

FORMULATION AND EVALUATION OF POLYHERBAL HAIR OIL FOR HAIR GROWTH

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Article Received on 15 April 2026,
Article Revised on 05 May 2026,
Article Published on 16 May 2026,

<https://doi.org/10.5281/zenodo.20204826>

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How to cite this Article: Patidar Pradeep*, Jaiswal Manoj and Jaiswal Navdeep. (2026). Formulation and Evaluation of Polyherbal Hair Oil For Hair Growth. World Journal of Pharmaceutical Research, 15(10), 846-855.

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ABSTRACT

The present study focuses on the formulation and evaluation of a polyherbal hair oil for promoting hair growth and improving scalp health. Various medicinal plants such as amla, hibiscus, neem, Tulsi, fenugreek, and curry leaves were incorporated using coconut and almond oil as base oils. The formulation was prepared by a heat infusion method to extract the active constituents of the herbs effectively. The prepared oil was evaluated for physicochemical parameters including pH, viscosity, specific gravity, acid value, saponification value, and organoleptic properties. The results showed that the formulation possessed acceptable characteristics, with pH suitable for scalp application, moderate viscosity, and good stability. No skin irritation was observed, confirming its safety.

The herbal ingredients provide essential nutrients, antimicrobial activity, and promote blood circulation, which helps in reducing dandruff and hair fall. Thus, the developed polyherbal hair oil can be considered a safe, effective, and economical alternative to synthetic hair care products.

KEYWORDS: Polyherbal hair oil, Hair growth, Herbal formulation, Scalp health, Natural cosmetics.

INTRODUCTION

HAIR

Hair is one of the most important parts of the body as it impacts the beauty and overall appearance of any individual. For hair care we often use various hair care products for

cleansing, modifying the texture of hair, treatment of the stressed hair and providing nourishment to the hair. Generally, we are using various synthetic products for hair care and hair treatment. Sometimes these synthetic products are showing few to many unwanted side effects instead of treating the particular problems. In order to come out from these issues we have formulated Poly herbal hair oil.^[1]

Hair is a protein filament that grows from follicles found in the dermis. Hair is one of the most important of our body that improves the overall appearance of a person.^[2] The hair fall, Dandruffs, split ends, grey hair are the major problem associated with hair. To overcome these problems, we use lots of cosmetics.^[2]

One of the most vital components of the body is the hair, which affects a person's entire appearance and beauty. When it comes to hair care, we frequently use a variety of products to cleanse, alter the texture of hair, cure stressed hair, and feed the hair. One of the essential bodily elements, hair is formed from the ectoderm of the skin and functions as both a decorative structure and a sebaceous gland. A person's dream has always been to have black, healthy, glossy, and high-quality hair. Regardless of how long or short they are, everyone prioritizes keeping and maintaining them.^[3]

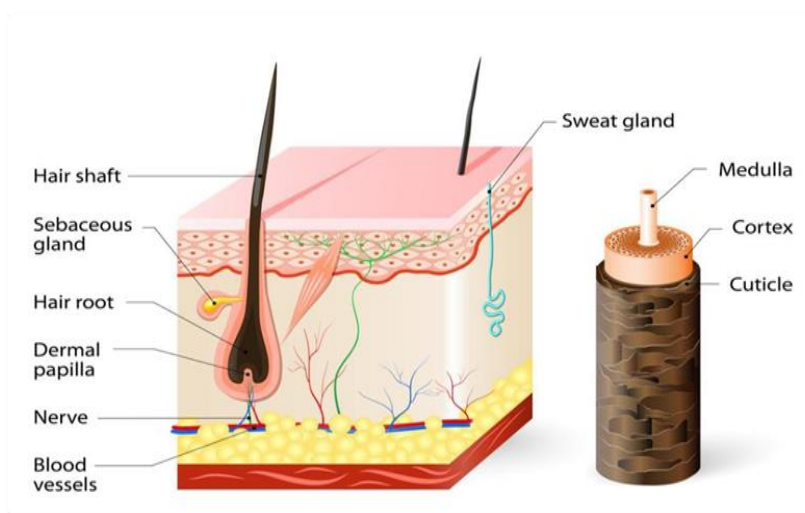


Fig. no. 1: Structure of Hair.

