



Herbal Hair Serum

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Abstract: -

The hair follicle holds a pivotal role within the mammalian system, influencing appearance, gender distinctions, and serving as a crucial element for temperature regulation and self-defence. Unfortunately, contemporary lifestyle choices, including factors like stress, fatigue, unhealthy dietary habits, and the frequent use of hairstyling/colouring techniques, have contributed to a growing concern of hair loss among younger generations. This hair thinning issue is often not temporary and can result in alopecia. In response to these concerns, individuals experiencing hair loss often seek a range of solutions, from traditional remedies rooted in mythology to more conventional and therapeutic approaches, including the utilization of substances like minoxidil and finasteride. It becomes evident that stimulating hair root activation is essential for enhancing hair growth and combatting hair loss.

Keywords: Hair Serum, Hair defence, Hair loss

Introductions: -

Hair serum is a liquid hair care product with a thicker consistency than water. It serves both styling and treatment purposes for various hair concerns like dryness, dullness, and manageability. Typically, it is applied to wet hair. It's worth noting that hair loss can be a challenging issue to address. One of the factors contributing to hair loss is the alpha reductase enzyme, which converts testosterone into Dihydrotestosterone (DHT). Hair follicles have receptors for DHT, which can lead to the shrinkage of dermal papillae cells, resulting in atrophy of the stem cells. Therefore, finding a definitive solution for hair loss remains a complex and elusive challenge. Consulting a healthcare professional or dermatologist for personalized advice is often recommended for those experiencing significant hair loss concerns. Human hair is widely regarded as a symbol of beauty in humans. The scalp, covering the cranium and the area where hair grows, is a critical element for hair growth. Composed of soft tissue layers, the scalp hosts numerous hair follicles and sebaceous glands. The pH level of the scalp is approximately 5.5, while that of the hair shaft is around 3.671. This slight acidity of the scalp helps maintain hair and skin health. However, the scalp is susceptible to various mycotic infections due to the presence of

sebaceous glands and cyclic environmental changes. These infections include conditions like excessive dandruff, tinea capitis (fungal infection), scalp psoriasis, scalp folliculitis, head lice infestations, and even alopecia (hair loss). In summary, the scalp's unique composition and pH balance are vital for maintaining healthy and beautiful hair. Proper scalp and hair care, hygiene, and seeking medical advice when needed are essential practices to address and prevent these scalp-related issues while promoting overall hair health and beauty.

Suitable types of hairs for using hair serum:

- stick straight
- straight
- wavy big curls
- small curls

Advantages of Hair Serum: -

1. Hair serum serves as a multi-purpose product, effectively smoothening, softening, and imparting silkiness to your hair.
2. Additionally, it acts as a protective shield for your hair against environmental aggressors, making it suitable for both pre-styling preparation and as a finishing touch.
3. Whether you're styling with heat tools or looking to safeguard your hair afterward, hair serum is versatile and can be used before or after heat styling.
4. One of its notable benefits is its ability to control frizz, especially useful for those with weak or damaged hair, as it helps reduce the appearance of fizziness and dryness.
5. Hair serum enhances the overall smoothness of your hair, making it look sleek and well-maintained.
6. Its anti-frizz properties contribute significantly to improving the overall smoothness and appearance of your hair.
7. Hair serum is also effective at reducing tangles, making your hair more manageable, while simultaneously promoting a healthy shine.
8. It can be used to enhance the straightness of your hair or define your curls, depending on your styling preferences.
9. Lastly, hair serum provides essential protection against various forms of hair damage, helping you maintain the health and vitality of your hair.

Side Effects of Using Hair Serum: -

1. Consistent and excessive use of hair serum can result in dry and unhealthy hair.
2. Applying serum directly to the scalp may cause inflammation.
3. Some hair serums contain silicones, which may have long-term negative effects on hair health.
4. It's advisable to avoid applying serum to the scalp to prevent excessive oiliness and potential inflammation.

MATERIALS AND METHODS: -

The crude thug required in our project was procured from nearby Ayurvedic Medical shop. The following ingredients were used for the preparation of the herbal hair serum formulation

1. Aloe Vera

Aloe vera has a long history of use in treating hair loss and promoting scalp health. It is known for its soothing properties and its ability to condition hair. Additionally, it can be effective in reducing dandruff and clearing blocked hair follicles caused by excess oil. Many people find success by applying pure aloe vera gel to their scalp and hair a few times a week. The skin can also benefit from aloe vera's properties. Excessive sun exposure can lead to an increased synthesis of melanin, resulting in darkened patches on the skin. Aloe vera is known for its ability to diminish pigmentation and dark spots on the face. However, it's important to keep in mind that the effectiveness of aloe vera can vary from person to person, and consistent application is often necessary for noticeable results. Always perform a patch test to ensure there are no adverse reactions when using aloe vera on your skin or scalp.



