

## A comprehensive review article for poly herbal hair serum is Magical Remedies for hair growth.

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**ABSTRACT:** Hair is an essential part of a person's identity. Herbal formulations have always had good activity and little or no side effects over synthetic ones. The hair serum has been developed by incorporating Aloe vera, ginger, vitamin E, flex, Rosemary, neem, almond oil. These cosmetics prove to be highly beneficial and have minimal chances of causing any adverse reactions. All the ingredients required for this serum are readily accessible in the market. This serum not only effectively manages frizz, improves smoothness, minimizes tangles, boosts shine, enhances straightness, but also safeguards against damage. Cosmetics are being used on an extensive basis for their various uses in day-to-day life. Mankind uses various items to enhance beauty and elegance in order to appear young and charming. Hair root activation is essential to promote hair growth and prevention of hair loss. The rise in living standards has led to an increase in the utilization of herbal cosmetics for personal hygiene and hair care. This analysis specifically examines the application of natural cosmetics in promoting healthy hair growth and preventing premature greying of hair.

**KEYWORDS:** Hair, Herbal, Hair Serum.

### I. INTRODUCTION<sup>[1]</sup>

Hair is one of the most important parts of the human body. Hair comes in different shapes, lengths, diameters, textures and Colors. All mammals have hair. Hair plays a vital role in regulating body temperature. Hair also helps to reduce friction and protect the scalp from the sun's rays.

Hair can be defined as - "improved epithelial structure formed as a result of keratinization of germinative cells" Hair loss has the potential to impact either the scalp or the entire body, and it can be either temporary or permanent.

This condition can arise due to various factors such as genetics, medical conditions, hormonal fluctuations, or simply as a natural consequence of aging. It is more commonly observed in men that they experience hair loss on their head.

The term "baldness" is often used to describe excessive hair loss specifically from the scalp. The primary cause of baldness is typically attributed to hereditary factors as individuals grow older. Some individuals choose to allow their hair loss to progress naturally without any intervention or concealment. On the other hand, some may opt to camouflage it using different hairstyles, makeup or scarves. Additionally, there are those who decide to pursue treatments aimed at preventing further hair loss or promoting hair growth.

Hair is a crucial component that enhances the overall beauty of the body. It serves as an epidermal derivative and faces various issues such as dandruff, hair fall, and greying. As individuals age, the pigment called melanin, responsible for hair colour, ceases to function, resulting in the hair turning white.

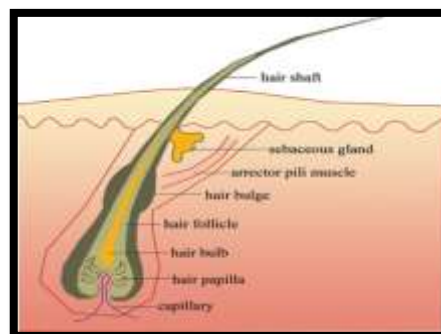


Fig 1: Structure of Hair

Hair plays vital role in human body. As hairs are considered to be one of the essential parts that complement the beauty of a person, it is important to take right care of the hairs. Hair can be

defined as- “improved epithelial structure formed as a result of keratinization of germinative cells”, hairs are the outgrowths from the follicles present on the skin. Hair is found on scalp, skin, and face and so on.

Hair is a complex system with unusual chemical and physical properties. It's a complicated structure made up of various morphological components that work together as a whole. The cuticle, cortex, and medulla are the three primary sections of a mammalian hair shaft.

#### Parts of Hair <sup>[1]</sup>:

1. Dermal papillae: The dermal papilla is essential in controlling the hair cycle and growth, as it houses androgen receptors that are responsive to DHT.
2. Matrix: The matrix surrounds the dermal papillae and contains all the vital elements needed for hair growth and the development of specific sections of the hair, such as the outer root sheath, inner root sheath, and the hair shaft.
3. Bulb, outermost sheath: The most external part of the hair, referred to as the outer root sheath is distinguished by its keratinized structure. Conversely, the internal root sheath is comprised of three separate layers: the Henley layer, Huxley layer, and Cuticle.

