



# FORMULATION AND EVALUATION OF HERBAL HAIR OIL

**Abhimanyu Arjun Wagh<sup>1</sup>, Dr. Swati S. Rawat<sup>2</sup>, Dr. Sunil S. Jaybhaye<sup>3</sup>,  
Ms.Pooja Ambhure<sup>4</sup>, Ms. Ashwini Shelke<sup>5</sup>**

<sup>1</sup>Student of Bachelor of Pharmacy, Institute of Pharmacy, Badnapur, Dist. Jalna.

<sup>2</sup>Faculty of Pharmaceutics, Principal of Institute of Pharmacy, Badnapur, Dist. Jalna.

<sup>3</sup>Faculty Of Quality Assurance, Vice Principal of Institute of Pharmacy, Badnapur, Dist. Jalna.

<sup>4</sup>Faculty Of Pharmaceutics Analysis, Institute of Pharmacy, Badnapur, Dist. Jalna.

<sup>5</sup>Faculty Of Pharmaceutics Analysis, Institute of Pharmacy, Badnapur, Dist. Jalna.

## ABSTRACT

Herbal hair oils are often safer and have fewer side effects compared to synthetic products. This study focuses on creating a herbal hair oil using natural ingredients like alma, hibiscus, bhringraj, jatamansi, raw garlic, muskmelon seeds, morning, curry leaves, guava leaves, papaya leaves, methi, mimosa pudica, and spring onion. The herbal oil was prepared using a boiling method, combining these ingredients in different formulas.

All the formulations were found to reduce hair fall and provide additional benefits, such as preventing dandruff, improving blood flow to the scalp, strengthening hair roots, preventing premature greying, and fighting fungal infections.

The oil was tested for properties like appearance, thickness, stability, acidity, pH, and texture. The results showed no sedimentation or grittiness, and the oil had appealing qualities similar to standard values. The findings of this study are discussed and reported in this

## INTRODUCTION

Hair plays a vital role in human life, serving both aesthetic and functional purposes. In India, traditional practices have long emphasized the preparation of hair oils infused with various hair growth-promoting herbs. Indian women, renowned for their long, shiny, and healthy hair, have incorporated hair care as an integral part of their self-care rituals. The Charaka Samhita, a definitive text on Ayurvedic medicine, highlights the significance of regular oiling of the hair and scalp for maintaining hair health and preventing hair loss. This daily practice, tailored with suitable herbal ingredients, has been preserved and continues to be followed even today.

Hair oil formulations are widely used to address common hair problems such as dandruff, hair fall, and split ends. Additionally, these preparations help cool the scalp, promoting luxurious hair growth for both men and women.

Various oils, such as coconut oil, almond oil, sesame oil, and others, serve as excellent carriers for herbal infusions, enhancing the therapeutic properties of the formulations. By combining traditional knowledge with modern techniques, herbal hair oils offer a holistic approach to hair care, blending nourishment, protection, and therapeutic benefits.

Among natural remedies, hair oils have become indispensable in addressing various hair concerns and promoting overall hair health. Almond oil, castor oil, and onion oil are widely applied to the scalp, often blended with herbal ingredients. However, coconut oil is considered the most effective base due to its superior absorption into hair strands, affordability, and compatibility with herbal infusions. Coconut oil, enriched with herbal ingredients, is widely recognized as a proven method for promoting hair growth and addressing hair issues.

Hair acts as the first line of defense against the sun's harmful UV rays, further emphasizing the need for proper care. Hair care products are formulations designed to cleanse, enhance texture, and address issues such as discoloration, damage, and lack of nourishment. Herbal cosmetics are highly favored due to their minimal adverse effects and the easy availability of natural ingredients. In recent years, the incorporation of herbs into hair care cosmetics has increased significantly, gaining recognition over synthetic



## ALTERNATIVES

Synthetic hair oils are made using artificial substances and are typically used to provide shine, excellent conditioning, and frizz control. However, natural hair oils are rich in vitamins, minerals, and fatty acids, which are vital for nourishing scalp cells and promoting healthy hair growth. When applied, these oils allow essential nutrients to penetrate the scalp and hair, aiding in regeneration and fortifying hair strands.

