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## Formulation and Evaluation of Multipurpose Herbal Hair Cream



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**Silpa G\*, N L Gowrishankar, Arjun Shaju, Ayesha. P S, Fehmi Ashraf K V, Sneha R, Vinaya Vijayan**

*\*Department of Pharmaceutics, Prime College of Pharmacy, Palakkad, India.*

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### ABSTRACT

Herbal hair care products have gained significant popularity due to their potential benefits in promoting healthy hair growth and preventing hair related problems. This abstract presents the formulation of novel herbal hair cream utilizing the extract of Ixora coccinea and curry leaves. Ixora coccinea and curry leaves have long been recognized for their therapeutic properties, including their ability to nourish hair follicles, strengthen hair strands, and enhance health. In this study, the extract of Ixora coccinea flower and curry leaves were incorporated into a synergistic hair cream formulation. The formulation process involved the extraction of active constituents from Ixora coccinea flower and curry leaves using appropriate solvent system. The obtained extract was then standardized for key phytochemical compounds, such as flavonoids, alkaloids, phenols, and terpenoids, through qualitative analyses. These compounds are known to possess antioxidant, antimicrobial, and hair growth-stimulating properties. Preliminary results demonstrated promising hair-related benefits associated with the formulated herbal cream. It exhibited considerable potential in promoting hair growth, reducing hair loss, and improving overall scalp health.



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## INTRODUCTION

The word 'Cosmetic' derived from a Greek word 'kosmesticos' that means to adorn. It is referred as Products, are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only, shall be called as "Herbal Cosmetics.[1]

## HAIR CREAM

Hair creams are used for protecting, styling, and refining the feel and look of hair. These cosmetic products obtain their desired properties through their many different ingredients. Hair creams are emulsion products providing nourishment and high gloss to hair. They may also be O/W or W/O emulsions, which break down easily on application. Creams can simply be oil in water emulsions with a 10-25% oil phase. The cream is a hybrid of the clear gel and an oil treatment or the emulsion. It can be a polymer-stabilized cream or simply a dispersion of oils, esters, or fatty products in a gelling matrix. The emulsion-stabilizing polymer thickener and stabilizer can be shear thinning for easier distribution and a lighter feel on the hands and the hair. The choice and concentration of esters, oils, silicones, fatty alcohols, or waxes determines the final feel and look of the product after dry-down. The higher the viscosity or melting point of the oils and waxes, the greasier the feel will be on the hair after dry-down and perhaps during the wet application.

## FUNCTIONS OF HAIR CREAM

- Promote hair growth.
- Hair cream provides nourishment to your hair.
- It gives medium hold to your hair and helps to get a wet look.
- It moisturizes the hair.
- Helps fight hair fall.
- Makes hair soft, shiny.
- Control hair damage.
- It improves the feel, texture and appearances and manageability of hair.

- It helps to reduce friction between strands of hair to allow smoother brushing.

- **MATERIALS AND METHOD**

**Plant Profile**



**Fig 1: *Ixora coccinea***

**Taxonomical classification of *Ixora Coccinea***

Table 1: Taxonomical classification of *Ixora Coccinea*

Kingdom	Plantae
Subkingdom	Tracheobionta
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Asteridae
Order	Rubiales
Family	Rubiaceae
Genus	<i>Ixora</i>
Species	<i>coccinea</i>

## USES

- Promote hair growth.
- Prevent hair loss.
- Balance the scalp sebum production with reduces dandruff formation.
- To treat dysentery and tuberculosis. (12)



**Fig 2: Curry Leaves**

## Taxonomical classification of *curry leaves*

Table 2: Taxonomical classification of *curry leaves*

Kingdom	Plantae
Subkingdom	Tracheodionta
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass:	Rosidae
Order:	Sapindales
Family	Rutaceae
Genus	Murraya
Species	koenigii

## USES

- Anti-Dandruff: Curry leaves when used regularly remove dead hair follicles, which is one of the reasons behind dandruff.
- Prevent Premature greying.
- Stimulates Hair Growth.
- Rejuvenation of Hair Follicles.
- Strengthening of Hair Shafts.
- Prevents Hair Thinning.

