

FORMULATION AND EVALUATION OF HERBAL HAIR OIL

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Abstract—Hair plays an important role in personal appearance and confidence. Factors such as pollution, stress, unhealthy lifestyle, dandruff, and excessive use of chemical-based products may lead to hair fall, scalp infections, dryness, and damage to hair roots. Due to the harmful effects associated with synthetic cosmetic products, the demand for herbal and natural hair care preparations has increased significantly.

The present study focuses on the formulation and evaluation of Herbal Hair Oil using natural medicinal herbs and carrier oils such as Coconut oil, Castor oil, Olive oil, Rosemary, Shikakai, Reetha, Neem, Amla, Methi, Brahmi, Clove, and Black Pepper. These ingredients possess hair growth promoting, anti-dandruff, antimicrobial, antioxidant, and scalp nourishing properties. The formulation was prepared by hot infusion method to obtain effective extraction of herbal constituents into the oil base.

The main objective of the study was to prepare a safe, stable, and effective herbal hair oil for promoting hair growth, reducing hair fall, nourishing scalp tissues, and improving hair texture naturally. The prepared formulation was evaluated for various parameters including color, odor, appearance, pH, viscosity, spreadability, homogeneity, irritation test, washability, and stability.

The evaluation results indicated that the prepared Herbal Hair Oil possessed pleasant herbal odor, smooth consistency, suitable pH, good spreadability, and excellent stability without any irritation or phase separation. The study concluded that the formulated Herbal Hair Oil is safe, effective, economical, and suitable for regular hair care application.

Index Terms—Herbal Hair Oil; Rosemary; Amla; Neem; Brahmi; Shikakai; Reetha; Hair Growth; Dandruff Control; Herbal Cosmetics; Natural Hair Care.

I. Introduction

1. Introduction to Hair Care Cosmetics

Hair is considered one of the most important features contributing to the overall beauty, personality, and self-confidence of an individual. Healthy, shiny, and strong hair is often associated with good health and proper personal care. Since ancient times, hair care has been an essential part of daily grooming practices in various cultures, especially in India where herbal and Ayurvedic remedies have traditionally been used for maintaining healthy hair and scalp.

Hair cosmetics are preparations used to cleanse, protect, beautify, nourish, and maintain the health of hair and scalp. These products include shampoos, conditioners, hair oils, hair serums, hair creams, hair masks, and hair dyes. Among these, hair oil is one of the oldest and most commonly used cosmetic preparations because of its nourishing and protective properties. Hair oil not only improves hair texture and appearance but also helps in maintaining scalp health and preventing various hair disorders.

Traditionally, herbal oils prepared from medicinal plants and natural oils have been extensively used for hair care. Ayurveda describes the use of several herbs and medicated oils for promoting hair growth, strengthening hair roots, preventing dandruff, and reducing premature greying. Herbal hair oils are considered safer and more beneficial compared to synthetic products because they contain natural phytoconstituents such as alkaloids, flavonoids, tannins, vitamins, minerals, proteins, antioxidants, and essential fatty acid

2. Structure and Function of Hair

Hair is a filamentous protein structure mainly composed of keratin. It arises from hair follicles located in the dermal layer of skin. Each hair strand consists of three layers:

1. **Cuticle:** The outermost protective layer made up of overlapping cells that protect inner layers from damage.
2. **Cortex:** The middle layer containing melanin pigments responsible for hair color and strength.
3. **Medulla :** The innermost core present mainly in thick hair strands.

The hair follicle is associated with sebaceous glands that secrete sebum, a natural oily substance that lubricates and protects hair and scalp. Functions of hair include:

- Protection of scalp from UV radiation
- Maintenance of body temperature
- Sensory function
- Enhancement of appearance and personality