Beyond nourishing the scalp, hair oiling provides additional benefits such as hydration, strengthening, and protection from external damage. Oil massages also enhance hair growth by stimulating hair follicles and improving blood circulation to the scalp. The primary purpose of oiling is to condition the scalp, offering a foundation for healthier, stronger, and more vibrant hair.

Herbal formulations, derived from plant-based sources, serve multiple purposes as cosmetics, conditioners, restorative treatments, and tonics. Different types of hair oils, such as coconut, castor, and almond oil, cater to various needs like hydration, dandruff control, split-end repair, and premature greying prevention. These oils can be incorporated into hair care routines in diverse ways, underscoring their universal appeal.

Hair oiling, a traditional practice of massaging oil onto the scalp, has gained global popularity due to its ability to increase moisture, luster, and shine while replenishing nutrients lost during frequent washing. It also prevents hair disorders such as baldness, hair discoloration, and excessive hair fall. Hair care products, including oils, play a pivotal role in giving stressed hair a healthy appearance and addressing common hair-related disorders, making them an integral part of daily self-care routines.

Hair care products are formulations designed to cleanse, enhance the texture, alter the color, and revitalize stressed or damaged hair. These products aim to nourish hair, improve its health, and provide a vibrant and healthy appearance. Among these, hair oils stand out as essential formulations used for addressing a variety of hair disorders.

Hair oils are particularly effective in treating conditions such as baldness, excessive hair fall, and discoloration. They work by nourishing the scalp, strengthening hair roots, and promoting regeneration, making them indispensable in maintaining hair health and combating common hair-related issues.

Hair fall and dryness of hair are common issues that can be effectively addressed through the proper use of hair oils. The addition of pleasant fragrances in these oils enhances their appeal and popularity. Non-sticky herbal hair oils, when applied correctly, not only provide a cooling effect to the brain but also add luster, softness, and a smooth flow to the hair.

**Hair Structure and Growth Phases** Hair consists of three main parts:

**Bulb:** A swelling at the base, originating from the dermis.



Root: The part of the hair beneath the skin surface.

1: The visible hair above the skin surface.

Hair growth occurs in cyclic phases:

Phase: The growing phase lasting 2–6 years.

Catagen Phase: A short transitional phase lasting 2–3 weeks.

Telogen Phase: The resting phase lasting 2–3 months.

### Benefits of Herbal Hair Oils

Herbal hair oils moisturize the scalp, reverse dryness, and promote normal hair growth by providing essential nutrients to maintain sebaceous gland function. The plant-based ingredients used in these oils are rich in bioactive compounds like flavonoids, polyphenols, saponins, tannins, vitamins, proteins, minerals, and ricinoleic acid. These constituents contribute to hair growth, nourishment, and overall hair health.

Herbal hair oils strengthen the hair, enhance its texture, and deeply hydrate the scalp, helping to eliminate dandruff. They smoothen the hair, impart a healthy shine, and repair damage by increasing blood circulation to the scalp. Regular application of herbal oils also reduces hygral fatigue—the swelling and drying caused by excessive water absorption and evaporation.

Additionally, herbal hair oils protect hair follicles from damage caused by surfactants by filling the gaps between cuticle cells. Scalp massages with these oils promote exfoliation, which can reduce hair fall and improve overall scalp health, ensuring strong and resilient hair.

Herbal hair oil formulations offer high-quality solutions for hair and scalp care. They provide essential nutrients to maintain the normal functioning of sebaceous glands and promote natural hair growth. Unlike synthetic alternatives, these formulations leverage bioactive ingredients from herbs, reducing side effects and enhancing both personal hygiene and the healthcare system.

### Significance of Herbal Hair Oils:

1. Natural Composition: Herbal ingredients ensure minimal or no side effects, making them safe for regular use.
2. Nutritional Benefits: Provide vital nutrients that improve scalp health and maintain healthy, attractive hair.
3. Broad Applications: Enhance overall personal care and hygiene through their natural and therapeutic properties.

