

**FORMULATION AND EVALUATION OF MULTIPURPOSE HERBAL  
HAIR OIL**

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**ABSTRACT**

Comparing herbal preparations to synthetic preparations, there are always fewer adverse effects. Numerous medications are manufactured and produced in pharmaceutical factories. Additionally, herbs are used to prepare tastes, colors, and cosmetics that enhance the appearance of the hair. In order to create herbal hair Oils with herbal elements like Bael leaves, moringa leaves, betal leaves, butter pea flower, Mint leaves, Fenugreek seed and coconut Oil, scientific research will be used to examine the conditions surrounding formulation. Based on the aforementioned findings, a basic herbal mixture was made by boiling and then turned into herbal hair Oil. The mixture has anti-hair loss and other beneficial qualities such as a reduction in hair pigmentation, an improvement in scalp and root blood circulation, an anti-fungal impact, and a reduction in hair graying, hair growth. The formulated Oil was

assessed, and this paper details the results, including the acid value, viscosity, saponification value, pH, and skin irritation.

**KEYWORDS:** Herbal Oil, Multipurpose, Evaluation parameter.

**INTRODUCTION**

The traditional procedure in India involves making hair Oils and mixing them with other drugs that encourage hair growth. Given that Indian women are known for having long, beautiful, and healthy hair, it is not surprising that hair care is an important part of their self-care regimens. In order to prevent hair loss and preserve healthy hair, the Charaka The importance of Oiling the scalp and hair is emphasized in the Samhitha, the gold standard of Ayurvedic medicine. It was instructed to use hair Oil every day, and people still adhere to this

custom today. The right herbs should be added to the Oil to enhance the flavors of the other ingredients.<sup>[1]</sup> Hair, along with sweat glands, sebaceous glands, and nails, is one of the vital body parts thought to be protective. appendages on the integument's body and accessory structure. The root, or hair beneath the skin's surface, and the shaft, or hair above the skin, are the three important parts of hair. The base of the bulb is swollen, originating from the dermis.<sup>[2]</sup> Hair loss, split ends, and dandruff in all its manifestations are treated with hair Oil formulations. For both men and women, the primary goals of hair Oil treatments are to soothe the scalp and encourage lush hair development. Almond Oil, castor Oil, and other Oils are used topically to the scalp in conjunction with the suitable herbal therapies. Compared to other Oils, it dissolves into the hair strands more efficiently and is more Coconut Oil is the most worthy Oil base out of these, and it's also less expensive than the others. Therefore, the greatest approach for hair development is to add coconut Oil to herbal remedies.<sup>[3]</sup> Herbal hair Oils help dry hair and scalp conditions in addition to moisturizing the scalp. It provides a broad spectrum of essential elements that promote normal sebaceous gland activity and the growth of hair. Flavonoids, polyphenols, saponins, tannin, vitamins, proteins, minerals, and ricin-oleic acid, among other nutrients, are abundant in the plant components that are employed. These substances also support the growth of hair and have a favorable effect on hair health.<sup>[4]</sup>

## HAIR OIL

Hair care products include hair Oil. Product formulations used for cleaning, altering the texture of hair, feeding the hair, and preserving the appearance of healthy hair are referred to as hair care products.<sup>[5]</sup> Hair Oils are hair care formulations that are applied to the hair to address conditions like baldness, hair graying, hair loss, and dry hair. They also aid in nourishing the hair.<sup>[6]</sup> The growing popularity of herbal cosmetics is a result of people's growing interest in them. In addition, herbal cosmetics are easier to find and have less adverse effects than conventional cosmetics.<sup>[7]</sup> An integral component of herbal cosmetics is herbal hair Oil. Herbal hair Oil is increasingly widely utilized and preferred for various hair needs.<sup>[8]</sup>

## ADVANTAGES

1. Enhancing hair cleanliness Addressing conditions of the scalp
2. Hair loss treatment
3. Dry scalp treatment

4. Treats greasy or Oily hair and eases itching and irritation.
5. Preserves hair's silky or smooth Shampoo fixes damaged hair
6. Maintains the beauty and vibrancy of your hair.<sup>[9]</sup>

### **BENAFITS OF HAIR OIL**

1. One of the most well-known hair treatments is herbal hair Oil.
2. Herbal hair Oil treats dry hair and scalp conditions in addition to moisturizing the scalp.
3. It offers a variety of vital nutrients needed to keep sebaceous glands functioning normally.
4. Encourages the growth of natural hair.<sup>[10]</sup>

### **PLANT PROFILE AND INGREDIENTS**

1. Moringa leaves
2. Bael leaves
3. Betal leaves
4. Butter pea flower
5. Mint leaves
6. Fenugreek seed
7. Coconut Oil

#### **1. MORINGA OLEIFERA**

Kingdom : plantae

Subkindom : Tracheophytes

Order: Brassicales

Family: Moringaceae

Genus: Moringa

Species : M. oleifera

Biological name: Moringa oleifera Lam.

