



Phytochemical Investigation of Palash Flowers and Preparation of Lipstick using Palash Flowers

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ABSTRACT

This study focuses on the phytochemical investigation of *Butea monosperma* (Palash) flowers and their application in herbal lipstick formulation. Palash flowers are known for their natural pigments and medicinal properties. The dried flowers were extracted using suitable solvent and subjected to phytochemical screening for the presence of flavonoid, tannins, phenols and saponins. The obtained extract was used as a natural coloring agent in lipstick showed good color, smooth texture and stability. The study concludes that Palash flowers can be used as a natural and safe alternative to synthetic colorants in cosmetic preparations. This study focuses on the formulation and evaluation of a herbal lipstick using the natural extract of Palash (*Butea monosperma*) flowers. Palash flowers are rich in natural pigments and phytochemicals which make them suitable for cosmetic applications. The aim of this research was to extract color from Palash flowers, Prepare a herbal lipstick formulation, and evaluate its physiochemical properties. The formulation was assessed for color, pH, melting point, spreadability, and stability. Results indicated that Palash flower extract provides a natural color and acceptable cosmetic properties for herbal lipstick preparation. Herbal cosmetics are more popular due to its efficacy, ease of availability, low cost, and lack of side effects. *Butea monosperma* (BM) belonging to the family *Fabaceae* is a widely known herbal plant which is a moderate sized deciduous tree grown widely in many parts of India it is also known as flame of forest commonly known as palash. It contains phytoconstituents like butin, butein, isobutrin, coreopsin, isocoreopsin, sulphurein, monospermoside and isomonospermoside, chalcones, aurones, flavonoids (palasitrin, prunetin) and steroids, alkaloids, flavonoids, phenolic compounds, amino acids, glycosides, steroids etc. The plant is highly used by the rural and tribal people in curing various ailments. Almost all parts of plant are used in the form of extract, juice, infusion, powder and gum. Different part of plant extract of *butea monosperma* (palash) shows various cosmeceutical activities. This review focuses on *butea monosperma* having cosmeceutical potential such as antifungal, antibacterial, anti-inflammatory, antioxidant activity, natural coloring agent, sun protecting factor (SPF).

Keywords: antibacterial, antifungal, anti-inflammatory, antioxidant, *Butea monosperma*, SPF.

INTRODUCTION:

Palash flower is widely used in traditional medicine and as a natural coloring agent. Palash flowers contain various phytochemicals such as flavonoids, tannins, glycosides, saponins, and phenolic compounds. Due to its natural orange-red pigment, Palash flower extract can be used in herbal lipstick formulation. Herbal cosmetics have gained significant popularity in recent years due to their safety, effectiveness, and minimal side effects compared to synthetic cosmetic products. Lipstick is one of the most commonly used cosmetic products worldwide.

However, many commercial lipsticks contain synthetic dyes, heavy metals, and chemicals that may cause allergic reactions, skin irritation, dryness, and long-term health hazards. Therefore, there is an increasing demand for natural and herbal alternatives in cosmetic formulations.

Palash flower (*Butea monosperma*), commonly known as "Flame of the Forest", are widely distributed in India and are known for their bright orange-red color and medicinal properties. These flowers contain various phytochemical constituents such as flavonoids, tannins, glycosides, and phenolic compounds. These phytochemicals possess antioxidant, antimicrobial, and anti-inflammatory properties which make palash flowers suitable for cosmetic applications. The natural pigments present in palash flowers can be used as coloring agents in herbal lipstick preparation.



Butea monosperma (Lam.) Kuntze is commonly known as palash and also known as the “Flame of the Forest”. The tree is believed to be a form of Agnidev, who is the God of Fire.

- **Extraction techniques**

- **Soxhletion method**

The *butea monosperma* extract is prepared by Soxhlet extraction method. 50gm of air dried plant material (flower, leaves and stem bark) of *butea monosperma* is extracted with 30 ml solvent (ethanol, methanol, etc.) in a Soxhlet extraction apparatus for 24 hours. Then remove the solvent and extract with petroleum ether (60-80 °C) to remove the waxy materials.

