

Development and Assessment of Herbal Hair Serum

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Publication Date: 2026/06/02

Abstract: The goal of the current study is to create, develop, and assess a herbal hair serum with natural elements that have been shown to have positive effects on hair. Curry leaf extract and hibiscus extract were added to the castor oil and almond oil basis of the serum to encourage hair growth and lessen hair loss. Methyl paraben was utilized as a preservative to extend shelf life, while vitamin E was added as an antioxidant to stop oxidative damage and promote scalp health. Curry leaves were hot infused into the carrier oils, hibiscus flowers were extracted aqueously, and all ingredients were blended under carefully monitored circumstances to guarantee stability and homogeneity.

Keywords: Herbal Hair Serum, Castor Oil, Almond Oil, Curry Leaves, Hibiscus, Vitamin E, Methyl Paraben, Formulation, Evaluation.

How to Cite: Ashish K. Shewale; S. J. Shid; Dr. S. K. Mohite (2026) Development and Assessment of Herbal Hair Serum. *International Journal of Innovative Science and Research Technology*, 11(5), 2736-2742.

<https://doi.org/10.38124/ijisrt/26may229>

I. INTRODUCTION

Hair is seen as a crucial component of one's look and is critical for enhancing self-esteem. However, issues like hair loss, dandruff, split ends, dryness, and early greying are frequently caused by things like pollution, stress, chemical treatments, poor nutrition, and overuse of synthetic hair care products. The need for safe and natural hair care alternatives has grown as a result.

Herbal hair serums are leave-on, non-greasy formulas that coat the hair's surface, minimize frizz, add luster, and transport active herbal ingredients straight to the scalp and hair shaft. Herbal serums use plant-based extracts and oils that nourish hair without causing long-term side effects, in contrast to synthetic serums that could contain harsh silicones and chemicals.

It is well known that oils like castor and almond oil strengthen hair roots, increase thickness, and stimulate growth. Proteins, beta-carotene, and antioxidants found in curry leaves help prevent premature greying and lessen hair loss. Amino acids, vitamin C, and flavonoids found in hibiscus flowers and leaves nourish hair, stimulate follicles, and guard against dandruff. As a natural antioxidant, vitamin E enhances scalp circulation and heals damaged hair. Methyl paraben and other preservatives are applied in acceptable amounts to guarantee product safety and shelf life.

The present work focuses on the formulation, development, and evaluation of a herbal hair serum incorporating these ingredients. The study aims to develop a stable, effective, and safe herbal serum and evaluate its physicochemical properties to ensure it meets standard quality parameters for cosmetic use.

➤ Advantages of Using Hair Serum:

- Reduces frizz & dryness: Forms a protective layer on hair cuticle, making hair smooth and manageable.
- Adds shine: Oils like almond and castor oil impart natural luster to dull hair.
- Protects from damage: Shields hair from heat, UV rays, pollution, and humidity.
- Promotes hair growth: Ingredients like curry leaves, hibiscus, and vitamin E nourish follicles and stimulate growth.
- Reduces hair fall & breakage: Strengthens hair shaft and improves elasticity.
- Conditions scalp: Antioxidants and nutrients help reduce dandruff and itching.
- Lightweight & non-greasy: Unlike heavy oils, serums absorb quickly and don't weigh hair down.
- Easy to use: Leave-on product, no washing required after application.

➤ *Side Effects of Hair Serum:*

- Scalp irritation/allergy: Some people may be sensitive to curry leaves, hibiscus, or methyl paraben. Patch test first.
- Greasy buildup: Over-application, especially near roots, can make hair look oily and attract dirt.
- Clogged pores: Heavy use on scalp may block hair follicles and cause pimples or folliculitis.

- Preservative sensitivity: Methyl paraben can cause mild irritation in very sensitive individuals, though it's approved in low concentrations.
- Hair fall if unsuitable: If the base oil doesn't suit your scalp type, it may worsen hair fall.
- Product buildup: Needs regular cleansing with a mild shampoo to avoid residue.

