



# “FORMULATION AND EVALUATION OF HERBAL HAIR CONDITIONER”

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**ABSTRACT:** A vital component of the human body, hair shields the scalp. After shampooing, hair conditioner is a hair care product that is applied to the hair and hair tips to condition the hair before being rinsed out. Hair conditioner is used to make hair easier to manage and seem more glossy. Its primary goal is to lessen friction between hair strands to make combing and brushing simpler. The primary goal is to create the hair care product that is most successful in meeting people's needs and to assess the finished product to determine its intended impact on the user. The majority of hair repair and conditioning solutions on the market today work by coating hair fibers with intricate formulas made of macromolecule and surfactant mixes. This causes the damaged portions in the outermost region of the capillary fibers to partially cover. This reduces friction between the fibers, making them easier to manage and more hydrated. A thorough analysis of the various physicochemical factors connected to the conditioning process, such as the deposits' thickness, water content, topography, or frictional qualities, is necessary for optimizing shampoo and conditioner formulations. The several physicochemical factors that affect our comprehension of the most basic underpinnings of the conditioning process are covered in this review. Herbal conditioners contain fenugreek, curry leaves, and mint leaves as their key constituents. Based on physicochemical parameters like stability studies and efficiency, it was assessed and examined. Changing customer expectations and emphasizing safety and efficacy would be part of a more radical strategy to popularize herbal conditioners. Producing herbal hair conditioners is the goal. In comparison to synthetic conditioners, all herbal conditioners showed equivalent solids percentage, high viscosity, steady lather, pH within the allowed range, and good wetting qualities.

**KEYWORDS:** Herbal conditioner, Fenugreek, Nourishing, efficiency.

## **I. INTRODUCTION:**

Hair conditioner is a hair care product that is applied after shampooing in order to condition the hair. Conditioning helps protect your hair and restore it. Conditioner means a preparation used to improve the condition of hair. The product is beneficial to all types of hair. It works by restoring moisture, and smoothing the cuticles of the hair follicles. Herbal hair conditioner that helps to prevent the hair from breakage and makes the hair strong and lustrous. Made with the key ingredients of aloe Vera and mint leaves, this herbal conditioner for healthy hair is a solution for keeping the hair dirt-free and smooth. To put it simply, after shampoo cleans and removes oils, conditioner reintroduces moisture back into your hair and helps to smooth your strands for a shiny, soft, healthy finish. It is kind of like how you wash your face and then apply moisturizer. Deeply

condition the hair and retain the scalp and hair moisture which helps to detangle the hair and support easy combing (use a wide tooth comb). Hair becomes smoother and stronger. It can't break out easily. All these prevent the hair from unwanted breakage. Hair conditioners are products that contain emollients and surfactants that keep your hair moisturized. Some of the advantages of using a hair conditioner include frizz reduction, improved smoothness, and protection of your hair from further damage. Keep in mind that you should select a hair conditioner suitable to your hair type. For example, regular hair conditioners are suitable for straight and wavy hair, while leave in conditioners are ideal for curly hair. While conditioners are safe for usage, some people may experience adverse reactions due to higher pH. levels. Conduct a patch test to be sure.<sup>[4]</sup>

## DIRECTIONS FOR USE



### STEP 1

WASH HAIR WITH A MILD SHAMPOO, RINSE OFF PROPERLY AND SQUEEZE EXCESS WATER FROM HAIR GENTLY WITH HANDS. LEAVE FOR 1-2 MINUTES AND RINSE OFF WITH A GENEROUS QUANTITY OF WATER.



### STEP 2

TAKE 2-3 PUMPS OF VANAURA CONDITIONER AND APPLY OVER THE HAIR STRANDS FROM HAIR REGION TO TIP. AVOID THE SCALP AREA.



### STEP 3

LET IT SIT FOR ABOUT 2 MINUTES AND RINSE OFF WITH A GENEROUS QUANTITY OF WATER.



### STEP 4

PAT DRY WITH A TOWEL AND GET TANGLE-FREE SILKY SMOOTH AND HEALTHY HAIR NATURALLY.