#### Different Problems Associated with Hair <sup>[2]</sup>:

1. Hair Loss: Although historically discussed as a problem among men, hair loss/thinning hair is additionally common among women. For several men, it's getting to be male pattern balding. Female hair loss is typically caused by stress, medication, changing hormones and even menopause. Additionally, many hair styling can contribute to hair loss.



Fig 2: Hair Loss

2. Dry Hair: Shampooing too often causes dry hair. Although squeaky clean hair may be a good thing, many overdo it by washing once,

sometimes twice or per day which will strip away all of the hair's natural oils.



Fig 3: Dry Hair

3. Split Ends: Over-brushing hair, excessive perming, too much heat and lack of a good conditioner cause split ends. "Split ends" refers to the splitting or fraying of the hair shaft, most commonly affecting long hair. This occurs when the outermost layer of the hair shaft, the cuticle, is damaged, exposing the cortex of the hair. This damage can lead to hair breakage and of split ends.



Fig 4: Split Ends

4. Dandruff: Dandruff consists of small white flakes of dead skin found in the hair or on the scalp. It is believed to be triggered by a fungus known as *Malassezia restricta* and *Globose*, previously referred to as *Pitosporum*, which can lead to yeast infections on the skin and scalp. Factors contributing to dandruff include inadequate hair brushing, allergies, and insufficient showering.



Fig 5: Dandruff

5. **Oily/Greasy Hair:** Oily hair is caused when the scalp produces an excessive amount of natural oil called sebum. It is produced by sebaceous glands, which may sometimes “work overtime”, leading to excessive amounts of oil. This oil, called sebum, coats the hair and scalp to protect it from moisture loss and the environment. However, too much sebum can make hair look dull and lifeless.



Fig 6: Oily/Greasy Hair

6. **Dull Hair:** Dull hair tends to lack moisture, shine and body. It can be caused by many factors, like using the wrong products, not getting enough nutrients in your diet, or overusing harsh chemicals or techniques. Other characteristics of dull hair include: Dryness, Frizziness, Rough texture, Lack of movement, and Tangles easily.



Fig 7: Dull Hair

7. **Heat Damaged Hair:** Use your curling iron or flat iron too much and your hair will become damaged. Prolonged exposure to warm air from a hair dryer can cause dryness, which can affect blood flow and melanocytes.



Fig 8: Heat Damaged Hair

8. **Frizzy Hair:** Frizzy hair occurs when the hair's moisture level falls below normal levels, and it can also be hereditary.



Fig 9: Frizzy Hair

#### Reasons for Hair damage<sup>[3]</sup>:

1. **Stress:** Although emotional stress is less likely than physical stress to cause hair loss, it can still occur in situations such as divorce, ageing parents, or the death of a loved one. It would be beneficial to have a hair fall tip to manage stress and anxiety using yoga, meditation, and talk therapy.
2. **Dietary habits:** Vitamin deficiency is the leading cause of hair loss. Hair loss is commonly caused by low vitamin B levels and a lack of necessary minerals. It occurs when there is a lack of nutrients in the diet and the food is not nutritious. Staying away from meals that promote hair loss and replacing them with nutritious foods like lean proteins and plenty of fruits and vegetables is one of the solutions to this hair loss problem.
3. **Protein Shortage:** Hair loss is frequently caused by a protein deficiency. If you don't get enough

protein in your diet, your body will break down more protein. This depletes the hair of the required protein for growth and prevents the inflow of keratin into the hair. Consume extra protein and necessary fats to promote hair development.

