

**FORMULATION AND EVALUATION ANTI-HAIRFALL GEL****Ms. Saima Akbar Shaikh*, Ass. Prof. Varsha Dighe, Dr. Sampat D. Navale**

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ABSTRACT

Hair fall is a common problem that affects both men and women and is influenced by genetic, hormonal nutritional, and environmental factors. Although synthetic anti-hair fall formulations can be effective, they often cause adverse effects such as scalp dryness and irritation. Consequently, research has increasingly focused on herbal alternatives that offer improved safety and tolerability. This review focuses on the formulation and evaluation of a herbal anti-hair fall gel using natural ingredients such as flaxseed, chia seeds, aloe vera, fenugreek, curry leaves, and neem. The study highlights their synergistic effects in promoting hair growth, reducing hair fall, and improving scalp health. Herbal hair gels are chemical-free products that promote hair health. It aims to nourish the scalp, moisturize hair, reduce hair fall, promote growth, and address

scalp issues like dandruff. Herbal gels offer styling benefits without damaging hair and are suitable for various hair types. Additionally, they focus on using environmentally sustainable, biodegradable ingredients. The main objective of present work is to formulate and evaluate herbal hair gel containing flax seed and curry leave extract. Extracts from flax seed and curry leaves were obtained through aqueous extraction.

❖ **KEYWORDS:** Flaxseeds, Curry leaves, Fenugreek, Chiaseed's, Neem.

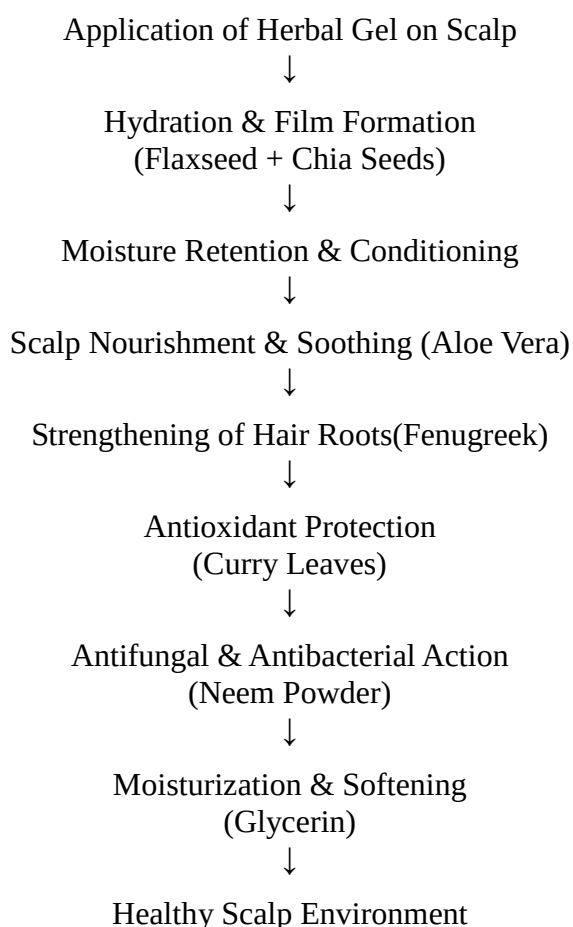
❖ INTRODUCTION

Hair fall is a common issue caused by stress, pollution, and nutritional deficiencies. Herbal formulations provide a safer alternative to synthetic products. Natural gels are gaining popularity due to their minimal side effects and effectiveness. Hair care is essential for

maintaining healthy, strong, and beautiful hair. It helps prevent damage and breakage, supports scalp health, promotes hair growth, and improves hair texture and appearance. Good hair care routines also reduce hair loss, protect against environmental damage, and make hair easier to style. Beyond physical benefits, caring for hair boosts confidence and self-esteem, as healthy hair enhances overall appearance and personal expression. Hair damage is caused by factors like excessive heat styling, chemical treatments, environmental exposure, products, and lack of moisture. Poor diet, rough handling, and health issues also weaken hair, making it more prone to breakage, dryness, and dullness. Reducing these damaging factors helps maintain healthier, stronger.

Properties of hair gel

- The gel should be clear.
- The formulation of gel should not be sticky non greasy.
- The gelling agent should be inert as well as safe.
- Gelling agent should not react with the active ingredients as well as other excipients
- It must not interact with active ingredients or other excipients.



