

A REVIEW ARTICLE ON FORMULATION AND EVALUATION OF HERBAL OIL

Prabhjinder Singh, Muskan Sharma*, Priyanka Kaundal and Asha Devi

School of Pharmacy and Emerging Science, Baddi University of Emerging Sciences and Technology Baddi,
Maknumajra H.P. 173205 India.



Corresponding Author: Muskan Sharma

School of Pharmacy and Emerging Science, Baddi University of Emerging Sciences and Technology Baddi, Maknumajra H.P.
173205 India.

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INTRODUCTION

Hair is one of the characteristics features of mammals and has various functions such as Protection against external factors i.e. heat, cold, etc. Hair is one of the important parts of body considered to be protective appendages on the body and accessory structure of the integument along with sebaceous gland and sweat gland.^[1] The basic part of hair is bulb, root, and shaft.^[2]

Hair is made up of two structures

Hair follicle: The hair follicle sits underneath the skin surface and extends down into the dermis layer of your skin. Each follicle has a subaceous gland that produces lipid-rich sebum oil) which is naturally protects the hair and moisturizes the scalp. At the base of the hair follicle is a hair bulb. This is where the actual hair growth process occurs.

Hair grows as your blood vessels deliver nutrients to the cells inside of the hair bulb. As hair cells grow, they are attached to the follicle and the older cells are pushed outwards resulting in the strand- like appearance of your hair.

Hair shaft: The hair shaft is the hard filamentous strands visible above the skins surface. The shape of the hair shaft and the angle it grows from the dermis plays a major role in determining your hair type. The hair shaft is made of three layers.

- **The Medullar:** Layer is made up of the sugar and amino acids, glycogen, and citrulline.
- **The Cortex:** The middle layer that surrounds the medulla. It contains keratin bond that aid is elasticity and melanocytes, special cells that produce melanin pigment that determines hair color.
- **The Cuticle:** The outermost layer of the hair. It is covered by a single molecular layer of lipid that repels water and gives hair its shine.^[3]

Structure of Hair



Fig 1: Hair Structure.

Hair types: Hair type is primarily based on your hairs curl pattern. The amount of curl in your hair is determined by hair follicle. The shape of follicle determines whether your hair is.^[4]

- Type 1-Straight
- Type 2-Wavy
- Type 3-Curly
- Type 4-Coily

Hair growth cycle

Hair growth cycle consists of 3 stages

- Anagen phase:** The Anagen phase is the growth phase of the hair. The Anagen phase will last from between 2-6 years. A new hair pushes the new hair that stopped growing up and out of the follicle.
- Catagen phase:** The Catagen phase is a transitional

stage and 3 % of all hairs are in this phase at any given time. This phase lasts for 2-3 weeks.

- c) **Telogen phase:** The Telogen phase is the resting phase which lasts for about 2-3 months. During the Telogen phase, the hair follicle is at rest and the club hair is completely formed.^[5]

Herbal Hair oil

Hair oil is hair care products. Hair care products are defined as the formulations which are used for the purpose of cleansing, modifying the hair texture, providing nourishment to the hair and maintaining the healthy appearance of hair.^[6]

Herbal hair oil is an essential part of herbal cosmetics. Herbal hair oil is more preferred and used in many ailments of hair. They not only promote hair growth but also provide necessary moisture to the scalp rendering in beautiful hair.^[7]

Herbal hair oil provides a number of essential nutrients which are important to maintain the normal function of

subaceous gland and promote natural growth of hair.^[8]

Herbal hair oil is natural oil products with essential properties to treat hair problems like thinning of hair and dry or flaky scalp. These oils are use only for moisturizing purposes but also to promote hair growth, improve circulation of blood in the scalp, prevent dandruff and add volume to the hair shaft. Massage your scalp with these herbal oils regularly to get rich and lustrous hair.^[9]

Different types of herbal hair oil available in market

- i. Amla hair oil
- ii. Coconut hair oil
- iii. Bhringraj hair oil
- iv. Jasmine hair oil
- v. Brahmi hair oil
- vi. Cantharidine hair oil
- vii. Onion hair oil