### Characteristics of herbal hair conditioner:

The conditioner's intrinsic need to have the highest level of moisture provision. It need to be extremely moisturizing and replenish the natural oils that regular shampooing and style have stripped from hair. Humectants and emollients will add lustre and moisture. A good conditioner will not only add moisture, but also slip, which helps with detangling. For successful detangling and length retention, slip is essential. Rich, thick, and creamy conditioners have a preference for consistency. The conditioner needs to get inside the hair shaft in order to have a high level of absorption and protection. One way to do this is with a water-based conditioner. It is imperative that you read the ingredients if you have a preference for natural components. Softens hair after use. A conditioner that leaves your hair feeling like cotton has done its job. If you suddenly have hand in hair syndrome, you can add the conditioner to your hair care routine.<sup>[4]</sup>

### The conditioners' functions include:<sup>[14]</sup>

- 1) Boost compatibility.
- 2) Emulate the natural lipid outer layer of hair.
- 3) Make hydrophobicity whole.
- 4) Close the cuticle.
- 5) Prevent or reduce frizz and friction to offset the appalling rate.

**Herbal conditioner benefits:** <sup>[14]</sup>

- 1) Provides smoothness and luster to hair.
- 2) Cut down on split ends.
- 3) Make things more manageable.
- 4) Avoid breaking off hair.
- 5) Guards against mechanical and chemical damage to hair.

**Other conditioners on the market have the same drawbacks:** <sup>[18]</sup>

- 1) Generally poisonous and damaging to hair.
- 2) Generates ocular discomfort.
- 3) The principal ingredients of other conditioners are ammonium and sodium laureth sulfates.
- 4) They promote split ends and frizz by drying out the hair shaft.

**Herbal hair conditioner application:** <sup>[4]</sup>

- 1) Designed to give your hair more shine.
- 2) To maintain its fluidity and softness.
- 3) To promote the growth of hair.
- 4) To make hair simpler to comb and more manageable.
- 5) To leave hair feeling hydrated and silky
- 6) To repair hair damage.
- 7) To straighten hair that is curly.
- 8) To hydrate and restore hair strands.
- 9) To shield style from heat and UV radiation.
- 10) Adds smoothness and luster to hair.
- 11) Cut down on split ends.
- 12) Make things more manageable.
- 13) Avoid breaking off hair.
- 14) Guards against mechanical and chemical harm to hair.

**II. INGREDIENTS :-**

- Fenugreek seeds
- Mint leaves
- Curry leaves
- Aloe vera gel
- Coconut oil
- Almond oil
- Rose water
- Glycerine
- Methyl paraben
- Water

**Fenugreek seeds :-**

Synonym : Trigonella ,Greek clover ,Trigonella foenumgraecum, Methi dana

Biological source : It consist of dried ripe seeds of Trigonella foenum graecum plantplant.

Family : Fabaceae



Chemical composition :

Flavonol glycosides found in fenugreek include the alkaloid and volatile compound present are the two main chemical constituents that cause the bitter taste and the odour of the seeds. The major constituents that are present in fenugreek seeds are carbohydrates, proteins, lipids, alkaloids, saponins, vitamins, fibres and minerals.

Uses:

- 1) Fenugreek hair oil helps lessen dandruff and increases blood circulation.
- 2) 2. Fenugreek seeds, known for their ability to combat dandruff and hair loss, are high in protein and nicotinic acid.
- 3) 3. It also addresses hair thinning, balding, and dryness.

**Mint leaves :-**

Synonym : Mentha, Pudina, Peppermint

Biological source : It consists of dried leaves and flowering tops of Mentha spicata Linn.,

Family : Lamiaceae



### Chemical Composition :

Among monoterpenes, menthol is the major constituent (35–60%), followed by menthone (2–44%), menthyl acetate (0.7–23%), 1,8-cineole (eucalyptol) (1–13%), menthofuran (0.3–14%), isomenthone (2–5%), neomenthol (3–4%), and limonene (0.1–6%), whereas  $\beta$ -caryophyllene is the main sesquiterpene (1.6–1.8%). The active chemical in mint is a terpene alcohol called menthol or peppermint camphor.