Hair is one of the vital parts of our body and it influences the overall appearance of person. Hair is a protein filament that grows from follicles found in the dermis. Hair is one of the most important of our body that improves the overall appearance of person. The hair fall, dandruffs, split ends, grey hair are the major problem associated with hair. Hair loss is

distressing condition for an increasing number of men and women. Hair loss is or alopecia, is a common patient problems/complaint. And a source of significant psychological and physical distress. To overcome these problems, we use lots of hair care products use.^[4]

HERBAL HAIR OIL

Nowadays, synthetic products are also used as perfume and colouring of hair oils. Traditionally hair oils are made from vegetable oils such as sesame seed oil, castor oil, coconut oil etc. But now petroleum white oils are used in the formulation of hair oil to reduce cost and improve product quality. Hair is present on most skin surfaces except the palms, palmar surface of the fingers, soles and plantar surfaces of the feet. In adults' hair usually seen in the scalp, in the eyebrows, in the axillae (armpits) and around the external genitalia. Genetic and hormonal influences largely determine hair thickness and the pattern of distribution. Each hair follicle goes through a growth cycle, which consists of a growth stage and a resting stage.^[5]

The poly herbal hair oil was prepared by collecting various plant materials such as amla, aloe vera, Bhringaraj, camphor, Indian indigo, coconut oil, fenugreek, hibiscus, neem& rosemary oil. Accurately weigh all the dried and fresh herbs and are crushed into a fine form. Hair oils are widely used in India for hair care indigenously available herbal ingredients are used to make hair oil.^[6]



Fig. no. 2: Poly Herbal Hair Oil.

Herbal hair oil not only moisturizes scalp but also converse dry scalp and dry hair conditions.

It provides numerous essential nutrients required to maintain normal functions of the sebaceous gland and promote natural hair growth. Hair oils are the hair care formulations

applied for cure of hair disorders such as baldness, greying of hairs, hair falling, and dryness of hairs. Hair oiling is the practice of pouring oil onto hair and massaging it into the scalp to increase moisture, lustre and shine. Hair oiling may soften the hair and provide vitamins and minerals that get stripped from frequent washing. Herbal hair oil are natural oil products with essential properties to treat hair problems like thinning of hair and dry or flaky scalp.^[7]

There are two categories of hair care products. They are hair tonics and hair grooming aids. Hair oil those contains herbal drugs are called as hair tonics. These are formulated by herbal extracts in an oil base. Hair oils are the hair care formulations applied for treatment of hair disorders such as baldness, greying of hairs, hair falling, and dryness of hairs.^[8]

Hair Growth cycle consists following stages

a) Anagen: The anagen phase, or growth phase of hair, is the time of year when new hair grows roughly 6 inches annually, with summer growth occurring more quickly than winter. The average length of this hair cycle phase is three to five years.

b) Catagen phase: The hair cycle continues in this phase after the catagen phase. Approximately 3% of all hair is in this stage, and the last of the catagen phase lasts for approximately 10 days.

c) Telogen phase: This is the natural hair growth cycle. Approximately 10 to 15% of hair is in the telogen phase at any given time, and the last of the telogen phase lasts for approximately 3 months to 100 days.

d) Exogen Phase: This is the last phase of the hair growth cycle, during which time individual hair strands separate from their follicles and shed.^[9]

BENEFITS OF POLYHERBAL HAIR OIL

Using polyherbal hair oil offers numerous benefits due to the combined therapeutic properties of the herbs involved:

- Promotes natural hair growth by stimulating blood flow to the scalp.
- Strengthens hair from the root and reduces hair fall significantly.
- Nourishes the scalp and provides essential nutrients to the hair follicles.
- Prevents premature greying of hair by preserving the natural melanin content.
- Provides a soothing and cooling effect, relieving stress and scalp irritation.

USES OF POLYHERBAL HAIR OIL

Polyherbal hair oil has multiple uses, making it suitable for a broad range of hair and scalp

issues:

- Used for routine scalp massage to improve blood circulation and nourish the hair follicles.
- Applied regularly to reduce hair fall and promote new hair growth.
- Useful in controlling dandruff and treating itchy, dry, or infected scalp.
- Helps in delaying the onset of premature greying and enhances natural hair color.
- Acts as a deep conditioner to restore shine, moisture, and softness to dry or damaged hair.

What is Hair Loss?

Hair loss, or alopecia, is the partial or complete loss of hair from areas where it normally grows. While mild hair shedding is a normal physiological process, excessive and persistent hair loss can be a sign of various underlying conditions.