Fig.1 Aloe Vera

2. Vitamin E:

Vitamin E-rich oils have the potential to rejuvenate and protect your hair. These oils can effectively replace the protective layer, restoring your hair's natural shine. Furthermore, they play a crucial role in sealing in moisture, reducing the likelihood of breakage, and safeguarding your hair from various forms of damage. Popular choices for such oils include argan, jojoba, and coconut. However, it's essential to apply them in moderation and choose the type of oil that best suits your specific hair type to avoid excessive greasiness.

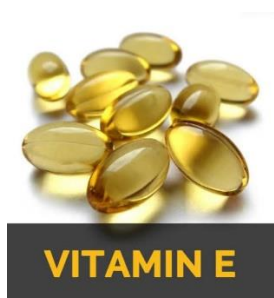


Fig.2 Vit E

3. Rose Water:

Rose water offers a range of potential benefits for both skin and hair. It possesses mild astringent properties, making it effective in combating excessive oiliness on the skin. Furthermore, rose water's anti-inflammatory properties make it a valuable asset for addressing specific scalp conditions such as psoriasis and eczema. Many individuals with curly hair have attested to the positive effects of rose water. They often use it to tame frizz and impart a healthy shine to their locks. It's important to bear in mind that the results may vary from person to person, and it's advisable to conduct a patch test before incorporating any new product into your skincare or haircare routine to avoid adverse reactions.



Fig.3 Rose water

4. Argan oil



Fig.4 Argan Oil

The argan nut typically contains one to three oil-rich argan kernels. The extraction process yields anywhere from 30% to 50% of the oil present in these kernels, depending on the chosen method. It's worth noting that producing just one liter of argan oil requires around 40 kilograms (88 pounds) of dried argan fruit. The key to the production process lies in extracting the kernels. Workers typically start by air-drying the argan fruit and then removing the fleshy pulp. Some producers opt for mechanical methods to separate the flesh from the fruit without prior drying. Interestingly, Moroccans often use the discarded flesh as animal feed. In certain regions, a unique tradition allows goats to climb argan trees and freely consume the fruits. Later, the kernels are collected from the goat droppings, reducing the labour involved in extraction at the cost of potential gustatory a version. In modern practices, the peels are removed manually, and workers gently roast the kernels intended for culinary argan oil production. Once the roasted argan kernels cool down, they are ground and pressed to produce the brown-coloured mash, expelling pure, unfiltered argan oil.

5. Almond Oil



Fig.5 Almond Oil

The almond fruit is categorized as a drupe, consisting of an outer hull and a hard shell enclosing the seed, which is distinct from a true nut. The process of shelling almonds involves removing the outer shell to access the seed. Almonds are available for purchase both in their shelled and unshelled forms. Blanched almonds refer to shelled almonds that have undergone a treatment involving hot water to soften the seedcoat, which is subsequently removed to reveal the white embryo. Once cleaned and processed, almonds have a good shelf life. Almonds are a staple in various cuisines and are frequently featured in desserts like marzipan. These trees thrive in a Mediterranean climate characterized by moderate temperatures and cool winters. While they are native to regions such as Iran and the Levant, it's rare to find wild almond trees in their original habitats today. Almonds have a rich history of domestication, dating back to the Early Bronze Age, as evidenced by archaeological findings in the Middle East. They have since spread across the Mediterranean region and similar arid climates with cool winters. One notable aspect of almonds is their ability to produce quality offspring entirely from seed, without the need for suckers or cuttings.

Procedure of Herbal Hair Serum Formulation:

1. Clean all the glassware and dry them properly as per SOP
2. Measure the accurate quantity of aloe vera, transfer it in beaker
3. Mix required quantity vitamin E in aloe vera,
4. Now mix rose water to the above mixture of aloe vera and vitamin E.
5. After stirring for few minutes, heat the prepared solution for few minutes.
6. Add few drops of almond oil,
7. After that stir the preparation with the help to magnetic stirrer
8. Transfer the preparation in measuring cylinder and adjust the final volume to 30ml.
9. Transfer final solution into container.

Evaluation of The Hair Serum: -

1. Visual Examination for Physical Appearance:

The prepared herbal hair serum was visually examined to assess its physical appearance, colour, and texture. The outcomes of this examination are summarized.

2. Homogeneity Test:

To test the homogeneity of the herbal hair serum, a clean and dry glass object was coated with the serum, and a cover glass was then sealed over it. The sample was inspected under light to identify any coarse particles or signs of non-uniformity. This test aimed to detect lumps, flocculates, or aggregates within the serum.

3. pH Test:

The pH meter was calibrated using pH 4 and pH 7 buffer solutions. Subsequently, the pH electrode was immersed in the hair serum and allowed to stabilize for a few minutes until the pH reading normalized. This test measured the acidity or alkalinity of the serum.