### Uses :

- 1) An excellent source of carotene and antioxidants, mint leaf extract encourages hair growth and inhibits hair loss.
- 2) Mint leaves are used to treat dandruff, head lice, and other infections due to their strong antibacterial and antifungal qualities.

### Curry leaves :-

Synonym : Kadi Patta , Karibevu , Mitho Limdo ,Karuvepillai , Meetha neem

Biological source : Curry leaves are a part of a small deciduous aromatic shrub, scientifically

Named *Murraya koenigii*.

Family : Rutaceae



#### Chemical Composition :

The main constituents of this plant include caryophyllene, terpene, menthol, menthone, carvomenthone, citral, and linalyl acetate, which contribute to the flavor. Curry leaves are a rich source of vitamin A, vitamin B, vitamin C, vitamin B2, calcium, and iron, apart from a heavy distinctive odor and pungent taste.

#### Uses :

- 1) Encourage the growth of hair
- 2) Heals Broken Hairs
- 3) Increases Bounce and Shine
- 4) Enhances Dental Health

#### Aloevera Gel :-

Synonym : Ghritkumari, Aloe, Mussabar, kumari, Korphad.

Biological source : Aloe is the dried juice collected by incision, from the bases of the leaves of various species of Aloe. Aloe perryi Baker, Aloe vera Linn or Aloe barbadensis

Family : Liliaceae



### Chemical Composition :

The aloe leaf gel consists of amino acids, polysaccharides, minerals, organic acids, and phenolic compounds. It also contains anthrones, C-glycosides, and anthraquinones such as aloe-emodin, aloesin, aldehydes, and ketones, etc

### Uses :

- 1) For natural hair, condition and strengthen it.
- 2) Encourage hair regrowth.
- 3) Even out organic curls.
- 4) Keep moisture inside
- 5) minimize flutter.
- 6) Untangle your hair.

### Coconut oil :-

Synonym: copra oil, Vegetable oil, Edible oil, Nariyal tel.

Biological Source : Coconut oil is the oil expressed from the dried solid part of endosperm of

Coconut, *Cocos nucifera* L..

Family : Areaceae



### Chemical Composition :

Copra contains 65-68% fat, 15-20% carbohydrates, 9.0% proteins, 4-9% crude fibres Carbohydrates contain glucose, fructose and raffinose. Copra oil contains Trimyristine, trilaurin, tripalmetin, tristearin, and many other glycerides.

### Uses :

- 1) Provides moisture to your hair.
- 2) It is more easily absorbed than other oils and is more effective at healing dry hair.
- 3) Hair will be condition.

### Almond Oil :-

Synonym : Prunus Amygdalus Dulcis Oil, Sweet almond oil

Biological source : Almond oil is a fixed oil obtained by expression from the seeds of Prunus amygdalus (Rosaceae) var. dulcis (sweet almonds) or P. amygdalus var. amara (bitter almonds).

Family : Rosaceae





### Chemical Composition :

The chemical composition of Almond oil is oleic acid (68%) (C18:1), stearic acid (C18:0), linoleic acid (C18:2), palmitoleic acid (C16:1) and palmitic acid (C16:0), . Almond oil is used as a carrier oil to dilute the essential oils making them safer to use on skin. It is filled with the goodness of minerals, including calcium, magnesium, and zinc, which are present in large quantities.

### Uses :

- 1) Almond oil moisturizes your scalp and relieves inflammation and dandruff.
- 2) Its components, which are rich in minerals, decrease hair loss and breakage while encouraging the formation of healthy hair.

### Rose Water :-

Synonym : Gulab jal

Biological source: Rose water is extracted from the flowers of *Rosa damascene*

Family : Rosaceae



### Chemical Composition :

Rose flowers are rich in biologically active compounds, such as phenolics, flavonoids, anthocyanins, and carotenoids. Rose absolute contains chemicals such as phenyl ethyl alcohol, farnesol, stearoptene,  $\alpha$ -pinene,  $\beta$ -pinene, citronellol, geraniol, nerol, linalool,  $\alpha$ -terpinene, limonene, eugenol, methyl eugenol, rose oxide, neral, citronellyl acetate and geranyl acetate.

### Uses :

- 1) Help with irritated scalp; reduce stress.
- 2) Diminish shine and tone of hair.