- **Cosmetic uses of *Butea monosperma***

Different part of and extract of *butea monosperma* shows various cosmeceutical activities such as antifungal, antibacterial, anti-inflammatory, free radical scavenging activity, natural coloring agent and sun protecting factor.

- **Antifungal activity**

Palash stem bark extract in ethyl acetate and petroleum have antifungal action against *Cladosporium cladosporioides*. Medicarpin is the chemical component responsible for its antifungal action. Its antifungal activity was shown to be stronger than that of the common fungal skin infection and used to formulate cosmetic products.

- **Antibacterial activity**

Butea monosperma gum is used to treat bacterial infections. The antibacterial activity of an alcoholic extract of *butea monosperma* gum was tested in vitro. It was done utilising disc diffusion against several microbial strains such as *Staphylococcus aureus*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, and *Candida albicans*.

- **Anti-inflammatory activity**

The anti-inflammatory efficacy of *butea monosperma* methanolic extract was assessed using carrageen-induced paw edema and cotton pellet granuloma. In carrageenin-induced paw edema, 600 and 800mg/kg prevented paw edema by 26 and 35%, respectively, and cotton pellet granuloma prevention of granuloma tissue development by 26 and 35%. *Butea monosperma* flowers hydroalcoholic extract and butrin, isobutrin enriched fraction were able to reduce the release of pro-inflammatory cytokines, matrix metalloproteinase, and prostaglandin synthesis. It also efficiently reduces any boils, pus or carbuncles and burning sensation on the areas of the skin affected by allergies, fungal infections, environmental pollutants and sun rays.

- **Free radical scavenging activity**

Antioxidants, such as butylated hydroxy toluene (BHT) and butylated hydroxy anisole (BHA), now a days used in cosmetics are suspected to be carcinogenic, and thus the use of plant based antioxidants has increased in recent years. According to unani research, the flower of *butea monosperma* contains butein, isobutein, and other chemical elements that are responsible for antioxidant function. Accordingly, utilisation of natural antioxidants in the formulation of cosmetic products like anti-ageing, antiwrinkle.

AIM and OBJECTIVES:

AIM:

Phytochemical investigation of palash flowers and preparation of lipstick using palash flowers.

OBJECTIVE:

1. To collect and identify Palash flowers for the study.

- 2.To prepare extract of Palash flowers using suitable extraction method.
- 3.To perform phytochemical investigation of Palash flower extract.
- 4.To formulate herbal lipstick using Palas flower extract as natural colouring agent.
- 5.To evaluate the prepared lipstick for various parameters such as colour, pH, melting point and stability.
- 6.To develop safe, natural and herbal lipstick formulation using Palash flowers.
- 7.To formulate a lipstick that is safe, effective, and suitable for all skin types.
- 8.For the Purpose of Beautification of Lips and to use in treatment of different Lip problems.
- 9.To promote the benefits of using a natural and eco-friendly lipstick to consumers.
- 10.Pigmentation: The bright red color of the *Butea monosperma* flower is used as a natural pigments in lipstick. It provides a rich and vibrant re color to the lips.

○ **Plant of work:**

1. Selection of Herbal Pigment For Formulation of Lipstick
2. Extraction of Pigment
3. Method of Formulation
4. Evaluation Parameter

Selection of Herbal Pigment For Formulation of Lipstick



Fig.1. Butea monosperma flower

Butea monosperma flower was selected as herbal pigment for formulation of lipstick.

Drug Profile of Palash Flowers

1. Biological Name - *Butea monosperma*
2. Synonyms - *Butea frondosa* - *Erythrina monosperma*



3. Family - Fabaceae

4. Common Names - Palash - Flame of the Forest - Tesu - Dhak

5. Biological Source The biological source of Palash consists of the dried flowers of *Butea monosperma* belonging to the family fabaceae.

Geographical Source

Butea monosperma is widely distributed in tropical and subtropical regions of India. It is commonly found in states such as Maharashtra, Madhya Pradesh, Uttar Pradesh, Rajasthan, and Bihar. It is also grows in forests, plains, and dry regions of Southeast.

Asia.

