



## Research on Formulation and Evaluation of herbal Hair growth stimulating activity of herbal Hair Oil

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### Abstract

Herbal formulations always have attracted considerable attention because herbal formulations have virtually no side effects when compared to synthetic medications, they have consistently garnered significant attention. Cosmetics and the idea of beauty are as old as humanity and civilization. Herbal formulations always have reduced or no adverse effects compared to synthetic. The current study's goal is to prepare herbal hair oil with substances such as castor oil, olive oil, coconut oil, almond peels, neem, amla, hibiscus, Moringa, methi, shikakai, and aloe vera. Based on the aforementioned facts, a boiling process was used to manufacture a mixture of crude pharmaceuticals in the form of herbal hair oil. We've used five distinct herbal medication formulations, and each one exhibits anti-hairfall properties along with a few additional advantageous properties like anti-dandruff activity, better blood circulation to the scalp, and roots, reduce hair pigmentation, anti-fungal activity, reducing the whitening of the hair. In conclusion, the prepared herbal hair oil is utilized to promote hair growth, for supplementation of vitamins and minerals, preventing dandruff, split ends and alternative choice from hazardous chemicals.

**Keywords:** Hair oil, herbs, formulation, preparation, evaluation, results and discussion.

### I. Introduction:-

Cosmetics come in a variety of forms. The most popular ones are composed of materials that have been applied, massaged, poured, sprinkled, or otherwise applied to a human body part with the intention of cleansing, beautifying, or otherwise improving its appearance. Because the practice of creating herbal medicines was first documented in

the Vedas and the Unani texts, it has been a medicinal modality for many years.[1]

Hair is essential to human existence. In India, the custom involves mixing different medications that promote hair growth with hair oils. Given that Indian women are renowned for having long, glossy, and healthy hair, it is not unexpected that hair care is a major component of their self-care routines. The canonical text on Ayurvedic medicine, the Charaka Samhitha, stresses the need of oiling the scalp and hair in order to preserve healthy hair and stop hair loss. It was advised to oil your hair every day using the right herbs that would fit other constituents, and this practice has persisted to this day[2].

The preparations for hair oil are included to treat split ends, dandruff, and other issues. The main purpose of hair oil preparations is to cool the scalp in order to promote luscious hair development in both men and women. Different kinds of oils, such as castor, almond, coconut, and onion oils, are mixed with appropriate herbal medications and applied topically to the scalp. Because it absorbs into hair strands more effectively than other oils and is more cost-effective than other oils, coconut oil is the most deserving oil base of them all. Therefore, the recommended method for the best hair development is coconut oil coupled with herbal drugs[3].

Hair is one of the traits shared by mammals and serving a variety of purposes, including defense against environmental elements like heat and cold. Along with the sweat and sebaceous glands, hair is one of the vital components of the body that is thought to be an accessory structure of the integument and a protective appendage.[4]



Cosmetics come in a variety of forms. The most popular ones are composed of materials that have been applied, massaged, poured, sprinkled, or otherwise applied to a human body part with the intention of cleansing, beautifying, or otherwise improving its appearance. The creation of herbal remedies is a therapeutic approach that has been practiced for ages, having its roots in the Vedas and unani text.[5]

Chemical medicine may have unfavorable side effects, thus using it may not always produce the desired results. Today, there is a global trend toward the frequent use of herbal products in the cosmetics industry and in beauty salons. Pharmaceuticals and bioactive components combine in herbal cosmetics to provide the desired effects.[6]

In addition to phytochemicals and botanicals, herbal products contain vitamins and minerals. Cosmetics are used to treat the body in two ways. Phytochemicals are natural substances that promote the biological activities of the body.[7] A healthy body produces healthy hair. Plants are used in herbal cosmetics in three ways: as total extracts or as single molecules obtained after extraction (for example, aloe vera gel, teas, plants), selective extracts (for example, wheat germ, ginkgo), and natural molecules (for example, vitamins, coenzyme Q10). Hair is not only a vital component of the body, but it also determines how a person seems.[8] Currently, there are various types of hair care products accessible on the market. They are primarily intended to clean, remodel, change, renew, replenish, and offer sustenance to hair. Herbal cosmetics are becoming increasingly popular in the global market, and they are regarded as a valuable natural gift. Herbal cosmetic products are now available in a wide range of smells and colors, making them suited for various types of beauty regimes.[9]

When used sparingly, herbal extracts can be used in cosmetics without causing skin irritation. There are numerous reasons why herbal hair oils are so popular for hair treatments. Additionally, the conditioner repairs dry scalp conditions and moisturizes the scalp to promote healthy hair growth. By keeping the sebaceous gland functioning properly, a range of vital nutrients are supplied to the gland. These criteria led to the design of the current study taking them into consideration.[10]