Different herbs used are as follows

S.No.	BOTANICAL NAME	COMMON NAME	FAMILY	CHEMICAL CONSTITUENTS
1	Phyllanthus Emblica	Amla	phyllanthaceae	Ascorbic acid, ellagic acid, Gallic acid
2	Azadirachta indica	Neem	Meliaceae	Nimbin, salannin
3	Aloe Vera	Alovera	Aphodelaceae	Chromone, anthraquinone
4	Cocos nucifera	Coconut	Arecaceae	Lauric acid, mristic acid, caprylic acid
5	Allium cepa	Onion	Amaryllidaceae	Methanol, acetic acid
6	Eclipta prostrate	Bhringraj	Asteraceae	Alkaloids, flavanoids, terpenoids
7	Senegalia ruguta	Shikakai	Fabaceae	Alkaloids, Tartaric acid, Citric acid
8	Lawsonia inermis	Henna	Lythraceae	Lawson, anthroquinones, glycosides
9	Bacopa monnieri	Brahmi	Plantaginaceae	Bacosides
10	Rosa-sinensis	Hibiscus	Malvaceae	Polyphenol, Anthocyanins
11	Glycyrrhiza glabra	Liquorice	Fabaceae	Glabridin, Enoxolone
12	Ocimum tenuiflorum	Tulsi	Lamiaceae	Eugenol, Linalool, Carvacrol

Plant profile

Amla

1.	Botanical name	Phyllanthus emblica
2.	Kingdom	Plantae
3.	Order	Malpighiales
4.	Family	Euphorbiaceae
5.	Genus	Phyllanthus
6.	Species	Emblica



Fig 2: Amla.

Phyllanthus Emblica is an important medicinal plant in medicinal plant in Indian traditional systems of medicine. The tree is small to medium in size, reaching 1-8m in height. The leaves are simple, subsessile and closely set along branchlets, light green, resembling pinnate leaves.^[10, 11, 12]

Role

- Provides hair strength
- Dandruff prevention and Antiseptic property
- Moisturizes dry hair
- Prevents hair loss
- Amla oil for grey hair.^[13]

Neem

1.	Botanical name	Azadirachta indica
2.	Kingdom	Plantae
3.	Order	Sapindales
4.	Family	Meliaceae
5.	Genus	Azadirachta.A Juss
6.	Species	Azadirachta indica

**Fig 3 –Neem.**

Leaves of the neem are used in the treating various disorders such as disorder of the eyes, nose bleeding, stomach infection, anorexia, cold and cough. The neem oil is made from the neem seed. Both neem seeds and neem oil are used in treating intestinal worms and leprosy.^[14]

Role

- Improves hair growth
- Nourishment weak hair
- Reduces hair itching and dandruff
- Removes head lice
- Eliminates infection of the scalp
- Stops hair falling
- Protects against early graying.^[15]

Aloe Vera

1.	Botanical name	Aloe Vera
2.	Kingdom	Plantae
3.	Order	Asparagales
4.	Family	Asphodelaceae
5.	Genus	Aloe
6.	Species	A.vera

**Fig 4: Aloe vera.**

Aloe Vera is a stem less or very short stemmed succulent plant growing to 80-100cm tall, spreading by offsets and root sprouts. The lower leaf of the plant is used for medicinal purposes. Leaves and seeds are the two edible parts of Aloe Vera.^[16]

Role

- Hair growth
- Hair fall control
- Forms a protective layer over hair and keeps it safe from harmful environment elements and also keeps it consistently hydrated.
- Condition and nourishes hair
- Dandruff remedy.^[17]

Coconut^[18]

1.	Botanical name	Cocos Nucifera
2.	Kingdom	Plantae
3.	Order	Arecales
4.	Family	Areaceae
5.	Genus	Cocos
6.	Species	C. Nucifera

**Fig 5: Coconut.**

Coconut oil is derived from milk of the coconut palm fruit. Coconut oil is used as meal oil, and is used in industrial applications for cosmetics and detergent production.

Role

- Coconut oil can help promote hair growth
- Coconut oil can help reduce dandruff
- Coconut oil can help prevent split ends and hair breakage
- Coconut oil can add shine and luster to your hair
- Coconut oil helps control frizziness
- Prevent scalp infections and dandruff
- Help moisturize the hair shaft
- Protect the hair from damage^[19]

Onion

1.	Botanical name	Allium cepa
2.	Kingdom	Plantae
3.	Order	Asparagales
4.	Family	Amaryllidaceae
5.	Genus	Allium
6.	Species	Allium cepa

**Fig 6: Onion.**

The onion is also known as the bulb onion or common onion, is a vegetable that is most widely cultivated species of genus *Allium*. The onion plant has been grown and selectively bred in cultivation for the least 7000 years. Modern varieties grow to a height of 15-45cm. the leaves are yellowish to bluish green. They are hollow, cylindrical with one flattened side.