4. Chemical-based products/wrong products: One of the most common causes of hair loss is the use of incorrect hair products. It's always a good idea to utilize products that keep your hair healthy and prevent hair loss. Anti-dandruff shampoo and conditioner for dry or damaged hair, for example, will not help you fix the problem. Instead, use a shampoo that is designed to help you combat hair loss in a targeted approach.
5. Heredity: Hair loss can be caused by genetic diversity, which is a significant factor. Hair loss with a pattern is inherited by both males and women. Hair loss is caused by a number of genes that have been found. This is why it's typical to hear that hair loss runs in families.

#### **Hair Serum<sup>[4]</sup>:**

Serum is a concentrated product which is widely used in Cosmetology. The name comes from itself in professional cosmetology. The cosmetic serum is as concentrated in water or oil as any other cream. Serums are defined as concentrated product that contains ten times more organic matter than cream. Therefore, deals with the cosmetic problem quickly and effectively.

Cosmetic is a Greek word which means to adorn (addition of something decorative to a person or a thing). Cosmetology is the study and application of beauty treatment. It is an art or science of beautifying and improving the skin, nails and hair and the study of cosmetics and their application.

Serum is packed with a bunch of beneficiary active components and nutrients such as antioxidants, ceramides, amino acids and others. This explains why face serum always being the costliest item in a skin care set. Whether it is moisturizer, anti-wrinkle or anti-aging product or skin serum, all these products should contain antioxidants, cell-communicating ingredients and skin-identical ingredients.

#### **Benefits of Hair Serum<sup>[5]</sup>:**

It is important to know hair serum benefits before you finalize the product. A hair serum predominantly has the following benefits.

- Multi-Purpose: A hair serum solves a lot of hair issues and not just one problem. There is a

reason it is called a one stop solution for all your hair woes. Hair serum transforms a bad hair day into a good hair day with just a few drops, your hair will feel and look different.

- Protects Hair: Hair serum forms a layer on hair strands. It thus acts as an excellent protect against heat, sun damage, dirt, dust and pollution.
- It prevents your hair from getting damaged. This is why it is advised to use a heat protecting serum before using hot styling tools.
- Gives Shine to the Hair: The layer formed by hair serum acts as a reflector of light thus making your hair look shiny and lustrous. Hair serums consist of amino acids which protect colored and chemically treated hair.
- Prevents Hair fall From Breakage: When our hair becomes a tangled mess, we tend to lose a lot of hair strands because of the wear and tear that goes into detangling. Hair serum acts as a lubricant for such hair and makes detangling easy. And the result is less hair fall.
- Best for Dry Hair: The most to benefit from hair serums are those who have dry and frizzy hair. Hair serums lock in the moisture and makes hair smooth and shiny.
- Nourishes Hair and Makes them Manageable: Hair serums fill the follicular cracks and revive brittle and damaged hair. Hair serum makes hair more manageable which further makes it easy to style them. Time, energy, patience. Everything is saved.

#### **Side Effects of Hair Serum<sup>[6]</sup>:**

- Regular use and over application can make the hair unhealthy and ultimately dry.
- Applying the serum on the scalp can lead to inflammation.
- Silicones present in the hair serum can be harmful for the hair in the long hair.
- Scalp application should be avoided as it might make it oily or can lead to inflammation.

#### **Highlights and Features of Hair Serum<sup>[6]</sup>:**

- Hair serum is the styling product that coats the surface of the hair known as hair serum.
- It is basically a hair care product in liquid form, its consistency thicker than water.
- Hair serum is not just meant for hair styling. They are also for treating multiple hair concerns like dry hair, dull hair, and unmanageable hair.
- It is not just for hair styling, they are also treating multi-purpose hair concerns like dry hair, dull hair and treat many hair problems include alopecia, hair fall happens because of

atmosphere, medical issues, nutritional deficiencies, eating junk food, etc.

- There are different kind of hair serums are available in the market to reduce hair problem.
- This is silicon-based styling product that is designed to coat the surface of hair to added shine, hydration, smoothness, pollution protection, treating many problems regarding to hair, etc.

