

FORMULATION AND EVALUATION ANTI-AGING HERBAL GEL FROM MULBERRY LEAVES

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ABSTRACT

Hair masks are formulated to address common hair issues, including dandruff, frizz, brittleness, and premature greying. Given the variety of available products, selecting an appropriate hair mask with minimal adverse effects can be challenging. The composition of these masks is based on known beneficial ingredients for hair health. Their primary functions include cleansing (removal of dirt and dandruff), strengthening hair fibres, and enhancing pigmentation. The described hair mask is free of synthetic chemicals, utilizing only natural components to ensure safety and efficacy. The hair root, a critical anatomical structure, influences external appearance, sexual dimorphism, thermoregulation, and protective functions. Recent lifestyle factors—such as stress, nutritional deficiencies, fatigue, and chemical treatments—have contributed to increased hair related disorders among younger populations. Alopecia, often a permanent condition, underscores the importance of follicle reinforcement to promote hair growth and minimize loss. Due to the hair's structural vulnerability, we have developed a hair mask incorporating bioactive compounds specifically selected to enhance hair strength and melanin retention. This formulation is designed to optimize hair care while minimizing potential damage.

KEYWORDS: Hair, Hair Cosmetic, Herbal, Hair Care, Healthy Hair.

INTRODUCTION

Human Hair

Human hair is a remarkable and multifunctional feature that plays a vital role in protection, sensory perception, and social identity. Composed primarily of keratin, a strong fibrous protein, hair grows from follicles embedded in the skin and varies widely in texture, colour, and thickness across individuals and ethnicities. Beyond its biological functions—such as shielding the scalp from UV radiation and regulating body temperature—hair holds significant cultural and

aesthetic value, often serving as a means of self-expression. The structure of hair consists of three key layers: the cuticle, cortex, and medulla, each contributing to its strength, elasticity, and appearance.^[1]

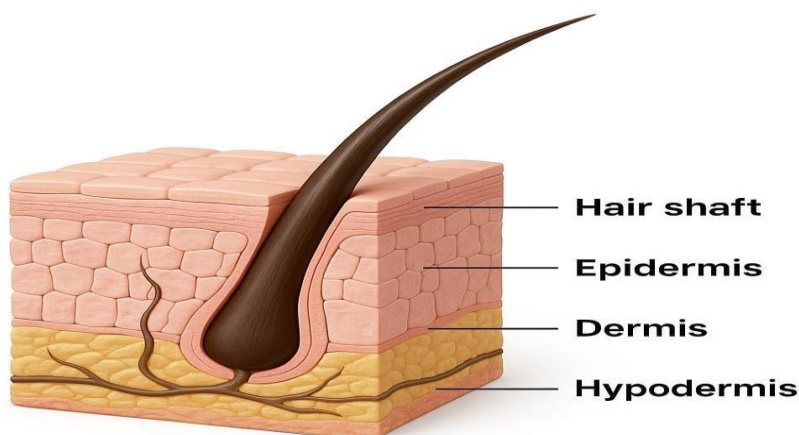
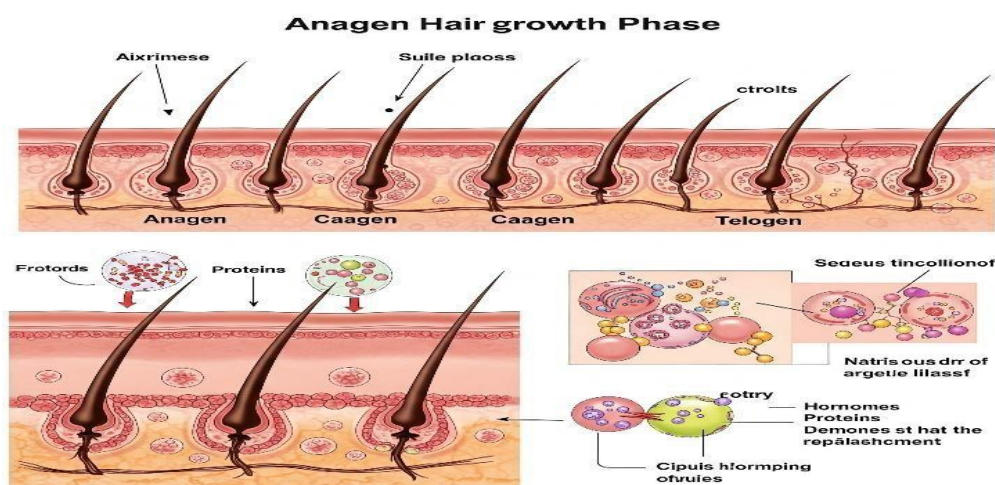