Active constituent: Flavonoids, glycoside, alkaloids, Saponins, Catechol, Tannins, Anthraquinones, myricetin, quercetin, kaempferol.<sup>[11]</sup>

#### **Uses**

1. Encourages the growth of natural hair.
2. To avoid damage, condition the roots of your hair.
3. Keeps split ends from occurring and safeguards the length.

4. Prevent for hair loss.<sup>[12]</sup>



**Fig. no. 1: Moringa Oleifera l.**

## **2. AEGLE MARMELOS**

Kingdom: plantae

Order: Sapindales

Family: Rutaceae

Subfamily: Aurantiodeae

Genus: Aegle

species: A.marmelos

Botanical name: Aegle marmelos

Active ingredient: limonene, Alkaloids, terpenoids, coumarins, phenylpropanoids, tannins, polysaccharides, Flavonoides.<sup>[13]</sup>

### **Uses**

1. Use it to reduce inflammation to the scalp
2. Additionally effective against dandruff and itchy scalps,
3. Bael leaves helps to hair growth.
4. Address hair loss.<sup>[14]</sup>



**Fig. No. 2: Aegle Marmelos.**

### **3. Piper betle L.**

Kingdom : Plantae

Division: Magnoliphyta

Class: Magnoliphyta

Order: piperales

Family: piperaceae

Genus: Piper

Species: Betle

Biological name: Piper betle L.

Active ingredient: eugenol, methyl eugenol, cadinene carvacrol, allyl catechol, chavicol, pcymene, caryophyllene, chavibetol, cineole, and estragol. The chemical composition of the mixture includes eugenol, eugenyl acetate, hydroxyl chavicol, eugenol, and piper betol.<sup>[15-16]</sup>

#### **Uses**

1. Encourages healthy hair
2. Lowers hair loss
3. Increases hair growth. Conversely
4. Dry hair and split ends.<sup>[17]</sup>



**FIG. NO. 3: Piper Betle L.**

#### **4. Mentha piperita L.**

Kingdom: Plantae

Order: Lamiales

Family: Lamiaceae

Subfamily: Nepetoideae

Genus: Mentha L.

Species : piperita

Biological name: Mentha piperita L.

Active ingredient : Menthol, limonene, pulegone, caryophyllene, and pinene.<sup>[18]</sup>

#### **Uses**

1. It support hair growth
2. Prevent hair fall.
3. Strengthen the health of the scalp
4. Give of a cooling feeling and fragrance
5. Improve the texture of hair.<sup>[19]</sup>



**Fig. No 4: Mentha Piperita L.**

## 5. *Clitoria ternatea* L.

Kingdom : plantae

order: Fabales

Family: Fabaceae

subfamily: Faboideae

Genus: *Clitoria*

Species: *C. ternatea*

Biological name: *Clitoria ternatea* L.

Active ingredient: anthocynin, kaempferol, quercetin, and myricetin, flavanol glycosides, ternatin.<sup>[20]</sup>

### Uses

1. Preserving hair follicle health.
2. Encouraging rebust, healthy hair growth.
3. Very important for premature hair graying.
4. Help hair retain its natural black color for an extended amount of time.
5. Used to treat hair loss.<sup>[21]</sup>



Fig. No. 5. *Clitoria Ternatea* L.

## 6. *Trigonella Foenum graecum* L.

Kingdom: plantae

Order: Fabales

Family: Fabaceae

Subfamily: Faboideae

Genus: *Trigonella*



Species: *T. Foenum graecum*

Biological name: *Trigonella Foenum graecum* L.