➤ *Hair Serum Benefits:*

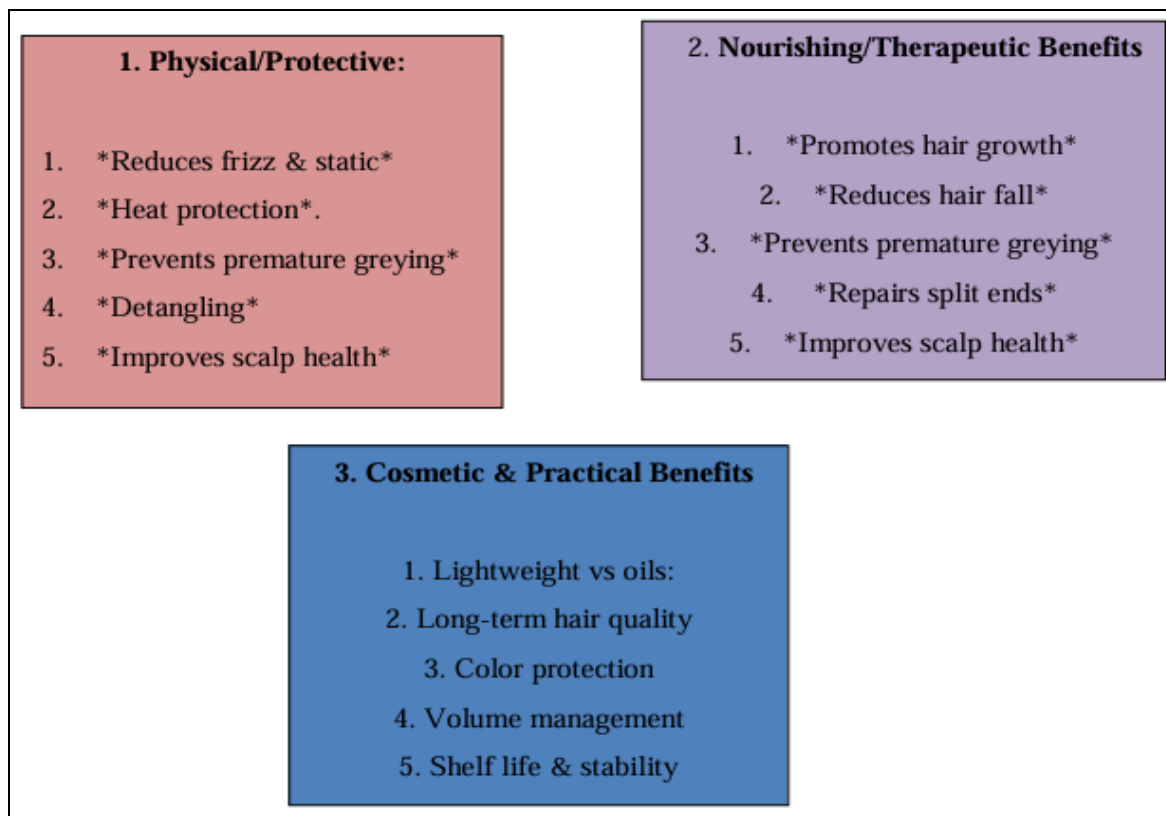


Fig 1 Hair Serum Benefits

➤ *Hibiscus Rosa-Sinensis:*



Fig 2 Hibiscus Rosa-Sinensis

• *Botanical & Chemical Profile*

- ✓ Common name: Hibiscus, Jaswand (Marathi), Gudhal
- ✓ Key phytoconstituents: Flavonoids (anthocyanins, quercetin), amino acids, vitamin C, AHA's like malic & citric acid, mucilage, calcium, iron, riboflavin

• *Role of Hibiscus in Hair Serum*

- ✓ Hair growth stimulant
- ✓ Prevents hair fall
- ✓ Natural conditioner
- ✓ Anti-dandruff
- ✓ Prevents premature greying
- ✓ Adds shine

➤ *Curry Leaves:*



Fig 3 Curry Leaves

- Scientific name: *Murraya koenigii*
- Part used: Fresh/dried leaves
- Key actives: Beta-carotene, proteins, B vitamins, antioxidants, iron, calcium, amino acids.
- *Main Benefits:*
 - ✓ Reduces hair fall
 - ✓ -Controls dandruff
 - ✓ Stimulates growth
 - ✓ Adds thickness

➤ *Almond Oil:*



Fig 4 Almond Oil

Vitamin E, magnesium, biotin, omega-6 & 9 fatty acids, proteins.

- *Main Benefits:*
 - ✓ Deep nourishment
 - ✓ Adds shine & softness
 - ✓ Reduces breakage
 - ✓ Scalp health
 - ✓ Lightweight

➤ *Fenugreek Seed (Methi):*



Fig 5 Fenugreek Seed (Methi)

Scientific name: *Trigonella foenum-graecum*

- *Benefits in Hair Serum*
 - ✓ Controls hair fall
 - ✓ Promotes growth
 - ✓ Anti-dandruff:
 - ✓ Natural conditioner
 - ✓ Adds volume
 - ✓ Prevents split ends

➤ *Vitamin E Tablet/Capsule:*



Fig 6 Vitamin E Tablet/Capsule

- *Benefits in Hair Serum*
 - ✓ Antioxidant protection
 - ✓ Improves scalp circulation
 - ✓ Repairs damage
 - ✓ Adds shine
 - ✓ Preservative booster
 - ✓ Anti-inflammatory

➤ *Procedure of Herbal Hair Serum Formulation:*

• *Extraction of Hibiscus flowers and Curry Leaves:*

- ✓ Fresh flowers of Hibiscus and Curry leaves were collected and Dried.