Figure 1: Structure of Hair.

Additionally, hair undergoes a cyclical growth process involving the anagen, catagen, and telogen phases, which determine its length and shedding patterns. Factors like genetics, hormones, nutrition, and environmental exposure influence hair health, making it a subject of interest in dermatology, cosmetics, and forensic science. From its role in thermal insulation to its use in DNA analysis, human hair remains a fascinating and complex aspect of human biology.

Healthy hair improves the appearance of the individual and it builds confidence in the person. Skin and hair contribute immensely in human communication.^[1] Hair length, colour, and style play an important role in people's physical Appearance and self-perception.



Essential oils, minerals, and extracts from traditional Ayurvedic plants are used in herbal shampoos as Remedial measures. Herbs provide the vital nutrition That hair needs to grow healthy and strong from the Roots. Natural ayurvedic components, natural oils, Minerals, and medicinal herbs are used to make herbal Hair masks for hair loss. By nourishing the shafts and Roots of your hair, these substances enhance the Hydration in the hair.

Herbal Hair masks are designed to promote hair growth aim to Strengthen the hair follicles by delivering vital oils and Nourishment directly to the hair's base and follicles.^[2] In Effect, this encourages the growth of new, strong hair Roots, and promotes hair growth. Natural and necessary Antibacterial characteristics included in herbal hair Masks shield the hair and scalp from the sun's Damaging UV rays, avoiding skin infections. New hair Becomes healthy with everyday usage of herbal Shampoos, therefore, making hair glossy, shining, and Bouncy hair. Herbal hair masks preserve the hair's Natural colour and, with frequent use, can even make it Seem better. Also, they maintain healthy, lustrous, Bouncy hair with a balanced, healthy scalp. Hair masks can keep hair nourished and hydrated. They Work particularly well on frizzy, dry, or damaged hair. Even some hair masks have the potential to strengthen Hair and enhance scalp health. These hair masks spend More time penetrating and bolstering hair than your typical cleanser or conditioner, providing astonishing Benefits with just one usage. They may even be able to Moisturize dry hair and keep coloured hair from fading. Hair masks are frequently developed using oils, kinds of butter, extracts, and other strengthening substances That are made to penetrate into the hair and provide Noticeable results after only one use. The goal of the study includes the formulation and Development of an herbal hair mask made with herbal.^[3]

2. Some hair problems

Human hair can suffer from various issues due to environmental factors, genetics, poor nutrition, improper hair care, and underlying health conditions. Below is a detailed breakdown of the most common hair problems:

1. **Hair Loss (Alopecia):** Hair loss is one of the most prevalent hair concerns and can occur due to multiple reasons:



Figure 3 Alopecia

- ✦ Androgenetic Alopecia (Pattern Baldness): Hereditary thinning in men (receding hairline, bald spots) and women (diffuse thinning).
- ✦ Telogen Effluvium: Temporary shedding due to stress, illness, childbirth, or drastic weight loss.
- ✦ Alopecia Areata: An autoimmune disorder causing patchy hair loss.
- ✦ Traction Alopecia: Caused by tight hairstyles (braids, ponytails) that pull on hair roots.
- ✦ Medical Conditions: Thyroid disorders, anaemia, and hormonal imbalances can trigger excessive shedding.^[6]

