

A DETAILED REVIEW ON THE HAIR GROWTH POTENTIAL OF HERBAL HAIR GELS

Dr. G. Tulja Rani^{1*}, K. Kabir Ahmadh², B. Navyasri³

Malla Reddy Pharmacy College, Maisam Maguda, Secundrabad, 500100.

Article Received on 05 March 2026,
Article Revised on 25 March 2026,
Article Published on 04 April 2026,

<https://doi.org/10.5281/zenodo.19413413>

*Corresponding Author

Dr. G. Tulja Rani

Malla Reddy Pharmacy College,
Maisam Maguda, Secundrabad,
500100.



How to cite this Article: Dr. G. Tulja Rani^{1*}, K. Kabir Ahmadh², B. Navyasri³. (2026). A Detailed Review On The Hair Growth Potential Of Herbal Hair Gels. World Journal of Pharmaceutical Research, 15(7), 1437-1449. This work is licensed under Creative Commons Attribution 4.0 International license.

ABSTRACT

India is renowned for its traditional medical practices, such as ayurveda, yoga, Unani, and siddha. The use of herbal plants and their cosmetic preparations to improve human appearance is gaining popularity globally due to their effectiveness, quality and safety. This study aimed to create an herbal hair gel that promotes not only hair growth and health but also offers effective styling. Herbal cosmetics are the preparations used to enhance the human appearance. Herbal hair gel is formulated from natural ingredients and herbal extracts helps in controlling hair falling and reduce dandruff. The present study now a days many people face the major problem related to hair i.e. hair loss. There are many Causes of hair loss physiological conditions, emotional or physical stress, nutritional deficiencies, hormonal Disorders one of the due to hormone deficiency of

estrogen. External administration of the estrogen could change the hormonal cycle and increase cancer risk some natural alternative estrogen therapy can be found in the various plants containing natural products those having weak estrogen activity like Phyto-estrogen. Herbal Drug has less side effects and more effective as comparative to synthetic drug.

KEYWORDS: Hair growth, Reduce Dandruff, Hair gel.

INTRODUCTION

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. 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.

Uses of herbal hair gel

Herbal hair gels as a natural, healthier alternative to synthetic ones, seeking styling hold herbal hair nourishing the scalp, reducing hair fall, dandruff, and promoting growth.

Promoting Hair Growth

Some herbal gels are formulated with growth-stimulating herbs like Brahmi, Ashwagandha, and Jatamansi, which are believed to boost blood flow to hair follicles.

Moisturizing and Conditioning

Unlike many regular gels that dry out hair, herbal gels are often enriched with moisturizing ingredients like aloe vera, coconut oil, and plant extracts.

Scalp Health and Soothing

Herbal gels are usually free from harsh chemicals like sulfates, parabens, and synthetic fragrances.

Properties of gel

1. The gel should be sterile or clear.
2. The formulation of gel should not be sticky.

3. The gelling agent should be inert as well as safe.
4. It should be easily spread on to the skin.
5. Entrapped the drug by swelling property.

Types of Hair Gel

1. Water based pomade
2. Oil based pomade
3. Hybrid pomade.

1. **Water based pomade:** Water based pomades are water soluble, they wash out easily with water. With a firm hold, natural shine, a clean and crisp cedar scent our gel makes looking good to easy.
2. **Oil based pomade:** These are traditional hair greases that have been innatural oils in these pomades promote high levels of shine. These products do not dry completely after application.
3. **Hybrid pomade:** This hybrid pomade is a water soluble cream that feels like a firm version of their oil based pomade. Goes into the hair with ease and washes out offer one shampoo. Hair gels are actually categorized by “HOLD” which refers to the strength-holding capacity of the gel.

Synthetic Hair gel

Synthetic hair gels use polymers for strong hold but can contain harsh chemicals (like alcohol, phthalate, sulfates) that dry hair and scalp causing damage.

Herbal hair gels

Herbal hair gels use plant based ingredients (aloe, flaxseed, essential oils) for lighter, nourishing hold, often promoting hair health (moisture, growth)with fewer side effects, though they might offer less extreme hold.

Table 1: Difference between synthetic and herbal hair gels.