### Types of Hair Serum<sup>[7]</sup>:

There are many different kinds of herbal hair serums, and each is a supply of blood to the scalp and is designed to target particular hair issues and tastes. Typical herbal hair serum varieties include the following:

1. **Moisturizing serum:** These serums are designed to hydrate dry, brittle hair. Herbal components usually contain nutrients like argan oil, shea butter, coconut oil, and aloe vera, which work to moisturize and nourish the hair strands, leaving them feeling silky and smooth and easier to manage.
2. **Growth-promoting serum:** Hair density and growth stimulation are the two main goals of these serums' formulations. Ingredients like biotin, promote hair growth ginseng extract, and fenugreek extract may be present in them; these are thought to stimulate follicles.
3. **Strengthening serum:** To prevent breakage and encourage healthier-looking hair, strengthening serums are made to strengthen weak, damaged hair. The presence of vitamins, minerals, and antioxidant rich herbs that promote hair resilience and strength, such as horsetail extract, nettle leaf extract, and rosemary oil, is common in them.
4. **Anti-dandruff serum:** Anti-dandruff serums are designed to address problems with the scalp, including flakiness, itching, and dandruff. They frequently contain herbal ingredients like tea tree oil, neem oil, and peppermint oil that have antimicrobial and anti-inflammatory qualities. These ingredients help to calm the scalp and lessen the bacteria that cause dandruff.
5. **Color-protecting serum:** The purpose of color-protecting serums is to maintain the brightness and durability of hair that has had color treatment. Herbal components like green tea extract, grapeseed oil, and sunflower seed oil are frequently found in them; these ingredients help prevent UV rays and environmental damage from fading hair color.
6. **Repairing serum:** Damage from chemical treatments, heat styling, and environmental

stressors can all be repaired with the help of repairing serums. Herbal extracts that help to seal the hair cuticle, tame frizz, and bring back shine include keratin, avocado oil, and bamboo extract.

7. **Herbal Hair serum:** Herbal hair serums often contain antioxidants that help protect the hair and scalp from environmental damage, such as UV radiation and pollution. Antioxidant-rich ingredients like vitamin E can help prevent oxidative stress and keep the hair looking healthy and vibrant.
8. **Soothing serum:** The purpose of soothing serums is to soothe and calm the scalp, thereby lowering inflammation and irritation. Herbal ingredients with anti-inflammatory and calming qualities, such as calendula extract, lavender oil, and chamomile extract, may be present in them to help soothe and reduce scalp discomfort.
9. **Smoothing serums:** These serums are intended to make hair look sleek and smooth, manage to fly away, and reduce frizz. They frequently include ingredients like silicone or argan oil for a smooth texture and to coat the hair shaft.
10. **Shine serums:** Shine serums are designed to give dull hair luster and brightness. To increase shine without weighing the hair down, they typically include light-reflecting particles or oils like coconut or jojoba oil.
11. **Repairing serums:** By supporting and fortifying the hair shaft, reparative serums help repair damaged hair. Along with vitamins and minerals to support healthy hair and repair damage, they may contain proteins like keratin or amino acids.
12. **Heat protectant serums:** These serums act as a barrier to keep heat-producing manufacturing hair are blow dryers, flat irons, and curling irons among the styling instruments that are safe. To reduce the harm caused by heat styling, they frequently include silicones or other heat-protective substances.

### Herbs used in herbal hair serum<sup>[1,8-11]</sup>:

1. **Aloe vera:** When it comes to hair care and skin care, aloe vera gel is a boon. A healthy and balanced pH is essential for healthy hair growth. Aloe vera gel comes into play here. It also acts as a natural conditioner and prevents hair loss. Simply apply it to your scalp and hair, and let the gel work its magic on your scalp and hair for complete nourishment.