2. **Dandruff (Seborrheic Dermatitis):** A flaky, itchy scalp caused by:

- Malassezia Fungus: Overgrowth leads to increased skin cell turnover.
- Dry Skin: Cold weather or harsh shampoos can cause flaking.
- Oily Scalp: Excess sebum production traps dead skin cells.
- Skin Conditions: Psoriasis or eczema can mimic dandruff.^[7]

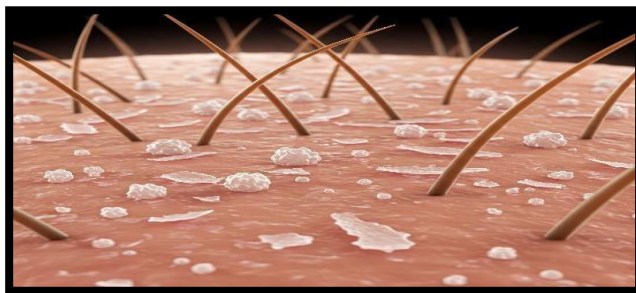


Figure4. Dandruff

3. Dry & Brittle Hair: Hair becomes rough, frizzy, and prone to breakage due to:

- Overuse of Heat Tools: Flat irons, blow dryers, and curling wands strip moisture.
- Chemical Damage: Bleaching, perming, and excessive colouring weaken hair.
- Environmental Factors: Sun exposure, chlorine, and hard water dehydrate hair.
- Nutritional Deficiencies: Lack of proteins, vitamins (Biotin, D, E), and omega fatty acids.^[8]



Figure5. Dry & Brittle Hair

4. Split Ends (Trichoptilosis): When hair shafts fray at the tips due to:

- Mechanical Damage: Brushing too hard, towel drying aggressively.

Lack of Trimming: Infrequent haircuts allow splits to travel upwards.

5. Advantages of Herbal Hair Gel

1. Natural & Chemical Free: Free from sulphates, parabens, and synthetic additives, reducing the risk of irritation and long-term damage.^[16]
2. Rich in Nutrients: Packed with vitamins, minerals, and antioxidants (e.g., aloe vera, hibiscus, and fenugreek) that strengthen and nourish hair.^[17]
3. Gentle on Scalp: Herbs like neem, amla, and tea tree oil soothe scalp conditions (dandruff, itchiness) without harsh side effects.^[17]
4. Improves Hair Growth: Ingredients like Bhringraj, rosemary, and onion juice stimulate blood circulation and promote thicker, longer hair.^[18]
5. Cost-effective & Easily Available: Most ingredients (like coconut oil, yogurt, and honey) are affordable and can be found at home or local stores.^[19]

6. Ingredients and Their Use

1. Shea Butter

Shea butter is a highly beneficial natural ingredient for hair care, prized for its deep moisturizing, nourishing, and protective properties. Extracted from the nuts of the African shea tree (*Vitellaria paradoxa*), it is rich in fatty acids (such as oleic, stearic, and linoleic acids), vitamins A and E, and antioxidants, which help strengthen, soften, and repair damaged hair.^[37,38,38]

Its emollient properties make it an excellent sealant for retaining moisture, preventing dryness, and reducing frizz, particularly in curly, oily, or chemically treated hair types. Shea butter also forms a protective barrier against environmental stressors like UV rays, pollution, and heat styling, minimizing breakage and split ends. Additionally, its anti-inflammatory.



Figuer 12: Shea butter.

2. Physicochemical Parameters ➤ Melting point: 29–45°C

- Specific gravity: ~0.91
- Saponification value: 170–190
- Acid value: ≤ 4.0
- Iodine value: 50–70
- Refractive index: 1.466–1.470

3. Phytochemical Constituents Shea butter contains

- Triglycerides (mainly stearic and oleic acid esters) ➤ Unsaponifiable matter (3–17%) including:
- Triterpenes (lupeol, amyirin)
- Sterols (campesterol, stigmasterol, sitosterol)
- Tocopherols (Vitamin E)
- Cinnamic acid esters (UV protective)
- Catechins (antioxidants)

4. Adulterants and Substitutes

- Adulterants include other vegetable fats like cocoa butter or hydrogenated oils.
- Detection through melting point, acid value, and chromatographic profiling.

