

# Formulation and Evaluation of Herbal Anti-Dandruff Hair Gel

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**Abstract:** Hair's is one amongst the vital a part of the body derived from ectoderm of the skin & its protection appendages on the body & considered accessory addition on the skin together with oil gland, sweat glands & mails. Conditioners that add shine to the hair and make it straight..

**Keywords:** Hair's

## I. INTRODUCTION

Hair's is one amongst the vital a part of the body derived from ectoderm of the skin & its protection appendages on the body & considered accessory addition on the skin together with oil gland, sweat glands & mails. Conditioners that add shine to the hair and make it straight.

Hair is simple in structure made of the root and shaft. The root is enclosed in the hair follicle, submerges into the skin in inclination and ends down to the bulb; while hair shaft is the part of the hair seen above the skin. Hair is made up of a tough protein called keratin that decides the strength of hair. Hair structure is made up of different layers and structures. Usually hair consists of two parts: Follicle; Shaft. The hair follicle is the center of biological activity like hair growth, pigmentation; whereas the hair shaft is considered to be dead and is mainly made of protein. Hair is a protein filament that grows from follicles found in the dermis. Hair is one of the defining characteristics of mammals. The human body, apart from areas of glabrous skin, is covered in follicles which produce thick terminal and fine vellus hair.

## Structure Of Hair

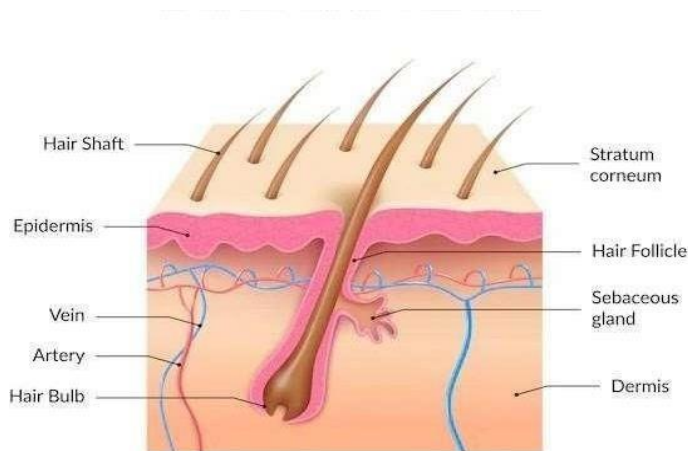


Fig no 1: Structure of Hair

Symptoms - Dandruff signs and symptoms may include:

- Skin flakes on your scalp, hair, eyebrows, beard, and shoulders
- Itchy scalp
- Scaly, crusty scalp in infants with cradle cap
- Red or inflamed patches on the scalp
- Greasy or oily patches of skin covered with white or yellowish scales
- Burning sensation on the scalp

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- Sensitivity or tenderness in affected areas
- Hair thinning or temporary hair loss in severe cases
- Dryness or tightness of the scalp

Causes : Dandruff may have several causes, including:

- Irritated, oily skin
- Dry skin
- A yeastlike fungus (*Malassezia*) that feeds on oils on the scalps of most adults
- Sensitivity to hair care products (contact dermatitis)
- Other skin conditions, such as psoriasis and eczema
- Infrequent shampooing, allowing oils and dead skin to build up
- Stress, which can trigger or worsen symptoms
- Cold, dry weather that dries out the scalp
- Hormonal changes that affect oil production

Risk factors : Almost anyone can have dandruff, but certain factors can make you more susceptible.

- Age: Dandruff usually begins in young adulthood and may persist through middle age, though it can affect people of any age—even seniors.
- Being male: Dandruff is more common in men, possibly due to hormonal differences or larger sebaceous (oil) glands.
- Certain illnesses: Conditions like Parkinson's disease, epilepsy, and other neurological disorders can increase risk. People with HIV or weakened immune systems are also more susceptible.