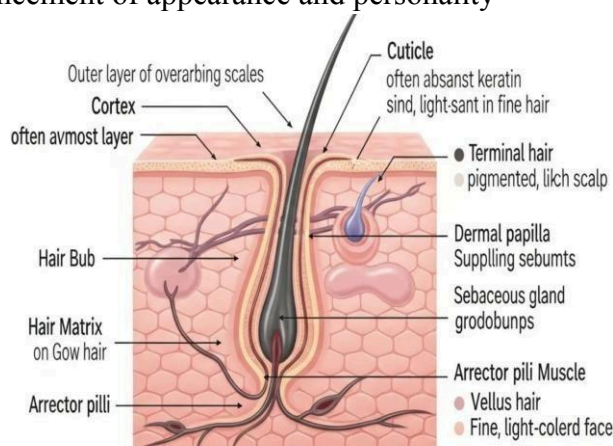


FIGURE 1.1 STRUCTURE OF HAIR

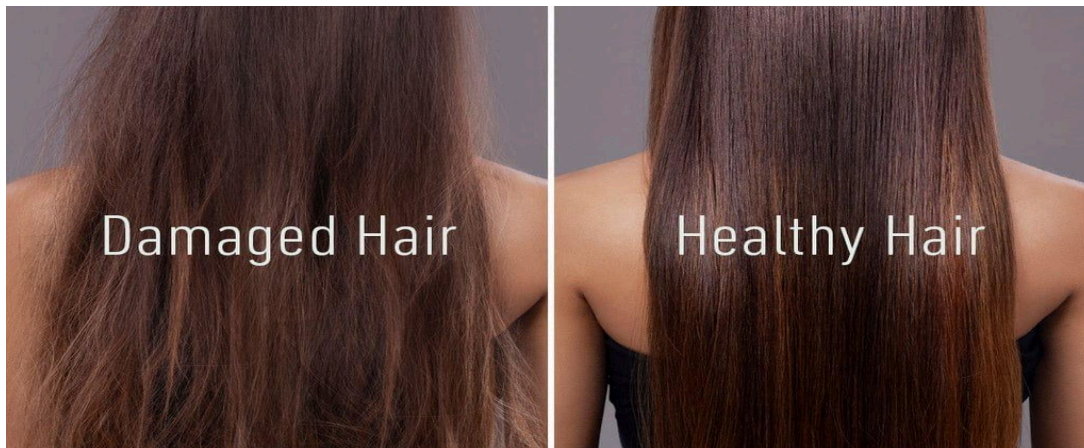
3. Common Hair Problems

Modern lifestyle changes and environmental conditions have significantly increased hair-related problems among people of all age groups. Several internal and external factors contribute to hair damage and scalp disorders.

Common hair problems include:

- **Hair Fall:** Excessive shedding of hair due to weak roots, stress, nutritional deficiencies, hormonal imbalance, or scalp disorders.
- **Dandruff:** A common scalp condition characterized by itching and flaking due to fungal growth or dry scalp.

- Premature Greying: Loss of natural hair pigment before normal aging.
- Dryness and Frizziness: Occurs due to lack of moisture, excessive heat exposure, and chemical treatments.
- Split Ends: Damage to the hair shaft causing breakage and rough texture.
- Scalp Infection: Caused by microbial or fungal contamination leading to itching and irritation.
- Hair Thinning: Reduction in hair density due to weakening of hair follicles.



4. Causes of Hair Damage

Several factors contribute to hair and scalp damage:

- Environmental Factors
 1. Pollution
 2. Dust
 3. UV radiation
 4. 4.Hard water exposure
- Lifestyle Factors
 1. Stress
 2. sleep
 3. Unhealthy diet
 4. Smoking
- Cosmetic Factors
 1. Excessive use of hair dryers and straighteners
 2. Chemical hair treatments
 3. Hair coloring
 4. Synthetic shampoos and hair oils
- Nutritional Deficiency

Lack of proteins, vitamins, iron, and minerals weakens hair structure

5. Importance of Hair Oil

Hair oil plays a major role in maintaining healthy hair and scalp. Application of oil nourishes hair roots, improves blood circulation, reduces dryness, and strengthens hair shafts.

- Preservatives Benefits of hair oil include:

- Moisturization of scalp
- Reduction of hair breakage
- Prevention of dandruff
- Improvement in hair shine
- Relaxation and stress reduction
- Protection from environmental damage
- Oiling also acts as a conditioning treatment and helps in maintaining softness and smoothness of hair.