## METHODOLOGY

### Preparation of extract of *Ixora Coccinea*

The Ixora flower was collected, cleaned and shade dried and grained into fine powder (sieve no.22). The 20g of Ixora fine powdered plant material were weighed out and extracted by using Maceration technique with 300ml of methanol and then loaded into maceration chamber (after 72 hours) the product was filtered and evaporated.

### Preparation of extract of *Murraya koeinigii*

The 20g of fresh curry leaves was collected, cleaned and chopped into small pieces. It was extracted by decoction technique, mix fresh curry leaves with 100 ml distilled water in a beaker. It boils for 20 minutes and then filtered and collected the extract.

## PRELIMINARY PHYTOCHEMICAL TEST

### 1. Test for Carbohydrates

#### a) Fehling's test

Mix Fehling's A and Fehling's B solution boil for 1 minute. Add extract boil for 5-10 minutes.

Appearance of orange red precipitates indicates presence of carbohydrates.

**b) Benedict's test**

Mix Benedict's reagent and extracts heat in boiling water bath for 15 minutes. Solution appears green yellow or red indicate presence of reducing sugar.

**2. Test for Flavonoids**

**a) Alkaline test**

Test solution treated with sodium hydroxide solution. Increasing in the in the intensity of yellow color which become colorless on addition of dilute acid indicate presence of flavonoids.

**b) Ferric Chloride test**

To the alcoholic solution of extract add few drops of neutral ferric chloride solution. Appearance of green color indicates presence of flavonoids.

**3. Test for Protein**

**a) Ninhydrin test**

Test solution treated with Ninhydrin reagent and warms the solution. Appearance of blue indicates the presence of protein.

**b) Xanthoprotein test**

Test solution treated with concentrated nitric acid and boiled. Appearance of yellow precipitate indicates presence of protein.

**4. Test for Glycosides**

**a) Keller killani test**

The test solution with few drops of glacial acetic acid in 2 ml of ferric chloride and concentrated sulphuric acid is added from the sides of test tube. Shows the separation between two layers, lower layer shows reddish brown and upper layer turns bluish green indicate the presence of glycosides.

**b) Legal test**

Test solution when treated with pyridine (made alkaline by adding sodium nitroprusside solution). Pink to red color indicate the presence of glycosides.

**5. Test for Tannins**

a) To the extract add 10% alcoholic ferric chloride. Black precipitate indicates presence of tannin.

**b) Lead acetate test**

A few drops of Lead acetate were added to 5 ml of aqueous extract. Formation of yellow or red color precipitate indicates the presence of tannins.

**6. Test for Saponin**

**Salkowski reaction**

A small quantity of the extract was mixed with 2 ml Chloroform and 2 ml concentrated sulphuric acid, Shake it well. Chloroform layer appears red and acid layer shows greenish yellow fluorescence.

**FORMULATION OF HERBAL HAIR CREAM**

Weigh the required amount of ingredients. Oil phase is prepared by melting beeswax on China dish followed by the addition stearic acid, lanolin, cetyl alcohol, mint oil and almond oil. Aqueous phase is prepared by dissolving extract of ixora and curry leaves on China dish followed by the addition triethanolamine and water. Both phases maintained at 70°C. Later oil phase was added to aqueous phase with constant stirring and required preservatives were added and smooth cream was formed.

Table 3: Formulation chart of Hair cream

SL NO.	CONTENT	QUANTITY
1	Curry Leaves Extract	2.5ml
2	Ixora Flower Extract	6.25ml
3	Stearic Acid	10g
4	Shea Butter	5g
5	Cetyl Alcohol	7.5g
6	Lanolin	2.5g
7	Olive Oil	2.5ml
8	Almond Oil	2.5ml
9	Methyl Paraben	0.005g
10	Propyl Paraben	0.025g
11	Triethanolamine	5g
12	Water	Q.S

### Packing of Cream:

The prepared cream was packed in a wide mouth bottle with air tight closure.

## EVALUATION STUDIES

### A. Organoleptic Properties of Hair Cream

Organoleptic properties such as color, odor, clarity and homogeneity of the herbal hair cream were observed by visual inspection.