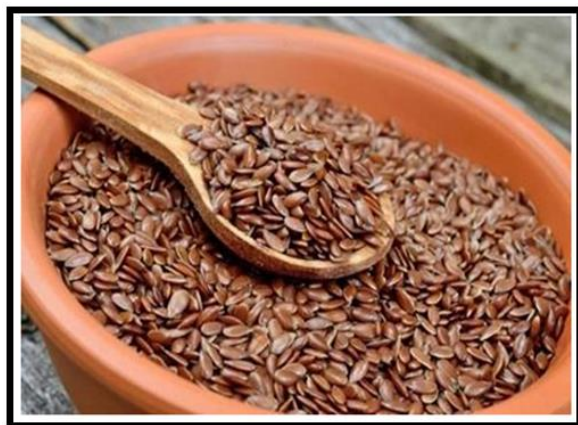


Figure 1: Flaxseeds.

1. Flaxseed (*Linum usitatissimum*)

Flaxseed promotes hair growth due to its rich content of omega-3 fatty acids, which nourish hair follicles, and vitamin E, which improves scalp health. Flaxseed oil, fiber, and flax lignans have inherent health benefits such as reducing atherosclerosis, diabetes, cancer, cardiovascular disease, Herbal hair gels have fewer side effects, can encourage hair growth, and help prevent hair loss. Many commercial gels contain silicone and chlorides, which can damage hair, making herbal options more desirable. Hair gels also help retain moisture, which is essential for healthy hair growth, and provide necessary nutrients. Gels are a relatively new form of dosage created by trapping large amounts of aqueous hydroalcoholic liquids within a three-dimensional polymeric network made from either natural or synthetic gums, which have undergone significant physical or chemical cross-linking.



Figure 2: Curry Leaves.

2. Curry Leaves (*Murraya koenigii*)

Curry leaves contain numerous important constituents like carbohydrates, proteins, filaments, calcium, phosphorus, iron, magnesium, minerals and vitamins like nicotinic acid, vitamin B, C, A and E, antioxidants, fatty sterols glycosides and flavonoids. The oil painting is used

externally for bruises, eruptions, in cleaner and incense assiduity. The essential oil painting from leaves yielded di- α - phellandrene, D- sabinene, D- α pinene, dependence, D- α - terpinol and caryophyllene.



Figure 3: Fenugreek.

3. Fenugreek Seeds (*Trigonella foe Num-graecum*)

Fenugreek, commonly known as methi dana, is a potent herbal ingredient that promotes hair growth and reduces hair fall. It contains nicotinic acid, proteins, and lecithin, which nourish hair shafts, add shine, and prevent dandruff. Its natural saponins possess cleansing properties, while its mucilage provides conditioning effects. Fenugreek seeds (*Trigonella foe Num-graecum*) are an important herbal ingredient due to their high protein and nicotinic acid content. They strengthen hair roots, promote hair growth, and reduce hair fall.



Figure 4: Alovera gel.

4. Aloe vera Gel

Aloe vera is known for its moisturizing, soothing, and healing effects. It contains enzymes that remove dead scalp cells, promoting healthy follicle activity. The gel hydrates hair, balances scalp pH, and provides a cooling effect. Aloe vera also exhibits antimicrobial and

anti-inflammatory actions, helping in dandruff control and scalp irritation. Aloe vera (*Aloe barbadense*) is widely known for its soothing and cooling properties. It contains vitamins, enzymes, and amino acids that nourish the scalp, reduce dandruff, and promote healthy hair growth. It also enhances the smooth texture of the gel.



Figure 5: Neem Leaves.

5. Neem (*Azadirachta indica*)

Neem has strong antibacterial and antifungal properties, making it highly effective against dandruff and scalp infections. It purifies the scalp, reduces itchiness, and improves overall scalp health. Neem extract strengthens hair follicles, minimizes breakage, and promotes clean and healthy hair growth. Neem powder (*Azadirachta indica*) is included for its strong antifungal and antibacterial properties. It helps in controlling dandruff and scalp infections, thereby maintaining a healthy scalp environment for hair growth.



Figure 6: Chia seeds.

6. Chia Seeds (*Salvia hispanica*)

Chia seeds are abundant in omega-3 fatty acids, proteins, and antioxidants. When soaked, they form a natural gel-like consistency that helps in binding and moisturizing the hair. Chia

gel improves elasticity, strengthens follicles, and adds volume and luster to the hair. chia seeds (*Salvia hispanica*) are rich in mucilage and proteins, which contribute to the thickness and viscosity of the gel. They also help in retaining moisture, keeping the hair hydrated and soft.



Figure 7: Glycerin.

8. Glycerin

Glycerin acts as a humectant in the formulation. It attracts and retains moisture, which helps in keeping the hair soft, smooth, and well-hydrated. Glycerin (also known as glycerol) is a colorless, odorless, and viscous liquid widely used in pharmaceutical and cosmetic formulations. It is a natural humectant that helps in retaining moisture and improving hydration. Due to its non-toxic and biocompatible nature, glycerin is commonly used in topical formulations such as creams, gels, and lotions. Glycerin attracts moisture from the environment and helps in maintaining hydration of the scalp. This prevents dryness and promotes healthy hair growth.