4. Viscosity Measurement

Viscosity measurement was carried out using a Brookfield viscometer (RVDV-II+PRO) with spindle number 6. In a beaker, 50 ml of the hair serum was placed, and the viscosity was measured at various rotational speeds, including 10, 20, 50, and 100 rpm. This test provided information about the thickness and flow properties of the serum.

5. Spreadability

Spreadability was measured by a parallel plate process typically used to assess and measure the spreadability of semi-solid preparations. One gram hair serum was pressed between two horizontal plates of dimension 20x20 cm, the upper of which weighed 125 g. The spread diameter was measured after 1 min. Spreadability was calculated using the following formula:

$$S = \frac{MXL}{T}$$

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

Discussion: -

1. Physical Appearance: -

The herbal hair serums were uniformly characterized by a pale brown colour with a translucent appearance. Upon application, they exhibited a smooth texture.

2. Homogeneity: -

Through a visual examination of the herbal hair serums appearance and the presence of any lumps, flocculates, or aggregates, it was determined that the prepared serum exhibited a high level of homogeneity. This demonstrates that the serum is consistent in composition and free from any visible irregularities.

3. Rheological Study: -

The rheological examination of the prepared herbal hair serum unveiled an intriguing characteristic - pseudoplastic flow. This property is highly advantageous for topical applications, as it ensures optimal coverage when applied. The mechanism behind this flow behaviour can be elucidated as follows: under standard storage conditions, the long-chain molecules of the polymers in the serum spontaneously undergo

aging and dispersion. These molecules tend to align their long axes in the direction of the applied shear stress. This alignment induced by the stress reduces the material's resistance. Furthermore, this stress-induced orientation leads to the release of solvent molecules previously associated with the polymer molecules. Consequently, both the effective concentration and size of the molecules decrease. This combined effect allows for a gradual reduction in viscosity as the shearing stress increases, making the serum more suitable for application. This understanding of the serum's rheological properties can be invaluable for optimizing its formulation to achieve the desired application characteristics.

4. pH Determination: -

The pH level of the whole herbal hair serum was measured at 7.3. This pH level falls within the neutral range, indicating that it is neither too acidic nor too alkaline. For hair care products, it is generally recommended for the pH to be slightly acidic, ranging from 4.5 to 5.5, as this pH range is believed to be more suitable for maintaining the health of the hair cuticle. While a pH of 7.3 is not significantly higher than the recommended range, it may be slightly more alkaline. Whether the herbal hair serum is suitable for your hair depends on various factors, including your hair type and personal preferences. It is advisable to consider not only the pH level but also the ingredients in the serum and how your hair responds to it before determining its suitability for your specific needs.

5. Draize Eye test: -

A sensitivity assessment test was conducted to evaluate the protective properties of an herbal hair serum. The test involved three rabbits, with controls applied to the right eye using physiological saline. In the left eye of each rabbit, three drops of a sterile 25 percent herbal extract were administered. Observations were made at various time intervals: 30 minutes, 60 minutes, 120 minutes, 240 minutes, 1 day, 2 days, 3 days, and 4 days. The results of this test revealed no signs of opacity in the left eyes of the rabbits, and their conjunctiva remained normal with no swollen eyelids. The eyes appeared to be in a normal condition, with the only noted effect being the generation of tears. The ocular irritation index was recorded as 2 on the first day but decreased to 0 on the second, third, and fourth days. It's worth mentioning that the maximum possible ocular irritation index is 110. In conclusion, the data suggests that the herbal hair serum has a moderate inflammatory effect based on the observed ocular irritation index. However, it's important to remember that this assessment was conducted on rabbits, and further research may be necessary to assess the safety of the serum for human use.

6. Hair growth activity test: -

During the initial week, the normal control and negative control groups exhibited similar outcomes, while the positive control group showed a modest variation. However, in regions treated with positive regulation, there was a significant disparity in hair length compared to both the normal control and negative control groups. Moreover, there was a noteworthy difference observed in the growth behaviour among the normal control, negative control, and positive control groups ($p < 0.05$). This suggests that despite the hair serum used being a single formula, it displayed a more substantial hair growth activity, amounting to 698 mm.

7. Microbial Contamination: -

After a seven-day period, an examination of the herbal hair serum revealed a fungal microbial contamination of 189 Colony Forming Units (CFU) per unit after 24 hours.

8. Stability Studies: -

The herbal hair serum maintained its stability throughout the duration of the research. There were no observable physical changes, and the pH levels remained consistent before and after the study.