Active ingredient: Vitamins, nicotinic acid, Flavonoides, Saponins, vitamin A, C, Folic acid vitexin, tricin, naringenin, quercetin.<sup>[22]</sup>

### Uses

1. Encourage the development and thickness of hair.
2. Encourages hair development.
3. Reduces irritation on the scalp.
4. Reduces dandruff.
5. Enhances soft texture and shine.<sup>[23]</sup>



**Fig. No. 6: *Trigonella Foenum Graecum* L.**

### Coconut Oil

Oil made from the dried fruits of the Aceraceae family plant *Cocos nucifera* L. Coconut Oil's lauric acid offers restorative qualities that are particularly likely to seep into your hair strands. Coconut lubricant swiftly absorbed into your hair to supply moisture and control frizz and breakage.<sup>[24]</sup>

### Uses

1. Reduces hair fall.
2. Conditions and softens
3. Encourages the growth of new hair
4. Moisturize dry hair.<sup>[25]</sup>





**Fig. No. 7: Coconut Oil.**

## **MATERIAL AND METHOD**

The seeds of *Trigonella foenum graecum* L were collected from local market shahada, leaves of *aegle marmelos*, *moringa oleifera*, *Piper betle*, *Mentha piperita*, *clitoria ternatea* L (flower) is collected from botanical garden. The collected leaves were dried in the shade and then powder to a coarse consistency and stored in a container.



**Fig. No. 8: Crude Drugs.**

**DESCRIPTION OF INGREDIENTS USED****TABLE NO- 1.**

SR.NO.	Common Name	Biological Name	Part Used	Category
1.	Moringa leaves	Moringa oleifera	Leaves	Used for hair growth
2.	Bael leaves	Aegle marmelos	Leaves	Reduce inflammation on the scalp
3.	Betal leaves	Piper betle L	Leaves	Prevent hair loss
4.	Butter pea	Clitoria ternatea L.	Flower	Prevent premature graying of hair
5.	Fenugreek	Trigonella foenum graecum L.	Seeds	Anti dandruff agent
6.	Mint	Mentha piperita L.	Leaves	For Fragrance

**Table No. 2: Formula.**

SR NO	INGREDIENT	QUANTITY
1	Moringa oleifera	3gm
2	aegle marmelos	3gm
3	piper betle	3gm
4	Mentha piperita	3gm
5	clitoria ternatea L	3gm
6	Trigonella foenum graecum L	3gm
7	Cocus nucifera L	50ml

**FORMULATION PROCEDURE OF HAIR OIL****DIRECT BOILING METHOD**

The first process is called "direct boiling," which involves weighing, powdering, and then immediately boiling the crude medications in coconut Oil while stirring and heating continuously until the drug was fully extracted into the Oil base. the Oil's composition was 3% and there were 3 gm of each medications; Moringa oleifera, Aegle marmelos, Piper betle, Mentha piperita, Clitoria ternatea L, Trigonella Foenum graecum L, were the extraction process was finished each one was filtered through muslin cloth now combined with 50 ml of coconut Oil, and The herbal Oil was placed in a beaker and kept cool in the freezer by covering it with aluminum foil.<sup>[26]</sup>

**Fig. No. 9: Extraction of Herbal.**



**Fig. No. 10: Formulation of Hair Oil.**

### EVALUATION PARAMETER

Prepared herbal hair Oil was evaluated based on physicochemical characteristics to determine its product performance.

1. **Color:** Detected by naked eyes. formulation of herbal hair Oil is greenish color is obtained.
2. **Odour:** Characteristics.
3. **Sensitivity Test:** Applied on the skin and left in the sunlight for 5 minutes to see if the skin was irritated or not.
4. **Grittiness:** Applied to the skin and watched.
5. **Sedimentation:** After leaving the entire preparation during the night, look for sedimentation.

### 6. PH Determination

Deep a piece of pH paper into the specially prepared hair Oil to see if the color changes.

PH is 6 yellow color obtained the pH 6 is generally considered safe for the scalp. It is close to the natural ph of the scalp, which help to maintain a healthy balance.



**Fig No. 11: Ph Paper.**

## 7. SPECIFIC GRAVITY

There are a few things to do after rinsing the specific gravity bottle with distilled water. The bottle is then weighed (a) after being dried in the oven for 15 minutes, cooled, and sealed.

The sample can now be weighed once more (b) by adding it to a fresh specific gravity vial, capping it.<sup>[27]</sup>

Executing the procedure once more.

