

# Formulation and Evaluation of Herbal Hair Oil Beneficial for All Hair Disorders

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**Abstract:** Ayurveda has earned the moniker "science of life." Herbs play an important role in the health-care system of Ayurveda medicine. Many Ayurvedic plant items have been replaced by synthetic chemical compounds because the safety and efficacy of natural products could not be matched. Hair is a protein filament grows from follicles in the dermis layer of skin. Hair is one of the characteristics that differentiate mammals. Hair is most commonly associated with hair growth, hair types, and hair maintenance, but it is also an important biomaterial made up primarily of protein, specifically alpha keratin. There are multiple causes responsible for causing baldness like hormones, hereditary, age factors, pollution, work environment, stress and many more for causing dandruff, hair loss, dry hair, split ends, frizzy hair, dull hair, heat damaged hair, colour damaged hair, grey hair, and other problems are common. To address these concerns, we are developing herbal hair oil by using thirteen ingredients.

**Keywords:** Ayurveda, dermis, alpha keratin

## 1. Introduction

Hair is one of the distinguishing features of mammals, serving a variety of functions including protection from external factors, production of sebum, apocrine sweat, and pheromones, influence on social and sexual interactions, thermoregulation, and serving as a resource for stem cells. Hair is an epidermal derivative that consists of two distinct parts: the follicle and the hair shaft. The follicle is the basic building block for hair growth. Hair follicles go through a continuous growth and rest cycle known as the hair cycle. The duration of the growth and rest cycles is coordinated by many endocrine, vascular, and neural stimuli and is determined not only by the location of the hair but also by other factors.

### Hair growth cycle

Hair will continue to grow longer as long as new hair cells continue to grow in the hair bulb.

Stage 1: The anagen phase is the hair's growth phase. Most hair stays in this stage for three to four years. A new hair pushes the old hair out of the follicle that has stopped growing. The anagen phase of eyelashes, brows, and leg and arm hair lasts only 30 to 45 days. That is why those hairs are usually shorter than those on your head.

Stage 2: The catagen phase is a transitional stage in which 3% of all hairs are at any given time. It lasts between two and three weeks. Growth slows during this period, and the outer root sheath shrinks and attaches to the hair root. This develops into club hair.

Stage 3: The telogen phase, which lasts about three months, is the resting phase. It is responsible for 10% to 15% of all hair. The hair follicle is at rest during this phase, and the club hair is fully ref<sup>1</sup>.

### Different types of Hair

Except for a few areas, such as the palms of our hands or the soles of our feet, the entire surface of our body is covered in

hair. On the body, there are two types of hair: shorter and thinner "vellus" hairs (peach fuzz) and longer and thicker "terminal" hairs. Hair on your head, facial hair, eyelashes, brows, pubic hair, chest hair, and belly hair are all examples of terminal hairs.

The proportion of each hair type varies from person to person and is also affected by age and gender. Vellus hair, for example, is commonly found on children's bodies. In women, terminal hair covers approximately 30% of the body's surface, whereas men cover approximately 90%.

### Functions of Hair

- The most important function of hair in mammals is to keep body heat warm by insulating against cold.
- The different colours and patterns in hair coats can also be used for camouflage as well as sexual recognition and attraction among members of a species.
- Hair serves several functions in humans, including protection from external factors, the production of sebum, apocrine sweat, and pheromones, and thermoregulation. Hair also has an impact on an individual's social and sexual interactions ref no.<sup>1</sup>.
- Thermoregulation<sup>1</sup>

### Hair oil

Hair oil is a cosmetic product based on oil that is used to improve the condition of hair. Many cosmetic products contain oils, such as shampoo, heat protectant, hair drops, and hair masks. Natural hair oil called sebum is produced by glands around each follicle in humans. Similar oils, such as lanolin, are produced by other mammals. Artificial hair oils, like natural oils, can reduce scalp dryness by forming hydrophobic films that reduce trans epidermal water loss and evaporation of water from the skin. [3] Hair oils can reduce water absorption, which damages hair strands due to repeated hygral stress as hair swells when wet and shrinks as it dries. Oils also protect the cuticle cells in the hair follicle and prevent substances like surfactants from penetrating. Saturated and monounsaturated oils penetrate hair more effectively than polyunsaturated oils.

