

Formulation And *In-Vitro* Evaluation of Myroxylon Balsamum Hair Growth Serum

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Abstract:

This research work focused on developing a hair serum using natural ingredients myroxylon balsam oil, Flaxseed, almond oil and Vitamin-E. Herbal hair serums have become increasingly popular as a natural alternative to conventional hair care products. This is due to their potential advantages, which encompass reducing dandruff, enhancing hair shine, and calming the scalp. Tolu balsam oil, known for its anti-inflammatory and antioxidant properties, is included in these hair serums. Flaxseed helps to cleanse the scalp by removing impurities and dead skin cells. Almond oil protects, nourishes, and moisturizes hair while preserving the serum's thick consistency. Vitamin E is effective in treating dry and damaged hair and provides hydration to the scalp, promoting hair growth.

Keywords:

Hair, hair serum, hair care, cosmetics, herbal extract.

I. INTRODUCTION :

Herbal hair serum is a beauty product that boasts a significantly high level of active ingredients, designed to provide deep nourishment to the skin's lower layers while ensuring a lightweight finish suitable for hair. Hair is a by product of the skin's follicles and is characterized as "enhanced epithelial structure resulting from the keratinization of germinative cells." This study aimed to assess user satisfaction with hair serum products that incorporate local herbal ingredients and to compare the properties and risk factors associated with synthetic products against a herbal hair serum enriched with regional herbs.[1]

ADVANTAGES :

- The deep moisturizing abilities of hair serum safeguard hair against heat or environmental harm while imparting a natural shine.
- Serums are recognized for hydrating and locking in moisture, resulting in smoother hair and a healthier appearance.

- This also results in hair being less fragile and in better condition.
- The hair serum's anti-frizz properties also enhance its smoothness.(2)

DISADVANTAGES :

- Overuse might lead to hair damage.
- With regular use over several days, hair becomes dull and lifeless because of product buildup.
- Applying serum to the scalp might lead to inflammation(3)

BENEFITS OF USING HAIR SERUM

1) Multipurpose: Rather than treating just one hair issue, a hair serum treats several. There's a reason it's called a one-stop shop for all of your hair issues. Hair serum can transform a terrible hair day into a good one. After just a few drops, your hair will feel and look different.(4)

2) Protects Hair: The hair strands are covered in a coating of hair serum. Consequently, it offers exceptional protection against heat, dust, pollution, and sun damage. It prevents your hair from getting damaged. Therefore, it is advised to use a heat-protecting serum before utilizing hot styling products.

3) Shines the Hair: Your hair appears shiny because of the layer that hair serum forms, which reflects light. Hair serums contain amino acids that protect chemically treated and colored hair. (5)

4) Prevents Hair Fall From Breaking: We lose a lot of hair strands since detangling tangled hair requires a lot of wear and tear. Hair serum acts as a lubricant and tear. Hair serum acts as a lubricant and makes detangling easier for this type of hair & the result is less hair loss.

5) Nourishes Hair and Helps Manage It: Hair serums fill up follicular cracks to mend brittle and damaged hair. By making hair easier to maintain, hair serum facilitates styling. patience, effort, and time. Everything has been secured.(6)

II. MATERIALS AND METHOD

Myroxylon balsamum oil, flax seed, almond oil, vitamin E, sodium benzoate, distilled water were purchased from local market, Hyderabad.

Extraction of flax seed gel:

1. Take flaxseeds and distilled water in a beaker and leave it for soaking atleast half an hour.
2. Then place it on water bath until it comes to boil.
3. Let it cool & strain the mixture through cheese cloth or fine-mesh sieve.
4. Squeeze out the gel and discard the seeds.



Fig no: 1 Flax seed gel extract

PREPARATION OF HERBAL HAIR SERUM

1. Mix oils:
Combine Almond oil, Tolu balsam oil, and Vitamin E oil separately in a china dish
2. Mix aqueous phase:
Mix rose water, distilled water, and flaxseed extract.

3. Slowly add the aqueous phase to the oil phase stirring constantly
4. Dissolve Sodium benzoate (preservative) in a small amount of Distilled water and add to the mixture.
5. Mix all ingredients thoroughly to get a uniform serum.
6. Fill in the suitable container.



