

A REVIEW OF NATURAL INGREDIENTS IN HERBAL HAIR SERUMS

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ABSTRACT

The hair serum has been developed using aloe vera, almond oil, rose water, vitamin E, and essential oil. These ingredients are highly beneficial and carry minimal risk of causing adverse reactions. All the components required for this serum are readily available in the market. The serum effectively manages frizz, improves smoothness, reduces tangles, boosts shine, enhances straightness, and also protects the hair from damage. Aloe vera provides multiple benefits for the hair and scalp due to its moisturizing and sealing properties. This helps prevent dryness, flakiness, and dandruff. Almond oil, rich in vitamin B, not only moisturizes the scalp but also strengthens hair follicles. Ginger conditions the hair, prevents dandruff, promotes hair growth, reduces scalp inflammation, and protects against heat damage. Rosewater is recognized for its moisturizing and conditioning effects on the hair. Lime essential oil helps reduce dandruff, stimulate hair growth, and enhance natural shine. Lastly, vitamin E contains natural antioxidants that support a healthy scalp and may contribute to hair growth. To evaluate the various properties of the formulated hair serum, I conducted assessments including physical appearance, homogeneity, pH, viscosity, spreadability, and other relevant parameters. The rise in living standards has led to increased use of herbal cosmetics for personal hygiene and hair care. This analysis focuses on the application of natural cosmetics in promoting healthy hair growth and preventing premature graying.

KEYWORDS: Hair serum, aloe vera, almond oil, rose water, vitamin E, spreadability, premature graying.

1. INTRODUCTION

Hair is one of the most important components of the human body. It varies in shape, length, diameter, texture, and color. All mammals have hair, which plays a vital role in regulating body temperature, reducing friction, and protecting

the scalp from the sun's rays. The global rise in the cost of living has led to an increased demand for cosmetic products. Cosmetics have become more significant as people seek to appear younger and more attractive. The term cosmeceuticals refers to a fusion of the cosmetics and pharmaceutical industries. Cosmetics companies typically produce beauty products, while pharmaceutical companies manufacture medicinal ones. A skincare product that combines both is referred to as a cosmeceutical. Herbal cosmetics are developed by using approved cosmetic ingredients as a base and incorporating one or more herbal components to offer specific benefits.

The word "cosmetic" originates from the Greek word *kosmetikos*, meaning the skill of adornment. Historically, cosmetics were associated with hunting, warfare, religion, and medicine. Herbal cosmetics utilize compounds that can also be used to create treatments for difficult diseases like cancer, based on their potent natural ingredients. Serums, suitable for individuals of all ages, contain high concentrations of biologically active substances and plant-based compounds. Skin infections, acne, and hair loss may also occur. Various natural ingredients have been used in hair treatments, including aloe vera, tulsi, hibiscus, guava leaves, coconut oil, almond oil, and fenugreek (methi). Orange peel (*Citrus sinensis*) can improve hair smoothness and shine and protect against pollutant damage due to its antioxidant content.

1.1 HAIR GROWTH CYCLE

Anagen Phase: This is the first stage of the hair growth cycle and lasts approximately 1,000 days. It begins in the papilla and can last from two to six years. About 80–90% of all human hair is in the anagen stage at any given time. This is the period of active growth when the cells around the follicle rapidly divide and deposit materials within the hair. Hair can grow up to 1 meter during this phase, and the rate of growth is determined by genetics. The cells in the papilla divide to produce new hair fibers, and the follicle buries itself into the dermal layer of the skin to nourish the strand.

Catagen Phase: At the end of the anagen phase, hair enters the catagen phase. This is a short transitional stage that lasts approximately 10 days. The first sign of catagen is the cessation of melanin production in the hair bulb and the apoptosis (programmed cell death) of follicular melanocytes. Also known as the transitional phase, the follicle renews itself. Over two weeks, the hair follicle shrinks due to disintegration, and the papilla detaches, cutting the hair strand off from its nourishing blood supply. Hair does not grow during this phase, but the length of the terminal fiber increases as the follicle pushes it upward.

Telogen Phase: This is the final stage of the hair growth cycle. During this phase, the hair follicle is dormant or resting, and hair is easily shed. Around 10–18% of hair is in the telogen phase at any given time. The follicle remains inactive for about three months. Meanwhile, the epidermal cells lining the follicle channel continue to grow and accumulate around the base of the hair. Within two weeks after the telogen phase ends, the follicle will re-enter the growth phase, and a new hair shaft will begin to emerge. This results in normal hair loss, known as shedding.