Along with the sweat and sebaceous glands, hair is one of the vital components of the body that is thought to be an accessory structure of the integument and a protective appendage.[11]

Hair's bulb, root, and shaft are its constituent parts.[12] A few well-known issues with

hair are split ends, dandruff, hair loss, and gray hair.[13] Although a hair strand appears straightforward, it is actually one of the body's most intricate systems. There are two structures in hair:-

**Follicle of hair:** Hair starts to develop and is retained in place in the hair follicle. It is a structure that begins in the epidermis and resembles a stocking. It reaches the dermis. An inner and outer sheath that lines the follicle ends immediately before the sebaceous gland opening, protecting and shaping the hair as it grows.

**Hair shaft:** The section of the hair consisting of three keratin layers is called the hair shaft. These layers are as follows:

- i. The inner layer, also known as the medulla. The presence or absence of the medulla varies with the kind of hair.
- ii. The cortex, or middle layer, comprises the majority of the hair shaft and is known by this name.
- iii. The outer layer: Also referred to as the cuticle, it is made up of closely spaced scales that overlap to resemble roof tiles.

**Hair types:** The pattern of curls in hair is the main indicator of hair type. The hair follicle controls the amount of curl in the hair. Genetics determines hair type. Andre Walker, the stylist for Oprah Winfrey for many years, is recognized for having created the method that categorizes hair into one of four curl patterns.

Type 1: Linear

Type 2: Curved

Type 3: Curly type

Type 4: Coily

**Cycle of hair growth:-**There are three stages in the hair growth cycle: [14]

**a) Anagen phase:** The hair grows during the anagen phase. The duration of the anagen phase is two to six years. The newly grown hair that has ceased growing is forced out of the follicle by a fresh hair.

**b) Catagen phase:** 3% of all hairs are in this transitional stage at any given moment, which is known as the catagen phase. This stage lasts two to three weeks.

**c) Telogen phase:** This two to three month resting phase is known as the telogen phase. The hair follicle is at rest and the club hair is fully developed during the telogen phase.

**d) Exogen phase:** The exogen phase of hair development is basically a continuation of the telogen stage. Hair falls out of the scalp throughout the exogen phase, with brushing and washing frequently assisting. During the exogen period, it is common to lose 50 to 100 hairs every day. As the old



hairs fall out of the follicles, new hairs grow in during the exogen phase, which can last anywhere from two to five months.

#### Functions of Hair:

- Keeping body heat warm by protecting against cold is the primary role of hair in animals.
- A species' individuals can utilize the various hues and patterns of their hair coats for both sexual recognition and attraction as well as for hiding.
- Human hair performs a number of roles, including thermoregulation, apocrine sweat, sebum production, and defense against environmental aggressors.
- An individual's social and sexual interactions are also influenced by their hair.
- Thermoregulation [15]

#### Hair Oil

Hair care products include hair oil. Formulations intended for cleaning, altering the structure of hair, feeding the hair, and preserving the appearance of healthy hair are referred to as hair care products.[16] Hair oils are hair care formulations that are applied to the hair to cure conditions like baldness, graying hair, hair loss, and dry hair. They also aid in nourishing the hair.[17].Because hair swells while wet and shrinks as it dries, repetitive hydral stress causes damage to hair strands. Hair oils can minimize this absorption of water. Additionally, oils shield the hair follicle's cuticle cells from harm and stop chemicals like surfactants from getting inside. Hair is more easily penetrated by saturated and monounsaturated oils than by polyunsaturated ones.

#### Types of hair oils

Mineral and vegetable oils are used to make a wide range of conventional and commercial hair oils. Coconut oil is a frequently used component. Other vegetable sources include burdock, castor, almond, argan, babassu, and tea seed.[18].

#### 1. Coconut oil

coconut oil both before and after washing helps to minimize the loss of protein in hair. Lauric acid, a fatty acid type with a low molecular weight and linear shape that may permeate the hair shaft, is known to be present in coconut oil.

#### 2. Argan oil

ArganoilMoroccan-originated argan oil is well-known for its conditioning properties, which soften and reduce frizz in hair.

#### 3. Avocado oil

Avocado oil Rich in nutrients is avocado oil. It contains a lot of vitamin E, an antioxidant that may help prevent hair loss and promote hair growth.

