

Formulation and Evaluation of Herbal Hair Oil

Vaishnavi D. Jadhav¹, Mr. Ravindra Dukare², Pratibha D. Kale³, Vaishnavi M. Shinde,⁴
Chaitrali M. Supekar⁵, Gayatri A. Sonawane,⁶ Pratiksha N. Badhe⁷, Dr. Santosh Jain⁸
^{1,3,4,5,6,7}*B. Pharm Sem. VII, Shri Sai College of Pharmacy, Khandala, Maharashtra, India*
²*Associate Professor, Shri Sai College of Pharmacy, Khandala, Maharashtra, India*
⁸*Professor, Shri Sai College of Pharmacy, Khandala, Maharashtra, India*

Abstract—Herbal hair oils have gained significant attention as safe, effective, and eco-friendly alternatives to synthetic hair care formulations. This review focuses on the preparation, formulation techniques, and evaluation parameters of herbal hair oils developed from various medicinal plants known for their hair-nourishing properties. Traditional and modern extraction methods such as maceration, infusion, boiling, and Soxhlet extraction are discussed with emphasis on their influence on the quality and efficacy of the final product. Commonly used herbs such as Amla (*Embllica officinalis*), Bhringraj (*Eclipta alba*), Brahmi (*Bacopa monnieri*), Hibiscus (*Hibiscus rosa-sinensis*), Neem (*Azadirachta indica*), and Fenugreek (*Trigonella foenum-graecum*) are reviewed for their role in promoting hair growth, preventing dandruff, and reducing hair fall. Evaluation parameters including physicochemical properties, stability studies, microbial analysis, and biological assessments essential for standardization are summarized. Overall, herbal hair oils demonstrate considerable therapeutic potential and consumer acceptability while encouraging further scientific validation and innovation in natural cosmetic formulations.

Index Terms—Herbal hair oil, medicinal plants, formulation, evaluation, hair growth, natural cosmetics.

I. INTRODUCTION

Hair plays a significant role in human appearance and personality. Healthy hair reflects proper nutrition, hygiene, and overall health. Modern lifestyle factors such as pollution, stress, poor dietary habits, and excessive use of chemical-based cosmetic products contribute to hair damage, dandruff, premature greying, and hair fall. Herbal hair oils have emerged as natural alternatives to synthetic hair care products due to their safety, efficacy, and minimal side effects.

Traditional medicinal systems such as Ayurveda have extensively utilized medicinal plants for maintaining hair and scalp health. Herbal oils nourish the scalp, strengthen hair follicles, improve blood circulation, and stimulate hair growth. Medicinal plants such as Amla, Neem, Hibiscus, Fenugreek, Coconut, and Shikakai possess antioxidant, antimicrobial, anti-inflammatory, and conditioning properties that help in maintaining healthy hair.

The present review focuses on the formulation methods, ingredients, evaluation parameters, advantages, and therapeutic benefits associated with herbal hair oil preparations.

II. LITERATURE REVIEW

Several researchers have investigated the preparation and evaluation of herbal hair oils using medicinal plants and natural oils.

1. A review on herbal hair oil (2025) discussed traditional herbs such as *Embllica officinalis*, *Eclipta alba*, *Azadirachta indica*, and *Bacopa monnieri* along with carrier oils like coconut and sesame oil. The study highlighted antioxidant, antimicrobial, and anti-inflammatory mechanisms and analytical methods including HPTLC and GC-MS.
2. Design and analysis of herbal hair oil (2024) focused on formulation development and component analysis of herbal hair oil prepared using carrier oils and medicinal herbs.
3. Preparation of herbal hair oil exploring therapeutic benefits and evaluation (2024) emphasized preparation methods and quality control parameters such as pH, viscosity, organoleptic properties, and stability studies.

4. Formulation and evaluation of hair fall control herbal hair oil (2023) utilized herbs such as curry leaves, neem, hibiscus, rosemary oil, and henna for controlling hair fall and improving hair health.
5. Clinical studies conducted on proprietary Ayurvedic oils such as Keshohills hair oil and Indulekha Svetakutaja hair oil demonstrated reduction in dandruff and hair fall through randomized and controlled trials.