## **OBJECTIVE**

Aim of study: -

- Dandruff free hair: Neem and Flaxseed gel helps to avoid dandruff in hair
- Free from Itching: Neem and Flaxseed gel helps to stop itching in hair
- Styling: Hair gel is commonly used to achieve and maintain a specific hairstyle. It provides hold, control, and structure to the hair, allowing you to create various looks such as slicked-back styles, spikes, or defined curls
- Taming frizz: Hair gel can help control frizz and flyaways, especially in humid or damp conditions. It smooths the hair strands, providing a sleeker and more polished appearance.
- Adding volume and texture: Certain hair gels are formulated to add volume and texture to the hair. They can help create a fuller, more voluminous look, particularly for individuals with fine or thin hair.
- Lasting hold: Hair gel provides a strong hold, keeping the hair in place throughout the day. This is beneficial for those who want their hairstyle to remain intact and maintain its shape for an extended period.
- Enhancing natural curls: For individuals with curly hair, hair gel can be used to enhance and define the natural curls. It helps reduce frizz, adds shine, and maintains the curl pattern.
- Wet look: Some people use hair gel to achieve a wet or glossy look. This style gives the appearance of wet hair even when dry, creating a sleek and shiny effect.

## **Need of the study**

Hair gel products with essential properties to treat hair problems like thinning of hair and dry or flaky scalp and shiny hair.

These gel prevent dandruff and add volume to the hair shaft. Here are some you can use to nourish your hair.

## **Plan of work: -**

Literature Survey: Read books, research papers, and online information about dandruff, Neem, and how herbs are used for hair care.

Aim and Objective: To make a herbal hair oil and gel using Neem to treat dandruff naturally.

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- Selection of Plant Material (Neem): Choose Neem leaves because they have good properties for hair and scalp like killing germs and reducing itching.
- Extraction of Selected Plant Material: Take out useful parts from Neem leaves using simple methods like boiling or using oil.
- Study of Medicinal Uses of Neem: Learn how Neem is used in medicine, especially for hair problems like dandruff and scalp infections.
- Formulation of Herbal Hair Oil: Make hair oil using Neem and mix it with base oils like coconut or olive oil.
- Formulation of Hair Gel: Make a hair gel using Neem extract and a gel base like aloe vera to apply easily on the scalp.
- Evaluation of Hair Gel: Test the hair gel for things like how smooth it is, how it smells, its pH, and how well it works against dandruff.
- Observation: Note down what you see while making and using the oil and gel — like how it looks, feels, and works.
- Conclusion: Write what you learned from the project — was the Neem oil and gel helpful for dandruff?
- Result: Show the final outcome — how well the products worked and what changes were seen.

### **WHY USING NEEM & FLAXSEED?**

**Flaxseed:**

Flaxseed (also known as linseed) . Flaxseed oil, fibers and flax lignans have potential health benefits such as in reduction of cardiovascular disease, atherosclerosis, diabetes, cancer, arthritis, osteoporosis, autoimmune and neurological disorders. Apart from this, flaxseed is full of fatty-acids and anti-oxidants which help to remove toxins and dead cells from the scalp. Flax seed gel can be applied to scalp and hair as a moisturizer that can help to stimulate growth and improve the strength of existing hair. Hair is a protein filament that grows from follicles found in the dermis. Hair is one of the defining characteristics of mammals. The human body, apart from areas of glabrous skin, is covered in follicles which produce thick terminal and fine vellus hair.

Flaxseed gel helps clumps come together easier than other styling products, and this in turn, greatly reduces frizz. || The vitamin E present in flaxseed plays a significant role in fending off damage. It's known to combat free radicals and reduce scalp inflammation.

Is it good to apply flaxseed gel on hair daily?

This flaxseed hair gel doesn't have any artificial elements and hence can be used every day. Once cool, you can store this gel in a container for future purpose too. This flaxseed hair gel can be your hair styling product every morning.

**Neem:**

Neem is a natural herb that comes from the neem tree, other names for which include Azadirachta indica and Indian lilac. The extract comes from the seeds of the tree and has many different traditional uses. Neem is known for its pesticidal and insecticidal properties, but people also use it in hair and dental products. Neem is effective herb to treat hair loss; it is excellent way to cure dandruff. most frequently use Neem in hair and skin care products. using neem water is a pretty good technique to get rid of dandruff from your hair. However, before starting the method, you need a few neem leaves and one litre of water. Boil the water and add the neem leaves to it. After this, leave it on your scalp all night.

- o Condition your scalp.
- o Promote healthy hair growth.
- o Temporarily seal hair follicles.
- o Soothe frizz.
- o Minimize grays.
- o Reduce dandruff.