### Evaluation of Formulation

Evaluation is critical to understanding the effectiveness and quality of herbal hair oil formulations. It helps identify strengths, areas for improvement, and ensures the product meets its intended goals.

The following tests are typically performed:

Acid Value Test: Measures the amount of free fatty acids.

Saponification Test: Determines the molecular weight of the oil. pH Test: Ensures the formulation is scalp-friendly.

Viscosity Test: Assesses the oil's flow and consistency.

Specific Gravity Test: Determines the oil's density compared to water.

### Objectives of the Study

1. Explore the natural benefits of herbal hair oil
2. Understand the role of ingredients in maintaining scalp and hair health.
3. Prevent hair fall and control frizz effectively.
4. Identify the optimal combination of herbs for maximum benefit.
5. Study the process of formulation, preparation, and evaluation.
6. Provide a relaxing and nourishing hair treatment through scalp massage.

### Key Benefits of Herbal Hair Oils:

Promote natural hair growth by nourishing the roots.

Reverse dry scalp and hair conditions.

Reduce hair fall and control frizz.

Ensure a healthy, moisturized scalp.

This study aims to provide an in-depth understanding of the formulation and evaluation of herbal hair oils, emphasizing the importance of natural ingredients and their effectiveness in hair care.

Drug Profile: Coconut Oil Family- Aceraceae.

Scientific name- Cocos nucifera L.



Parts used- kernel oil.

Geographical location: Southern India.

Active constituents- Fatty acid, capric Acid, lauric acid.

Uses

Coconut oil is widely used in hair care for its numerous benefits, including:

Vehicle for other ingredients: Often used as a base or carrier oil in formulations for hair and skin products.

Promotes Hair Growth: Coconut oil stimulates hair growth by nourishing the hair follicles and providing essential nutrients.

Coconut oil is a valuable ingredient in both traditional and modern hair care, known for its ability to strengthen, condition, and promote healthy hair growth.



### Tilloil

Family- Pedaliaceae.

Scientific name- *S. indicum*.

Parts used- Seeds oil.

Geographical location- Middle east states of India.

Active constituents- Sesamin, palmitic acid and Linoleic acid.

Uses- Used as vehicle, Makes hair smoother and good for dry hair and scalp.



### Castor oil

Family- Euphorbiaceae.

Scientific name- *Ricinus communis* L.

Parts used- Seeds oil.

Geographical location- Gujarat in western India.

Uses -

Active constituents- Phytosterols, Castor oil is commonly used to lubricate the hair shaft, enhancing its flexibility and promoting overall hair health. erols, tocopherols, carotenoids



### Almond Oil

Family- Rosaceae.

Scientific name- *Prunus dulcis*.

Parts used- Dried kernels of almond tree.

Geographical location- Northern India.

Active constituents- Palmitic acid, linolic acid, oleic acid.

Uses- Strengthen the hair, protect the hair from sunlight, use as scalp treatment.



### Curry Leaves

Family- Rutaceae.

Scientific name- *Murraya koenigii*.

Parts used- Leaves.

Geographical location: Subtropical and tropical

Regions through the Asia.

Active constituents- Bismahanine, murrayanine, murrayazolinol.

Uses- Strengthen the hair, protect the hair from sunlight, use as scalp treatment.





### Methileaves/Fenugreek

Family- Fabaceae.

Scientific name- *Trigonella foenum-graecum*.

Parts used- Seeds.

Geographical location: Maharashtra.

Active constituents- Trimethylamine, Trigonelline, Quercetin.

Uses- Reduce dandruff, promotes hair growth and shows anti-fungal activity.



### Jasmineoil

Family- Oleaceae.

Scientific name- *Jasminum officina* Parts used- Oil of jasmine oil.



Geographical location- Tamil Nadu.

Active constituents- Benzyl acetate, Linalool Benzyl alcohol.

