

PREPARATION AND EVALUATION OF HERBAL SCALP SERUM.

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Abstract

Nowadays, cosmetics are in high demand in everyday life, and many people use them on regular basis. Herbal cosmetics are popular because they have fewer negative effects and provide higher protection and safety. People who are experiencing hair loss are looking for ways to increase hair development and prevent hair loss. Scalp serums moisturise the skin behind the hair, making them a popular treatment for dry scalp. The formulation mainly contains concentrated ingredients such as amla. One of the most important medicinal plants, *Phyllanthus Emblica* Linn (Amla), offers necessary minerals and the highest level of vitamin C. It also promotes hair growth, pigmentation, and the prevention of greying. Vitamin E, Aloe vera, Guar gum, and Rose water were added to the aqueous extract of amla, to improve the effect in the scalp. The prepared medicated scalp serum was evaluated, and several characteristics such as physical appearance, viscosity, spreadability, and anti-microbial contamination were determined and documented. The colour of the prepared scalp serum was discovered to be lime. The formulation had a smooth and lubricating texture, and the pH was within the permissible range. The formulations were found to be stable when placed in the stability chamber and also found to have good anti-bacterial activity.

Introduction

A sound head of hair is portrayed as hair that has gloss, is smooth, long, and satiny, fun, with great volume and without any proof of thinning up top and dandruff. To accomplish this, the hair care industry has furnished us with numerous items to improve, upgrade our hair.

Hair care items are wanted to give extra advantages, for example, improving the hair, making it simple to deal with or fixing harms. Moreover, there are exceptional items for the treatment of specific hair issues, for example, dandruff. In human, hair has an aesthetic function impacting our appearance. Hair is a complex structure made by many components that act as a unit, with the biological purpose of protecting the scalp and enhancing physical attractiveness. Herbal 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. Herbal hair serum is not just meant for hair styling. They are also for treating multiple hair concerns like dry scalp, dull hair, and scalp moisturizer. There are different types of hair serums for different hair goals. Depending on the products formula, a hair serum might reduce frizz, add shine, or straighten the hair. This is herbal-based styling product that is designed to coat the surface of hair to help impart added shine,

smoothness hydration, humidity and pollution protection. A herbal hair serum solves a lot of hair issues and not just one problem. An assortment of botanical extracts, vitamins, essential oils, and other natural ingredients are often found in herbal hair serums, which are designed to nourish hair, enhance its appearance, and treat particular issues like frizz, dryness, or damage. This not only reduces the regularity of tangles & knots, but it also helps minimize frizz. Scalp serums are targeted treatments that directly address concerns like hair dryness, thinning, itchy scalp sensations and more. Scalp serums are lightweight, concentrated treatments designed to nourish and revitalize your scalp. Think of them like skincare serums, but for your scalp! They're packed with beneficial ingredients that address specific scalp concerns.

Materials and methodology:

Table 1: Materials

Sr. no	Ingredients	Various action of components	Source
1.	Amla extract	Antioxidant, Strengthen hair and scalp hair growth	Marketed powder
2.	Aloevera gel	Moisturizing agent, conditioner	Natural gel
3.	Rice Water	Hair growth, antioxidant	Natural (rice)
4.	Rose water	Perfuming agent	Natural product
5.	Glycerine	Damage repair	Marketed product
6.	Guar gum	Thickening agent	Marketed product
7.	Almond oil	For nourishment	Natural oil
8.	Distilled water	Vehicle	-
9.	Methylparaben	Preservative	Marketed product

Method of Preparation:

Preparing Dry Amla Powder Extract:

1. Sourcing and Preparation:

Obtain high-quality dry amla powder from a reputable source. Ensure it's free from contaminants.

2. Extraction Process (Aqueous):

Ratio: A common ratio is 1:10 (1 part amla powder to 10 parts distilled water).

Heating: Combine the amla powder and distilled water in a heat-resistant container.

Simmering: Gently heat the mixture over low heat, allowing it to simmer for approximately 20-30 minutes.

Avoid boiling, as excessive heat can degrade beneficial compounds.

Cooling: Allow the mixture to cool completely.

Filtration: Use a fine-mesh cloth or filter paper to strain the liquid, separating the extract from the amla powder residue. Squeeze the cloth to extract as much liquid as possible.

3. Concentration (Optional):

If you desire a more concentrated extract, you can gently simmer the filtered liquid further to reduce its volume. However, be cautious to prevent burning.



Figure 1 : Amla Extract

II. Formulation of Herbal Hair Serum:

Ingredients:

Amla Powder Extract: (As prepared above)

Aloe Vera Gel: (Pure, preferably extracted from fresh leaves)

Rose Water: (Pure, distilled)

Glycerine: (Vegetable glycerine)

Guar Gum: (As a thickening agent)

Almond Oil: (Sweet almond oil)

Distilled Water: (To adjust consistency)

Methylparaben: (As a preservative)

Equipment:

Beakers or heat-resistant glass containers

Measuring spoons and cups

Electronic weighing scale (for precise measurements)

Glass stirring rods or a small electric mixer

Water bath or double boiler

pH strips (optional, to check pH)

Bottles for storing the serum

Table 2: **Formulation Table**:- We have considered F3 as a final formulation

Sr. no	Ingredient	F1	F2	F3
1	Amla Extract	3ml	2ml	2ml
2	Aloevera Gel	10ml	8ml	8ml
3	Rose water	10ml	12ml	12ml
4	Glycerin	5ml	5ml	5ml
5	Almond oil	2.8ml	2ml	2ml
6	Tragacanth gum	0.4gm	-	-
7	Acacia gum	-	0.3gm	-
8	Gaur gum			
9	Methyl Paraben	0.2gm	0.2gm	0.4gm
10	Rice water	7ml	10ml	10ml
11	Distilled water	qs	qs	qs

Procedure:**1. Guar Gum Hydration:**

Disperse the guar gum in a small amount of glycerine. This helps prevent clumping.