5. Quality Control and Standards Assessed by

- Organoleptic evaluation
- Physicochemical parameters
- Thin Layer Chromatography (TLC)

2. Fenugreek (*Trigonella foenumgraecum*):

Fenugreek seeds (*Trigonella foenumgraecum*) are a powerhouse of nutrients that offer numerous benefits for hair health, making them a popular ingredient in natural hair care. Rich in proteins, vitamins (A, C, and K), minerals (iron, potassium, and calcium), and antioxidants, these seeds help strengthen hair follicles, reduce hair fall, and promote healthy growth. Fenugreek seeds are particularly known for their high content of lecithin, a natural emollient that moisturizes the scalp, reduces dryness, and prevents dandruff. When soaked and ground into a paste, fenugreek seeds form a gel like substance that can be applied as a hair mask to condition the hair, add shine, and combat frizz.^[42,43,44]



3. Hibiscus (*Hibiscus rosasinensis*)

Hibiscus, a vibrant flowering plant (scientifically known as *Hibiscus rosasinensis*), is a treasured ingredient in natural hair care due to its remarkable ability to strengthen, nourish, and enhance hair growth. Rich in vitamins (A and C), amino acids, antioxidants, and alpha hydroxy acids (AHAs), hibiscus helps stimulate blood circulation in the scalp, promoting thicker, longer, and healthier hair. Its natural mucilage content acts as a conditioning agent, adding moisture and shine while reducing frizz and preventing breakage.



Fig. Hibiscus (*Hibiscus rosasinensis*).

4) Flaxseed (*Linum usitatissimum*)

Flaxseeds, derived from the *Linum usitatissimum* plant, are a powerhouse of nutrients that offer exceptional benefits for hair health. Packed with omega3 fatty acids, lignans, vitamins (B1, B6, and E), and minerals (magnesium, zinc, and selenium), flaxseeds help strengthen hair follicles, reduce breakage, and promote healthy growth. One of the most notable uses of flaxseed in hair care is flaxseed gel, a natural styling product made by boiling flaxseeds in water to extract their mucilage—a gel like substance rich in proteins and polysaccharides. This gel provides long-lasting moisture, defines curls, reduces frizz, and adds shine without the harsh chemicals found in commercial products.

The omega3 fatty acids in flaxseeds nourish the scalp, reducing dryness, flakiness, and inflammation, while their antioxidant properties protect hair from environmental damage and premature aging. Regular use of flaxseed treatments can also prevent split ends, improve hair elasticity, and add volume by coating each strand with a protective layer.



Figure 15: Flaxseed (*Linum usitatissimum*).

Additionally, flaxseeds contain phytoestrogens, which may help balance hormones linked to hair thinning and loss.

Whether consumed as part of a healthy diet or applied topically as a gel or oil, flaxseeds are a natural, cost-effective solution for achieving stronger, smoother, and more manageable hair.

5) Tulsi

Tulsi, or Holy Basil (*Ocimum sanctum*), is a revered herb in Ayurveda known for its powerful medicinal and therapeutic properties, making it highly beneficial for hair health. Rich in antioxidants, vitamins (A and C), iron, calcium, and essential oils, Tulsi helps strengthen hair follicles, reduce hair fall, and stimulate new growth. Its antifungal, antibacterial, and anti-inflammatory properties make it effective in treating scalp infections, dandruff, and itchiness, promoting a healthier scalp environment for hair growth.



Figure 15: Tulsi.

Tulsi also helps detoxify the scalp, removing excess oil, dirt, and product buildup that can clog hair follicles and lead to thinning. The eugenol present in Tulsi oil improves blood circulation to the scalp, ensuring better nutrient delivery to hair roots, which helps in preventing premature greying and breakage. Additionally, Tulsi's.