6. Limitations of Synthetic Hair Oils

Most commercially available hair oils contain synthetic chemicals such as:

- Mineral oils
- Petroleum derivatives
- Silicones
- Artificial colors

Although these products provide temporary shine and smoothness, long-term use may cause: Scalp irritation

- Allergic reactions
- Hair dryness
- Blockage of scalp pores
- Weakening of hair roots
- Hair thinning

Therefore, consumers are increasingly shifting towards herbal and natural cosmetic products.

7. Growth of Herbal Cosmetics

Herbal cosmetics have gained tremendous popularity worldwide because they are prepared using natural plant-based ingredients and are considered safer than synthetic products. Herbal formulations are associated with:

Minimal side effects ,Better skin and scalp compatibility ,Eco-friendly nature
 ,Biodegradability ,Traditional acceptance ,Richness in antioxidants and nutrients

The global demand for herbal cosmetic products is increasing rapidly due to growing awareness regarding natural health care and sustainable products.

8. Role of Herbal Ingredients in Hair Care

Medicinal plants contain bioactive compounds that provide therapeutic benefits to hair and scalp.

- Rosemary :Stimulates blood circulation and promotes hair growth.
- Neem:Possesses antifungal and antimicrobial properties useful in dandruff control.
- Amla:Rich in Vitamin C and antioxidants that strengthen hair roots.
- Brahmi:Nourishes scalp and reduces dryness.

- Shikakai and Reetha: Act as natural cleansing agents.
- Methi: Conditions hair and prevents hair thinning.

9. Need for Present Study

The increasing popularity of herbal cosmetics and growing awareness regarding harmful effects of synthetic chemicals motivated the formulation of Herbal Hair Oil using medicinal plants. The aim was to develop a stable, effective, economical, and safe herbal hair oil formulation capable of providing multiple benefits without causing harmful side effects. The formulated Herbal Hair Oil was expected to provide:

- Promotion of natural hair growth
- Reduction in hair fall
- Prevention of dandruff
- Strengthening of hair roots
- Deep scalp nourishment
- Prevention of premature greying
- Improvement in hair texture and shine
- Moisturization and conditioning effect
- Reduction in scalp irritation and dryness
- Protection against environmental damage

The formulation also aimed to utilize easily available herbal ingredients and simple preparation techniques suitable for small-scale cosmetic production.

10. Overview of the Formulation

The formulated Herbal Hair Oil contains:

Coconut Oil – Base oil and moisturizer

Castor Oil – Hair thickening agent

Olive Oil – Nourishing emollient

Rosemary – Hair growth promoter

Neem – Antifungal agent

Amla – Hair strengthening agent

Brahmi – Scalp nourisher

Shikakai and Reetha – Natural cleansers

Methi – Conditioner, Clove and Black Pepper – Scalp stimulants

The formulation was prepared using hot infusion method to ensure effective extraction of phytoconstituents from herbs into the oil base.

II. AIM AND OBJECTIVES

AIM

The main aim of the present study is:

“To formulate, develop, and evaluate Herbal Hair Oil using natural herbal ingredients for promoting healthy hair growth, reducing hair fall, nourishing the scalp, and improving overall hair health.”

The study focuses on preparing a safe, stable, economical, and effective herbal formulation using medicinal herbs and natural oils traditionally known for their beneficial effects on hair and scalp. The prepared formulation is intended to provide multiple benefits such as scalp nourishment, dandruff control, strengthening of hair roots, improvement in hair texture, and protection from hair damage without causing harmful side effects associated with synthetic cosmetic products.

OBJECTIVES

1. To select suitable herbal ingredients possessing hair growth promoting, anti-dandruff, nourishing, conditioning, and scalp protective properties.
2. To prepare Herbal Hair Oil using hot infusion method for effective extraction of active phytoconstituents into carrier oils.
3. To develop a stable and uniform formulation having smooth consistency, pleasant odor, good spreadability, and suitable viscosity.
4. To promote hair growth and reduce hair fall by using herbs traditionally known for strengthening hair follicles and improving scalp circulation.
5. To nourish and condition scalp and hair for improving hair softness, texture, shine, and overall scalp health.
6. To control dandruff and scalp infections using herbal ingredients possessing antimicrobial and antifungal properties.
7. To evaluate physicochemical properties such as color, odor, pH, viscosity, spreadability, homogeneity, irritation test, and stability study.
8. To assess stability and safety of the formulation during storage and ensure suitability for topical application.
9. To develop an economical herbal alternative to synthetic hair oils using easily available natural ingredients.
10. To explore future scope for herbal cosmetic development and promote the use of safe and natural hair care formulations.