### Glycerine :-

Synonym : Glycerol, 1,2,3-Propanetriol, Glycerin

Biological Source : Glycerin is produced from the hydrolysis of fats and oils, and is a by-product of biodiesel production. It can be obtained either from animal fats or botanical sources such as palm, coconut, or soybean oil.



Uses :

Due to its strong conditioning properties, glycerin can help soften and smooth down the hair cuticle, providing the appearance of additional shine and lustre. The moisturizing properties of glycerin can also help curly hair owners look better by controlling frizz and unruly strands.

### III. Methodology :-

- We take 4 grams of fenugreek seeds, 4 grams of curry leaves, and 4 grams of mint leaves, and we put them in a china dish with 100 milliliters of water.
- Boil it until just one-fourth of the liquid is left.
- This procedure is entirely based on plant extract.
- The next step is to take 2.8 grams of aloe vera gel, 2.8 grams of citric acid, and 5.5 milliliters of glycerin and place them in another beaker. Stir continually until the necessary solution dissolves.
- This procedure is known as the aqueous phase.
- Almond oil (3ml) and coconut oil (3ml) were combined and swirled in a separate beaker.
- Drop by drop, an aqueous phase will be added to the plant extract and constantly stirred; after that, an oil phase will be added and continuously stirred.
- A small amount of methyl paraben is added to the aforesaid solution in this formulation as a preservative.
- The finished solution will yield 40 milliliters when measured in a measuring cylinder.
- To make up for the 50ml, 10ml of rose water was added to this solution.
- For around 20 minutes, the solution was stirred mechanically to enhance its viscosity.

### Procedure for Applying hair conditioner:

- Wash your hair with a choice of your shampoo on your scalp before rinsing with warm water.
- Squeeze a coin-sized amount of conditioner on your palm, Apply on hair from mid-length of your hair to the tips.
- Let it sit on your hair.
- Rinse with warm water

#### IV. EVALUATION PARAMETER

##### ➤ Physical evaluation

Physical characteristics like color, smell, and texture were carefully identified.

##### ➤ Washability

After applying formulations to the hair, the comfort and scope of water washing was personally verified.

##### ➤ Irritancy test

On the dorsal side surface of the left hand, 1-2 ml of the formulation was applied, and the area was watched for signs of redness, irritancy, and inflammation for two hours.

##### ➤ PH of formulation

Using litmus paper, the formulation's pH was determined. To see how their colors changed, blue and red litmus were both dipped into the mixture.

##### ➤ Conditioning effect

When shampooing, a sufficient amount of formulation was applied to the hair, and when the hair dried the difference was noted by washing it with water.

##### ➤ Viscosity

Pouring the mixture from one beaker to another allows for the measurement of viscosity as well as flowability and pourability.

##### ➤ Stability test at room temperature

The product is tested for stability at room temperature by leaving it there for three months.

##### ➤ Sensitivity

Not Sensitive

#### V. **Result:-**

A natural hair conditioner must be made and evaluated in a few steps. First, choose suitable herbal ingredients (such coconut oil and aloe vera) that are known for nourishing hair. After that, you'll create a recipe taking into account variables like viscosity, pH equilibrium, and component compatibility. Following manufacturing, you will assess the conditioner's performance in terms of hair softening, detangling, and nourishment. This may involve sensory analyses and laboratory testing for factors like hair strength and moisture retention. Lastly, input from customers can aid in improving the formula for market readiness.

##### 1. Physical properties:

Color, smell, and texture were used to evaluate the prepared conditioner's organoleptic qualities. The prepared mixture had a light yellow hue. Its texture is smooth and it smells nice

**Table 1: Physical properties of formulated**

Sr. No	Parameter	Evaluation
1.	Colour	Pale green
2.	Odour	Pleasant
3.	Texture	Smooth

## 2. Washability:

It was simple to remove the conditioner from hair by just washing with tap water.

## 3. pH of the Conditioner:

Humans and sebum naturally have PH levels between 4.5 to 5.5. The typical pH of conditioner is 7-8, and this acidic formula helps keep the cuticles of the scalp healthy by inhibiting the growth of bacteria and fungus. The PH of the herbal mixture was 5.0.

