



## Formulation and Evaluation of Herbal Hair Serum

**Chandrakant Kushwaha\*, Revathi A. Gupta**

Institute of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore

### ABSTRACT :

Hair health is influenced by genetics, environment, and lifestyle, making it prone to issues such as dandruff, dryness, and hair loss. Synthetic hair products often cause side effects, creating a demand for herbal alternatives. This study aimed to formulate and evaluate an herbal hair serum using aloe vera, rose water, vitamin E, and coconut oil. The prepared formulations were tested for physical appearance, pH, viscosity, spreadability, homogeneity, and stability. Results indicated that the optimized formulation was stable, homogenous, pH-compatible with scalp physiology, and provided nourishing, conditioning, and protective effects. The study highlights the potential of herbal hair serum as a safe, effective, and multi-functional hair care product.

**Keywords:** Herbal cosmetics, hair serum, aloe vera, rose water, coconut oil, vitamin E.

### Introduction

Hair is a protective appendage with significant cosmetic and psychological importance. However, modern lifestyle factors such as stress, poor diet, and excessive use of chemical treatments have led to increased incidences of hair loss and scalp disorders. While synthetic drugs like minoxidil and finasteride are available, they are associated with side effects, driving interest in herbal alternatives. Herbal cosmetics combine traditional knowledge with modern formulation science to deliver safe and effective solutions. Hair serums, first introduced in the 1990s, are leave-in formulations designed to smooth, protect, and nourish hair. This study focuses on the development of an herbal hair serum formulated with natural ingredients known for their hair growth-promoting and conditioning properties.

### Materials and Methods

#### Ingredients:

- Aloe vera (2.5–3.5 ml) – conditioner, scalp soother
- Vitamin E (1 ml) – antioxidant, hair growth promoter
- Rose water (15–19 ml) – fragrance, mild astringent
- Coconut oil (1 ml) – nourishment, moisturizer
- Distilled water (5.5–10.5 ml) – vehicle

#### Method of Preparation:

Aloe vera gel was mixed with vitamin E and rose water, followed by gentle heating. Coconut oil was added, and the formulation was stirred with a magnetic stirrer until homogenous. The final volume was adjusted with distilled water and stored in airtight containers.

#### Evaluation Parameters:

1. Physical appearance – color, odor, consistency
2. Homogeneity – absence of lumps or aggregates
3. pH – measured using calibrated pH meter
4. Viscosity – determined by Brookfield viscometer
5. Spreadability – evaluated by parallel plate method
6. Stability – assessed over time for physical and chemical consistency

### Results and Discussion

The formulations (F1–F3) were yellowish-brown, smooth, and homogenous with a rose-like odor. pH values ranged between 5.0–5.6, aligning with scalp physiology (4.5–5.5). Viscosity ranged between 216–229 cps, and all samples exhibited good spreadability. Stability studies confirmed no significant changes in pH or viscosity. The optimized formulation (F3) showed excellent homogeneity, suitable pH, and higher viscosity, ensuring better adherence and prolonged effect.

The incorporation of aloe vera, rose water, coconut oil, and vitamin E provided synergistic benefits including scalp hydration, anti-frizz effect, protection from environmental damage, and hair root nourishment. These findings are consistent with previous research advocating herbal formulations as safer alternatives to synthetic serums.

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## Conclusion

The study successfully formulated and evaluated an herbal hair serum with promising cosmetic and therapeutic benefits. The serum was stable, safe, and effective in nourishing the scalp and improving hair health. Its natural composition minimizes risks of irritation and adverse effects, supporting its potential for large-scale application in herbal cosmetic industries. Future studies may focus on clinical trials and consumer acceptability to further validate its efficacy.

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