Features	Synthetic hair gels	Herbal hair gels
Main ingredients	Water +synthetic polymers (carbomer, pvp) silico ne alcohol, sulfates, parabens, artificial fragrances, preservatives.	Water+natural thickeners(aloevera, flaxseeds, guar gum, xanthan gum) plant extract (aloe, hibiscus, amla, rosemary) plant oils(coconut, jojoba, castor) essential oils
Hold strength	Very strong, stiff hold; good for spike backs and long lasting styles	Light to medium hold; better for soft curls, waves and natural styles

Feel on hair	Can feel crunchy, sticky. when dry may feels with build up	Softer, more flexible hold; hair feels less stiff and more natural
Shine	High shine due to silicones and polymers	Natural, low to medium shine; less Greasy look
Effect on hair	Can cause dryness, brittleness and build up over time; may block pores and weaken hair with long use	Generally moisturizing and Conditioning; less likely to cause build up; may help reduce breakage
Scalp safety	Higher risk of irritation, itching, or dandruff especially for sensitive scalp; can clog follicles	Gentler on scalp; less irritating; often helps soothe scalp issues like dryness or less dandruff
Hair Growth & Health	No real benefit for growth; some ingredients may even contribute to hair fall	Often promotes hair growth and reduces hair fall due to nourishing herbs and nutrients

PLANT MATERIALS ARE USED FOR PRODUCTION OF HERBAL GEL

Fenugreek Powder: Best for Dandruff & Dryness

Fenugreek seeds, commonly known as methi, are widely used in Ayurveda for hair and scalp care. When ground into Fenugreek Powder, they become a powerful remedy for dryness and dandruff. **Key benefits of Fenugreek Powder** Fenugreek is commonly known by the botanical name **Trigonella foenum-graecum**, and in India the drug is mainly obtained from the dried, ripe seeds of this plant. It belongs to the family **Fabaceae** (Papilionaceae) and is widely cultivated as an annual herb for both seeds and leaves.



Fig. No. 1.

- Helps reduce flakes and itchiness
- Supports moisture balance in the scalp
- Helps with fenugreek for dandruff concerns
- Softens rough and dry hair
- Encourages natural shine.

Fenugreek contains natural conditioners like mucilage, which helps coat the hair and make it smooth. Many people mix Fenugreek Powder with Aloe Vera or curd to create a hydrating

hair pack. It is useful for people who experience dryness due to weather changes, frequent styling, or chemical products.

Aloe Vera Powder: Gentle Care for Scalp Health

Aloe vera is commonly known scientifically as **Aloe vera (L.) Burm.f. or Aloe barbadense** Miller, and the drug is usually obtained from its fresh or dried leaves or leaf gel. It belongs to the family **Asphodelaceae** Aloe vera is well-known for its cooling and soothing qualities. When used as Aloe Vera Powder, it helps maintain scalp cleanliness and moisture balance.



Fig. No. 2.

Benefits of Aloe Vera Powder for hair

- Helps calm irritated or itchy scalp
- Supports aloe vera for scalp health
- Adds natural moisture to dry roots
- Makes hair soft and manageable
- Helps reduce minor scalp inflammation

Aloe vera contains vitamins, minerals, and natural enzymes that keep the scalp clean and hydrated. When used with Brahmi or Fenugreek, it creates a nourishing blend that supports overall hair health.

For people with sensitive scalps, Aloe Vera Powder is one of the safest and gentle options. It helps maintain natural pH levels without stripping the scalp of essential oils. If you are new to herbal powders, aloe vera is a great starting point because of its mild nature.

Bhringraj Powder: Nourishment for Stronger Hair

Bhringraj drug consists of the dried or fresh whole plant or aerial parts of *Eclipta prostrata* family Asteraceae Bhringraj is often called the “king of herbs” in Ayurveda for hair care. Bhringraj Powder is made from dried Bhringraj leaves, which have strengthening and rejuvenating properties.



Fig. No. 3.

Bhringraj powder uses include

- Supporting stronger roots
- Reducing hair fall
- Improving shine
- Helping with early greying concerns
- Encouraging healthy hair regrowth.

Bhringraj is deeply nourishing and works well for people who experience frequent hair fall or weak roots. It can be mixed with Brahmi, coconut oil, or aloe gel to create a restorative hair mask. Since Bhringraj is naturally rich in minerals and nutrients, it supports overall scalp health and helps improve growth over time. It is often used alongside Brahmi Powder for a well-rounded hair care routine.

Curry Leaves

Curry leaves are the leaves of the curry tree **Murraya koenigii** a small tree of the family.

Rutaceae

and the drug consists of its fresh or dried leaves.

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.



Fig. No. 4.

Benefits of Curry Leaves for Hair

- 1. May support hair growth** o Curry leaves contain nutrients like iron, amino acids, and antioxidants that help nourish hair follicles and support healthy growth.
- 2. Helps strengthen hair** o Regular use may help reduce hair breakage by improving the strength and texture of hair strands.
- 3. Can help reduce premature greying** o Traditionally, curry leaves are believed to help maintain natural hair pigment by supporting melanin production.
- 4. Improves scalp health** o Their antimicrobial and antioxidant properties may help keep the scalp clean and reduce dandruff or itchiness.
- 5. Adds shine and softness** o When used as hair oil or a mask, curry leaves can make hair look shinier and smoother.
- 6. May help with hair fall** o By nourishing the scalp and roots, curry leaves may help reduce hair fall caused by weak roots or dryness (not medical hair loss).