Pharmacognostic Study

1. Botanical Description:

- ✦ Plant Type: Erect, branched subshrub, 30–60 cm tall
- ✦ Stem: Quadrangular, hairy
- ✦ Leaves: Opposite, ovate, margin toothed, aromatic

6) Aloe Vera

Aloe Vera, a succulent plant (*Aloe barbadensis miller*), is a miracle ingredient in hair care, renowned for its deep moisturizing, healing, and revitalizing properties. Packed with vitamins (A, C, E, and B12), minerals (zinc, magnesium), enzymes, amino acids, and fatty acids, aloe vera nourishes the scalp and hair follicles, promoting healthy growth and reducing hair fall. Its proteolytic enzymes repair dead skin cells on the scalp, unclog hair follicles, and combat dandruff, while its anti-inflammatory and antimicrobial properties soothe irritation, reduce scalp redness, and prevent infections. Aloe Vera's natural pH balancing effect helps maintain scalp health, preventing excess oiliness or dryness.^[61,62]



Figure 17: Aloe Vera.



Pharmacognostic Study

1. Botanical Name: *Aloe vera* (L.) Burm.f.

✦ Family: Asphodelaceae (formerly Liliaceae)

✦ Common Names: Aloe, Ghritkumari, Indian Aloe

8) Gaur Gum

Guar gum, a natural polysaccharide derived from guar beans (*Cyamopsis tetragonoloba*), is widely used in hair care for its exceptional thickening, conditioning, and stabilizing properties. In hair products, it acts as a natural alternative to synthetic thickeners, providing a smooth, gel like consistency to shampoos, conditioners, and styling gels without harsh chemicals. Its hydrating properties help lock in moisture, reducing frizz and enhancing hair manageability, while its film forming ability creates a protective barrier against environmental damage and heat styling.



9) Rose water

Rose water is a versatile and beneficial ingredient in herbal hair mask formulations, offering multiple advantages for hair and scalp health. Its natural hydrating properties help moisturize dry hair and scalp without causing greasiness, making it suitable for various hair types. With a slightly acidic pH, rose water helps balance the scalp's natural pH levels, reducing irritation, dandruff, and excess oil production. Its soothing and anti-inflammatory properties calm an itchy or inflamed scalp, while its antioxidants (such as vitamins A, C, and E) protect hair from environmental damage and strengthen hair follicles to minimize breakage.

Additionally, rose water acts as a mild astringent, tightening hair follicles and reducing excess sebum. When combined with herbal ingredients like aloe vera, hibiscus, or fenugreek, it enhances nutrient absorption, allowing deeper penetration of beneficial compounds into the hair shafts. Beyond its functional benefits, rose water adds a delicate, natural fragrance to hair masks. Improving.



MATERIALS AND METHOD

Authentication, collection of plant material

The all material Used in present study that is Flaxseed, Fenugreek seeds, Shea butter, Rosemary oil, Geogard and vitamin E are purchased from the local market. The Aloe Vera, Tulsi leaves, Hibiscus flower are collected from nearby farms. The Guar gum and Rose Water are taken from the Our college (Rupesh Badhan Institute of pharmacy).

Table 1: Key Ingredients With Their Functions

Sr No	Ingredient	Functions
1.	Shea butter	Moisturizing, Nourishing, and Protective properties
2.	Flaxseed Gel	Moisturizing, Nourishing, and Protective properties
3.	Fenugreek Extraction	Promotes hair growth, reduces dandruff
4.	Aloe Vera Gel	Soothes scalp, moisturizes hair
5.	Guar Gum	Thickening agent, improves texture
6.	Rose Water	Hydrates, adds fragrance
7.	Hibiscus Extraction	Prevents hair fall, darkens hair
8.	Rosemary Oil	Stimulates hair growth
9.	Geogard (Preservative)	Extends shelf life
10.	Tulsi Leaves	Antimicrobial, strengthens hair
11.	Vitamin E	Nourishing and protective benefits. Antioxidant Property.