The weight (b-a) is calculated by subtracting b from a.<sup>[28]</sup>



**Fig. No. 12: Specific Gravity.**

## 8. DENSITY

Distilled water has a density of 0.997g/ml and Oil has a specific gravity of 0.8g/ml. distilled water has a density of 0.997g/ml and Oil has a specific gravity of 0.8g/ml.<sup>[29]</sup>

Specific gravity of Oil = density of Oil/density of distilled water

## 9. VISCOSITY

It is the process of calculating a liquid's flow resistance; the higher the viscosity, the larger the flow resistance. The viscosity was measured using an Ostwald viscometer.<sup>[30]</sup>

Viscosity formula,

$$N_2 = N_1 \times P_2 \times T_2 / P_1 \times T_1$$

$P_1$  = Density of water (g/ml)

$T_1$  = Water flow time

$N_1$  = Viscosity of water

$N_2$  = Liquid viscosity

$T_2$  = Liquid flow time

$P_2$  = Liquid density



**Fig. No. 13: Viscosity.**

## 10. ACID VALUE

25 ml of ethanol and 25 ml of ether were poured to 10 ml of Oil. After adding phenolphthalein as an indicator, a 0.1M potassium hydroxide solution was used to titrate the mixture; the acid value was 5.61n/w.<sup>[31]</sup>

Where

w = weight of Oil

n = number of ml of 0.1M KOH



**Fig. No. 14: Acid Value.**

## 11. SAPONIFICATION VALUE

A 250 mL conical flask was filled with precisely weighed 1 mL of Oil, then 10 mL of a 2:1 ethanol to ether mixture was added. 25 mL of 0.5 N alcoholic KOH were added to this flask. After 30 minutes, the flask was allowed to cool. Titrating the cooled solution against 0.5 N HCl was done using indication of phenolphthalein. In a similar manner, the blank titration was carried out without using an Oil sample. The KOH usage was determined in mL.<sup>[32]</sup>

Value of Saponification:  $28.05(b-a)/w$



**Fig. No. 15: Saponification Value.**

## RESULT

SR NO	PARAMETERS	OBSERVATION
1.	COLOR	GREENISH COLOR
2.	ODOUR	CHARACTERISTIC
3.	GRITTINESS	SMOOTH
4.	SEDIMENTATION	NO SEDIMENTATION
5.	SENSITIVITY TEST	NO IRRITATION
6.	PH	6
7.	VISCOSITY	0.9263
8.	DENSITY	0.7976
9.	SPECIFIC GRAVITY	0.8
10.	ACID VALUE	1.73
11.	SAPONIFICATION VALUE	420.75

## DISCUSSION

Herbal ingredients used in the hair Oil include peppermint leaves, coconut Oil, fenugreek seed, butter pea flower, betel leaves, moringa leaves. All of these ingredients have no negative side effects. Every ingredient used in preparation is given a name based on the Evaluation that takes into account factors like color, odor, specific gravity, density, PH,



viscosity, acid value, saponification value, and irritation test. Hair Oil has a greenish color the specific gravity of 0.8, a density of 0.7976, a PH of 6, an acid value of 1.73, a saponification value of 420.75, a viscosity of 0.9263, and it doesn't harm skin in any way.

## CONCLUSION

Guidelines for using herbal ingredients to prepare herbal hair Oil with little to no negative effects are provided by this research. Many disorders, including alopecia area are treated with this research or hair Oil. The primary goal of herbal hair Oil is to strengthen and nourish hair while also addressing other issues including hair loss. Since all of the additional substances have numerous benefits and all of the metrics indicated that they are within acceptable bounds, this Oil will aid in promoting healthy hair development, guard against dandruff, and produce shiny, healthy-looking hair.

## REFERENCE

1. IJRAR, E ISSN 2348-1269, PRINT ISSN 2349-5138.
2. Jain PK, Joshi H, Dass DJ, Drug that Causes Hair Loss and Promotes Hair Growth - A Review, International Journal of Research in Pharmaceutical and Biomedical Sciences, 2012; 3(4): 1476-82.
3. <http://jddtonline.info>, Diary of Medication Conveyance and Therapeutics, 2019; 9(1): 68-73. From google.
4. Patni P., Varghese D., Balekar N. furthermore, Jain D.K. Detailing and assessment of home-grown hair Oil for alopeciamanagement. Planta Indica, 2006; 2(3): 27-30.
5. Swarnlata Saraf, Manjusha Jharaniya, Herbal Hair Cosmetics: Advancement and Recent Findings, World Journal Of Pharmaceutical Research, ISSN 2277-7105
6. B. Ramya Kuber, Ch. Lavanya, Ch. Naga Haritha, S. Preethi, G. Rosa, Preparation and evaluation of poly herbal Oil, Journal of Drug Delivery and Therapeutics, 2019; 9(1): 68-73.
7. Rahathunnisa begum and Afzalunnisa begum, Preparation and Evaluation of Herbal Oil, International Journal of Research and Analytical Reviews, E ISSN:2349-5318
8. Omkar V. Narule, Manohar D. Kengar, Pranali P. Mulik, Soheli I. Nadaf, Bhagyashree A. Mote, D. dudhagaonkar, Formulation and Evaluation of Poly Herbal Oil. Research J. Topical and Cosmetic Sci., 10(1): 09-12. doi:10.5958/2321-5844.2019.00003.7
9. Bhari D, Quazi A, Joshi A. Formulation and evaluation of anti-dandruff. International Journal of Engineering Science and Computing, 2020; 10(3): 25116-25122.