Figure 8: Rose oil.

9. Rose oil

It effect, rose oil is added in a small quantity. It imparts a pleasant aroma and provides mild scalp relaxation. Rose oil is a natural essential oil extracted from the petals of Rosa. It is widely used in cosmetic and pharmaceutical formulations due to its pleasant fragrance and therapeutic properties. Rose oil possesses antimicrobial, anti-inflammatory, and soothing effects, making it suitable for scalp and hair care formulations.

❖ MATERIALS AND METHODOLOGY

❖ MATERIALS

SR. NO.	MATERIAL	QUANTITY [for 20ml]	ROLE
1.	Fenugreek seeds	2g	Hair-growth promoter
2.	Flaxseed	2g	Natural-gelling agent
3.	Chia seeds	1g	Gives Hydration
4.	Curry leaves	5-6 leaves	Anti-hair fall agent
5.	Distilled water	q.s to 20ml	Solvent
6.	Foaming agent	0.5-1ml	Cleansing
7.	Sodium benzoate	0.02g	Preservative
8.	Rose oil	2-3 drops	Fragrance



Figure 9: Materials.

❖ METHADODOLOGY

1. Preparation of Flaxseed Gel Base

Flaxseed (2 g) was taken in a beaker containing approximately 15 ml of distilled water and heated for 5–7 minutes with continuous stirring until a viscous gel was formed. The gel was then filtered using a clean muslin cloth to obtain a clear gel base.

2. Preparation of Chia Gel

Chia seeds (1 g) were soaked in 5 ml of distilled water for 10–15 minutes until a gel-like consistency was obtained. The formed gel was lightly crushed to ensure uniformity.

3. Preparation of Herbal Extract

Fenugreek seeds (1 g) and curry leaves (1 g) were boiled in 10 ml of distilled water for 5–7 minutes. After cooling, neem powder (0.3 g) was added and allowed to stand for a few minutes. The mixture was then filtered to obtain a clear herbal extract.

4. Formulation of Gel

The filtered flaxseed gel was taken in a clean beaker, to which chia gel and aloe vera gel (4 g) were added. The mixture was stirred slowly to obtain a uniform consistency. The prepared herbal extract was then added gradually with continuous stirring until a homogeneous gel was formed.

5. Addition of Additives

Glycerin (1 ml) was added as a humectant to improve moisture retention. Sodium benzoate (0.02 g), previously dissolved in a small quantity of distilled water, was incorporated as a preservative. Finally, 1–2 drops of rose oil were added to impart fragrance.



Figure 10: Herbal Gel.

6. Volume Adjustment and Packaging

The final volume of the gel was adjusted to 20 ml using distilled water. The prepared gel was then transferred into a clean, dry, air-tight container and stored under suitable conditions.

7. Storage Conditions

The formulated gel was stored in a cool and dry place, preferably under refrigerated conditions to enhance stability and shelf life.

❖ EVALUATION AND PARAMETERS

1. Physical Appearance

The prepared gel was visually inspected for color is Light brown to yellowish-brown [due to herbal extracts like aloe, seeds]

Odor:

Mild, characteristic herbal smell (may be slightly nutty or earthy due to seeds)

Appearance:

Semi-liquid gel with visible suspended particles (seeds present)

Texture:

Smooth but slightly grainy (because of seeds)