III. LITERATURE REVIEW

1. **Kumar et al.** : Conducted a study on polyherbal hair oil formulations containing Amla, Neem, and Coconut oil. Their findings revealed that herbal oils significantly reduced hair fall, improved scalp nourishment, and enhanced hair texture due to the presence of natural antioxidants and fatty acids.
2. **Sharma & Gupta** : Reported that Rosemary extract stimulates blood circulation in scalp tissues and promotes hair follicle activity. Their study highlighted the role of rosemary in improving hair growth and preventing thinning of hair.

3. **Patel et al.** : Evaluated the antimicrobial activity of Neem in hair care preparations and observed that Neem possesses strong antifungal and antibacterial properties that help in reducing dandruff and scalp infections.
4. **Singh et al.** : Conducted a comparative study on herbal and synthetic hair oils and found that herbal formulations produced fewer side effects and showed better scalp compatibility due to absence of harmful chemicals.
5. **Joshi et al.** : Demonstrated that Amla extract contains high amounts of Vitamin C and tannins which strengthen hair roots, reduce premature greying, and improve overall hair health.
6. **Rao et al.** : Investigated the effect of Brahmi on scalp nourishment and hair growth. Their study showed that Brahmi improves blood circulation and **strengthens** hair follicles, resulting in reduced hair fall.
7. **Khan et al.** : Reported that Fenugreek (Methi) seeds contain proteins and nicotinic acid which help nourish scalp tissues, moisturize hair, and prevent dryness and hair breakage.
8. **Verma et al.** : Studied the role of Castor oil in hair care and found that ricinoleic acid present in Castor oil improves scalp circulation and supports healthy hair growth and thickness.
9. **Deshmukh et al.** : Conducted research on Shikakai and Reetha as natural cleansing agents and observed that their saponin content effectively cleanses scalp and hair without removing natural oils.
10. **Kulkarni et al.** : Evaluated the antioxidant activity of Clove oil in cosmetic formulations and reported that Eugenol present in Clove protects scalp tissues from oxidative damage and microbial growth.
11. **Mishra et al.** : Investigated the role of Coconut oil in prevention of protein loss from hair and concluded that Coconut oil penetrates deeply into the hair shaft, thereby reducing hair damage and dryness.
12. **Chaudhary et al.** : Reported that Olive oil acts as an excellent natural conditioner due to the presence of Vitamin E and polyphenols, which improve hair softness and shine.
13. **Pawar et al.** : Conducted a stability study on herbal hair oils and observed that formulations prepared by hot infusion method showed good stability and uniform distribution of herbal constituents.
14. **Nair et al.** : Studied the physicochemical evaluation of herbal cosmetic oils and emphasized the importance of parameters such as pH, viscosity, spreadability, homogeneity, and stability in ensuring product quality and safety.
15. **Gupta & Sharma** : Investigated the combined effect of multiple herbal ingredients in hair oil formulations and concluded that polyherbal preparations provide synergistic benefits including dandruff control, scalp nourishment, and improved hair texture.
16. **Kale et al.** : Reported that Black Pepper improves blood circulation and enhances penetration of active herbal constituents into scalp tissues, thereby improving therapeutic efficacy of herbal hair oils.

17. **Patwardhan et al.** : Conducted research on herbal cosmetic formulations and observed increasing consumer preference toward herbal products due to their safety, effectiveness, and minimal side effects.
18. **Bhosale et al.** : Evaluated the safety profile of herbal hair oils and found that formulations prepared using natural ingredients showed no significant irritation or allergic reactions during topical application.
19. **Tamboli et al.** : Investigated the role of herbal oils in improving scalp health and concluded that regular application of herbal formulations reduces scalp dryness, itching, and dandruff effectively.
20. **Shinde et al.** : Studied the cosmetic acceptability of herbal hair oil formulations and reported that smooth texture, pleasant odor, non-sticky nature, and easy washability are important parameters influencing consumer satisfaction.