TYPES OF HAIR LOSS

Hair loss, or alopecia, can occur due to various underlying causes. Understanding the type of hair loss is essential for selecting appropriate treatment strategies:

- 1. Androgenic Alopecia:** Also known as male or female pattern baldness. It is a genetic condition caused by the effect of androgens on hair follicles, leading to progressive thinning of hair.
- 2. Telogen Effluvium:** A temporary form of hair loss caused by emotional stress, illness, surgery, or hormonal imbalance that pushes a large number of hair follicles into the resting phase.
- 3. Alopecia Areata:** An autoimmune disorder where the immune system attacks hair follicles, leading to patchy baldness on the scalp and other areas of the body.
- 4. Traction Alopecia:** Hair loss caused by constant pulling of the hair due to tight hairstyles like braids, ponytails, or buns over prolonged periods.
- 5. Anagen Effluvium:** Rapid hair loss during the growth phase due to exposure to toxic chemicals, especially during chemotherapy or radiation therapy.
- 6. Cicatricial Alopecia:** Also known as scarring alopecia, it results from inflammation that permanently destroys hair follicles and replaces them with scar tissue.
- 7. Tinea Capitis:** A fungal infection of the scalp that causes round patches of hair loss, mostly seen in children. It is contagious and causes redness, scaling, and itching.

Why Polyherbal Hair Oil?

Polyherbal formulations combine the therapeutic potentials of multiple herbs, each offering unique properties that contribute synergistically to overall scalp and hair health. This

integrated approach addresses not just the symptoms (e.g., hair fall or dandruff), but also the root causes, such as poor circulation, microbial infection, and follicular damage. They're extensively popular due to their holistic benefits — not just for the hair but also for relaxation and stress relief, thanks to their soothing aroma and cooling goods.

Types of Herbal Hair Oil

1) Nourishing Hair Oil

- Promotes hair strength, softness, and shine.
- Examples: Coconut oil with herbs like Amla, Bhringaraj.
- Your oil fits here – strengthens roots and nourishes scalp.

2) Anti-hair fall Hair Oil

- Targets hair loss, promotes regrowth.
- Herbs like Bhringaraj, Fenugreek, Amla help reduce hair fall.
- Your oil also fits here – due to these ingredients.

3) Medicated Hair Oil

- Contains herbs with therapeutic actions (antibacterial, antifungal, anti-inflammatory).
- Used for treating dandruff, itching, infections.
- Camphor gives your oil cooling and antimicrobial properties.
- Your oil qualifies here as well.

4) Cooling Hair Oil

- Soothes scalp and relieves stress.
- Camphor contributes to this effect.
- Your oil has mild cooling properties.

5) Hair Growth Oil

- Specifically targets new hair growth.
- Bhringaraj and Castor oil are known for stimulating hair follicles.
- Your oil supports this function Similarity: 29% 8 Powerful Ayurvedic Ingredients for Healthy, Luscious Hair Precautions for Herbal Hair Oil.^[10]

Bio-compounds for treatments of Various Hair Problems

Natural components in Phyto cosmetics include extracts, essential or fixed oils, and

unprocessed substances (such as resins, waxes, lipids, etc.) that serve as the active ingredients of the product. Hair oils are utilised for the treatment and prevention of alopecia, hair damage, and other associated conditions. Hair loss, being a dermatological condition, prompts individuals to seek natural therapies that may enhance hair growth. The cosmetic body art is argued to be the earliest form of a ritual in the culture of human-being. Humans always have used the cosmetics without any knowledge. For hunter gatherers in olden days, it meant to apply the mixture of urine and mud over the skin or using the ash which was made by burning shells of snails in order to colour their faces. Hair oil containing herbal drugs are usually called as hair tonic. Hair care products are categorized into two main categories, hair tonics and hair grooming aids. These are basically the extracts of medicinal plants in an oil base. In this present study, a comparative study was attempted to formulate effective poly-herbal hair oil using indigenous and organic medicinal plants/parts based on the literature study. Various oils were selected for formulation using various organic herbs/parts and evaluate them and finally select the best of all.^[11,12,13]

METHOD AND MATERIAL

The polyherbal hair oil was prepared using natural ingredients including coconut oil and almond oil as base oils. Herbal components such as curry leaves, amla powder, Tulsi leaves, hibiscus flowers, hibiscus leaves, fenugreek seeds, and neem leaves were selected for their known therapeutic properties in promoting hair growth and maintaining scalp health. All the materials were procured from local sources and used in dried or fresh form.