Fig 10: Aloe vera

- Ginger:** Ginger juice for hair has a major benefit in preventing seborrhoeic dermatitis, also known as dandruff. Dandruff is caused by a yeast infection called malassezia, which causes itchy flakes and redness on the scalp. Antifungal agents, on the other hand, can help curb its growth. Ginger has a potent antifungal effect on your hair, according to studies. It can help reduce dandruff. Gingerol, the most abundantly found active ingredient in the ginger rhizome, is responsible for its antimicrobial properties. Ginger for hair also has an anti-inflammatory effect, which means it reduces inflammation and relieves dandruff-related pain.



Fig 11: Ginger

- Vitamin E:** Vitamin E-rich oil can help replace that protective layer and bring back shine. Oil in general also helps seal out moisture, reduce breakage, and protect the hair from damage.



Fig 12: Vitamin E

- Flax (Linum usitatissimum):** Linum usitatissimum seed oil is an amber-colored oil extracted from the seeds of the linseed/flax plant (*linum usitatissimum*). In some of our hair care products, we use this ingredient as an emollient, resulting in smooth and healthy hair. Linum usitatissimum seed oil, also known as flaxseed oil, is a seed oil that is extracted from linum usitatissimum seed oil. This well-known super ingredient contains essential fatty acids as well as unsaturated fatty acids, which will help soften your hair and give it a beautiful shine. Flaxseed oil's omega-3 fatty acids can also help to strengthen your hair.



Fig 13: Flax

- Rosemary:** Rosemary has been used for hundreds of years to help aid in hair loss. It is great to use on thinning hair and balding. It best works for hair growth when it is used with olive oil. Combine rosemary oil mixed with a bit of olive oil and apply directly to the scalp. Not only does it promote hair growth, but also helps to prevent hair from going prematurely grey. It is excellent for giving hair follicles the nourishment they need.



Fig 14: Rosemary

6. **Neem:** Neem's anti-bacterial properties work effectively for scalp conditions like dandruff and itching. Hair follicles grow stronger, and the scalp gets healthier too.



Fig 15: Neem

7. **Almond Oil:** The nourishing oil can soften and strengthen your hair. It's rich in vitamin B-7, or biotin, so almond oil helps to keep hair and nails healthy and strong. It can also help protect your hair from sun damage, with a natural SPF 5. You can use almond oil as a scalp treatment.



Fig 16: Almond Oil

**Role of Ingredients<sup>[13]</sup> :**

Ingredients	Role
Aloe vera	: Replenishing the scalp's dead skin

- Ginger : Promote hair growth and Improve hair quality
- Vitamin E : For Hair growth
- Flax : Reduce breakage and add shine
- Rosemary : Antidandruff, Conditioner
- Neem : Scalp Inflammation
- Almond Oil : Rich Nutrients

**Evaluation of Herbal Hair Serum<sup>[13-15]</sup>:**

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

1. **Physical Appearance:** Physical appearance was evaluated by observation on the texture, color and smell of the formulated cosmetic serum.
2. **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.
3. **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.
4. **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.

5. **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.
6. **Skin Irritation Test:** After applying the serum to the skin, it is checked for any redness or itching after two hours.
7. **Viscosity:** The viscosity measurement was performed with a Brookfield viscometer. In the beaker, 50 ml of hair serum was placed, and the

viscosity was measured at various rpm, i.e., 10, 20, 50, 100.

8. Sensitivity of the Eye (Draize Eye Test): Eye sensitivity was tested on three rabbits for getting the average result of sensitivity. One drop of hair serum was injected into the left eyes of the rabbits in physiological NaCl (as the control is the right eye) and then observed for 30 minutes, 60 minutes, 120 minutes, 240 minutes, 1 day, 2 days, 3 days, and 4 days. The scores of the cornea, iris, and conjunctiva were determined.

## II. CONCLUSION:

Herbal Cosmetics are still commonly used by average citizens because of fewer side effects and greater protection and safety profile. Current research has revealed that herbal formulations are effective in enhancing hair consistency.

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