Extraction of Flaxseed gel

Procedure

1. Combine 30 g of whole flaxseeds with 200 mL of distilled water in a 250 mL beaker.
2. Place the beaker on a heating apparatus and bring the mixture to a gentle simmer (~90–95°C) under medium heat.
3. Continuously stir the solution to prevent sedimentation and ensure uniform mucilage extraction.
4. Maintain heating for 25–30 minutes until a viscous gel like consistency is achieved.
5. After the stipulated time, discontinue heating and allow the mixture to cool slightly (~5 min) to facilitate efficient filtration.
6. Filter the warm mixture through a sterile cotton or muslin cloth to separate the gel from residual seed particles.
7. Apply gentle manual pressure to maximize gel yield while ensuring clarity.^[91,92,100]

Extraction of Fenugreek seeds**Procedure**

1. Weigh 40 g of fenugreek seeds and transfer them into a 250 mL beaker.
2. Add 200 mL of distilled water to the seeds and allow them to soak at room temperature ($25 \pm 2^\circ\text{C}$) for 12–16 hours (overnight) to facilitate mucilage release.
3. The following day, place the beaker on a heating apparatus and initiate gentle simmering ($\sim 85\text{--}90^\circ\text{C}$) under medium heat.
4. Continuously stir the mixture at a moderate speed (150–200 rpm) for 20–30 minutes to ensure uniform mucilage dispersion.
5. After the stipulated duration, discontinue heating and allow the mixture to cool for 5–10 minutes to optimize filtration efficiency.
6. Filter the warm suspension using filter paper, cotton cloth, or muslin cloth to separate the viscous mucilage from residual seed debris.
7. Apply gentle manual pressure (if necessary) to maximize mucilage yield while maintaining clarity.
8. Collect the filtrate (mucilage extract) in a clean container.

Store at 4°C if not used immediately to prevent microbial contamination.^[93,94,100]

Extraction of Hibiscus**Procedure:**

1. Measure 5–10 grams of fresh Hibiscus flowers.
2. Then flower is dried in hot air oven at $30\text{--}40^\circ\text{C}$ for 15–20 Minutes.
3. Then Combine with 40 mL of coconut oil in a 100 mL beaker.
4. Simmer the mixture at a controlled temperature (maintained below boiling point of coconut oil, $\sim 175^\circ\text{C}$) for 20–30 minutes under gentle heating to facilitate extraction.
5. Discontinue heating and allow the mixture to cool slightly.
6. Filter the extract using either Qualitative filter paper, Sterile cotton, Muslin cloth
7. Collect the filtrate (hibiscus infused coconut oil) in a clean, dry container for further analysis or use.^(95,96,100)

Extraction of Tulsi leaves:**Procedure:**

1. Weigh 2–5 grams of fresh Ocimum sanctum (Tulsi) leaves and Properly Wash It.
2. Combine with 20 mL of distilled water in a clean glass beaker.
3. Simmer the mixture at $80\text{--}90^\circ\text{C}$ (avoid boiling) for 10–15 minutes to facilitate the diffusion of water-soluble phytochemicals.
4. Remove from heat and allow the decoction to cool to room temperature ($\sim 25^\circ\text{C}$).
5. Separate the aqueous extract from plant residue using:
6. Qualitative filter paper, Sterile cotton, Layered muslin cloth
7. Collect the filtrate in an amber glass vial to prevent photo degradation of bioactive constituents.^[98,99,100]

Formulation Procedure

Procedure

For the preparation of Herbal hair mask need to prepare the two different phases that is oil phase and water phase.