Exogen Phase: Previously thought to be part of the telogen phase, hair shedding is now understood as a distinct stage called the exogen phase. This is a highly controlled, active process of hair fiber shedding. It differs from the quiescence (resting) typically seen during hair follicle cycling. The exogen process has two steps: After telogen, the follicle base cells receive a signal to initiate exogen, turning on effectors responsible for shedding.

Kenogen Phase: Kenogen refers to the period when the hair follicle remains empty after the telogen phase and before a new anagen hair begins to grow. It is characterized by the absence of a hair fiber in the follicle. Hair loss, thinning, and growth problems occur when this cycle is disrupted.

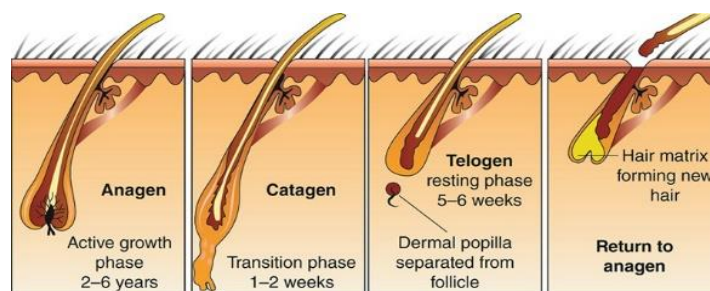


Fig. 1: Hair Cycle.

1.2 HISTORY OF HERBAL HAIR SERUM

- **Ancient Practices:** Historically, people have used various natural oils and balms to condition and protect their hair. These practices often involved applying oils like coconut oil, almond oil, or other plant-based oils to moisturize and nourish the hair and scalp.
- **Early Cosmetic Formulations:** As the cosmetics industry developed, these natural oils and balms were likely incorporated into more complex formulations, possibly including other ingredients to enhance their effects or create specific textures.
- **Modern Hair Serum Development:** The development of modern hair serums, often containing silicones or other synthetic ingredients, likely occurred alongside advances in chemistry and cosmetic science. These serums were marketed as a way to address specific hair concerns, such as frizz, split ends, or dryness.
- **Focus on Natural Alternatives:** In recent years, there's been a growing interest in natural and herbal hair care products, including herbal hair serums. These serums often incorporate ingredients like aloe vera, almond oil, and essential oils, offering a more natural approach to hair care.
- **Continued Evolution:** The hair serum market continues to evolve, with new formulations and ingredients emerging to address a wide range of hair needs and preferences.



Fig 2: Herbal Hair Serum.

1.3 ADVANTAGES OF HAIR SERUM

1. Protects the hair from environmental damage.
2. Functions as both a pre-styling treatment and a finishing product.

3. Can be used before or after heat styling.
4. Shields the hair from external factors that may cause damage.
5. Enhances the smoothness and shine of hair strands.

1.4 DISADVANTAGES OF HAIR SERUM

1. Regular use of hair serum may compromise overall hair health.
2. Applying serum directly to the scalp can potentially cause inflammation.
3. It is recommended to avoid applying serum on the scalp to prevent issues such as oiliness or irritation.

1.5 IDEAL PROPERTIES OF HERBAL HAIR SERUM

- **Nourishing and Strengthening:** Delivers essential nutrients to the hair shaft and follicles, promoting stronger and healthier hair.
- **Scalp-Friendly:** Free from irritants and safe for sensitive skin; helps soothe the scalp and prevent issues such as inflammation or dandruff.
- **Heat and UV Protection:** Forms a protective barrier that shields the hair from heat styling tools and harmful UV rays.
- **Frizz Control and Smoothness:** Tames flyaways and frizz, leaving the hair smooth, manageable, and shiny.
- **Moisturizing and Hydrating:** Retains moisture in the hair, preventing dryness and split ends.
- **Promotes Hair Growth:** Infused with herbal extracts known to stimulate blood circulation and encourage hair growth (e.g., rosemary, hibiscus, and fenugreek).
- **Free from Harsh Chemicals:** Contains no sulfates, parabens, silicones, or alcohols that could damage the hair over time.
- **Pleasant Natural Fragrance:** Features a light, refreshing scent derived from essential oils or herbs, without being overpowering or synthetic.
- **Natural Ingredients:** Made from plant-based extracts and oils (e.g., amla, bhringraj, argan, aloe vera, neem) without harmful chemicals or synthetic fragrances.
- **Non-Greasy and Lightweight:** Easily absorbed into the hair without leaving a sticky or oily residue, making it suitable for daily use.