Uses- Flavoring agent

### Moringa

Family- Moringaceae.

Scientific name- *Moringa oleifera*.

Parts used- Leaves.

Geographical location: Southern states of India.



Active constituents- Flavonoids, glycosides, alkaloids.  
 Uses- Strengthen the hair and moisturize scalp.

### **Rawgarlic**

Family- Amaryllidaceae.

Scientific name- *Allium sativum*.

Parts used- Bulbs of the garlic.

Geographical location- Gujarat, Madhya Pradesh, Maharashtra and Rajasthan.

Active constituents- Diallyl thiosulphate, Diallylsulfide, Diallyl

Trisulfide.

Uses- Shows antimicrobial properties and contain vitamin C helps to promote Hair growth



### **Pumpkinseeds**

Family- Cucurbitaceae.



Scientific name- Cucumis sativus.

Parts used- Seeds.

Geographical location- West Bengal and Uttar Pradesh Active constituents- Palmitic acid andStearicacid.

Uses- Contains cucurbitin responsible for hair growth.



### Betel Leaves

Family- Piperaceae

Scientific name- Piper betle. L.



Parts used- Leaves.

Geographical location- Assam, Andhra Pradesh,Bihar, Gujarat, Odisha, Karnataka, Rajasthan, West Bengal.

Active constituents- Alecoline, Vitamin C, Thiamine, Niacine, Riboflavin.

Uses- For quick hair growth, treats dandruff and split ends.

### Cedarwood Oil

Family- Pinaceae.

Scientific name- Cedrus.

Parts used- Cedarwood oil.

Geographical location- Himachal Pradesh, Uttarkhand, Jammu and Kashmir Active constituents- Methyl Thujate and thujic acid.





Uses- Cleanse the scalp, removing dirt and dandruff and it enhances the circulation to scalp and tightens the Follicle  
 Habeeba Shaikh et al., Was concluded That hair care cosmetics added With herbs are well recognized composed of Synthetic one. The formulation done with natural Herbs are better and not having much side effects Compared with the synthetic one.

➤ S.Gejalakshmi et al., Says that the herbal hair oil

maintains normal functions of sebaceous gland and promotes natural hair growth by providing numerous essential nutrients required to it. India has a wide variety of medicinal herbs with various cosmetic and healing properties.

➤ Rahathunnisabegum et al. Showed that Me Thicurb hair fall and strengthens your hair from root to Tip. Almond oil is rich in vitamin E and are used for Hair loss and strengthen the hairs. Coconut oil Nourishes the scalp gives shine to the hair and the Jasmine which serves as antimicrobial agent, Conditioning agent and also gives good odour to The oil.

➤ T. Usha Kiran Reddy et al., Says that Addition of Neem acts as antidandruff. Amla helps in thickening and blackening of hair and Hibiscus Helps in hair softening resulting in healthy Growth. All these dried and fresh ingredients mixed with Coconut oil will give a solution for hair Fall and proper hair growth. And the use of hair oils used for headaches due to the cooling effects and also helps in relieving from stress and strain conditions.

➤ Ranganathan et al., Found out that the Herbal hair oil is more effective in reducing the hair Fall when compared to coconut oil by Three-month Evaluation of a herbal hair oil versus coconut oil Was conducted on human volunteers with hair fall Problem in a Y. M. T. Ayurvedic Medical College,

Kharghar. Combining assay was performed to evaluate the efficacy of the herbal hair oil. The final study shows that the test oil was effective in reducing the hair fall. Kalpesh Gaur et al., Found out that the Hibiscus is having many good activities which is Beneficial to hair and the hydro-alcoholic extract of Hibiscus rosa Sinensis Linn. Was found to possess Significant immunostimulatory action on Immunesystem.

➤ Shirode, D et al., Suggested the hair Growth activity of Hibiscus rosa-sinensis & Glycyrrhiza glabra were evaluated in albino rats. The extract of Hibiscus rosasinensis (petroleum Ether & benzene extract) & Glycyrrhiza glabra (alcohol Extract) respectively 0.2%w/v & 2%w/v Exhibit maximum hair growth activity as compared To standard group animals as treated with minoxidil Solution (2%w/v).