7. Morphological Description

a) Plant (tree)

- Medium-sized deciduous tree

- Height: 10-15 meters

- Bark: Greyish or brown, rough

b) Leaves

- Large and trifoliate (three leaflets)

- Broad and leathery

c) Flowers

- Bright orange -red in colour

- Arranged in dense clusters

- Flowering season: February to april

- Rich in natural pigments

d) Fruits

- Flat pods containing one seed

8. Chemical constituents

Palash flowers contains various important phytochemicals such as:

- Flavonoids: Responsible for antioxidant activity and natural coloring

- Tannins: Provide astringent and antimicrobial properties

- Phenolic compounds: Protect against oxidative damage

- Glycosides: Show medicinal activity

- Saponins: Provide cleansing and foaming properties.



This constituents make Palash flowers suitable for medicinal and cosmetic applications.

9. Parts Used

- Flower (mainly used for this project)
- Leaves
- Bark
- Seeds

10. Medicinal Uses

Palash has been used in traditional medicine for many years. Some important medicinal uses include:

- Anti-inflammatory activity
- Antioxidant activity
- Antimicrobial activity
- Treatment of skin disorders
- Wound healing properties
- Used in Ayurveda for various diseases

11. Uses in cosmetics

Palash flowers are widely used in herbal cosmetic preparations due to their natural properties:

- Used as a natural coloring agent
- Used in herbal lipstick formulation
- Provides safe and chemical-free color
- Protects lips due to antioxidant properties
- Eco-friendly and biodegradable

Methodology

- Collection and Preparation of Plant Material.
- Extraction of Palash Flower Pigment
- Phytochemical Screening

The Palash flower extract was subjected to various qualitative phytochemical testes to detect the presence of different bioactive



compounds.

1. Test for Flavonoids :

A small amount of extract was treated with a few drops of dilute ammonia solution. Formation of yellow coloring indicated the presence of flavonoids.

2. Test for Tannins :

The extract was treated with ferric chloride solution. Appearance of dark green or blue-black color confirmed the presence of tannins.

3. Test for Phenols :

The extract was treated with ferric chloride reagent. Formation of color indicated the presence of phenolic compounds.

4. Test for Saponins :

The extract was shaken with water. Formation of stable foam indicated the presence of saponins.

5. Test for Glycosides :

The extract was treated with appropriate reagents; color change indicated the presence of glycosides.

Formulation of Herbal Lipstick

The herbal lipstick was prepared using natural ingredients along with Palash Flower extract as a coloring agent.

Procedure

- Beeswax was taken in a beaker and melted using a water bath.
- Coconut oil or castor oil was added to the melted beeswax and mixed thoroughly.
- The Palash flower extract was added slowly to the mixture with continuous stirring to obtain uniform color.
- Vitamin E capsule was added as an antioxidant and preservative.
- The mixture was stirred properly to ensure uniform consistency.
- The molten mixture was poured into lipstick moulds.
- The moulds were allowed to cool at room temperature until solidification.
- After complete cooling, the lipstick was removed from the mould and stored for evaluation.

Evaluation of Herbal Lipstick

The prepared lipstick was evaluated for the following parameters:

- Color : The appearance and intensity of color were observed visually.
- Texture : Smoothness and uniformity of the lipstick were checked by touch.
- Melting Point : Determined by heating the lipstick gradually.
- Spreadability : Tested by applying lipstick on skin.



- Stability : The lipstick was observed for any changes in color, texture, or odor over time.

EXPERIMENTAL WORK

Phytochemical screening Palash flower extract

□ **Phytochemical test** : phytochemical test screening of palash flower extract was carried out to detect the presence of various chemical constituents such as carbohydrates, amino acid, steroid, Glycoside flavonoids, Alkaloids, tannins, acidic compound organic acid etc.