Table no. 1: Role of ingredient used in formulation.

Sr. no.	Ingredient	Use
1.	Coconut oil	Moisturizing
2.	Almond oil	Nourishing
3.	Curry leaves	Flavouring
4.	Amla powder	Antioxidant
5.	Tulsi leaves	Antimicrobial
6.	Hibiscus flower	Conditioning
7.	Hibiscus leaves	Strengthening
8.	Fenugreek seeds	Conditioning
9.	Neem leaves	Cleansing

METHOD

- *Formulation of 100ml Poly Herbal Hair Oil*
- In a suitable beaker, combine coconut oil and almond oil.

- Add curry leaves, Amla powder, Tulsi leaves, Hibiscus flowers, Hibiscus leaves, Fenugreek seeds, and Neem leaves to the oil mixture.
- Heat the mixture over low heat by using double boiler setup, allowing the herbs to infuse into the oils for about 30 to 40 minutes. Stir occasionally.
- Remove the beaker from double boiler or heat and let the oil cool down to room temperature.
- Once cooled, strain the oil using a fine sieve or cheesecloth to remove any solid particles and herb residues.
- Transfer the strained oil into a clean, sterilized bottle or container for storage.

EVALUATION PARAMETER

1. Acid Value: To determine the acid value, a solution of the herbal oil was prepared by adding 10ml of oil to a mixture of 25ml ethanol and 25ml ether. Phenolphthalein was utilized as an indicator, and titration was carried out using a 0.1M potassium hydroxide solution. The acid value was calculated using the formula $5.7n/w$, where 'n' represents the volume of 0.1M KOH used in millilitres and 'w' represents the weight of the oil.

2. Saponification Value: The saponification value was determined by accurately weighing 2g of the oil and transferring it to a 250ml iodine flask. Subsequently, 25ml of 0.5M alcoholic potassium hydroxide was added, and the mixture was refluxed on a water bath for 30 minutes. Phenolphthalein was added as an indicator, and titration was carried out against 0.5M HCl. The saponification value was calculated using the formula $20.00(ba)/w$, where 'a' and 'b' represent the volumes of 0.5M HCl used in millilitres in the presence and absence of the sample, respectively, and 'w' represents the weight in grams of the solution.

3. pH: The pH of the herbal oil was determined using a pH meter. **4. Viscosity:** Viscosity was measured using Ostwald's viscometer.

4. Specific Gravity: The specific gravity of the prepared oil was determined using a pycnometer or specific gravity bottle.

5. Refractive Index: The refractive index was determined using a refractometer found to be 1.150

6. Organoleptic Properties: Manual assessment of the oil's color is Brown, Odor is

Characteristics, and skin irritation potential was conducted. A small amount of oil was applied to the skin and exposed to sunlight for 5 minutes to detect no any signs of irritation.

RESULT AND DISCUSSION

Table no. 2: Result of Evaluations.

Sr. No.	Parameter	Observation / Result
1.	Organoleptic Properties	Pleasant characteristics odour, dark green to brown colour, Smooth and non sticky texture.
2.	pH	5.5 – 6.5
3.	Viscosity	Moderate
4.	Specific Gravity	0.9 – 0.95
5.	Saponification value	180 – 200 mg KOH/g
6.	Irritation Test	No redness, itching, or irritation observed

The formulated polyherbal hair oil showed acceptable physicochemical properties, including suitable pH, moderate viscosity, and good stability. The absence of skin irritation confirmed its safety for topical use. The combined effect of herbal ingredients like amla, neem, hibiscus, and fenugreek helps in nourishing the scalp, reducing hair fall, and promoting hair growth. Overall, the formulation proved to be an effective and natural alternative to synthetic hair oils.

SUMMARY AND CONCLUSION

The formulated polyherbal hair oil was successfully prepared using natural ingredients such as hibiscus, neem, fenugreek, and coconut oil. Evaluation studies showed good stability, suitable physicochemical properties, and absence of skin irritation, indicating its safety for topical application. The herbal components are rich in nutrients that nourish the scalp, strengthen hair roots, improve blood circulation, and effectively reduce dandruff and hair fall. Regular use of this formulation can promote healthy hair growth and enhance overall hair quality. Thus, the developed polyherbal hair oil is an effective, economical, and natural alternative to synthetic hair care products.

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