### **INFORMATION ABOUT FLAXSEED**

#### **FLAXSEED:**

Common names: Flax seed, linseed, Alsi or teesi (Hindi, Gujarati, and Punjabi, Ali vidai in Tamil, Atasi and Jawas in Marathi, Tishi in Bengali, Pesi in Oriya, Agasi in Kannada, Aviseginzalu in Telugu, and Cheruchanavithu in Malayalam.

- o Botanical Name: *Linum usitatissimum*
- o Kingdom: Plantae
- o Subkingdom: Viridiplantae
- o Division: Magnoliophyta
- o Class: Magnoliopsida
- o Order: Malpighiales
- o Family: Linaceae
- o Genus: *Linum*
- o Species: *Lusitatissimum*
- o Part use: Seed



Fig No.2: plant of Flax-seed

Flaxseed is a reliable source of B vitamins, a group of nutrients that are known for making your hair grow stronger and healthier at a more rapid.



Fig no. 3 Flaxseed





**o Chemical Constituents:**

Flaxseed accumulates many biologically active compounds. and elements including linolenic acid, linoleic acid, lignans, cyclic peptides, polysaccharides, alkaloids, cyanogenic glycosides, and cadmium.

**o Uses:**

1. Flaxseeds emerging as an important functional food ingredient because of its rich contents of  $\alpha$ -linolenic acid (ALA, omega-3 fatty acid), lignans, and fiber.
2. Flaxseeds are rich in vitamin E, which is great for both skin and hair health.
3. It helps improve circulation in the head, thus promoting hair growth and slowing down hair breakage.
4. It may also help prevent premature greying of hair.
5. Flaxseed is renowned for its ability to decrease blood pressure levels.
6. Flaxseed oil, fibers and flax lignans have potential health benefits such as in reduction of cardiovascular disease, atherosclerosis, diabetes, cancer, arthritis, and osteoporosis, autoimmune and neurological disorder.

**INFORMATION ABOUT NEEM**

NEEM: Common names: Neem or Indian Lilac in English, kadu-limba in Marathi Neem in Punjabi, Rajasthani, Urdu, Hindi, in Arabic Azad-darakhul- hind in Bengali Nim

**o Botanicalname:** Azadirachta indica

**o Kingdom:** Plantae

**o Subkingdom:** Tracheobionta

**o Division:** Magnoliophyta

**o Class:** Magnoliopsida

**o Order:** Sapindales

**o Family:** Meliaceae

**o Genus:** azadirachta Juss.

**o Species:** Azadirachta indica

**o Part of use:** Neem leaves



Fig No 4: Neem

**o Chemical Constituent:**

Neem leaf and its constituents have been demonstrated to exhibit immunomodulatory, anti-inflammatory, antihyperglycaemic, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, antimutagenic and anticarcinogenic properties. This review summary the wide range of pharmacological activities of neem leaf.

**o Uses:**

1. Neem has properties is an effective herb to treat hair loss.
2. It has antifungal properties that may help within the treatment of dandruff.
3. The regenerative properties of neem help in reducing hair fall.



4. It helps the hair follicles to become stronger and also encourages hair growth.
5. Its medicinal properties are an effective herb to treat hair loss.
6. The extracts of the leaves are widely used in skincare and hair care products
7. Ayurveda medicine for controlling blood sugar level, cleansing blood and strengthening the immune system.

Information about Orange oil



figure no. 5: orange oil

- The orange oil is effectively treats dry irritated scalp and eliminates dandruff.
- The essential vitamins in orange oil provide deep nourishment to your hair follicles making them thick and strong. It is prevent from turning rough ,dull and brittle hair strand .

o Uses:

1. Orange oil treats dry and irritated scalp, helping to remove dandruff.
2. It contains vitamins that nourish hair follicles, making hair stronger and thicker.
3. Prevents hair from becoming dry, dull, rough, and brittle.
4. Its antifungal and antibacterial properties help keep the scalp clean and infection-free.
5. Enhances blood circulation in the scalp, which promotes healthy hair growth.
6. The refreshing citrus aroma helps to reduce stress and may help with better hair health.
7. Used in many herbal shampoos, hair oils, and scalp treatments for its cleansing and strengthening effect.

#### MATERIAL, METHODS AND PREPARATION

Collection and authentication of plant materials:

The herbal hair gel was prepared by collecting and using various plant materials these are, Flax- seed, neem etc are collected local region near Ahmednagar.