Preparation of aqueous phase

- ⇒ Accurately weigh the 5g of freshly extracted Flaxseed gel, 5g of fenugreek seed extract, 5g of Rose water, 3g of Tulsi leaf extract, Transfer into a 100 mL borosilicate glass beaker.
- ⇒ Place the beaker on a precalibrated magnetic stirrer (e.g., 500–1000 rpm).
- ⇒ Insert a coated stir bar (2 cm length) to ensure turbulent mixing.
- ⇒ Stir continuously ($25 \pm 5^\circ\text{C}$, 10–15 min) until a homogeneous colloidal suspension is achieved, as confirmed by visual phase uniformity (no stratification or particulate aggregation).
- ⇒ On the other side mix the 0.25gm Guar Gum in 5gm of Rose water

Preparation of oil phase:

- ⇒ Accurately weigh the Shea butter: 7.5gm, Aloe Vera gel: 12g melt using the heating Mantel for 5 to 10 minutes.
- ⇒ Then add Hibiscus oil extract 5g, Rosemary Oil 0.15 g, Vitamin E oil 0.15 g, using an analytical balance
- ⇒ Place the beaker on a magnetic stirrer and introduce a sterile magnetic stir bar.
- ⇒ Initiate continuous stirring at a moderate speed (e.g. 300–500 rpm) at room temperature ($25 \pm 2^\circ\text{C}$) until a homogeneous mixture is obtained.
- ⇒ Monitor the mixture visually to ensure complete dissolution and uniform consistency.

Mixing of both phases

- ⇒ After proper mixing of oil phase, add the aqueous phase slightly or Drop by Drop with the continuous stirring.
- ⇒ During the stirring process add required quantity of Guar Gum for the thickening of the formulation.
- ⇒ After that add the Geogard as an preservative.

Composition of Herbal Hair Mask

Sr. No.	Ingredients	Quantity (g)	Percentage (%)
1.	Shea Butter	7.5	15%
2.	Flaxseed Gel	5	10%
3.	Fenugreek Seed Extraction	5	10%
4.	Aloe Vera Gel	12.5	24.8%
5.	Guar Gum	0.25	0.5%
6.	Rose Water	5	10%
7.	Hibiscus Extract	5	10%
8.	Rosemary Oil	0.15	0.3%
9.	Geogard (Preservative)	0.1	0.2%
10.	Tulsi Leaves	3.0	6%
11.	Vitamin E Oil	0.15	0.3%
12.	Water (Distilled)	6.45	12.9%

Evaluations of herbal hair mask formulation

1. Physical appearance

The mask formulation was evaluated in terms of physical character Like phase separation and change in colour, odour and rheological parameters.^[101]

2. Homogeneity

Formulated mask was tested for homogeneity by visual inspection after the mask was placed in the container. Formulated hair mask was tested for the Appearance, presence of any aggregates and flocculates.^[102]

3. pH

The pH of the mask was determined by using digital pH meter. Take one gram of mask and dissolve in 100 ml distilled water and measure the pH for three times and average value was calculated.^[103]

4. Washability

The formulated hair mask was applied on the skin and then ease and extent of washing with water is checked normally.^[101]

5. Spread ability

Take (2g) of formulated mask was sandwiched between two glass slides. 500g of weight was placed on the slides. The weight was placed for specific period of time for 5 minutes. The weight was removed and the diameter of the spread circle was measured at different points. Finally^[104], spread ability was calculated by using the formula.

$$S = M.L/T$$

Where,

S = Spread ability

M = Weight placed on the slide

L = Diameter of circle in cm

T = time in second

6. Viscosity

Viscosity of cream was done by using Brookfield viscometer at a temperature of 25 °C using spindle No. 63 at 2.5 RPM.

7. Patch test

Apply the prepared formulation to a quarter sized patch on the skin. A person should apply the formulation as thickly as they would when using it regularly. Leave the formulation on the patch of skin for as long as it would normally be on the skin. Repeat the patch test twice a day for upto 2 to 3 days. If a reaction may not happen immediately, so it is important to continue applying the product for this length of time. If a person's skin reacts to the formulation, they should wash it off as soon as possible and stop using it. A person can use a cool compress or petroleum jelly to relieve the skin from.