CONCLUSION

The use of herbal hair serums has been shown to provide essential nutrients that support sebaceous gland function and natural hair growth. This has led to a significant shift in the personal hygiene and healthcare industry towards herbal cosmetics. The demand for herbal-based cosmetics is growing rapidly, indicating a promising future for this market. Bioactive ingredients in cosmetic formulations are recognized for their positive impact on body characteristics and their ability to offer vital nutrients for healthy and beautiful hair. The use of herbal hair serums is believed to promote hair growth and improve hair consistency with minimal side effects and hypersensitivity reactions. Traditional Indian medicine has a rich history of herbal remedies for hair growth promotion. Herbal extracts are known to provide microprotein supplements to nourish hair effectively, leading to healthier hair. Herbal cosmetics are gaining popularity in the personal care industry due to their absence of parabens and sulphates global herbal industry is thriving and is estimated to be worth over US\$10 billion, with a steady annual growth rate of three to four percent. Europe stands as the largest region in both herbal product production and demand, followed closely by Asia.

Reference: -

1. Kirsten Nunez, November 2020, Hair Serum Benefits and How to Used
2. <https://www.healthline.com/health/how-to-use-serum-for-hair>.
3. Sneha Kalra, March 2020, Hair care: Advantages, disadvantages and everything you need to know about Hair Serums, <https://www.pinkvilla.com/fashion/beauty/haircare-advantages-disadvantages-and-everything-you-need-know-about-hair-serums-514085>.
4. Begum Rand Begum A "Preparation and evaluation of herbal hair oil. Int J of Res and Anal Reviews.
5. Image of Argan oil <https://www.anveya.com/blogs/top-tips/argan-oil-benefits-and-uses-for-skin>
6. <https://en.m.wikipedia.org/wiki/Almond> Almond Oil Information
7. <https://www.jindeal.com/product/vedini-almond-oil-food-grade/> Image Almond Oil
8. Ashwini S. Pundkar, Prachi M. Murkute, Snehal Wani, Mohini Tathe. A Review: Herbal Therapy Used in Hair Loss. Pharmaceutical Resonance 2020 Vol.3- Issue 1.
9. M. Narshana and P. Ravikumar. An Overview of Dandruff and Novel Formulation as A Treatment Strategy. International Journal of Pharmaceutical Sciences and Research IJPSR (2018), Volume 9, Issue 2.
10. S. Budish, I. Masinah, K. Jiya Uddin, M. Kale mullah, A. D. Samer, A. Mohd Fadli and Eddy Y., Formulation and Characterization of Cosmetic Serum Containing Argan Oil as Moisturizing Agent, Science and Technology Publications, 2018;297-304.
11. Kirsten Nunez, November 2020, Hair Serum Benefits and How to Use, <https://www.healthline.com/health/how-to-use-serum-for-hair>.
12. Elea Carey, February 2019, How to Use Olive Oil for Hair Care, <https://www.healthline.com/health/beauty-skin-care/olive-oil-hair-care>
13. Sneha Kalra, March 2020, Hair care: Advantages, disadvantages and everything you need to know about Hair Serums, <https://www.pinkvilla.com/fashion/beauty/hair-care-advantages-disadvantages-and-everything-you-need-know-about-hair-serums-514085>.
14. Rohan R. Vakhariya, Rutuja R. Shaha, Archana R. Dhole, Dr. C.S Magdum, Preparation of Novel Biocompatible Honey Hydrogel with Turmeric and Aloe vera, Research Journal of Pharmacology and Pharmacodynamics, 2017;9(2):77-80.
15. Rohan R. Vakhariya, Swati Talokar, Archana R. Dhole, Dr. S.K. Mohite, Dr. C.S. Magdum, Comparative Standardization Study of Two Marketed Shatavari Churna Formulation, Asian Journal of Pharmaceutical Analysis, 2019;6(1):1-6.
16. Nikita R. Nikam, Priyanka R. Patil, Rahul P. Jadhav, Rohan R. Vakhariya, Dr. C. S. Magdum, Formulation and Evaluation of Herbal Shampoo: A Comparative Study, Research Journal of Topical and Cosmetic Sciences, 2019;10(2):61-64.
17. Gautam S, Dwivedi S, Dubey K, Joshi H. Formulation and evaluation of herbal hair oil. Int J Chem Sci., 2012; 10(1): 349-53.

18. Shivani J. Patil*, Snehal S. Patil, Rohan R. Vakhariya, Dr. A. R. Chopade, Dr. C. S. Magdum, Formulation and Evaluation of Medicated Herbal Hair Oil- An Effectual and Economical Cosmetic, Pensee International Journal, 2021;51(5):398-405.
19. Beroual K, Maameri Z, Halmi S, Benleksira B, Agabou A, Hamdi PY., Effects of Linum usitatissimum L. ingestion and oil topical application on hair growth in rabbit. Int J Med Arom Plants 2013; 3(4): 459-63.
20. Medicinal news today different way to prevent damage hair