Gradually add this mixture to a portion of the distilled water, stirring continuously to create a smooth, thick solution. Heat this mixture gently in a water bath until the guar gum is fully hydrated and the solution thickens.

2. Combining Aqueous Ingredients:

In a separate beaker, combine the prepared amla extract, aloe vera gel, and rose water. Mix thoroughly.

Add this mix to the guar gum mixture, and stir well.

3. Adding Oil Phase:

Warm the almond oil slightly in a water bath. Slowly add the warm almond oil to the aqueous phase, stirring constantly. An electric mixer can be helpful for emulsification.

4. Preservation:

Dissolve the methylparaben in a small amount of warm distilled water.

Add the methylparaben solution to the serum, stirring thoroughly. This is crucial for preventing microbial growth.

5. Final Adjustments:

If the serum is too thick, add small amounts of distilled water until the desired consistency is achieved.

(Optional) Check the pH of the serum. A pH between 4.5 and 5.5 is generally considered ideal for hair products. You can adjust the pH using citric acid or sodium hydroxide solutions if necessary.

6. Cooling and Packaging:

Allow the serum to cool completely and transfer the serum to clean, sterilized bottle

Evaluation of The Hair Serum:

1) Physical Appearance

The physical appearance, color, and feel of the prepared herbal hair serum are visually tested. Reflects the outcomes.

2) 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.

3) pH Test

The pH meter was calibrated using pH 4 and pH 7 buffer solutions. Then, the electrode was soaked in the hair serum and left until the pH normalized after a few minutes.

4) Viscosity

The viscosity measurement was performed with spindle number 6 on a Brookfield viscometer (RVDV-II+PRO), In the beaker, 50 ml of hair serum was placed, and the viscosity was measured at various rpm, ie., 10, 20, 50, 100.

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 dimensions 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:

$$S = ML / T$$

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.

6) Microbial Contamination

Microbial contamination of hair serum was determined via spreading a thin loopful of the serum on a nutrient and agar and incubating for 48 hours at 37 °C. In order to examine the degree of contamination, one gram of material was used to be dispersed in 4 ml of sterile Ringer solution, containing 0.25% Tween 80. In the same dispersion vehicle, sufficient dilutions were made, and 0.5 ml was mounted on the appropriate solid medium using the viable surface procedure. Following required incubation, emergent colonies were counted.

7) Stability

The herbal hair serum was kept for three months at two separate temperatures of 4 plus/minus 2 °C and 30 plus/minus 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.

Results And Discussion:

1) Physical Appearance

It was observed that the color of all the herbal hair serum was pale brown with a translucent look, which on the application was found smooth.

2) Homogeneity

By visual examination of the appearance and presence of any lumps, flocculates, or aggregates, the produced herbal hair serum was checked for homogeneity. The homogeneity of prepared serum has been shown to be fine.

3) pH Determination

The pH of the whole herbal hair serum was 7.3, which was sufficient for the hair, suggesting that the herbal hair serum was suitable for the hair

4) Microbial Contamination

At the end of seven days, the microbial contamination of the herbal hair serum after 24 hours was observed to be 1.89 CFU for fungi.

Table 3: Results and discussions

Parameters	Results
Colour	Soft brown
Odour	Rose type
pH	6
Homogeneity	homogenous
Microbial contamination	No microbes detected

Conclusion:

In contrast to other beauty products that are available in the market, natural cosmetics are both safe and effective to use. Fits all types of hair. According to findings, herbal hair serum offers a variety of vital nutrients required to maintain the sebaceous glands' normal function and promote the development of natural hair.

Since ancient times, medicinal plants have been used to treat hair disorders due to their lower risk of side effects and hypersensitivity reactions. Since ancient times, medicinal plants have been used to treat hair disorders due to their lower risk of side effects and hypersensitivity reactions. Many herbal medications are recommended by India's traditional medical system to stimulate hair growth.

The best part is that herbal extracts will give hair adequate nourishment and microprotein supplements, resulting in safe hair. Because they don't contain parabens or sulphates, herbal cosmetics are becoming more and more popular in the personal care sector and are in high demand in daily life. Trial and error led to the successful formulation and evaluation of the herbal hair serum. The study's findings indicate that it has natural ingredients that support the growth and upkeep of hair.

This study conclude polyherbal extracts were used in a variety of compositions to have multipurpose effects on scalp and hair, such as antimicrobial, reduce hair loss, increased hair growth and follicles, reduce hair loss, prevent hair loss, and scalp damage. The aim and objective of present work was to formulation of herbal hair serum for treat several scalp and hair follicle related problems.

It should be stimulate hair growth, hair follicle stimulations and it can able to act against bacterial and fungal related disease. So, our research study completely focused on selections of pharmacologically potent herbal drug, it should be control hair fall and scalp related microbial diseases. The plants are more potent healers because they promote the repair mechanism in the natural way.

The knowledge and experience of usage of herbs are being blend with advanced cosmetic technology to develop a safe and effective product.

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