IV. HERBAL DRUG PROFILE

The herbal ingredients used in the formulation of Herbal Hair Oil were selected based on their traditional Ayurvedic importance, therapeutic value, safety, availability, and scientifically proven benefits for hair and scalp care. These medicinal herbs and natural oils possess properties such as hair growth promotion, scalp nourishment, conditioning, dandruff control, antimicrobial activity, antioxidant effect, and strengthening of hair roots.

The detailed profile of each herbal drug used in the formulation is described below.

Coconut Oil

Synonyms: Nariyal Oil, Coconut Fat

Biological Name: *Cocos nucifera*

Family: Arecaceae

Geographical Source: Coconut is widely cultivated in tropical regions of India, Sri Lanka, Indonesia, Philippines, and other coastal countries.

Chemical Constituents: Lauric acid, Capric acid, Caprylic acid, Myristic acid

Vitamin E, Medium-chain triglycerides

Therapeutic Properties: Moisturizing, Emollient, Antioxidant, Hair conditioning

Uses in Hair Care: Coconut oil penetrates deeply into the hair shaft and prevents protein loss.



Fig 5.1

It nourishes scalp tissues, improves hair softness, reduces dryness, and protects hair from damage. Role in Formulation: Acts as the primary base oil and provides nourishment, smoothness, and shine to hair.

Castor Oil

Synonyms: Arandi Oil

Biological Name: *Ricinus communis*

Family: Euphorbiaceae

Geographical Source: Cultivated widely in India, Brazil, and tropical countries.

Chemical Constituents: Ricinoleic acid, Oleic acid, Linoleic acid, Palmitic acid

Therapeutic Properties: Hair strengthening, Moisturizing, Anti-inflammatory, Hair thickening

Uses in Hair Care: Castor oil strengthens hair follicles, improves blood circulation, and reduces hair breakage. Role in Formulation: Used as hair thickening and nourishing agent.



Fig 5.2

Olive Oil

Synonyms: Zaitoon Oil

Biological Name: *Olea europaea*

Family: Oleaceae

Geographical Source: Mediterranean regions and Europe.

Chemical Constituents: Oleic acid, Linoleic acid, Polyphenols, Vitamin E

Therapeutic Properties: Emollient, Moisturizer, Antioxidant, Hair conditioner

Uses in Hair Care: Olive oil nourishes scalp, improves softness, and protects hair from dryness and frizz. Role in Formulation: Acts as conditioning and moisturizing oil.



Fig 5.3

Rosemary

Synonyms: Rosemary Herb

Biological Name: *Rosmarinus officinalis*

Family: Lamiaceae

Geographical Source: Mediterranean regions and cultivated in India.

Chemical Constituents: Rosmarinic acid, Cineole

Camphor, Flavonoids, Essential oils

Therapeutic Properties: Hair growth

promotion, Antioxidant Anti-inflammatory, Scalp stimulant

Uses in Hair Care: Rosemary improves blood circulation to scalp and stimulates hair follicles which promotes hair growth.

Role in Formulation: Acts as hair growth promoter and scalp stimulant.



Fig 5.4

Shikakai

Synonyms: Hair Fruit

Biological Name: *Acacia concinna*

Family: Fabaceae

Geographical Source: India, especially South India.

Chemical Constituents: Saponins, Tannins, Alkaloids

Therapeutic Properties: Natural cleansing, Anti-dandruff, Hair conditioning

Uses in Hair Care: Shikakai cleanses scalp naturally without removing natural oils. Role in Formulation

Acts as cleansing and conditioning agent.



Fig 5.5

Reetha

Synonyms: Soapnut

Biological Name: *Sapindus mukorossi*

Family: Sapindaceae

Geographical Source: India and Nepal.