Fig. 3: Hair Serum.

1.6 BENEFITS

- **Natural Ingredients:** Herbal hair serums typically contain natural components such as botanical extracts, essential oils, and vitamins. These ingredients are generally gentler on the scalp and hair compared to synthetic chemicals, reducing the risk of irritation or adverse reactions.
- **Nourishment & Hydration:** These serums are formulated to nourish and hydrate both the hair follicles and scalp. Ingredients like aloe vera help moisturize the hair, making it softer, smoother, and more manageable.
- **Strengthening & Repair:** Many herbal hair serums include ingredients known for their ability to strengthen the hair shaft and repair damage, thereby enhancing hair resilience and reducing breakage.
- **Stimulated Hair Growth:** Certain herbal ingredients are believed to promote hair growth by improving blood circulation in the scalp and nourishing the hair follicles. Ingredients such as rosemary oil and rose water.
- **Antioxidant Protection:** Herbal hair serums often contain antioxidants that protect the hair and scalp from environmental damage, including UV radiation and pollution. Antioxidant-rich ingredients like vitamin E help prevent oxidative stress, keeping the hair healthy and vibrant.
- **Soothing Scalp Benefits:** Many herbal ingredients possess soothing and anti-inflammatory properties, which can help calm irritated or itchy scalps, promoting overall scalp health.
- **Eco-Friendly & Sustainable:** Herbal hair serums are often produced using sustainable practices and biodegradable ingredients, making them more environmentally friendly than many conventional hair care products. Additionally, they frequently come in recyclable packaging, further reducing their environmental impact.



Fig. 4: Hair Serum Benefits.

1.7 SIDE EFFECTS

- **May Cause Dryness:** Excessive and frequent application of herbal hair serum can lead to dryness and may compromise overall hair health.
- **Scalp Irritation:** Applying serum directly to the scalp may cause irritation, especially for those with sensitive skin or existing scalp conditions.
- **Oiliness & Inflammation:** Using the serum—or any scalp cream—on the scalp can result in excess oiliness or inflammation, which may worsen scalp issues.
- **Allergic Reactions:** Some herbal ingredients may trigger allergic reactions, scalp irritation, or even hair damage, particularly if the product contains botanicals that are unsuitable for your specific hair type or sensitivities.
- **Patch Test Recommended:** Always perform a patch test before using a new herbal serum. If you experience any adverse effects, discontinue use immediately and consult a dermatologist or healthcare professional.

2. HERBAL INGREDIENTS

2.1 PURSLANE PLANT EXTRACT



Fig. 5: Purslane Plant.

- **Common Name:** Purslane
- **Botanical Name:** *Portulaca oleracea*
- **Family:** Portulacaceae
- **Part Used:** Whole plant (especially leaves and stems)
- **Form Used in Serum:** Extract, juice, or oil infusion

Key Nutrients In Purslane Extract

- Omega-3 Fatty Acids (like alpha-linolenic acid)
- Vitamins A, C, and E
- Flavonoids (such as kaempferol and quercetin)
- Essential Minerals: magnesium, potassium, calcium, and iron
- Mucilage and Polysaccharides (natural gel-like compounds that help retain moisture)

2.2 ALOE VERA



Fig. 6: Aloe vera.

- **Synonym:** Aloe, Musabbar, Kumari.
- **Biological Source:** It is the leaves of various species of aloe vera—*aloe barbadensis*, *aloe perryi*, *aloe spicata*, *aloe africana*.
- **Family:** Liliaceae
- **Chemical Constituents:** Aloe vera is a major source of anthraquinone glycoside. Aloe vera contains aloin, barbaloin, and aloe-emodin.

- **Uses:** To make stronger hair, it provides antioxidant properties and also acts as an emollient, improves the texture of hair, and repairs dead skin on the scalp. Aloe vera gel is a slightly viscous & clear liquid having good moisturizing properties.

2.3 FLAXSEED



Fig. 7: Flaxseed.

- **Botanical Name:** *Linum usitatissimum*
- **Family:** Linaceae
- **Synonym:** Linseed, flaxseed
- **Biological Source:** It consists of the dried, fully ripe seeds of *Linum usitatissimum* Linn. omega-3 fatty acid, lignans, etc.
- **Uses:** anti-inflammatory, antioxidants, hair growth stimulator

2.4 FENUGREEK



Fig. 8: Fenugreek.