Neem

Neem drug comprises the dried leaves, bark, seeds, or seed oil of *Azadirachta indica A. Juss.*, family **Meliaceae**. 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.

Hair Benefits • Reduces dandruff and flaky scalp • Promotes scalp health

- **May reduce hair fall** caused by scalp infections
- **Helps control head lice** (traditional use)



Fig. No. 5.

Almond Oil

Almond oil is a fixed oil expressed from the seeds (kernels) of **Prunus amygdalus** belonging to the family **Rosaceae**.

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.

Hair Benefits

- **Strengthens hair** – Rich in vitamin E, magnesium, and healthy fats that help reduce breakage.
- **Adds shine & softness** – Makes hair smoother and easier to manage.
- **May reduce hair fall** caused by dryness or weak hair strands.
- **Nourishes scalp** – Helps with dry scalp and mild dandruff.
- **Supports healthy hair growth** when used regularly with massage.



Fig. No. 6:

Chia Seeds

Chia seeds are the edible seeds of **Salvia hispanica**, an annual herbaceous plant in the mint family

(**Lamiaceae**), primarily cultivated for its nutrient-rich seeds.

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.

Supports Hair Growth

- Rich in **protein**, which is essential for hair structure (keratin).
- Contains **omega-3 fatty acids** that nourish hair follicles.

Strengthens Hair

- Helps reduce **hair breakage** and split ends.
- Improves hair thickness and elasticity over time.



Fig. No. 7:

Rice Water

Rice is the staple cereal from *Oryza sativa*, an annual grass in the family Poaceae. Rice water, the starchy liquid obtained after rinsing or boiling rice, has been traditionally used as a natural hair-care remedy in many Asian cultures. 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.

Strengthens Hair

- Contains **amino acids** that help strengthen hair shafts.

- Helps reduce **breakage and split ends. Improves Shine & Smoothness**
- Makes hair look **shinier and silkier**.
- Helps smooth the hair cuticle, reducing frizz.

Supports Hair Growth

- Rich in **inositol**, which helps repair damaged hair and protect it from future damage.
- Supports healthier-looking growth (not a medical treatment).



Fig. No. 8:

EVALUATION TEST OF HERBAL GEL

a) PH

The pH value of herbal hair gel is determined by the pH meter. The measurement was performed at 1, 30, 60, 90 days after preparation to detect any pH changes with time.

b) VISCOSITY

The measurement of viscosity of the prepared herbal hair gel was done by using Brookfield viscometer (model RVTDV II). The reading was taken at 100 rpm using the spindle.

c) APPEARANCE AND HOMOGENECITY

The prepared gels were tested by physical appearance and homogeneity by visual observation of an herbal hair gel formulation.

d) SPREADABILITY

The spreadability was determined by parallel plate method which is widely used for determining and quantifying the spreadability of semisolid preparations. Various formulations (1 g) were pressed between two 20 × 20 cm horizontal plates, the upper of which weighed 125 g. The spread diameter was measured after 1 min.

Spreadability was calculated using the following formula:

$$S = M \times L / T$$

Where, S = Spreadability,

M = Weight in the pan (tied to the upper slide),

L = Length moved by the glass slide and T = Time (in sec.) taken to separate the slide completely each other.

DIFFUSION STUDY

The diffusion study was important to determine the drug release of prepared herbal hair gel formulation. It carried out such way taken Franz tube in which 1gm of herbal hair gel was taken packed on the bottom with cellophane membrane. Membrane is work as skin. The tube surface is deep in to the solution. 250ml phosphatebuffer solution use to absorption media of drug and maintain the PH 7.4 of solution remove the 5 ml sample from the media time to time hours 1,2,3,4,5,6,7,8 hours and replace with stock solution then determine drug release at 234 max of herbal hair gel.

STABILITY STUDY

Optimized formulation was subjected to stability as per ICH guidelines at the following conditions (ICH, 2003). It showed No significance change in properties of the optimized formulation & the drug release. Sufficient quantity of herbal hair gel formulation were packed in stability container and kept in a Stability chamber at Samples were kept in stability chamber at following conditions for 3 months- 1. $40 \pm 2^\circ\text{C}$ and $75 \pm 5\%$ RH (Accelerated temperature)2. Room temperature Formulations were analyzed at 1, 2 and 3 months for following tests- i) Visual appearance ii) Drug diffusion study.

CONCLUSION

Hair gels containing natural ingredients and herbal extracts of flax seed and aloe vera have potential effects in controlling hair fall and removing dandruff. Herbal hair gels help to overcome the various damages caused by chemical agents in various marketed products. The Prepared product was tested for its antifungal activity using *Candida albicans* as test organism, which causes dandruff and various scalp problems. Herbal hair gel containing flaxseed and aloe vera is a solution for nourishing hair, treating dandruff and other scalp problems. This product can be manufactured in large scale and commercialized as an alternative for chemical hair gels.

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