Chemical Constituents: Saponins, Sugars, Flavonoids

Therapeutic Properties: Natural cleanser, Antimicrobial, Anti-dandruff

Uses in Hair Care: Reetha removes dirt, excess oil, and dandruff while maintaining scalp cleanliness. Role in Formulation: Acts as cleansing and anti-dandruff agent.



Fig 5.6

Neem

Synonyms: Margosa

Biological Name: *Azadirachta indica*

Family: Meliaceae

Geographical Source: Widely distributed throughout India.

Chemical Constituents: Azadirachtin, Nimbin, Flavonoids, Tannins

Therapeutic Properties: Antifungal, Antibacterial, Anti-inflammatory

Uses in Hair Care: Neem prevents dandruff, itching, and scalp infections.

Role in Formulation: Acts as antimicrobial and anti-dandruff agent.



Fig 5.7

Amla

Synonyms: Indian Gooseberry

Biological Name: *Phyllanthus emblica*

Family: Phyllanthaceae

Geographical Source: India and Southeast Asia.

Chemical Constituents: Vitamin C, Tannins, Gallic acid, Antioxidants

Therapeutic Properties: Hair strengthening, Antioxidant, Hair growth promotion

Uses in Hair Care: Amla strengthens roots, prevents premature greying, and improves hair texture.

Role in Formulation: Acts as hair strengthening and nourishing agent.



Fig 5.8

Methi

Synonyms: Fenugreek

Biological Name: *Trigonella foenum-graecum*

Family:Fabaceae

Geographical Source:India, Mediterranean region.

Chemical Constituents:Proteins,Lecithin,Nicotinic acid,Flavonoids

Therapeutic Properties:Hair conditioning,Moisturizing,Hair strengthening

Uses in Hair Care:Methi nourishes scalp and prevents dryness and hair thinning.

Role in Formulation:Acts as conditioner and moisturizer.



Fig 5.9

Brahmi

Synonyms:Water Hyssop

Biological Name:Bacopa monnieri

Family:Plantaginaceae

Geographical Source:India and wet tropical regions.

Chemical Constituents:Bacosides,Alkaloids,Saponins

Therapeutic Properties:Scalp nourishment,Hair strengthening,Cooling effect

Uses in Hair Care:Brahmi improves scalp condition and strengthens hair roots.

Role in Formulation:Acts as nourishing and strengthening agent.



Fig 5.10

Clove

Synonyms:Laung

Biological Name:Syzygium aromaticum

Family:Myrtaceae

Geographical Source:Indonesia and tropical countries.

Chemical Constituents,Eugenol,Tannins,Flavonoids

Therapeutic Properties:Antimicrobial,Antioxidant,Scalp stimulant

Uses in Hair Care:Clove improves blood circulation and reduces scalp infections.

Role in Formulation

Acts as scalp stimulant and antimicrobial agent.



5.11 clove

Black Pepper

Synonyms:Kali Mirch

Biological Name:Piper nigrum

Family:Piperaceae

Geographical SourceIndia and tropical countries.

Chemical Constituents: Piperine, Volatile oils, Alkaloids

Therapeutic Properties: Blood circulation enhancer, Scalp stimulant

Uses in Hair Care: Black pepper stimulates scalp tissues and enhances penetration of herbal constituents.

Role in Formulation: Acts as scalp stimulant and penetration enhancer.



Fig 5.12

V. MATERIALS AND METHODOLOGY

This chapter describes the materials, ingredients, equipment, and detailed methods used for the preparation and development of Herbal Hair Oil. The formulation was designed using herbal ingredients traditionally known for promoting hair growth, reducing dandruff, strengthening hair roots, and improving scalp health. The preparation method was selected based on standard cosmetic formulation techniques and Ayurvedic principles

MATERIALS USED

The following herbal ingredients and carrier oils were used for the preparation of 60 mL Herbal Hair Oil formulation.

Herbal Hair Oil formulation.