**Types of Hair oils**

A variety of commercial and traditional hair oils are made with mineral and vegetable oils. A common ingredient is coconut oil. Almond, argan, babassu, burdock, Castor, and tea seed are some other vegetable sources.

Natural oils are becoming more popular as scalp cosmetics. Natural oils are derived from natural resources that are high in nutrients like vitamins and fatty acids.

**The oil of coconut**

When used before and after washing, coconut oil has properties that reduce protein loss in hair. Because of its low molecular weight and linear conformation, coconut oil is known to contain lauric acid, a type of fatty acid that may penetrate the hair shaft<sup>6</sup>.

**Argan oil**

Argan oil originates from Morocco and is known for a conditioning effect that leaves hair soft and relieves frizz<sup>6</sup>.

**Avocado oil**

Avocado oil is rich in nutrients. It has a high concentration of vitamin E, which is an antioxidant that may decrease hair loss and encourages hair growth<sup>6</sup>.









**Other oils**






Oils including almond oil, grape seed oil, jojoba oil, olive oil may promote hair elasticity and help prevent dryness and hair damage<sup>6</sup>.

**2. Material and Method**

Selection and authentication of plant Dried roots of *Taraxacum officinale*, entire herb of *Bacopamonniera*, plants of *Aloe barbadensis*, fresh leaves of *Ocimumtenuiflorum*, collect fresh flowers of *Hibiscus rosa-sinensis*, fresh leaves of *Azadirachta indica*, dried flowers buds of *Syzygium aromaticum*, fresh leaves of *Murrayakoenigii*, dried fruits of *Phyllanthusemblica*, dried bulb of *Allium sativum*, seeds of *Trigonella foenumgraecum*, rhizome of *Zingiber officinale*, obtained oil of *Cocos nucifera* shown in Table No.1. The desired parts of plant drugs collected and to remove unwanted foreign material, shade dried and then crushed in with the help of mechanical device and passed through the sieve number 60. The powdered drugs were subjected to screening for confirmation and characterization of phyto-constituents present in the drug sample ref.no. <sup>(6,8,9,17)</sup>.

**Table 1: List of Drugs**

S. No	Herbs			Figures
	Latin Name	Common Name	Uses	
1.	<i>Taraxacum officinale</i>	Dandelion root	-Fast hair growth -Teat dandruff -Reduce hair greying	
2.	<i>Bacopamonnieri</i>	Bramhi	-Prevent split ends -Reduced hair loss -Clean scalp -Reduced dryness	
3.	<i>Aolebarbadensis</i>	Aloevera	-Control grassy hair -strengthens hair -smooth and shine to hair	
4.	<i>Ocimumtenuiflorum</i>	Tulsi	-Prevents hair loss -Prevents bacterial infection	
5.	<i>Hibiscus rosa-sinensis</i>	Hibiscus	-Prevents premature greying -Prevents dandruff -Stimulates new hair growth	
6.	<i>Azadirachta indica</i>	Neem	-Promotes healthy growth -Reduces dandruff -Treats head lice	
7.	<i>Syzygium aromaticum</i>	Clove	-Enhances hair growth -Prevents premature greying -Provides silky & shiny hairs	
8.	<i>Murrayakoenigii</i>	Curry leaves	-Treats hair damage -Reduces hairfall -Prevents premature -thinning	

9.	Phyllanthusemblica	Amla	-Enhances natural hair colour -Prevents dandruff -Improves scalp health	
10.	Allium sativum	Garlic	-Cleans hair follicle -Kills bacteria and germs	
11.	Zingiberofficinale	Ginger	-Provides blood circulation to scalp -Stimulates hair growth Prevents hair loss	
12.	Cocosnucifera	Coconut	-Moisturises hair -Deals with dandruff -Provides shine -Helps tame frizz	
13.	Trigonellafoenumgraecum	Methi	-Reduces hair fall -Fights dandruff -Revives damage hair	

**Preparation of hair oil**

Hair oils those embraces herbal drugs are called as hair tonics. These are contrived by herbal extracts in an oil base. 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 (Joshi et al., 2017). A plethora of herbs have been employed for hair treatments. A few of these herbs are dandelion root, hibiscus, bramhi, aloe vera, tulsi, hibiscus, neem<sup>20</sup>, clove, curry leaves, amla<sup>20</sup>, garlic, fenugreek seeds, ginger, coconut oil etc ref.no. <sup>18</sup>. Herbal formulations always have considerable attention because of their good bustle and comparatively lesser or no side effects than product ref no. <sup>8</sup>.