Fig No.2 : preparation of Herbal hair serum

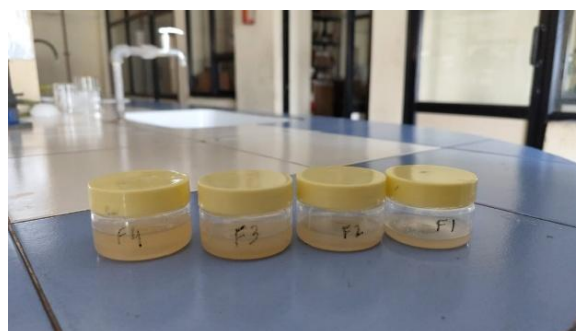


Fig No.3 : Herbal hair serum

Table 1. Ingredients used in formulation of herbal hair serum

S.NO.	Ingredients	F1	F2	F3	F4
1.	Myroxylon balsamum oil	2.5ml	2.5ml	2.5ml	2.5ml
2.	Flax seed extract	2ml	4ml	6ml	8ml
3.	Almond oil	1ml	2ml	3ml	4ml
4.	Vitamin E	1ml	1ml	1ml	1ml
5.	Sodium benzoate	2mg	2mg	2mg	2mg
6.	Distilled water	q.s	q.s	q.s	q.s

EVALUATION OF HERBAL HAIR SERUM

1. Physical Look :

The physical appearance, color, and texture of the herbal hair serum are all included in the visual evaluation. (7,8)

2. Test for Homogeneity:

A clean and dry object glass was utilized for the application of the hair serum, followed by the attachment of a cover glass. The visibility of specific coarse particles and homogeneity was assessed under illumination. The herbal hair serum was visually

inspected for consistency and examined for the presence of lumps, flocculates, or aggregates. (9)

3. pH :

The pH cadence was modified in accordance with the pH 4 and pH 7 buffer results. Furthermore, the electrode was submerged in the hair serum and left there for a few moments until the pH stabilized. (10)

4. Test of Sensitivity:

During the process, the serum is applied to the skin, left in the sun, and then checked ten minutes later to check for irritation or rashes. (11)

6. Stability:

The herbal hair serum was kept at two different temperatures (four degrees Celsius and thirty degrees Celsius) with a relative humidity of sixty-five for three months. The pH and density of the herbal hair serum were assessed three months later and compared to the initial readings. (12,13)

7. Viscosity:

On a Brookfield viscometer (RVDV-II+PRO), spindle number six was used to measure the viscosity.

The viscosity was measured at rpm after 50 ml of hair serum was added to the beaker. (14)

8. Spreadability :

The spreadability was evaluated using a parallel plate method commonly employed to assess and quantify the spreadability of semi-solid formulations. A one-gram sample of hair serum was placed between two horizontal plates measuring 20×20 cm, with the upper plate weighing 125 g. The diameter of the spread was recorded after one minute. 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. (15)

III. RESULTS AND DISCUSSION

1. Physical Appearance

The physical appearance, color, odour and texture of the prepared herbal hair serum are visually tested. Table 2 reflects the outcomes

Table 2: Physical Appearance of Herbal Hair Serum

Parameter	F1	F2	F3	F4
Color	Pastel yellow	Pastel yellow	Pastel yellow	Pastel yellow
Odour	Vanilla like	Vanilla like	Vanilla like	Vanilla like
Texture	Smooth	Smooth	Smooth	Smooth

2. pH, Viscosity, Homogeneity and Spreadability Test

The pH scale is used to specify the acidity or basicity of a product in order to ensure that it is safe to use. The value obtained is recorded in table 3.

Table 3: pH, Viscosity, Homogeneity and Spreadability Test of Herbal Hair Serum

Parameter	F1	F2	F3	F4
pH	5.5	5.2	5.1	5.1
Homogeneity	Good	Good	Very good	Good
Spreadability	Spreadable	Spreadable	Easily Spreadable	Spreadable
Viscosity (cps)	2550	3800	6200	4450



Fig no.4 Determination of pH



Fig no.5 Spreadability

IV. CONCLUSION :

This research provides information on herbal hair serum with minimal or no side effects. Tolu balsam oil is a crucial component of the serum, which is made using a variety of natural substances. This strategy is a step in the direction of creating safe cosmetics that the general public may use and accept. The serum composition process is straightforward and efficient, mainly using herbal (natural) substances with specific qualities to encourage hair growth and reduce adverse effects. A number of criteria were used to evaluate the various serum compositions. Based on the evaluation, formulation F3 was found to be the most effective concentration tested, maximal local effects, and positive outcomes. F3 was therefore regarded as the optimal formulation. It also showed positive stability research findings.

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