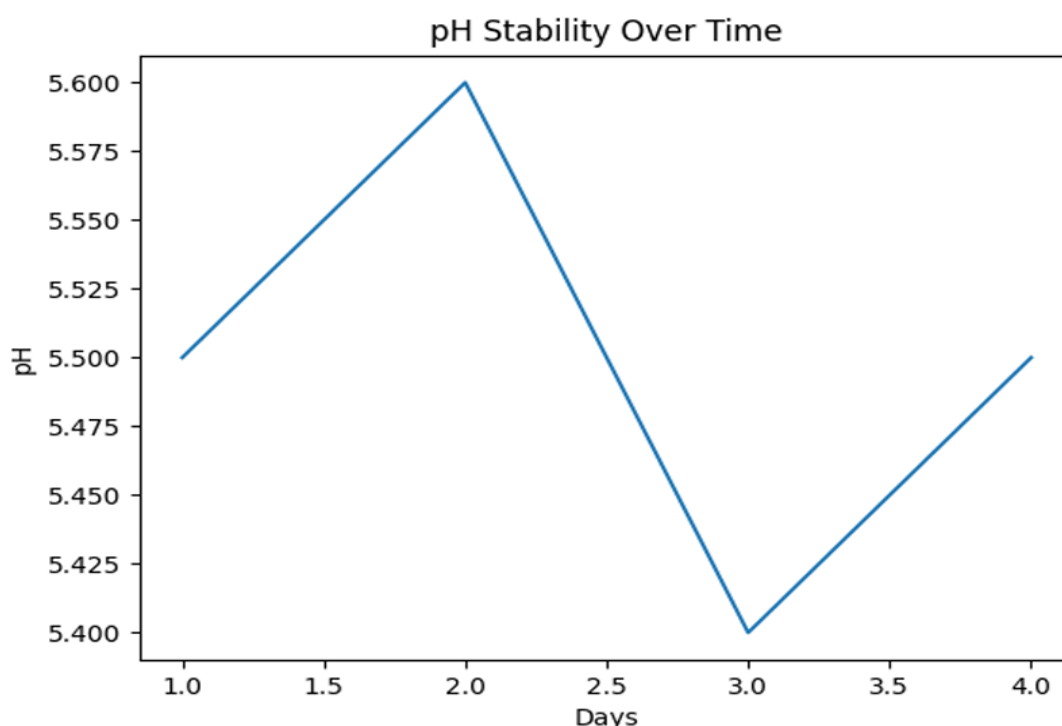
2. Determination of pH

The pH of the gel was measured using a digital pH meter.

1 g gel was dissolved in 10 ml distilled water and pH was recorded.

Should be in range 5.0 – 6.5 (suitable for scalp)

Graph: pH Stability



3. Spread ability

Spread ability was determined by using glass slide method.

The time taken to spread the gel between two slides was measured.

Good (easily spreads on skin/scalp without lumps).

4. Washability

A small amount of gel was applied on skin and washed with water.

Easily wash with water.

5. Skin Irritation Test

Gel was applied on a small area of skin and observed and after 24 hours.

No irritation, redness, or itching on application.

6. Viscosity

Viscosity was measured using viscometer (or simple flow method).

Consistency and thickness were evaluated.

7. Stability Studies

Gel was stored at room temperature for 1–2 weeks.

Observed for No Change in color, odor, or texture.

❖ FORMULATION OF HAIRFALL GEL



Figure 11: Hair Fall Gel.

Ingredient	F1	F2	F3	F4	F5
Flaxseed (g)	1.5	2	2.5	2	2
Chia seeds (g)	0.5	1	1	1.5	1
Fenugreek (g)	2	2	2	2	2
Curry leaves	Same	Same	Same	Same	Same
Aloe vera (ml)	3	3	3	3	4
Neem powder (g)	0.5	0.5	0.5	0.5	0.5
Glycerin (ml)	1	1	1	1	1
Sodium benzoate	0.02 g	0.02 g	0.02 g	0.02 g	0.02 g
Rose oil	2 drops	2 drops	2 drops	2 drops	2 drops
Water	q.s	q.s	q.s	q.s	q.s

❖ RESULT AND DISCUSSION

The formulated herbal gel showed good physical appearance with smooth texture and pleasant odor. The pH was found to be within acceptable range (5–6), making it suitable for scalp application. The gel exhibited good spread ability and was easily washable with water. No signs of skin irritation were observed, indicating safety. The viscosity was appropriate, providing good consistency. Stability studies confirmed that the formulation remained stable without significant changes. The presence of natural ingredients like fenugreek, flaxseed, chia seeds, and curry leaves contribute to nourishment of hair and reduction in hair fall.

Parameter	Observation
Appearance	Smooth gel
pH	5.5
Spread ability	Good
Washability	Easy
Irritation	None
Viscosity	Moderate

❖ CONCLUSION

The Herbal anti-hair fall gel was successfully formulated using natural ingredients. The evaluation results confirmed that the gel is safe, stable, and effective for hair care. It can be considered as a natural alternative to chemical-based hair products. The present study successfully formulated and evaluated a herbal anti-hair fall gel using natural ingredients such as fenugreek, flaxseed, chia seeds, curry leaves, aloe vera, neem powder, glycerin, and Rose oil. The formulation was developed with the objective of providing a safe, effective, and economical alternative to synthetic hair care products.

The prepared gel exhibited satisfactory physicochemical properties, including appropriate pH, good viscosity, smooth texture, and excellent spread ability. The pH of the formulation was found to be within the acceptable range for scalp application, ensuring minimal risk of irritation. The gel also demonstrated good washability, making it user-friendly for routine application. No signs of skin irritation were observed during testing, indicating that the formulation is safe for topical use.

Further studies, including long-term stability testing and clinical evaluation, are recommended to validate its efficacy on a larger scale.

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