ml	0.8ml	1ml
Beetroot powder	0.4ml	0.4ml	0.4ml
Strawberry essence	q.s	q.s	q.s
Methyl paraben	q.s	q.s	q.s

Table 2 :Formulation table

METHOD OF PREPARATION:

INGREDIENTS	Uses
Castor oil	Moisturizing and hydration
Bees wax	Anti inflammatory
Lanolin	Antimicrobial
Isopropyl alcohol	Disinfecting and solvent properties
Tween 80	emulsifier
Glyceryl monostearate	Stabilizer and emollient
Bixa Ornella	Colouring agent
Beetroot powder	Reduce pigmentation
Methyl paraben	preservative
strawberry essence	Fragrance

EXTRACTION OF COLOUR PIGMENTS:

I. Extraction of Bixa Ornella: The shade dried coarsely powdered seeds of Bixa Ornella 50g was extracted with ethanol (60-80ºC) for 16 hrs. keep the extraction for distillation after completion of extraction the extract was filtered with whatman filter paper to remove any impurities if present.

The extract was evaporated on water bath to reduce its volume. Orange colour extract was obtained. The concentrated extract was then kept in desiccators to remove the excessive moisture. The extract
was packed in an air tight container for further studies.

II. beetroot extract:

Beet root was collected form the local market and wash and peel to remove the dirt and chop into pieces
Blend the beet root into pulp.
Boil the pulp with distilled water for 20 to 30 minutes and cool and filter remove the solids.
Store the red extract for further studies.

PROCEDURE

- Take castor oil bees wax in a beaker A, heat the mixture to 55 degrees c
- In another beaker B take isopropyl alcohol, tween 80, glyceryl monostearate and remaining ingredients and heat up to 55
- Then add the contents of beaker a to beaker by vigorous stirring.
- Then add the solution into the mould
- Freeze the moulds.

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Evaluation tests:

Organoleptic evaluations: The prepared lipstick formulations were evaluated for organoleptic parameters like its colour, odour, texture using sensory organs and the observations were reported as same.

Surface anomalies: Surface anomalies test was carried out for all the formulations in order to identify any kind of crystal formation, contamination or rough surface development on the lipstick formulations and the observations were reported .

Skin irritation test: This evaluation was carried out to ensure the irritation property of formulation. The lipsticks were applied on skin of volunteers and it is been left for 10 minutes and the observation was reported.

pH of the formulation: The pH of formulated herbal lipsticks was determined using pH meter. The average of 3 readings was taken and the pH was reported.

Size and shape analysis: Size and shape of developed lipstick formulations was carried out using vernier caliper. The shape was reported and length and width of lipsticks were determined by placing lipstick horizontally and vertically within jaws of vernier caliper and the readings taken thrice to get average value.

Solubility of lipsticks: Solubility of lipstick formulations were carried out using different solvents of varying polarity for this ethanol, water, chloroform, methanol, petroleum ether were used and solubility profile was reported as completely soluble, partially soluble and soluble.

Colour imparting test: Colour imparting test was carried out to ensure the dispersion of colour from the lipstick formulation. For this evaluation one lipstick from each formulation was taken and rubbed gently on the paper. The extent of colour dispersion was reported as poor, good or excellent. The observations were reported as same.

Melting point: Melting point of lipstick was a major parameter for this little quantity of lipstick formulation was placed in test tube and a thermometer was immersed in it. Then it was clamped tightly to burette stand. The whole assembly was immersed in a beaker containing water which is placed on a heating mantle. The temperature was increased gradually and at particular temperature at which the lipstick gets melted is been reported as its melting point.

Breaking point: Breaking point evaluation was carried out to determine the strength of lipstick. The lipstick was held horizontally in a socket inch away from the edge of support. The weight was placed using thread in position to vertical direction towards the gravity. Then the weight is been gradually increased by a specific value (10 gm) at specific interval of 30 second and weight at which breaks was considered as the breaking point. The average values of three readings were taken to avoid errors.