The available literature indicates increasing consumer demand for natural and safe cosmetic products along with the need for standardized formulations and long-term clinical evaluation.

III. AIM AND OBJECTIVES

Aim

To formulate and evaluate herbal hair oil using medicinal herbs for improving hair growth and scalp health.

Objectives

- To promote hair growth and reduce hair fall.
- To strengthen hair roots and prevent breakage.
- To reduce premature greying.
- To nourish and moisturize the scalp.
- To prevent dandruff and scalp irritation.
- To improve hair texture, shine, and softness.
- To protect hair from environmental and chemical damage.
- To develop a natural alternative to synthetic hair care products.

IV. MATERIALS USED IN HERBAL HAIR OIL

Herb	Botanical Name	Therapeutic Use
Amla	Emblica officinalis	Promotes hair growth and prevents premature greying
Coconut	Cocos nucifera	Moisturizes hair and prevents damage
Onion	Allium cepa	Enhances hair growth and scalp health
Hibiscus	Hibiscus rosa-sinensis	Conditions hair and enhances shine
Neem	Azadirachta	Prevents dandruff and scalp

	indica	infection
Fenugreek	Trigonella foenum-graecum	Prevents hair fall and improves texture
Shikakai	Senegalia rugata	Natural cleanser and anti-dandruff agent
Almond	Prunus dulcis	Nourishes scalp and strengthens hair

V. FORMULATION OF HERBAL HAIR OIL

Sr. No.	Ingredient	Quantity	Role
1	Coconut oil	100 ml	Base oil and scalp nourishment
2	Almond oil	20 ml	Emollient and conditioning agent
3	Amla	8 g	Promotes hair growth
4	Onion juice	8 ml	Reduces hair fall
5	Hibiscus	4 g	Hair conditioning
6	Neem leaves	4 g	Anti-dandruff activity
7	Fenugreek seeds	4 g	Strengthens hair
8	Shikakai	4 g	Natural cleanser
9	Vitamin E	1 capsule	Antioxidant
10	BHT	0.05 g	Preservative
11	Perfume	q.s.	Fragrance
12	Liquid paraffin	4 ml	Improves spreadability

VI. METHOD OF PREPARATION

1. Collection and cleaning of herbal ingredients.
2. Drying and grinding of herbs into coarse powder.
3. Preparation of oil base using coconut oil, almond oil, and liquid paraffin.
4. Addition of herbal powders into the oil base.
5. Heating at 60–70°C with continuous stirring.
6. Addition of onion juice followed by mild heating.

7. Cooling and filtration using muslin cloth or filter paper.
8. Addition of Vitamin E, BHT, and fragrance.
9. Filling the prepared oil into airtight containers.
10. Labeling and storage under suitable conditions.

VII. METHODS OF HERBAL HAIR OIL PREPARATION

7.1 Maceration Method

Powdered herbal materials are soaked in a suitable oil base for several days at room temperature and filtered.

7.2 Boiling Method

Herbal materials are boiled with oil until moisture evaporates and active constituents are transferred into the oil.

7.3 Infusion Method

Fresh or dried herbs are infused in warm oil for several hours and filtered.

7.4 Soxhlet Extraction Method

Active constituents are extracted using solvents and incorporated into the oil base.

VIII. EVALUATION PARAMETERS

8.1 Organoleptic Evaluation

- Color
- Odor
- Appearance
- Consistency
- Feel on application

8.2 Physicochemical Evaluation

- pH determination
- Viscosity measurement
- Specific gravity
- Refractive index
- Acid value
- Saponification value
- Peroxide value
- Iodine value

8.3 Microbial Evaluation

- Total bacterial count
- Fungal count
- Pathogen testing

8.4 Stability Studies

- Color and odor changes
- Phase separation
- Viscosity changes
- Rancidity studies

8.5 Performance Evaluation

- Spreadability test
- Washability test
- Irritation test
- Combing ease test

8.6 Phytochemical Evaluation

Qualitative analysis of alkaloids, flavonoids, tannins, terpenoids, and phenolic compounds.