Onion has been valued as a food and a medicine plant since ancient times.^[20,21]

Role

- Controls hair loss and encourages Re-growth
- Delays premature graying
- Acts as an Anti-dandruff agent
- Lends luster and softness to the hair
- Can be used as a natural conditioner.^[22]

Bhringraj

1.	Botanical name	Eclipta prostrata
2.	Kingdom	Plantae
3.	Order	Asterales
4.	Family	Asteraceae
5.	Genus	Eclipta
6.	Species	E.prostrata

**Fig 7: Bhringraj.**

Bhringraj is commonly called false daisy. Common Hindi names are “Bhangra” and “Bhangraya”. It is one main herb that is used in hair dyes. Bhringraj is also good for healthy functioning of liver. Liver is main site of metabolism of body and this herb is used to improve liver metabolism. It provides strength to liver and cure various disorders and promotes overall liver health.^[23]

Role

- Dry scalp, hair fall, and scalp itching can be healed by applying Bhringraj oil.
- Bhringraj oil is quite famous for its various medicinal properties globally
- It anti-bacterial, anti-microbial, anti-inflammatory, anti-stress and antipruritic properties too.
- Bhringraj oil is good at treating various skin problems.^[24]

Shikakai

1.	Botanical name	Acacia concinna
2.	Kingdom	Plantae
3.	Order	Fabales
4.	Family	Fabaceae
5.	Genus	Acacia
6.	Species	A.Concinna

**Fig 8: Shikakai.**

Acacia concinna is an evergreen tree growing to 10m (32ft) by 10m (32ft) at a medium rate. It is a thorny spreading shrub or tree that can either be scandent or

climb into other parts.

Bark is light grey. Leaves are oblong 4-10mm long forming 7-11 pairs of branches each with 17-37 pairs of leaflet. Flower buds are purple or dark red. The flowers are cream and white.^[25]

Role

- Treating scalp infection
- Treating dandruff
- Hair growth
- Oil for grey hair
- Bhringraj oil antibacterial and antimicrobial properties.^[26]

Henna

1.	Botanical name	Lawsonia Inermis
2.	Kingdom	Lythraceae
3.	Order	Myrtales
4.	Family	L.inermis
5.	Genus	Lawsonia
6.	Species	Plantae



Fig 9: Henna.

Henna is a tall shrub or small tree, standing 1.8-7.6m tall (6- 25ft.). It is glabrous and multi- branched, with spine-tipped branchlets. The leaves grow opposite each other on the stem. Henna flower have 4 sepals a 2mm (0.079) calyx tube, with 3mm spread lobes. Its petals are ovate, with white or red stamens found in pairs on the rim of the calyx tube.^[27,28, 29]

Role

- Anti fungal and anti microbial properties
- Helps in maintaining the scalp health

- Repair hair damage
- Improving hair elasticity
- Reduces premature graying of hair

Brahmi

1.	Botanical name	Bacopa Monnieri
2.	Kingdom	Plantae
3.	Order	Plantaginaceae
4.	Family	Lamiales
5.	Genus	Bacopa
6.	Species	B.Monnieri



Fig 10: Brahmi.

Brahmi is a non-aromatic herb. The leaves of Brahmi plants are succulent oblong and 4-6mm thick. Leaves are oblanceolate and are organized oppositely at the stem. The flowers of plant are small, actinomorphic and white with four to five petals. It is found in warm wetlands and local of India and Australia and is also found in United and East Asia.^[30]

Role

- Elimination of dandruff
- Cleanses scalp
- Gives soothing effect
- Reduction of hair loss
- Prevention of split ends