8. Accelerated stability studies

Stability of a drug was defined as the ability of a particular formulation, in a specific container, to remain within its physical, chemical, therapeutic and toxicological specifications. The purpose of stability testing is to provide evidence on how the quality of a drug substance or drug product differs with time under the influence of a variety of environmental factors such as humidity and light, and enables recommended storage conditions, retest periods and shelf lives to be established. In the present work the formulation was stored at room temperature (25⁰–30°C) for 30 days and observed for changes in their physical characteristics and evaluation parameters.^[108]

RESULT AND DISCUSSION

The herbal hair mask was prepared by using the preparation of Shea butter, Flaxseed gel, Fenugreek seed extraction, Aloe vera gel, Gaur gum used as gelling agent, Rose Water, Hibiscus extract, Rosemary oil, vitamin E, Tulsi leaves, Geogard as preservative.

Based on our comparative evaluation of formulations F1 and F2, F2 demonstrated suboptimal performance relative to the standard reference. Specifically, F2 exhibited inconsistent stability, with observable phase separation occurring within hours to days of preparation.

Given these findings, Formulation F1 has been selected for further investigation to identify the underlying causes of instability and to optimize its physicochemical properties.

1. Physical appearance

Table 4: Physical appearance.

Sr. NO.	Test	Result
1	Colour	Mint Green or Pastel Green
2	Odour	Aromatic

2. Homogeneity

After the mask formulations have been set in the container, all developed masks were tested for homogeneity by visual inspection. They were tested for their appearance and presence of any lumps, flocculates or aggregates are not formed.

3. pH

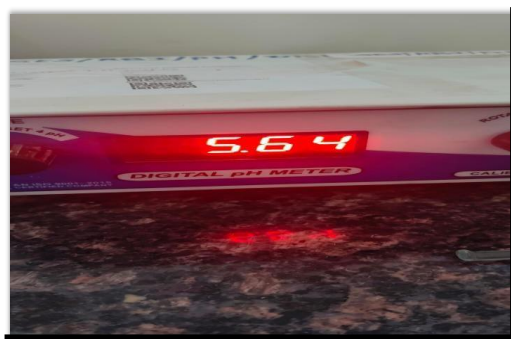


Figure 23: PH.

Test	Result
pH	5.64

4. Washability

Test	Result
Washability	Easily washable

5. Spreadability

Those Formulation shows lower sliding time having better Spreadability.

Test	Result
Washability	Easily washable

6. Skin irritation test

Test	Results
Irritancy	No irritancy
Erythema	No erythema
Edema	No edema

7. Viscosity

Test	Result
Viscosity	6450

8. **Patch test:** The site of patch was inspected after 24hrs. As there was not reaction the test was repeated 3 times. As no reaction was observed on 3rd application, the person may not hypersensitive to the formulations.

9. **Stability Studies:** The formulation was undertaken stability studies for physical and chemical changes. No considerable variations in properties of the formulation were observed.

Table 10: Stability Studies.

Visual Appearance	Mint Green
Phase separation	Nil
Homogenetic	Good

13. CONCLUSION

The recent studies conclude that use of herbal plant products with proven efficacy, such as in the formulation of hair masks. This investigation was carried out on the basis of the traditional and present-day knowledge that was used to formulate the “**Revitalizing**” **Herbal Hair Gel**. Frequent use of this mask results in healthy, dandruff-free hair. The formulation of Flaxseed hair mask provides a good base for treating the scalp and strengthens the hair thereby preventing the Anti-Bacterial & Anti-Fungal and inhibiting the hair loss. Flaxseed hair mask is prepared by simple boiling procedure, so it is less in cost and easy to handle. In flaxseed hair mask the aloe Vera gel is also incorporated so it results in elimination of dandruff from scalp and protective for hair and provides healthy growth.

The evaluation of the formulations was done on various parameters like physical appearance, pH, homogeneity, viscosity, spread ability and stability, in in-vitro evaluation study. The evaluation results shows that the flaxseed hair mask is compatible for hair and it having less side effects and these parameters show results in standard range. Hence, there is a further scope for pharmacological studies in lower animals.

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