- ✓ Aqueous extraction of fine coarse powder was done by using 10gm Powder.
- ✓ Allow the mixture to cool at room temperature.
- ✓ Filtered by using Muslin cloth.

• *Method of Preparation:*

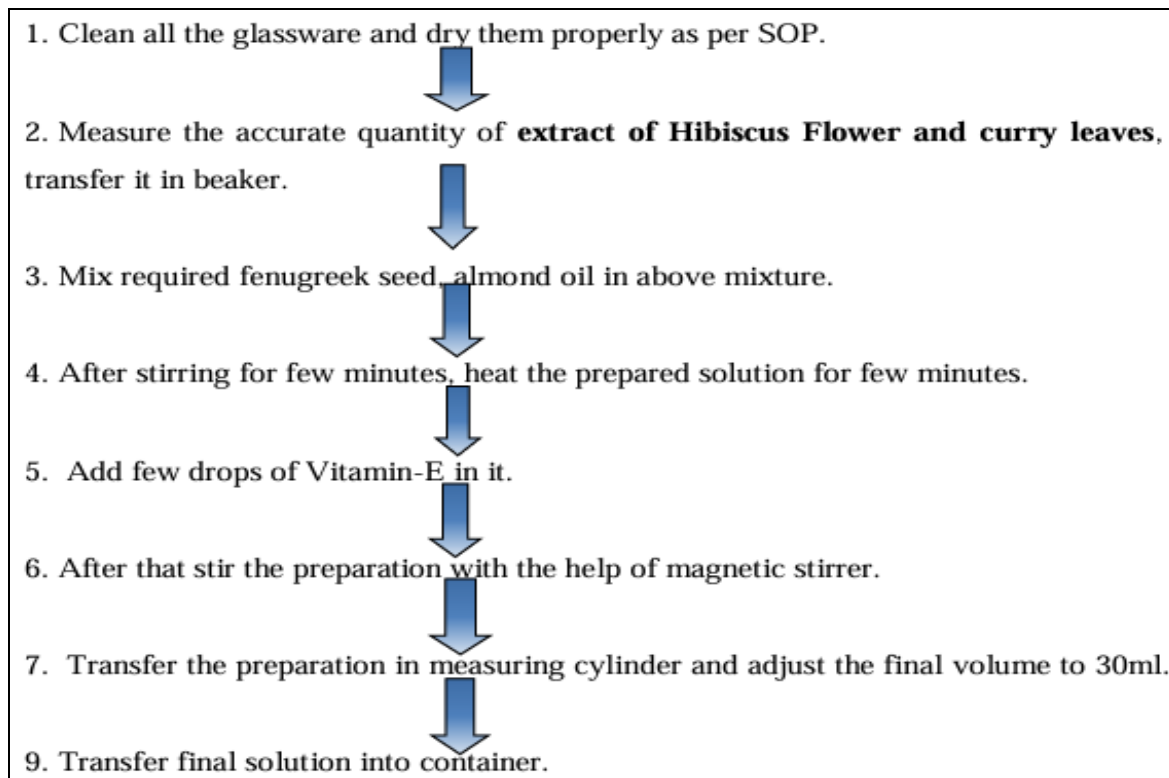


Fig 7 Method of Preparation

➤ *Formulation Table:*

Table 1 Ingredients of Herbal Hair Serum

Ingredient	Batch I	Batch II	Role of Ingredient
Hibiscus flower extract	7ml	7 ml	Prevents premature greying
Curry leaves extract	5ml	5ml	Stimulates growth
Fenugreek seed	10gm	30gm	Controls hair fall
Almond oil	15ml	15ml	For nourishment
Vitamin-E	1ml	1ml	For Hair Growth
Rose oil	QS	QS	Perfume

II. EXPERIMENTLE WORK

➤ *Evaluation of Herbal Hair Serum*

The following parameters are used to evaluate the prepared herbal hair serum:

• *Physical Appearance:*

Physical appearance was evaluated by observation on the texture, color and smell of the formulated cosmetic serum.

• *pH: 7*

The pH test will be determined by using Digital pH Meter. Dipper of digital pH will be deep into the sample of serum formulation and the pH value will be recorded. The

pH of the formulation should having acidic pH as the skin is having an acidic pH of around 4–6.

• *Homogeneity Test:*

A clean and dry object glass was smeared with the hair serum, and a cover glass was sealed. The appearance under the light of some coarse particle/homogeneity was investigated. Herbal hair serum was tested by visual examination for homogeneity and tested for some lumps, flocculates, or aggregates.