Sr No	INGRDIENT	QUANTITY
1	Coconut oil	30ml
2	Castor oil	15ml
3	Olive oil	15ml
4	Rosemary powder	2g
5	Shikakai powder	2g

6	Reetha powder	2g
7	Neem powder	1g
8	Amla powder	2g
9	Methi powder	1g
10	Brahmi powder	2g
11	Clove	0.5g (3-4pieces)
12	Black pepper	0.5(4-5pieces)

Scientific Rationale for Ingredient Selection

The selected herbal ingredients were chosen based on their traditional medicinal value and scientifically proven hair care benefits.

TABLE I. Coconut Oil deeply penetrates the hair shaft and prevents protein loss.

TABLE II. Castor Oil strengthens hair follicles and improves hair density.

TABLE III. Olive Oil nourishes scalp and conditions hair.

TABLE IV. Rosemary stimulates hair follicles and promotes hair growth.

TABLE V. Shikakai and Reetha act as natural cleansing agents.

TABLE VI. Neem controls dandruff and scalp infections.

TABLE VII. Amla strengthens roots and prevents premature greying.

TABLE VIII. Methi conditions and moisturizes hair.

TABLE IX. Brahmi nourishes scalp and reduces dryness.

TABLE X. Clove and Black Pepper improve blood circulation and stimulate scalp tissues.

EQUIPMENT AND GLASSWARE USED

The following equipment and instruments were used during the preparation and evaluation of Herbal Hair Oil:

Analytical Weighing Balance
Beakers (100 mL and 250 mL)
Water Bath / Double Boiler
Glass Rod
Thermometer
Stainless Steel Spoon
Muslin Cloth / Filter Cloth
Measuring Cylinder
Funnel
Amber Colored Glass Bottle

METHOD OF PREPARATION OF HERBAL HAIR OIL

The Herbal Hair Oil was prepared by the Hot Infusion Method, which is commonly used for extracting phytoconstituents from medicinal herbs into carrier oils. This method helps in: Extraction of active constituents, Improvement in therapeutic properties, Better infusion of herbal aroma, Increased effectiveness of herbal oils

PREPARATION PROCEDURE

Step 1: Preparation of Oil Base

Accurately measure the following oils using a measuring cylinder:

Coconut Oil – 30 mL

Castor Oil – 15 mL

Olive Oil – 15 mL

Transfer all oils into a clean and dry 250 mL beaker.

The oils were selected due to their nourishing, moisturizing, and conditioning properties.

Step 2: Addition of Herbal Ingredients

Accurately weigh the following herbal powders using analytical balance:

Rosemary Powder – 2 g

Shikakai Powder – 2 g

Reetha Powder – 2 g

Neem Powder – 1 g

Amla Powder – 2 g

Methi Powder – 1 g

Brahmi Powder – 2 g

Add the powdered herbs into the oil mixture.

Then add:

Clove – 0.5 g

Black Pepper – 0.5 g

The ingredients were mixed thoroughly using a glass rod to ensure uniform dispersion of herbs throughout the oil phase.

Step 3: Heating Process

The beaker containing oil and herbal mixture was placed in a water bath maintained at a temperature of 60–70°C. The mixture was heated continuously for approximately 30–45 minutes with intermittent stirring.

Controlled heating was necessary to:

Prevent degradation of active constituents, Improve extraction efficiency

Enhance infusion of medicinal compounds into oils, During heating, the herbal constituents gradually released their phytochemicals, aroma, and color into the carrier oils.

Step 4: Cooling of Formulation

After completion of heating, the beaker was removed from the water bath and allowed to cool naturally at room temperature. Cooling was necessary to:

[1] Prevent thermal degradation

[2] Stabilize infused phytoconstituents

[3] Improve filtration efficiency

Step 5: Filtration

The cooled oil was filtered using clean muslin cloth to remove herbal residues and obtain clear herbal hair oil. Filtration helped in:

[4] Removal of suspended particles

[5] Improvement in clarity and texture

[6] Better aesthetic appearance

The filtrate collected was dark brown in color with pleasant herbal odor.

Step 6: Storage of Herbal Hair Oil

The prepared herbal hair oil was transferred into clean, dry amber-colored glass bottles using

a funnel. The formulation was stored in a cool and dry place away from direct sunlight to prevent oxidation and degradation of herbal constituents.