The details of the plant materials study are given in following table: -

Sr. no	Herbs	Medicinal uses
1	Flax-seed.	Great for Hair Growth
2	Neem	Condition your scalp, Treat hair loss.

Table 1- Materials



## METHODS AND PREPARATION

Formulation of herbal hair gel.

o Collection of herbs required for hair gel preparation.

o Herbs are as follows

o Quantity is taken as given in table:

Sr. no.	Ingredients	Quantity
1	Flaxseed	50g
2	Neem	3 to 4 leaves
3	Water	300ml
4	Orange Oil	6 drops

Table 2 - Ingredients

## FORMULATION AND PROCEDURE

### Formulation

### Procedure

o Step 1: - Herbs were collected & washed properly.



o Step 2: - Flax-seed boil with water. Boil for 25 min.



o Step 3: -Neem boil with water & Filter with filter paper. Boil for 25 min.



o Step 4: - The filter material was collected in beaker and poured in container. Stay to settle down solution for 15 to 20 min.



o Step 5: - Add Orange Oil



### STANDARDIZATION AND EVALUATION OF GEL

The formulated hair gel was expected to be examined for parameters like Organoleptic Parameters, pH, Acid value, Viscosity.

#### 1. Organoleptic Characteristics:

Organoleptic evaluation involves checking the sensory features of the gel, which includes:

- Appearance: The visual look of the gel (clear, smooth, no lumps).
- Color: Should be consistent with the herbal ingredients used.
- Odour/Aroma: Should have a pleasant herbal or citrus smell without any foul odor.
- Texture: Smooth and soft to touch, without any rough or gritty particles.
- Feel on application: Should spread easily and feel non-sticky on the scalp.

These sensory tests help ensure the product is acceptable for consumer use.

#### 2. pH Determination:

- The pH of the hair gel is important to match with the natural pH of the scalp and hair (4.5).
- The pH was measured using a digital pH meter.
- A balanced pH ensures the gel is non-irritating, helps maintain scalp health, and does not damage hair strands.





**3. Viscosity:**

- Viscosity refers to how thick or thin the gel is, which affects how easily it can be applied.
- It was measured using Ostwald's Viscometer.
- A good hair gel should have moderate viscosity — not too runny and not too thick.
- Proper viscosity ensures better spreadability and easy extrusion from the tube or container.

**4. Acid Value:**

- Acid value helps to determine the free fatty acids present in the gel.
- Lower acid values are preferred, as they indicate better stability and shelf-life.
- This also ensures the gel does not irritate the scalp.

flaxseed is full of fatty-acids and anti-oxidants which help to remove toxins and dead cells from the scalp. The evaluation of all the formulations were done on various parameters like physical appearance, pH, viscosity, spreadability, extrudability, homogeneity, grittiness and stability.

## **II. RESULT AND DISCUSSION**

Herbal hair gel is one of the most useful hair treatments. Herbal hair Gel not only moisturizes scalp but also there by preventing the Anti-Bacterial & Anti-Fungal activity. The herbal hair Gel was prepared from various herbs like neem, Flax-seed etc.

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

Organoleptic characteristic: Our formulated hair gel was transparent in nature. It has good odour given by fragrance add in gel. The gel has good spreading ability.

<b>Sr. no.</b>	<b>Parameter</b>	<b>Inference</b>
<b>1</b>	Sensitivity test	No sensation
<b>2</b>	Irritation test	No irritation
<b>3</b>	Grittiness test	smooth
<b>4</b>	Ph.	4.5

Table no.3 - Evaluation parameter

## **III. CONCLUSION**

The formulation of Flaxseed hair gel provides a good base for treating the scalp and strengthens the hair thereby preventing the Anti-Bacterial & Anti-Fungal. There is a further scope for pharmacological studies. The formulation of Flaxseed hair gel provides a good base for treating the scalp and strengthens the hair thereby preventing the hair fall. Flaxseed hair gel also prevents the hair from dandruff. Flaxseed also acts as an Anti-dandruff agent and involved in to reduce the generation of dandruff flakes.



Flaxseed hair gel is prepared by simple boiling procedure, so it is less in cost and easy to handle. In flaxseed hair gel 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, extrudability, and stability, In vitro evaluation study. The evaluation results shows that the flaxseed hair gel is compatible for hair and it having less side effects and these parameters show results in standard range. Hence, there is a further opportunity for pharmacological studies.

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