• *Spreadability Test:*

Spreadability was measured by a parallel plate process typically used to assess and measure the spreadability of semisolid preparations. One gram hair serum was pressed

between two horizontal plates of dimension 20× 20 cm, the upper of which weighed 125 g. The spread diameter was measured after 1 min. Spreadability was calculated using the following formula:

$$S = M \times L / T$$

Where,

S= Spreadability,

M= Weight in the pan (tied to the upper slide),

L= Length moved by the glass slide, and

T = Time (in sec) taken to separate the slides completely 10

• *Stability Test:*

The herbal hair serum was kept for three months at two separate temperatures of 4± 2°C and 30± 2°C, with 65% RH. Compared with the original pH and viscosity, the pH and viscosity of the herbal hair serum were determined after three months. [28,29]

III. RESULTS AND DISCUSSION

➤ *Physical Appearance:*

The physical appearance, color, odour and texture of the prepared herbal hair serum are visually tested. Table 2 reflects the outcomes.

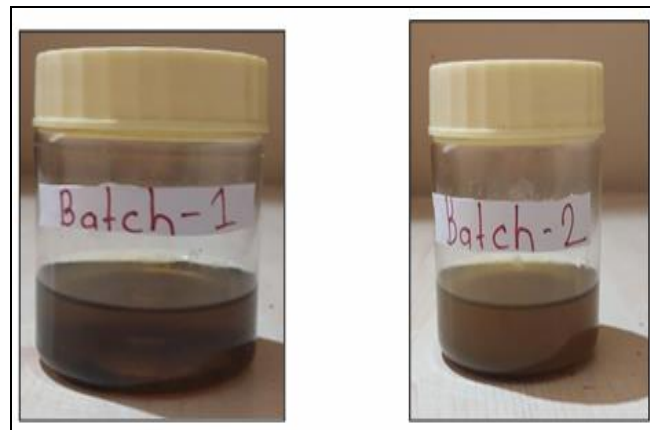


Fig 8 Physical Appearance

Table 2 Physical Appearance of Herbal Hair Serum

Parameter	Batch I	Batch II
Colour	Yellowish Brown	Yellowish Brown
Odour	Aromatic , Plesant	Aromatic , Plesant
Texture	Smooth	Smooth

➤ *pH, Viscosity, Homogeneity and Spreadability Test:*

The pH scale is used to specify the acidity or basicity of a product in order to ensure that it is safe to use. The value obtained is recorded in table 3.

Table 3 pH, Viscosity, Homogeneity and Spreadability Test of Herbal Hair Serum

Parameter	Batch H1	Batch H2
pH	5.61	5.78
Homogeneity Test	Good	Good
Viscosity	216	221
Spreadability Test	Easily Spreadable	Easily Spreadable

• *pH Meter Test:*



Fig 9 pH Meter Test

• *Homogeneity Test:*

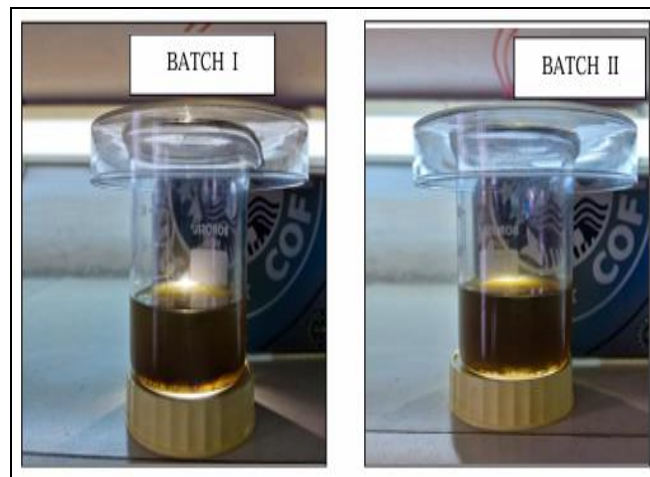


Fig 10 Homogeneity Test

• *Spreadability Test:*



Fig 11 Spreadability Test

➤ *Stability Studies*

Table 4 reveals that the herbal hair serum was stable during the research time, as these serums showed no physical instability, and there was no noticeable difference in the pH before and after the study. [30,31]

Table 4 Stability Study of Herbal Hair Serum

Sr. No.	Parameter	Initial	Final
1	pH	5.51	5.78
2	Viscosity	229	232

IV. CONCLUSION

This hair serum will help maintain healthy hair growth, turn slate hair to black, and provide essential nutrients required to preserve the proper function of the sebaceous glands and support the growth of natural hair because all the parameters demonstrated that they are within the limits and because all the constituents added have numerous advantages. The usage of herbal cosmetics has evolved significantly in the specific hygiene and healthcare system. Therefore, there is a lot of glitter in the herbal cosmeceuticals individual care or specific health care industry, which is essentially focusing and paying unnecessary care on the creation of herbal-based cosmetics. [32,33]

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