1. Carbohydrates Test
2. Amino Acid Test
3. Steroid Test
4. Cardic Glycosides Test
5. Tannins Test
6. Flavonoids Test
7. Acidic Compound Test
8. Organic Acid Test



Fig.2. Phytochemical test

Formulation of Lipstick :

□ Ingredients and Formula

Sr.no	Ingredients	Quantity	Role	Function
1.	Beeswax	3g	Provides	Give firmness, improve
2.	Cocoa butter	2g	Hardness moisturizer	
3.	Coconut oil	2ml	Emollient	Shape retention make lips soft, prevent dryness
4.	Castor oil	2ml	Glass & smooth	Add shine & improves spreadability
5.	Palash flower extract	1-2g	Natural colorant & active compound	Provide natural colour, antioxidant property
6.	Vitamin E	2-3 drops	Antioxidant	Prevents rancidity

Procedure :

- Step 1: Collection and drying



- Collect fresh Palash flowers
- Wash properly to remove dust
- Dry in shade for 4-5 days
- Step 2: Powder Preparation
- Grind dried flowers into fine powder
- Store in an airtight container
- Step 3: Extraction
- Take Palash powder in a beaker
- Add ethanol or distilled water
- Keep for 24 hours (maceration)
- Filter using filter paper
- Collect the extract
- Step 4: Preparation of Base
- Take beeswax and cocoa butter in a beaker
- Heat using water bath until completely melted
- Step 5: Addition of oils
- Add coconut oil and castor oil
- Stir continuously for uniform mixing
- Step 6: Addition of extract
- Add Palash flower extract slowly into melted base
- Mix properly to get uniform color
- Step 7: Addition of Additives
- Add vitamin E (antioxidant)
- Add fragrance (rose essence, optional)
- Step 8: Moulding
- Pour the mixture into lipstick mould
- Avoid air bubbles
- Step 9: Cooling
- Allow it to cool at room temperature



- Keep in refrigerator for better setting

□ Step 10: Removal and Storage

-Remove lipstick from mould carefully

- Store in cool and dry place.

Evaluation Parameter

It is very essential to maintain a uniform standard for herbal lipstick, keeping this view in mind the formulated herbal lipsticks was evaluated on the parameters such as melting point, breaking point force of application, surface anomalies etc.

Colour and Texture :

Formulated lipsticks were checked for colour, glossy and smooth texture.

pH :

The pH of formulated herbal lipsticks was determined using a pH paper.

Melting Point :

Determination of melting point is important as it is an indication of the limit of safe storage. The melting point of formulated lipstick was determined by capillary tube method, the capillary was filled and kept in the capillary apparatus and firstly observed the product was slowly-slowly melted. After some times observation product was completely melted. The above procedure was done in 3 times and the melting point ratio was observed in all formulations.

Breaking Point :

Breaking point was done to determine the strength of lipstick. The herbal lipstick was placed horizontally in the socket away from the edge of support. The weight at which breaks was considered as the breaking point.

Force of Application :

It is test for comparative measurement of the force to be applied for application. A piece of coarse brown paper kept on a shadow graph balance and lipstick was applied 45 angle to cover a 1sq. inch area until fully covered. The pressure reading is an indication of force of application.

Solubility test :

The formulation herbal lipstick was dissolved in various solvents to observe the solubility.

Skin Irritation Test :

It is carried out by applying product on the skin for 10 min and observed.

Perfume Stability :

The formulation herbal lipstick was tested after 30 days, to record fragrance.

Aging stability :

Prepare herbal lipstick was stored at refrigerator temperature (4°C), room temperature (20 to 25°C), and high temperature (30 to 40°C) for 1h. various parameters such as bleeding, straking, catering, and blooming were observed.



Surface anomalies :

This test for determining the surface defects, such as no formation crystals on surfaces, no contamination by molds, fungi.

Result and Discussion

Result of Phytochemical Screening of Palash Flowers : The preliminary phytochemical screening of Palash flowers (*Butea monosperma*) extract revealed the presence of various bioactive constituents. The tests confirmed that the extract contains carbohydrates, amino acids, steroids, flavonoids, alkaloids, tannins, acidic compounds, and other organic compounds. The presence of these phytochemicals indicates that the plant has medicinal as well as cosmetic importance. The results support the use of Palash flower extract as a natural ingredient in herbal formulations such as lipstick.

• Phytochemicals and Result

SR.NO	PHYTOCHEMICAL	RESULT
1.	Carbohydrates	Present(+)
2.	AminoAcids	Present(+)
3.	Steroids	Present(+)
4.	Flavonoids	Present(+)
5.	Alkaloids	Present(+)
6.	Tannins	Present(+)
7.	Acidic Compounds	Present(+)
8.	Organic Compounds	Present(+)

• Discussion of Phytochemical Testes

The preliminary phytochemical screening of Palash flowers (*Butea monosperma*) extract revealed the presence of various bioactive compounds. Each test performed gives important information about the chemical nature and potential applications of the plant extract.