#### 4. Different oils

DifferentoilAlmond oil, grapeseed oil, jojoba oil, and olive oil are a few types of oils that can help prevent dryness and damage to hair while also promoting elasticity. [19]

## II. Material And Methods

The raw material was selected according to its availability in our environment and it allowed us to prepare an emulsion capable of improving hair growth. To make the herbal hair oil, a variety of plant ingredients were gathered and used. These include curry leaves, hibiscus powder, camphor powder, onion, kalonji seed, and fenugreek seed. Each one was gathered from an agricultural field and from Ayurvedic store . My project guide , Miss Yogita A Waghchaure, identified the plants that we collecte. The oils used for herbal hair oils were Coconut oil and castor oil. All Materials were purchased by daggerteli from Nashik. All the collected oils were identified by the project guide.

#### Plant profile

##### 1. Coconut oil

**Family:**Aceraceae.

**Scientific name:** Cocos nucifera L. Parts used: kernel oil. **Geographical location:** Southern India.

**Active constituents:** Fatty acid, capric acid,lauricacid.

**Uses:** Used as vehicle, promotes hair growth

##### 2. Olive oil

**Family:** Oleaceae

**Scientific name:** Olea europaea

**Parts used:** Fleshy part of the ripened fruit

**Geographical location:** California, south America ,Australia

**Active constituents:** oleic acid ,phenolic constituents and squalene **Uses:** hair follicle and repair hair damage

##### 3. Castor oil

**Family :**Euphoraceae

**Scientific name :**Ricinus



**Plant used:** seed of castor bean

**Geographical location :** India, China, and Brazil.

**Active constituents:** triglyceride, various fatty acids

**Uses:** Promote scalp health, help to reduce fungal and harmful bacteria on the scalp increased gloss or shine of the hair, increased hair shaft flexibility by coating the hair shaft.

#### 4. Amla

**Family:** Euphorbiaceae. Indiangooseberry

**Scientific name:** Amla ,myrobalanemblica.

**Geographical location :** India

**Plant used:** dried as well as fresh fruit of the Emblica officinalis. **Active constituents:** vitamin C gallic acid 5% carbohydrates

14% ,lectures,minerals,phenol acid, garlic acid ,amino acid

**Uses:** boost hair growth. Good for skin, hair & eyes .Promotes the immune function.

#### 5. Methyleaves/Fenugreek

**Family:** Fabaceae.

**Scientific name:**

**Geographical location:** Maharashtra

**Active constituents:** Trimethylamine, Trigonelline, Quercetin.

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

#### 6. Neem

**Family:** Meliaceae

**Scientific name:** Azadirachta Indica.

**Parts used:** leaves

**Geographical location:** india

**Active constituents:** nimbin,nimbidin,nimbidol.

**Uses:** It reduces hair loss by improving blood circulation in the scalp and hair. The sulphur in the juice helps in the production of essential collagen that promotes hair growth.

#### 7. Shikakai family:fabaceae

**scientific name :** acacia concinna

**Part used:** bark

**Geographical location:**South and Southeast Asia, India, Sri Lanka, Pakistan, Thailand, Malaysia, Cambodia, Indonesia

**Active constituent:** lupeol,acacic acid ,lactone ,natural sugar glucose **uses :**Shikakai is rich with saponins, vitamins and antioxidants that make your hair shiny, used to clean hair, grow hair quickly.

#### 8. Peppermint oil

**Family:** Labiates, Liliaceae

**scientific name:** menthe piperita land menthespicata.

**Part used :**leaves geographical location: North Africa, central and southern Europe, India, Bangladesh,

**Active constitutes:** Menthol land mentioned as well as several other minor constituents, including Menthofuran,1-8cineoleandlimonene.

**Uses:** mint is rich in natural Antimicrobial and antifungal properties, which treat many scalps issue, especially dandruff. It prevents growth of any unwanted bacteria or infections

#### 9. Hibiscus

**Family :**Malvaceae

**Scientific name:** Bombycidendron Zoll. & Moritzi Bombycodendron Hassk. Brockmania W.Fitzg. Part used flower

**Geographical Location:** India ,North America and Asia.

**Active Constituent:** tannins, anthraquinones, quinines, phenols, flavanoides, alkaloids,

**Uses :** Keeps hair healthy and conditioned, thickens and volumizes hair, treats dandruff, prevents split ends.

#### 10. Aloe vera

**Family :** Liliaceae

**Scientific name :** aloe barbadensis miller Part used: aloe gel **Geographical location:** Africa , asia and Europe ,india and America **Active constutient :** vitamins, enzymes,minerals salicylic acids, amino acids

**Uses:** to trat skin injuries ,anti microbial and anti inflammatory

#### 11. Moringa

**Family:** moringaceae

**Scientific name:** Moringa oleifera Part used: leaves **Geographical location:** asia , Africa, india

**Active constituent:** flavonoids ,lignance and phenocarboxylic acid **Uses:**Improve overall health hair ,nourishes hair follicles.