Perfume stability: The perfume stability of lipstick formulation was evaluated periodically at interval of 15 days and 30 days and the presence of perfume was reported.

II. RESULTS AND DISCUSSIONS:

Extraction of colour pigment from Bixa Orellana: The colour pigment from Bixa Orellana seeds were removed from the fruit and dried and colour pigment was extracted through Soxhlet extraction for 16 hrs and filtered and evaporated to reduce the volume red colour is obtained that is stored for further studies

Figure 10: Extraction Of Bixa Orellana

Development of lipstick formulation using natural pigment:

Using different concentration of oils and beeswax 3 different formulation chart was developed and accordingly the quantities each ingredients were taken and lipsticks were developed using moulding method. The lipsticks were shown in the below figure:

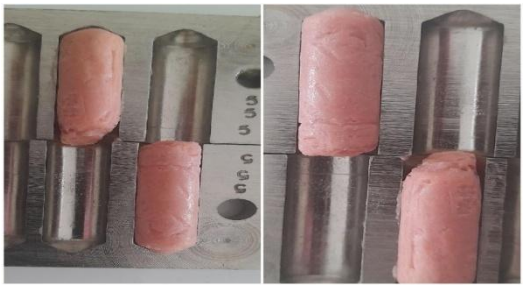

Figure 11: Lipsticks Formulations

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1.Organoleptic evaluation:

Developed lipstick were evaluated for its colour and odour and texture and observed characteristic were depicted in table.

	Parameter	F1	F2	F3
1.	colour	Orange	Orange	Orange
2.	Odour	Pleasant	Pleasant	Pleasant
3.	texture	smooth	smooth	smooth

Table 3 :Organoleptic Evaluation

2.Surface anomalies:

Surface anomalies test was carried out for all the formulation in which all the formulation f1 .f2,f3 absence of crystal formation, contamination and there is an even colour distribution of colour pigment was observed. The results are depicted in table

Sl.no	Parameter	formulation		
		F1	F2	F3
1.	Crystal formation	no	no	no
2.	contamination	no	no	no
3.	Colour distribution	even	even	even

Table 4:Surface Anomalies

3.Ph of the formulation: the ph of the each formulation was evaluated using digital ph meter whereas, all the formulation shows neutral ph values ranging from 6 to 7. The exact ph difference will not cause harm on the lips.

Slno	formulation	ph
1.	F1	6.1
2.	F2	6.7
3.	F3	7.0

Table 5: Ph of the formulation

Figure 12: Ph value

4.Skin irritation test:

Skin irritation test was carried out in volunteers. The skin was observed after application of 10 min. It was observed that there was no any skin irritation like redness, sweeling or itching is been observed in volunteer. All the formulations are free from irritation upon topical application.

5.Size and shape analysis:

The shape of all the lipsticks formulation were observed to be rounded smooth tip structure and length of the lipstick were ranging from 1cm diameter and 5cm length.

Sl.no	Parameter	F1	F2	F3
1.	Shape	Rounded and smooth tip	Rounded and smooth tip	Rounded and smooth tip
2.	Length	5cm	5cm	5cm
3.	Diameter	1cm	1cm	1cm

Table 6 :size and shape analysis

6.Solubility of lipstick:

The development of lipstick formulation were evaluated for its solubility profile since the lipsticks for formulation 3 contains more amount of bees wax the compared to other formulation even though all the formulations are insoluble in water, ethanol, and methanol.