Proper labeling was done mentioning:

Product Name

Batch Number

Date of Preparation

Storage Conditions

VI. RESULTS AND DISCUSSION

RESULT

The prepared Herbal Hair Oil showed satisfactory physical appearance and good quality characteristics. The formulation possessed smooth texture, uniform consistency, pleasant herbal odor, and good cosmetic acceptability.

●Physical Appearance

The oil showed dark brown color with smooth and uniform appearance. No phase separation or sedimentation was observed.

●Odor

The formulation possessed pleasant herbal odor due to the presence of medicinal herbs and natural oils.

●Consistency

The oil showed smooth and non-sticky consistency suitable for easy scalp application.

●pH

The pH of the formulation was found to be 6.5, which is suitable for scalp application.

●Viscosity and Spreadability

The formulation possessed suitable viscosity and spread easily over scalp and hair without excessive greasiness.

●Homogeneity and Grittiness

The oil showed good homogeneity and was free from coarse particles due to proper filtration.

●Washability and Skin Compatibility

The formulation was easily washable and showed no irritation, redness, or allergic reaction during testing.

●Stability Study

No significant changes in color, odor, consistency, or phase separation were observed during

storage.

DISCUSSION

The evaluation results confirmed that the prepared Herbal Hair Oil possessed satisfactory physicochemical and cosmetic properties. The formulation showed smooth texture, pleasant odor, suitable viscosity, good spreadability, and excellent stability.

The medicinal herbs used in the formulation provided multiple hair care benefits. Rosemary stimulated hair follicles and improved scalp circulation, while Amla strengthened hair roots and reduced hair fall. Neem exhibited antimicrobial and anti-dandruff activity, whereas Brahmi and Methi nourished scalp tissues and improved hair texture.

Coconut oil, Castor oil, and Olive oil acted as nourishing carrier oils that moisturized hair, reduced dryness, and improved softness and shine. The formulation also showed good washability and non-irritating nature, indicating safety for regular use.

Overall, the prepared Herbal Hair Oil was found to be safe, stable, effective, and suitable for regular hair care application.

VII. CONCLUSION

The present study on “Formulation and Evaluation of Herbal Hair Oil” was successfully carried out using medicinal herbs and natural carrier oils possessing beneficial effects on hair and scalp health. The Herbal Hair Oil was prepared using ingredients such as Rosemary, Amla, Neem, Brahmi, Methi, Reetha, Shikakai, Coconut oil, Castor oil, and Olive oil by hot infusion method.

The prepared formulation showed satisfactory physicochemical and organoleptic properties including pleasant herbal odor, smooth consistency, suitable viscosity, good spreadability, acceptable pH, and excellent stability. The formulation also showed good scalp compatibility without causing irritation or allergic reactions.

The medicinal herbs and natural oils used in the formulation contributed synergistically to promote hair growth, reduce hair fall, nourish scalp tissues, improve hair texture, and control dandruff. The study confirmed that herbal ingredients can be effectively used in cosmetic formulations as safer alternatives to synthetic hair care products.

Overall, the prepared Herbal Hair Oil was found to be safe, stable, effective, economical, and suitable for regular hair care application.

VIII. FUTURE PERSPECTIVE

The present study provides wide scope for future development of herbal cosmetic formulations. Further research can be carried out to improve the therapeutic effectiveness and commercial value of the formulation.

Future perspectives of the study include:

Incorporation of essential oils, vitamins, and natural preservatives for enhanced hair care benefits.

Development of specialized variants such as anti-hair fall oil, anti-dandruff oil, and hair growth promoting

formulations.

Clinical studies and advanced pharmacological evaluation for scientific validation of herbal efficacy.

Large-scale manufacturing and commercial production of herbal hair oil.

Improvement in packaging, fragrance, and shelf life for better consumer acceptability. Exploration of additional medicinal herbs for multifunctional herbal cosmetic products.

Promotion of herbal cosmetics as safe and eco-friendly alternatives to synthetic products.

The formulation method used in this study is simple, economical, and suitable for small-scale as well as industrial-scale production, which makes it promising for future herbal cosmetic development.

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