10. Banerjee, P.S., Sharma, M., Nema, R.K. Readiness, assessment and hair development animating action of natural hair Oil. *Diary of Compound and Drug Exploration*, 2009; 1(1): 261-267.
11. [https://en.m.wikipedia.org/wiki/Moringa\\_oleifera](https://en.m.wikipedia.org/wiki/Moringa_oleifera)
12. <https://thegoodleaf.in/products/moringa-hair-serum>
13. [https://en.m.wikipedia.org/wiki/Aegle\\_marmelos](https://en.m.wikipedia.org/wiki/Aegle_marmelos)
14. <https://www.healthshots.com/beauty/hair-care/5-benefits-of-using-bay-leaf-for-hair/>
15. Dwivedi V. and Tripathi S. Review study on potential activity of Piper betel. *Journal of Pharmacognosy and Phytochemistry*, 2014; 3(4): 93-98.
16. Chahal J., Ohlyan R., Kandale A., Walia A. and Puri S. Introduction, phytochemistry, traditional uses and biological activity of genus piper: a review. *IJCPR*, 2011; 2(2): 130-144.
17. <https://www.healthshots.com/beauty/natural-cures/read-the-hair-benefits-of-paan-or-betel-leaves-and-how-to-use-it/>
18. <https://en.m.wikipedia.org/wiki/Mentha>
19. <https://pharomeasy.in/blog/peppermint-Oil-for-hair-a-research-backed-guide-to-benefits-and-usage/>
20. [https://en.m.wikipedia.org/wiki/Clitoria\\_ternatea](https://en.m.wikipedia.org/wiki/Clitoria_ternatea)
21. <https://preservawellness.com/blogs/blogs/blue-pea-tea-for-ageless-skin-and-healthy-hair>
22. <https://en.m.wikipedia.org/wiki/Fenugreek>
23. Kokate C.K, Purohit A. P, Gokhale S. B, *Pharmacognosy*, Nirali Publications, 2008.
24. Gode V, Bhalla N, Shirhatti V, Mhaskar S, Kamath Y. Quantitative measurement of the penetration of coconut Oil into human hair using radiolabeled coconut Oil. *J Cosmet Sci.*, Jan 1, 2012; 63(1): 27-31.
25. <https://www.lovebeautyandplanet.com/us/en/the-love-beauty-planet-movement/our-purpose/our-blog/is-coconut-Oil-good-for-hair.html>
26. Sharma Meghan and banner Herald Pooja S., *Phcog.net*
27. Tiwari M, Dubey V, Lahiri A. Comparative study of various herbal cosmetics: A survey. *Asian J Pharm Clin Res.*, 2020; 13: 31-4. DOI:10.9734/bpi/tipr/v6/2570F.
28. Banerjee PS, Sharma M, Nema RK. Preparation, evaluation and hair growth stimulating activity of herbal hair Oil. *Journal of chemical and pharmaceutical research*, 2009; 1(1): 261-7.

29. Pal RS, Pal Y, Rai AK, Wal P, Wal A. Synthesis and evaluation of herbal based hair dye. The Open Dermatology Journal., Oct. 18, 2018; 12(1). DOI: 10.2174/1874372201812010090.
30. Rahathunnisa begum & Afzalunnisa begum Preparations and Evaluation Herbal hair Oil IJRAR –International Journal of Research and Analytical Review, March 2019; 6(1): E ISSN 2348-1269.
31. Adhirajan, N., Dixit, V. K. and Chandrakasan, G., Development and Evaluation of Herbal Formulations for Hair growth, Indian Drugs, Nov., 2001; 38(11): 559-563.
32. Roy, R. K., Thakur, M., Dixit, V. K., Development and Evaluation of polyherbal formulation for hair growth-promoting activity, Journal of Cosmetic Dermatology, Nov. 2006; 6: 108-112.