➤ Srivastava Varnika et al., Shared the Details and the medicinal uses of Mimosa pudica (touch me not plant)

➤ Kabyashi, N et al., Effects of 70% ethanolic extract from leaves of Ginkgo biloba On the hair regrowth in normal and high better diet-pretreated C3H strain mice which posterior hair we Shaved were investigated. GBE showed a Promoting effect on the hair regrowth.

➤ B. Ramya Kuber et al., It is concluded That the oil is beneficial in maintaining good Growth of hairs, turning grey hairs to black, Providing protection from dandruff and results in Lustrous looking hairs.

➤ Saraswat Nikita et al., Due to the Presence of natural ingredients, this formulation Proves to be a boon to fight the trending problem of Hair fall due to various reasons. Minoxidil was used As a standard to evaluate the effectiveness of the Herbal oil prepared. The herbal oil prepared was Found to be more effective than the hair regrowth Preparation of Minoxidil for stimulating hair Growth in cases of treating Alopecia.

➤ Ademiluyi AO et al., Modulatory effects Of dietary inclusion of garlic (Allium sativum) on Gentamycin-induced hepatotoxicity and oxidative Stress in rats.

➤ Allison GL et al., Aged garlic extract Inhibits platelet activation by increasing Intracellular cAMP and reducing the interaction of GPIIb/IIIa receptor with fibrinogen.

➤ Roy, R.K et al., Found that the Petroleum Ether extract of C. reflexa exhibited promising hair Growth-promoting activity as reflected from Follicular density, anagen/telogen ratio, and Skin sections.



- Ram Kumar Roy et al., Studied the Development and evaluation of polyherbal Formulation for hair growth–promoting activity and Revealed that hair growth initiation time was Markedly reduced to one third on treatment with The prepared formulation compared with control Animals.
- Libecco JF et al., The seeds of Tectona Grandis Linn. Are traditionally acclaimed as hair Tonic in the Indian system of medicine. Hair growth Initiation time was significantly reduced to half on Treatment with the extracts compared to control Animals. The treatment was successful in bringing a Greater number of hair follicles (64% and 51%) in Anagenic phase than standard minoxidil (49%). The Results of treatment with 5% and 10% petroleum Ether extracts were comparable to the Positivecontrol Minoxidil15
- Budd D et al., A questionnaire designed Specifically to evaluate attitudes to hair loss. Men With greater hair loss were more bothered, more Concerned about looking older due to their hair Loss, and less satisfied with their hair appearance. Male pattern hair loss has significant negative Effects on hair-loss specific measures in men 18 to40 years of age in France, Italy, Germany and the UK. The degree that hair loss is perceived as Noticeable to others appears to be a significant Contributor to these negativeeffects
- Mithal BM et al., A handbook of Cosmetics. 1<sup>st</sup> ed. Vallabh prakashan studied that Hibiscus consists of calcium, phosphorus, iron, Copper, zinc, vitamin B1, riboflavin, niacin, And Vitamin C which is used to stimulate thicker hair Growth by strengthening the strands and prevents Premature graying of hair17
- Shah CS et al., A Textbook of Pharmacognosy. 11<sup>th</sup> Ed. B.S. Shah Prakashan,Ahmedabad, 1996, 119 has studied that Ashwagandha has antioxidant and hormone Balancing properties which reduces hair fall and Promotes shinyhair18 Accurately weigh all the dried and fresh herbs such as, Fenugreek seed, Moringa leaves, Rawic, Curry leaves, Betelleaves.