**Table 2: pH of formulated conditioner**

Formulation	pH
Hair conditioner	5

## 4. Stability Testing:

After the formulation underwent long-term stability tests, lasting roughly ten days, it was discovered that the conditioner's pH, color, and odor remained unchanged.

## 5. Conditioning Effect Experiment:

We used a comb attached to a spring and scaled page to assess the ease of combing hair in order to evaluate the conditioning effect of conditioner. The incoming force on the ergo meter created by sliding the comb between hairs was displayed on the scaled page, together with the rate of resistance of the hare against combing using this method. We measured both before and after using the conditioner.

## 6. Dirt Dispersion Test:

The amount of ink present in the foam was light in the designed conditioner.

**Table 3: Dirt dispersion test**

Formulation	Result
Hair conditioner	Light foam

## The result of evaluation parameters of hair conditioner :

Sr. No	Parameter	Observation
1.	Physical appearance	Viscous paste
2.	Colour	Mint green
3.	Odour	Pleasant
4.	Texture	Smooth
5.	pH	5.5
6.	Sensitivity	Not sensitive
7.	Washability	Easily washable

## VI. Conclusion:-

It is clear from the research mentioned above that hair conditioner has superior conditioning qualities. Conditioners are used to smooth hair, enhance luster, and restore worn, mechanically damaged hair. They are applied to hair after washing. Because herbal hair conditioner doesn't include any chemicals, it's safe to use on any kind of scalp. Ingredients in hair conditioner help to protect, strengthen, and smooth hair while also encouraging lustrous, healthy hair. It has been determined through testing that the hair rinse's pH value, dirt dispersion test, wetting time calculation, cleaning efficacy, and stability are all safe and useful. In summary, aloe vera hair conditioner enhances the general health, look, and manageability of hair by utilizing the advantageous qualities of aloe vera gel. It promises to hydrate and sooth the scalp, feed the hair strands,

improve luster, and possibly even encourage hair growth. The hydrating and calming qualities of aloe vera can aid in the fight against dryness, minimize frizz, and ease inflammation on the scalp. Its nutritious ingredients also help to create healthier, thicker hair. Aloe vera hair conditioner is a natural solution for people looking to enhance the condition of their hair and boost overall hair wellbeing, even if more research is required to completely grasp its effects and mechanisms. Using methyl paraben as a preservative and glycerin as a thickening agent, a herbal hair conditioner with fenugreek seeds, aloe Vera gel, citrus, mint leaves, curry leaves extract, almond oil, and coconut oil was effectively created. A number of tests were conducted on the formulation, and the results were satisfactory in terms of color, odor, consistency, pH, spreadability, and washability. These results imply that the proposed formulation might work as planned, but more testing might be required before it can be applied in real-world situations. Conditioners play a major role in providing the hair with the TLC it requires, just like the skin. Any hair care regimen must include conditioning since it increases moisture, reduces frizz, and improves manageability. Make careful to deep condition your hair and periodically apply a hair mask. Using a conditioner after shampooing your hair helps prevent any dryness or damage caused by the shampoo, according to study. Additionally, it protects the hair fiber's surface. This approach also avoids the friction caused by anti-dandruff shampoo. Based on the study mentioned above, it is possible to draw the conclusion that herbal hair care products, including shampoos, conditioners, oils, and colors, have exceptional nourishing and conditioning qualities. Conditioners are used to smooth hair, enhance luster, and restore worn, mechanically damaged hair. They are applied to the hair after washing. The non-toxic nature of cosmetics made from herbs is a benefit. It relieves dandruff by clearing the scalp of extra oil. herbal Because hair cosmetics don't include any chemicals, they can be applied to any type of scalp without risk. Ingredients in hair care cosmetics strengthen, smooth, protect, and encourage healthy, lustrous hair. It has been determined through testing that the hair rinse's pH value, dirt dispersion test, wetting time calculation, cleaning efficacy, and stability are all safe and useful. Herbal elements in the gel conditioner treat hair from the scalp, making it last longer than chemical conditioners and providing relief from microbial illnesses and inflammation. Moreover, it improves the color and texture of hair and promotes hair growth.

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