- **Botanical Name:** *Trigonella foenum-graceum*
- **Family:** Leguminous
- **Synonym:** Methi, Methika, Alholva, Chandrika.
- **Biological Source:** It is obtained from the dried seeds of *Trigonella foenum-graceum*.
- **Chemical Constituents:** Vitamin B, alkaloids, flavonoids, saponins, etc.
- **Uses:** Hair growth stimulant, antibacterial.

2.5 COCONUT OIL



Fig. 9: Coconut Oil.

Coconut oil is one of the most widely used oils due to its numerous benefits. It is an age-old ingredient that has gained increasing popularity because of its remarkable properties. It functions as both a moisturizer and a sealant and is one of the most highly regarded ingredients for treating dry and damaged hair. The oil's small molecules act as a magical conditioner when used in small amounts, as they penetrate the hair shaft to improve the natural health of the hair. It is one of the best hair serum ingredients, enhancing overall scalp and hair health while adding shine. Because its penetration is limited, it remains on the hair shaft, working effectively as a sealant. The nutritional components in coconut oil that benefit hair include saturated, monounsaturated, and polyunsaturated fatty acids.

Benefits of Coconut Oil for Hair

- Essential for hair growth
- Improves blood circulation in the scalp
- Prevents excessive hair fall
- Kills dandruff-causing fungi
- Controls the production of sebum
- Nourishes the scalp

2.6: ROSE WATER



Fig. 10: Rose Water.

- Rosewater is a mild astringent that may help reduce oiliness and dandruff.
- It has anti-inflammatory properties, which may make it beneficial for certain scalp conditions such as psoriasis and eczema.
- The fragrance of rose water is calming and soothing. While this quality may not directly improve the appearance of your hair, the pleasant scent wafting from your locks may help lift your mood. It might even help relieve headaches and reduce irritability.
- Many women with curly hair swear by rose water's ability to tame frizz and add shine.

3. EVALUATION PARAMETERS

The following are the general parameters used for evaluating herbal serum:

- **General Appearance Test:** This test involves assessing the color, odor, and texture of the serum to ensure overall quality.
- **pH Test:** The pH of the serum is measured to ensure it falls within the optimal range for hair care products, typically between 4.5 and 7.
- **Homogeneity Test:** A clean slide is used to examine the serum under light for the presence of coarse particles, ensuring uniformity in texture.
- **Homogeneity Assessment:** A visual inspection is performed to confirm the absence of lumps, flocculates, or aggregates in the herbal hair serum.
- **Spreadability Assessment:** Spreadability is evaluated using a standardized method by measuring the spread diameter between two plates, which reflects the serum's ease of application.
- **Skin Sensitivity Test (Draize Skin Test):** This test assesses potential allergic reactions by applying the serum to shaved areas of the skin and recording observations before and after application.
- **Microbial Test:** After 7 days, the serum is tested for microbial contamination, specifically checking for fungal growth after 24 hours.
- **Viscosity Measurement:** A viscometer is used to determine the serum's viscosity, providing insight into its consistency.
- **STERILITY TEST:** Sterile discs are loaded with the serum and incubated to ensure the absence of microbial contamination.
- **Stability Test:** The serum is stored for a minimum of 7 days to evaluate its stability. The pH and viscosity are measured both initially and after the storage period to ensure consistency, indicating a stable formulation.

4. CONCLUSION

After reviewing various herbal hair serums, it is evident that these products offer promising benefits such as nourishing the scalp, promoting hair growth, and enhancing overall hair health. The blend of botanical extracts not only addresses specific hair concerns but also supports scalp wellness. Carefully selected herbs work synergistically to nourish the hair from root to tip, providing essential nutrients and hydration. Ingredients like reetha, fenugreek (methi), rosemary, amla, and citrus extracts offer vital nourishment, contributing to smooth, shiny, and dandruff-free hair. However, it is important to choose a serum that suits your specific hair type and needs. Conducting thorough research, reading product reviews, and consulting with a dermatologist can help identify potential side effects and ensure optimal results. By incorporating a high-quality herbal hair serum into your hair care routine, you can potentially achieve healthier, more vibrant hair. Trusting in the power of nature can lead to a truly enriching hair care journey.

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