Sl.no	Solvent	F1	F2	F3
1.	ethanol	Partially soluble	Partially soluble	Partially soluble
2.	water	Insoluble	Insolubl e	Insolubl e
3.	methanol	Partially soluble	Partially soluble	Partially soluble

Table 7 : solubility of lipstick

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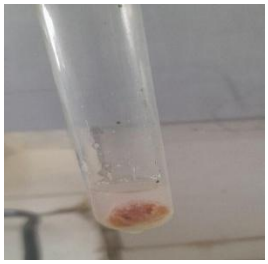

Figure 13: Solubility with water

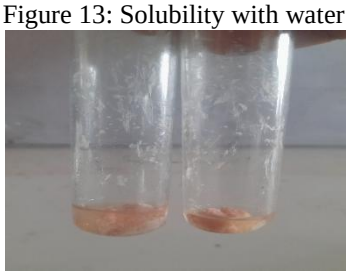

Figure 14: Solubility with ethanol and methanol

7.Colour imparting test:

Extent of colour imparting property of lipsticks formulation were evaluated using a white paper. Upon gentle pressure of all the three formulations showed same colour imparting property because equal addition of beet root powder and some variation is observed in other F1 and F2 because less addition of Bixa extract F3 shows good colour impartment property.

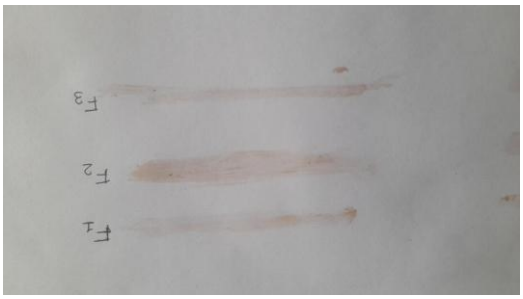

Figure 15: Colour imparting test

8.Melting point:

Melting point of all the formulation is observed at 55°c. So, the storage of lipstick formulation is recommended to be in cold places to prevent melting and promote ease of application.

Formulation	F1	F2	F3
Melting point	54°C	53°C	55°C

Table 8 : melting point

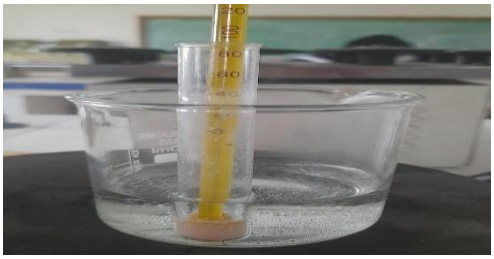

Figure 16: melting point

9.Breaking point:

F1 and F2 is observed least breaking strength because lesser amount of wax content

F3 is having more strength than compared to other formulation because f3 is having more amount of bees wax there is frequent increase in breaking strength is been observed.

10.Perfume stability:

Perfume stability of lipstick was carried out at 10^{th} day and 15^{th} day.

	F1	F2	F3
10^{th} day	good	good	good
15^{th} day	good	good	good

Table 9: perfume stability

III. CONCLUSION:

Considering the extensive use and importance of lip care in day today life the present work was designed and developed to prepare and evaluated the lipstick formulation using natural colour pigment. The aim of present work was to focus on the naturally occurring colour pigments and incorporating them into some cosmetics to avoid the synthetic colours to some extent. This could be helpful to safeguard our external health from the harmful side effects. After completion of the present project work some conclusions are briefed. Colour pigment was successfully extracted from bixa Orellana seeds using ethanol extraction process. Concentrated natural pigment was tested for its colour imparting property prior to development of lipstick. The lipstick formulation chart was developed considering varying the concentration of waxes and some emollient. The natural colour pigment was kept in all the

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 3 May-June 2025, pp: 2159-2170 www.ijprajournal.com ISSN: 2456-4494

formulation. the lipstick is prepared by molding method and formulation formulations were coded from F1to F3.Thus developed lipstick were evaluavted for various parameters.

Among all the formulations
In F1 we added 0.5gm of bees wax and 0.6ml of bixa extract.
In F2 we added 0.75gm of bees wax and 0.8ml of bixa extract
In F3 we added 1gm of bees wax and 1ml of bixa extract
So,F3 is considered as a best formulation because f3 has more amount of bees wax so texture is some more smooth in F3 formulation and the perfume stability is seen stable even after 15th day.

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