### FORMULATION

Ingredients	Quantity
Till Oil	15%
Cedarwood Oil	2%
Almond Oil	2%
Castor Oil	3%
Coconut Oil	60%
Moringa Leaves	4%
Raw Garlic	4%
Jasmine Oil	2%
Fenugreek	2%
Pumpkin Seeds	2%
Curry Leaves	1%
Betel Leaf	3%

- Accurately weigh all the dried and fresh herbs such as, Fenugreek seed, Moringa leaves, Raw garlic, Curry leaves, Betelleaves.
- Herbal product was mixed in Coconut oil, Till oil, Almond oil, Castor oil, The above content was boiled for 30 mins. Boiled mixture was subject for filtration through muslin cloth. After filtration coconut oil was added to the filtrate to make up the volume.
- Finally, flavoring agent was added to the oil and was placed in a bottle.

## EVALUATION PARAMETERS

### EVALUATION TEST FOR HAIR OILS

Prepared herbal hair oil was estimated for product Performance which includes physicochemical parameters.

#### 1. Organoleptic Property

- Color: Detected by naked eyes
- Sensitivity: Applied to the skin and exposed to the sunlight for 5 minutes to check for any irritation over skin
- Grittiness: Rubbed to the skin and observed
- Sedimentation: Keep the whole preparation aside for overnight and check for sededimentation

#### 2. pH Determination

Take a pH paper and dip into the formulated hair oil and check for the color change.

#### 3. Viscosity Measurement

The viscosity of prepared herbal hair oil was estimated by Ostwald's Viscometer at a room temperature. The viscosity of prepared herbal hair oil was calculated by using the equation,

$$\eta_1 \times t_2$$

$$\text{Viscosity of liquid } (\eta_2) = \frac{\eta_1 \times t_1}{t_2}$$



$\eta_1$  = Viscosity of water  $\rho_2$  = Density of sample  $t_2$  = Mean

time of oil from A to B  $\rho_1$  = Density of oil

$t_1$  = Mean time of flow of water from A to

B

#### 4. Acid Value

10 ml of oil was added with 25ml of ethanol and 25ml of ether. Phenolphthalein was added as indicator and titrated with 0.1M Potassium hydroxide solution  $n$  = Number of ml of 0.1M KOH  $w$  = Wt. of oil

#### 5. Specific Gravity

Specific gravity of the prepared oil was determined using specific gravity bottle.

## RESULT

### 1. Organoleptic Property

Formulation	Color	Sensitivity	Sedimentation
F4	Dark Greenish Brown	No Irritation	No Sedimentation

### 2. PH Determination

Formulation	PH value
F4	6

### 3. Viscosity Determination

Formulation	Viscosity (Centipoise)
F4	0.92

### 4. Acid Value

Formulation	Acid value
F4	5.2

### 5. Specific Gravity

Formulation	Specific Gravity
F4	1.09

## SUMMARY

Herbal hair oils are widely preferred for addressing various hair problems. They promote hair growth, prevent hair fall, and enhance the beauty of hair by providing essential moisture to the scalp. These natural oils also treat issues like hair thinning, dry scalp, and dandruff. Additionally, they improve blood circulation in the scalp, add volume to the hair, and maintain overall hair health.

## IV. CONCLUSION

The utilization of herbal hair oil in the cosmetics enhanced many folds in personal hygiene and health care system. Herbal oil is one of the most well-recognized hair treatments. The use of different herbal materials which is having different benefits with good combination will give the great effect for hair. The herbal extracts and constituents chosen for the formulation of hair oil were reported to have hair growth, relaxation, anti-dandruff, hair thickening, and hair , which when In promoting healthy and shiny hair growth. The formulation was proven to be safe for human use. Because values of evaluation parameters of our formulation show similar results as standard values hence it is concluded that the oil is beneficial in maintaining good hair growth of the hair turning grey hair to black providing protection from dandruff and results lustrous looking hairs. The formulated hair oil will help in Maintaining good growth of hair, not only that it also provides turning grey hair to black, protects from dandruff, reduces stress etc. It provides various essential nutrients required to maintain normal function of sebaceous glands and promotes natural hair growth. Formulation was done and evaluated by means of various parameters like pH, organoleptic properties (colour, odour, sensitivity, sedimentation) acid value, viscosity, specific gravity, and stability test. At last, it can be concluded that the herbal hair oil formulations have significant quality.



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