

Formulation and Evaluation of Herbal Anti-Hairfall Gel

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ABSTRACT

Hairfall 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. The present review focuses on the formulation and evaluation of an herbal hair gel developed using natural ingredients such as flaxseeds, curry leaves, Fenugreek (meethi dana), aloe vera gel, neem, almond, chia seeds, moringa leaves, rice water, and vitamin E capsule. These ingredients possess unique properties that strengthen hair roots, prevent hair fall, and improve scalp health. Color, smell, gel texture, clarity, pH, viscosity, spreadability, extrudability, gel strength, homogeneity, stability studies, and in vitro antifungal activity were among the parameters that were assessed for the formulations (F1 to F5). Herbal gels have gained wide acceptance as safer and eco-friendly alternatives to synthetic hair care products. The formulated gel combines the moisturizing, anti-oxidant, anti-microbial, and nourishing benefits of these herbs to promote hair growth, reduce dandruff, and enhance the overall texture of hair. *Murraya koenigii* (curry leaves), a well-known Ayurvedic herb, contains numerous bioactive compounds including carbazole alkaloids, flavonoids, and essential oils that demonstrate antioxidant, antimicrobial, and hair growth-stimulating activities.

Keywords: Aloe vera gel, Neem, Almond, Chia seeds, Flaxseed, Curry Leaves, Fenugreek, Hairgel, Herbal Hairgrowth

INTRODUCTION

Hair fall is one of the most common cosmetic and dermatological concerns affecting both men and women worldwide. Factors such as environmental pollution, chemical exposure, nutritional deficiencies, stress, and the use of synthetic cosmetics can cause weakening of hair follicles and excessive shedding. Synthetic hair care products often contain silicones and harsh surfactants, which may provide temporary results but damage hair and scalp in the long term. Recently, herbal formulations have gained importance due to their natural origin, safety, biodegradability, and effectiveness. Herbal ingredients are rich in vitamins, minerals, essential oils, flavonoids, and antioxidants that nourish the scalp, strengthen follicles, and stimulate new hair growth. A hair gel serves as a suitable topical dosage form due to its non-greasy texture, easy spreadability, and ability to deliver active ingredients directly to the scalp. This review aims to highlight the combined benefits of flaxseed, curry leaves, fenugreek, aloe vera, neem, almond, chia seeds, and moringa in the

formulation of a stable and effective herbal anti-hair fall gel.

Properties of Hair Gel:

- The gel should appear transparent.
- The formulation must be non-sticky and non-greasy.
- The gelling agent should be both inert and safe.
- It must not interact with active ingredients or other excipients.

1. Flaxseed (*Linum usitatissimum*):

Flaxseed is rich in omega-3 fatty acids, lignans, and vitamin E that promote scalp health and strengthen hair follicles. It provides moisturizing effects, enhances elasticity, and prevents dryness. The mucilage obtained from soaked flaxseed acts as a natural gelling and conditioning agent, making it suitable for herbal gel formulations. Anti-inflammatory and antioxidant properties help reduce scalp irritation and oxidative stress.

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.





2. Curry Leaves (*Murraya koenigii*):

Curry leaves are traditionally used to promote hair growth, reduce premature greying, and prevent dandruff. They are abundant in beta-carotene, amino acids, and flavonoids that nourish hair follicles. The presence of vitamin B, C, and iron helps in strengthening roots and maintaining natural hair pigmentation. Regular use of curry leaves extract supports healthy and thick hair growth.



3. Fenugreek Seeds (*Trigonella foenum-graecum*)

Fenugreek, commonly known as meethi 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.



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 reduction.



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.



6. Almond Oil (*Prunus amygdalus*):

Almond oil is a rich source of vitamin E, magnesium, and fatty acids, which deeply nourish and soften hair. It prevents hair loss caused by dryness and breakage, enhances hair strength, and imparts shine. Almond oil also helps in reducing scalp inflammation and improving blood circulation to hair roots.



7. 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.



8. Moringa Leaves (*Moringa oleifera*):

Moringa is known as a “miracle plant” due to its high nutritional value. It contains vitamins A, B, C, and E, along with zinc and amino acids essential for hair growth. Moringa leaf extract enhances keratin production, nourishes the scalp, and revitalizes damaged hair strands.



9. Rice Water (*Oryza sativa*):

Rice water, the starchy liquid obtained after rinsing or boiling rice, has been traditionally used as a natural hair-care remedy in many Asian culture. It is rich in vitamins (B1, B2, B3, B4, B5, B6), amino acids, minerals, and antioxidants, which contribute to its beneficial effects on the hair and scalp. The presence of inositol, a carbohydrate found in rice water, plays a major role in strengthening hair and reducing friction, thereby minimizing breakage.



MATERIALS AND METHODS:

1. Flaxseed Extract:

Natural gelling agent, conditioner.

2. Curry Leaves:

For strengthening of hair roots.

3. Fenugreek:

For nourishment, anti hairfall.

4. Aloe vera Gel:

Moisturizing and soothing agent.

5. Neem:

For anti-fungal and anti-bacterial.

6. Almond Oil:

For emollient and shine enhancer.

7. Chia Seeds:

For natural gel base and anti-oxidant.

8. Moringa Leaf:

For a hair growth stimulator.

★ Preparation of Method:

1. Preparation of extracts:

Each herbal ingredient was cleaned, dried, and powdered. The powder was extracted using distilled water or ethanol by boiling for 15–20 minutes, followed by filtration. The filtrates were stored in airtight containers.

2. Preparation of gel base:

Carbopol was dispersed in distilled water and allowed to hydrate. Glycerin and methyl paraben were added with continuous stirring.

3. Incorporation of Extracts:

Measured quantities of flaxseed, curry leaf, fenugreek, neem, moringa, chia seed, and aloe vera extracts were slowly added into the gel base under constant stirring to form a uniform gel. Triethanolamine was used to adjust pH and viscosity. Almond oil was added at the final stage for smooth texture and aroma.

4. Storage:

The prepared gel was transferred into airtight containers and stored at room temperature for further evaluation.

★ Evaluation Parameters:

• Appearance of color:

Visually inspected for homogeneity and color consistency.

• Ph:

Measured using a digital pH meter to ensure compatibility with the scalp (range 5.5–6.5)

• Viscosity:

Determined using a Brookfield viscometer.

• Spreadability:

Evaluated by parallel plate method.

• Washability:

Checked by washing the gel with water.

• Stability:

Observed under room temperature for 30 days.

• Microbial test:

Checked for absence of contamination.

CONCLUSION:

The formulated herbal anti-hair fall gel offers a natural, effective, and safe approach to hair care. The selected ingredients work synergistically to nourish hair follicles, improve scalp health, and prevent hair loss. The gel is stable, non-greasy, and easy to apply, providing both therapeutic and cosmetic benefits. Herbal formulations like this can be a sustainable alternative to chemical-based hair care products. The formulations were analyzed by F1 to F5 were based on Parameters, such as color, odor, texture, clarity, pH, viscosity, spreadability, gel strength.

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HOW TO CITE: Saima Akbar Shaikh*, Mayuri Auti, Samreen Salim Shaikh, Formulation and Evaluation of Herbal Anti-Hairfall Gel, *Int. J. Sci. R. Tech.*, 2025, 2 (12), 489-493.
<https://doi.org/10.5281/zenodo.18080546>