#### 12. Orange peels

**Family:** rutaceae

**Scientific name :** citrus reticulata

**Part used :** orange peel

**Geographical location:** india , china , Spain, madeira

**Active constituents :** peptine , cellulose and hemicellulose.

**Uses :** solves the issue of hair fall and also helps in balancing out the oiliness in your scalp.



### Formulations and Ingredients in herbal hair oil

Sr no	Ingredient	Quality
1	Coconut oil	60 ml
2	Olive oil	30 ml
3	Castor oil	25 ml
4	Aloe vera	10 ml
5	fenugreek	10 gm
6	Neem	10 gm
7	Shikakai	5 gm
8	Hibiscus	5 gm
9	Orange Peel	5 gm
10	Moringa	5 gm
11	Neem	5 gm
12	Peppermint oil	2 ml

Table no :01

### Procedure

**Extraction process:** Wash out the collected plant material with distilled water .An dried under the sunlight. Then grind the dried plant material in grinder and the coarse powder Table list of material [table no 1]. Herbal hair oil was prepared by boiling all the prescribed herb according to the formula. This process ensures adsorption of the active therapeutic properties of the ingredients used.

#### Methods of preparation

- 1) Herbs are weight by using weighing balance whereas, oils are measured through measuring cylinder.
- 2) The oils and herbs are mixed together in a vessel.
- 3) The above mixture is then allowed to boil on low flame with continuous stirring. So, as to avoid the adherence of the medicinal plants to the bottom of the vessel.
- 4) At this step moisture of the medicinal plant commenced to evaporate so it is agitated frequently and carefully to ensure that the mixture does not stick at the bottom of vessel
- 5) The herbs are taken out from time to time to know the condition and stage of mixture of oils.
- 6) As further heating to the content, the oil starts to form a froth. This is the condition where all the active ingredients of medicinal plants starts to concentrate in oil.
- 7) In the next step, the mixture is filtered through muslin cloth.
- 8) filter the oil two times
- 9) after filtering oil was placed in tightly closed bottle

- 10) Then labelled it. [20]

### Evaluation of the herbal hair oil

1. **Color:**  
brownish-yellow
2. **Odor:**  
attributes
3. **PH:**  
A pH meter (pH-5) was used to measure the prepared herbal hair oil's PH. After 30 minutes.
4. **Skin Irritation:**  
No irritation
5. **Viscosity:**  
Ostwald's viscometer was used to measure the viscosity.
6. **SkinSensitivity:**  
Applying the prepared herbal hair oil on a hand's 1 centimeter of skin, it was left in the sun for four to five minutes [21].
7. **Acid value**  
Preparation of 0.1molar solution weighted 0.56g of KOH pellets and dissolved water and stirred continuously. The prepared 0.1 molar KOH solution .Was filled in the burette. Preparation of sample: measured 10ml oil and dissolved in 25ml of ether mixture and shocked. Added 1ml of phenolphthalein solution and titrate against with 0.1molar KOH solution. The acid value of the prepared oil was calculated by using formula[22]  
$$\text{Acid value} = \frac{n \times W}{V}$$

Where,  
N= number of ml 0.1 molar KOH,  
W= weight of oil



### 8. Saponification value

2g of oil was accurately weighed and transferred into a 250ml iodine flask. 25ml of 0.5M alcoholic potassium hydroxide was added and boiled under reflux on a water bath for 30 minutes. Phenolphthalein was added as indicator and titrated against 0.5M HCl (a). Similarly blank was performed (b) without the sample. The saponification value of the prepared oil was calculated by using formula [23]

Saponification value =  $28.05 (b-a) \setminus w$

Where, W= weight in gram of the solution [24].

### III. Result and discussion

Herbal hair oil is one of the most well recognized hair treatments. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair condition. It provides numerous essential nutrients required to maintain normal function of sebaceous glands and promotes natural hair growth. The herbal hair oil was prepared from various parameters like sensitivity test, pH, irritation test, saponification value, acid value of herbal hair oil was evaluated.

### IV. Summary and conclusion

There are many hair treatments on the market today that contain herbal hair oils. In addition to moisturizing the scalp, herbal hair oils are also beneficial to reversing dry scalp and dry hair conditions. In addition to promoting natural hair growth, the product is packed with numerous essential nutrients. Herbal hair oil is made using several herbs (see Table 1), which have been discussed above as ingredients. Hence, it is concluded that the oil is beneficial in maintaining good growth of hairs, turning grey hairs to black, providing protection from dandruff & results in lustrous looking hairs.

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