1. Carbohydrates:

The Molisch's test showed a positive result indicating the presence of carbohydrates. These compounds help in **hydration and nourishment** of the skin and contribute to the moisturizing effect in lipstick formulation.

2. Amino Acids:

The ninhydrin test confirmed the presence of amino acids. Amino acids are essential for **skin repair and regeneration** making them beneficial for maintaining healthy lips.

3. Steroids:

The Salkowski test indicated the presence of steroids. Steroids possess **anti-inflammatory properties**, which help in soothing irritated or dry lips.

4. Flavonoids:

The Shinoda test confirmed flavonoids in the extract. These are powerful **antioxidants** that protect lips from oxidative stress and environmental damage, enhancing the protective effect of the lipstick.

5. Alkaloids:

Positive results in Dragendroff's test showed the presence of alkaloids. Alkaloids exhibit **antimicrobial activity**, which helps in preventing infections and maintaining lip hygiene.



6. Tannins:

Ferric chloride test confirmed tannins. These compounds have **astringent properties**, which helps in tightening tissues and providing a protective layer on the lips.

7. Acidic Compounds:

The litmus test indicated the presence of acidic compounds. These help in maintaining the **pH balance** of the formulation, making it safe and compatible with skin.

8. Organic Compounds:

General tests confirmed the presence of organic compounds, which contribute to the **overall biological activity** and **stability** of the extract.

• Overall Discussion

The presence of these phytochemicals demonstrates that Palash flower extract has significant **cosmetic** and **therapeutic potential**. These compounds collectively provide **antioxidant**, **antimicrobial**, **anti-inflammatory**, and **moisturizing properties**, which are highly desirable in herbal lipstick formulations.

• Result of Lipstick Evaluation (Observed Result)

The prepared herbal lipstick was evaluated for various parameters, and the following observations were recorded :

Sr.no	Parameter	Observed Result
1.	Color	Uniform light orange/reddish
2.	Odor	Pleasant fragrance
3.	Appearance	Smooth and glossy
4.	Texture	Soft and uniform
5.	pH	6-7(near neutral)
6.	Melting Point	60-70°C
7.	Breaking Point	With stood moderate pressure
8.	Spreadability	Easy and smooth application
9.	Surface Anomalies	No cracks,no sweating
10.	Stability	Stable at room temperature
11.	Skin Irritation	No irritation observed

• Final conclusion:

The present research work on **phytochemical investigation of Palash flowers and preparation of herbal lipstick using Palash flower extract** was successfully carried out with satisfactory results. The preliminary phytochemical screening of Palash flower (*Butea monosperma*) extract confirmed the presence of several important bioactive constituents such as **carbohydrates, amino acids, flavonoids, alkaloids, tannins, steroids, acidic compounds, and organic compounds**. These phytochemicals are known to exhibit various biological activities including **antioxidant, antimicrobial, anti-inflammatory, and skin-protective properties**, which are highly beneficial in cosmetic formulations. The presence of flavonoids and phenolic/tannin compounds indicates strong antioxidant potential, which helps in protecting the lips from oxidative stress and environmental damage. Alkaloids and steroids contribute to antimicrobial and soothing effects, while carbohydrates and amino acids support hydration and nourishment of lip tissues. Based on these finding, Palash flower extract was on successfully incorporated into a herbal lipstick formulation using natural ingredients such as beeswax, cocoa butter, and oils. The formulation process resulted in a stable product with good consistency, smooth texture, and uniform coloration due to the natural pigments present in the extract.

The prepared lipstick was evaluated for various parameters such as **color, odor, texture, pH, melting point, spreadability, breaking point, surface stability, and skin irritation**. The results of these evaluations showed that the lipstick possesses **desirable cosmetic properties**, including smooth application, good stability, acceptable hardness, and safe pH suitable for lip use. No signs of irritation or adverse effects were observed, confirming its safety. Furthermore, the formulation demonstrated



good physical stability and aesthetic appeal, indicating successful incorporation of natural ingredients without compromising product quality.

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