### B. Determination Of pH

The pH meter was calibrated using standard buffer solution. About 0.5g of the cream was weighed and dissolved 50.0 ml of distilled water and its pH was measured.

### C. Viscosity

The viscosity of hair cream was measured using Brookfield viscometer, 100 ml of the hair cream was analyzed using spindle no.64 at 12 RPM.



#### **D. Spreadability**

Spreadability of formulation was determined by measuring the spreading diameter of one gram of sample between two horizontal glass plates. (10cm × 20cm) after one minute.

Spreadability denotes the extent of area to which the formulation spreads on application to skin. The bioavailability efficiency of a formulation also depends on its spreading value.

Two glass slides of standard dimensions were taken. For this purpose, cream was applied in between two glass slides and they were pressed together to obtain a film of uniform thickness by placing 1000 gm weight for 5 minutes.

The spreadability (S) can be calculated using the formula

$$S = M.L/T$$

Where,

M = weight tied to upper slide

L = length to separate the slide

T = time taken to separate the slide

#### **E. Stability study at room temperature**

Optimized formulation kept in a tightly closed air tight container and stored at room temperature for 3 months and observed for any visible changes in colour, odour and physical state.

## RESULT AND DISCUSSION

### A. PRE-FORMULATION STUDIES

Table no.4: Preliminary phytochemical screening

TEST	IXORA FLOWER	CURRY LEAVES
<b>Carbohydrates</b>		
Felhings test	+	+
Benedicts test	+	+
<b>Flavanoids</b>		
Alkaline test	+	+
Ferric Chloride	+	+
<b>Protein</b>		
Ninhydrin test	+	+
Xanthoprotein test	+	+
<b>Glycosides</b>		
Keller killani test	-	+
Legal test	-	+
<b>Tannins</b>		
Lead acetate test	+	+
<b>Saponnin</b>		
Salkowski test	+	+



Fig. no. 3: Chemical test

## B. FORMULATION OF HERBAL HAIR CREAM



**Fig. no. 4: Hair Cream Formulation**

## EVALUATION STUDIES

### A. Organoleptic properties of herbal hair cream

Result showed that the organoleptic properties of herbal hair cream.

Table no. 5: Organoleptic properties of herbal hair cream

SL.NO.	ORGANOLEPTIC PROPERTIES	INFERENCE
1.	Colour	Light pink
2.	Odour	Pleasant odour
3	Appearance	Smooth texture

### B. Determination of pH

PH of the hair cream was observed by using digital pH meter and the pH of the cream was found to be **4.90 pH**.



**Fig 5: Determination of pH**

### C. Viscosity Evaluation

Viscosity of the hair cream was done by using Brookfield viscometer at temperature 25°C using spindle No. 64 at 12 RPM. Viscosity of the hair cream was found to be **17600 CP**.



**Fig 6: Viscosity evaluation**

### D. Spreadability

Table no. 6: Spreadability of cream was observed.

SL.NO.	Sample	Length(cm)	Time taken(s)	Spreadability(gcm/s)
1	Cream	5	14	35.71

### E. Stability study at room temperature

No visible changes in color, odor and physical state were observed upon 3-month storage at room temperature. This indicates stability of the Optimized formulation at room temperature.

### CONCLUSION

Herbal formulation for hair cream preparation contains various active constituents. The combination of *Ixora coccinea* and curry leaves in herbal hair cream has shown promising results in promoting hair health and addressing various hair-related issues. This formulation contains different active constituent have:

- Anti-oxidant (*Ixora coccinea* and curry leaves)

*Ixora coccinea* and curry leaves act as to nourish the scalp, strengthen hair follicles, and improve overall hair shining. The cream provides deep conditioning, moisturizes the scalp, and helps reduce dryness, dandruff, and itchiness. The antioxidants present in the herbal ingredients protect the hair from oxidative stress, promoting healthier and more vibrant hair. Hence combination contains extract and volatile oil for the preparation.

In present study aim at herbal formulation was prepared and various parameters are evaluated. The herbal cream shown acidic pH, viscosity, and spreadability. Overall, the herbal hair cream enriches and holds great potential for those seeking natural solutions to hair care practices, it can contribute to healthier, and stronger.

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