IX. ADVANTAGES AND DISADVANTAGES

Advantages

- Natural and biodegradable
- Fewer side effects
- Nutrient-rich and scalp-friendly
- Antioxidant and antimicrobial properties
- Cost-effective and sustainable

Disadvantages

- Possible allergic reactions
- Scalp irritation in sensitive individuals
- Greasy appearance on overuse
- Possibility of clogged pores
- Some oils may stain fabrics

X. USES AND BENEFITS OF HERBAL HAIR OIL

- Promotes hair growth
- Prevents hair fall
- Nourishes the scalp
- Controls dandruff and dryness
- Improves texture and shine
- Delays premature greying
- Reduces split ends and frizz
- Provides relaxation through scalp massage

XI. RESULTS AND DISCUSSION

The review of literature indicates that herbal hair oils possess significant potential in promoting hair

growth, reducing hair fall, and improving scalp health. Formulations containing herbs such as Amla, Hibiscus, Fenugreek, Neem, and Coconut oil showed positive outcomes in terms of physicochemical stability, spreadability, safety, and consumer acceptability.

The therapeutic effects are mainly attributed to phytochemicals including flavonoids, alkaloids, tannins, antioxidants, and essential fatty acids present in medicinal plants. Most formulations demonstrated acceptable pH, viscosity, and stability without causing irritation or adverse effects.

XII. CONCLUSION

Herbal hair oils represent effective and safe alternatives to synthetic hair care formulations due to their rich phytochemical composition and therapeutic benefits. Medicinal plants such as Amla, Neem, Hibiscus, Fenugreek, and Coconut oil provide multiple benefits including hair growth promotion, dandruff control, scalp nourishment, and prevention of hair fall.

The reviewed studies indicate that properly formulated herbal hair oils exhibit desirable quality, safety, and efficacy. However, further standardized clinical studies and advanced analytical evaluations are required to scientifically establish their long-term effectiveness and safety.

Herbal hair oils therefore remain a promising area for future research and development in natural cosmetic and therapeutic applications.

REFERENCES

- [1] Bagad YM, Barhate SD, Samir SK. Design, Formulation and Evaluation of Herbal Hair Oil for Enhance Hair Growth Activity. *Research Journal of Topical and Cosmetic Sciences*. 2025.
- [2] Shukla RK, Gudulkar S, Sachdev M, Ritambhara. Indulekha Bringha hair oil significantly improves hair density. *International Journal of Research in Dermatology*. 2025.
- [3] Panahi Y, et al. Rosemary oil vs. minoxidil 2% for treatment of androgenetic alopecia: randomized comparative trial. 2015.
- [4] Exploring Herbal Remedies for Hair Care: A Review. GSC Online Press. 2025.
- [5] Herbal Hair Oil: An Overview. IJPRA. 2024.

- [6] Ramya Kuber B, Lavanya C, Haritha CN, Preethi S, Rosa G. Preparation and Evaluation of Poly Herbal Oil. *Journal of Drug Delivery and Therapeutics*. 2019;9(1):68–73.
- [7] Rahathunnisa Begum, Afzalunnisa Begum. Preparation and Evaluation of Herbal Oil. *International Journal of Research and Analytical Reviews*.
- [8] Narule OV, Kengar MD, Mulik PP, et al. Formulation and Evaluation of Poly Herbal Oil. *Research Journal of Topical and Cosmetic Science*. 2019;10(1):09–12.
- [9] Wadekar H, Thara R. Preparation and Evaluation of Herbal Hair Oil. *International Journal of Science and Research*.
- [10] Jhadav AK, Surwase US, Thengal AV. Formulation and Evaluation of Polyherbal Hair Oil. *International Journal of Science and Research*.
- [11] Mali KD, Shroff RM, Chaudhari SD, Bacchav SS. Formulation and Evaluation of Ayurvedic Herbal Oil. *Indo American Journal of Pharmaceutical Research*.
- [12] Kumari I, Kaurav H, Chaudhary G. Eclipta Alba (Bhringraj): A Promising Hepatoprotective and Hair Growth Stimulating Herb. *Asian Journal of Pharmaceutical and Clinical Research*.