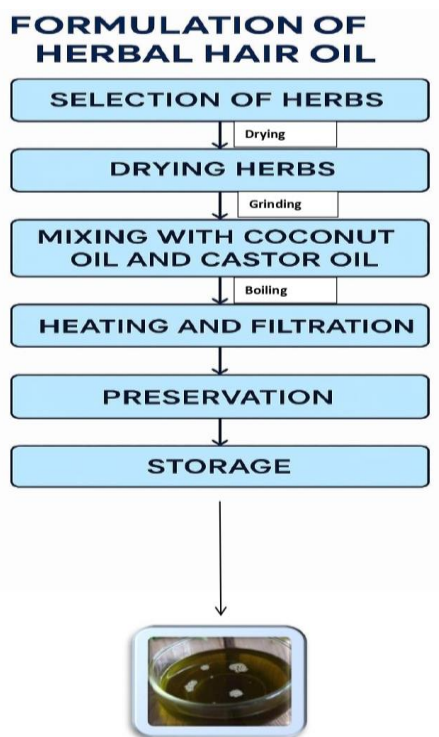
Formulation of Herbal hair oil

The various ingredients used in the formulation of herbal oil are presented in below.

S. No.	Ingredients	Quantity	Function
1	Amla (<i>Emblica officinalis</i>) powder	20 g	Strengthens hair follicles
2	Hibiscus petals (dried)	10 g	Conditions hair, prevents dryness
3	Neem leaves (dried)	10 g	Antifungal, treats dandruff
4	Coconut oil	200 ml	Carrier oil, nourishes scalp
5	Castor oil	50 ml	Thickens and strengthens hair
6	Vitamin E capsules	2-3 capsules	Acts as natural preservative

Process of Formulation

Weigh all ingredients such as Amla powder, Hibiscus Leaves, Neem leaves, Til Oil, Vitamin E Capsules, Castor Oil And Coconut Oil etc.



ensure they are clean and dry.



Fig 11.

2. **Mix the herbs** (amla, hibiscus, neem) together in a clean, dry container.
3. **Heat the oils** (coconut + castor) in a double boiler or thick-bottomed pan.

Method of Preparation (Hot Infusion)

1. **Powder the herbs** if not already powdered and

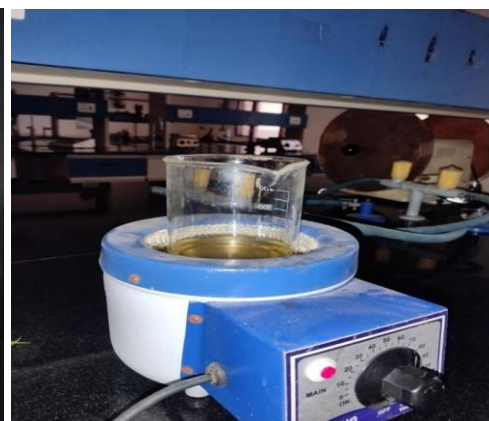


Fig 12.

4. **Add herbal mix** to the warm oil and keep heating on low flame for 2–3 hours.
5. **Stir occasionally** to prevent herbs from sticking or burning.
6. **Cool the oil** to room temperature once the infusion is complete.
7. **Filter** using muslin cloth to remove solid particles.



Fig 13.

8. Add Vitamin E from capsules and mix well.
9. Store in dark amber bottles, away from direct sunlight.



Fig 14.

Evaluation Parameters

Evaluation Test for Hair Oil

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 sedimentation

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 estimates by Ostwald's Viscometer at a room temperature.

4. Specific Gravity

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

5. Stability Study

It is performed by keeping the prepared herbal hair oil in a closed container at cooled And dry places.^[31]

CONCLUSION

Overall, the formulated herbal oil provides many nourishing value to hair such as Vitamins, mineral, and essential oils. The finished product is within the limits. In conclusion, oil is beneficial to prevent hair from damage, loss caused by pollution and dull hair promotes hair growth. It provides an alternative source from hazardous chemicals. Beauty and cosmetic concept is an ancient as mankind and civilization. Herbs are used for beautification purpose of body, preparation of cosmetics, flavoring and colouring agent. A hair plays a vital role in personality of human and we use a lots of cosmetics product for care of hair. The study aims reviewing the importance of herbal oil and their use in the common hair problem such as baldness, hair fall, hair dryness, dandruff etc. Herbal hair oil has been widely use for the nourishment of hair and for the protection of hair from hair fall and hair damage. Now a day's side effect is a

major problem after using any beauty product due to which herbal products are preferred because of having less probability of any types of side effect.

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