Selection and authenticating the herbal drug and confirming from the literature survey. Herbal dandelion oil was prepared by selecting infusion extraction method for preparation of oil in a fixproportion containing drugs (Taraxacumofficinale) shown in fig.no.1.

All the ingredients weighed and boiled properly with using base as coconut oil. The above content was boiled for 15-20 minutes and was filtered through muslin cloth. After this a small amount of flavouring agent i.e. camphor was added to oil and it was placed in amber colored bottle ref.no <sup>12, 21</sup>.



**Figure 1:** Preparation of dandelion oil

**Table 2:** Ingredients with sufficient quantity

S. No	Ingredient	Quantity (gm.)
1.	Taraxacumofficinale	2.4%
2.	Bacopamonniari	1.6%
3.	Aloe barbadensis	32%
4.	Ocimumtenuiflorum	2.4%
5.	Hibiscus rosa-sinensis	3.2%
6.	Azadirachtaindica	2.4%
7.	Syzygiumaromaticum	2.4%
8.	Murrayakoenigii	0.4%
9.	Phyllanthusemblica	1.6%
10.	Allium sativum	1.2%
11.	Trigonellafoenumgraecum	2.4%
12.	Zingiberofficinale	0.8%
13.	Cocosnucifera	250ml
14.	Cinnamomumcamphora	1.6%

**Evaluation parameter:**

1) Organoleptic properties:

Colour: Brown

Odour: like mothballs

- a) Acid value: 10 ml of oil was added with 25ml of ethanol and 25ml of ether. Phenolphthalein was added as indicator and titrated with 0.1M potassium hydroxide solution then calculated acid value shown in Table 3<sup>16</sup>.
- b) Skin irritation test: In vitro, non-animal test designed to identify those chemicals and mixtures capable of inducing moderate skin irritation applied small quality of oil on hairs shown in Table 3 ref.no <sup>11,16</sup>.
- c) Saponification value: Accurately weighed 1 mL of oil into a 250 mL of conical flask and 10 mL of ethanol:

ether mixture (2: 1) was added in the flask 25 mL of 0.5 N alcoholic KOH were added and Kept the flask aside for 30 min. then flask were cooled. The cooled solution was titrated against 0.5 N HCl using phenolphthalein as an indicators. Similarly the titration was performed without taking oil (sample). The amount of KOH in mg was calculated in oil sample result shown in Table 3<sup>16</sup>.

- d) pH: pH of the herbal oil was detected using pH meter result shown in Table 3<sup>16</sup>.
- e) Viscosity: Viscosity will be determined using Ostwald's viscometer shown in Table 3<sup>16</sup>.
- f) Specific gravity: Take the specific gravity bottle, wash it with distilled water, dry it in oven for 15 minutes, cool, closed it with cap and weigh it (a). Now fill the same specific gravity bottle with the sample and closed it with cap and again weigh it.

Determine the weight of sample per millilitre by subtracting the weight (b-a) (The viscosity was measured by using this instrument i. e. Ostwald viscometer) shown in Table 3 ref.no 16.

### 3. Result

Herbal oil prepared and evaluated by using infusion method for preparation of dandelion root oil extraction and used simple mixing method for formulation of oil.

S. No	Parameters	Observation
1.	Acid value	4.5
2.	Saponification value	201.08
3.	pH	Neutral
4.	Viscosity	0.93
5.	Specific gravity	0.96
6.	Skin irritation test	No irritation

### 4. Conclusion

This research work is to evaluate the parameters of the oil and its formulation. The oil consists of thirteen ingredients that provide necessary benefits to the hairs. The oil will be further stored in amber colour bottle. The hair oil is used for dressing and nourishing the hairs and grace of hair, dandruff, scaly particles that cling to the root of the hair, split ends, frizzy hair, dull hair, hair loss, can be caused by a poor diet, an infection, stress, genetics, hormonal changes, nutritional deficiency, and autoimmune diseases.

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