

Development and Evaluation of Herbal Hair Serum

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Abstract: *Human hair significantly influences one's personality, and various cosmetic products are used to maintain it. Herbal remedies often outperform synthetic formulations due to their effectiveness and minimal side effects. This study aimed to evaluate the benefits of polyherbal products in addressing common hair issues such as baldness, alopecia, hair loss, grey hair, dryness, and dandruff. Many cosmetics are utilized daily for their diverse applications. People use these products to enhance their appearance and maintain a youthful, appealing look. Activating hair roots is essential for promoting hair growth and reducing hair loss.*

Keywords: Polyherbal, Alopecia, Cosmetics, Formulation, Viscosity, Dandruff

I. INTRODUCTION

Nowadays, people all over the world are turning to herbal products and choosing a more natural way of life. The use of herbal cosmetics has grown a lot, especially in personal care, and many people want these products. Indian herbs and their importance are known worldwide. The demand for herbal cosmetics is increasing every day. Ayurveda, an ancient Indian system of medicine, has used many herbs and plants to make cosmetics for beauty and protection from outside damage. Herbal cosmetics do not cause many side effects on the human body.

In modern times, traditional knowledge about herbal products is combined with advanced technology to create safe and effective herbal products that can improve health. Herbal hair serums are made by mixing different ingredients in the right amounts and tested for benefits like fighting dandruff, preventing hair breakage, treating dry scalp, providing a cooling feeling, and moisturizing the hair.

Herbal hair serum:-

Herbal hair serum is a beauty product that contains a lot of active ingredients. It provides strong nutrition to the deeper layers of the skin and leaves a non-greasy, smooth feel that is good for the skin.

Hair serums add natural shine and protect hair from damage caused by the environment or heat. They have strong moisturizing effects. Hair serum keeps out humidity and helps make hair healthier. Its anti-frizz properties also help make hair smoother.

Antioxidant, anti-inflammatory activity of Rosemary Extract in Herbal hair serum:-

Rosemary extract, taken from rosemary leaves (*Rosmarinus officinalis*), works in many ways to help the scalp. According to Erkan and others, rosemary oil and extract have important natural compounds like carnosol, rosmarinic acid, and hesperidin. The strongest antioxidants in rosemary are called carnosol and other diphenols. Bozin and colleagues said rosemary has a strong antioxidant effect, which means it helps protect the scalp from harmful free radicals.

Rosemary leaves also reduce inflammation, helping to calm the scalp and hair follicles. It is a natural option to block DHT, a hormone that can cause hair loss when levels are high. Rosemary blocks the conversion of hormones linked to hair loss. It also helps balance hormones to support healthy hair growth, making hair grow longer and stronger. Additionally, rosemary helps stop the growth of *Malassezia*, a fungus on the scalp that can cause dandruff and hair loss if it grows too much.



Highlights of herbal hair serum using rosemary leaves:-

How to use herbal hair serum:-

- Use the serum after washing your hair.
- Put a few drops of serum in your hands and rub them together.
- Then spread it evenly on the middle and ends of your hair.

How does herbal hair serum work:-

- It goes deep into the hair and hair roots to help fix damaged hair.
- The serum creates a protective layer on each hair strand.

MATERIALS AND METHODS:-

The raw materials needed to make the herbal hair serum were bought from the local market in Wardha. The following ingredients were used to prepare the serum.

Drug information:-

(1)Murraya koenigii (Curry Plant):-



Figure 1: Murrayakoenigii

Curry leaves are highly valued for their distinctive aroma and their potential digestive benefits. They are used as a popular aromatic spice, typically in small quantities, to enhance the flavor of various dishes. The ancient saying, “Let food be thy medicine and medicine be thy food,” reflects the long-standing tradition of utilizing natural and herbal remedies in folk medicine across diverse cultures worldwide.



In recent years, growing awareness among researchers and healthcare professionals regarding the therapeutic potential of medicinal plants has increased scientific interest in this field. Medicinal plants are not only affordable and easily accessible but are also considered safe and effective for managing various ailments when used appropriately.

The curry leaf plant (*Murrakoenigii*) holds significant importance as both a leafy vegetable and a medicinal herb. Its leaves, widely used in Indian cuisine, possess a mildly acidic, slightly bitter, and subtly spicy flavor, which remains even after drying. Furthermore, curry leaves play an important role in traditional Indian medical systems such as Ayurveda and Unani, where they are valued for their health-promoting properties.

Classification:-

Kingdom:-Plantae (Plants)

Sub-Kingdom:-Tracheobionta (Vascular plants — plants with conducting tissues)

Super Division:-Spermatophyta (Seed-producing plants)

Division:-Magnoliophyta (Flowering plants or angiosperms)

Class:-Magnoliopsida (Dicotyledons — plants with two seed leaves)

Sub-Class:-Rosidae

Order:-Sapindales

Family:-Rutaceae (Citrus family)

Genus:-Murrak

Species:-Murrakoenigii

Binomial Name:- Murrakoenigii (L.) Spreng.

(2) ALMOND OIL

The oil derived from the fruits of *Prunusamygdalus* (almond tree), a species native to regions of South America and the Middle East, holds significant medicinal and cosmetic value. In Ayurvedic medicine, this oil is traditionally recognized for its aphrodisiac properties.

Almond oil is obtained from almonds and is a rich source of vitamins E and A, along with monounsaturated fatty acids. It is well known for its excellent moisturizing qualities, making it a common ingredient in skincare and haircare formulations. Additionally, it is widely utilized in aromatherapy and serves as an effective carrier oil for essential oils. Beyond its cosmetic applications, almond oil has been the subject of scientific research for its potential health benefits, including promoting cardiovascular health and supporting digestive function.



Figure 2: Almond Oil

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(3) TOCOPHEROL:-

Vitamin E contains natural antioxidants that can help promote hair growth and maintain scalp health. These antioxidants help reduce oxidative stress and neutralize free radicals, which can otherwise damage the cells responsible for healthy hair follicle function.



(4) ROSE WATER

Rose water is a mild astringent which may help to reduce oiliness and dandruff. It has anti-inflammatory properties, which may make it beneficial for certain scalp conditions, like psoriasis and eczema. Many women with curly hair swear by rose water's ability to calm down frizz and add shine.



ALOE VERA:-

SYNONYME: Aloe, Musab bar, kumari.

BIOLOGICAL SOURCE: It is the leaves of various species of aloe-vera- aloe barbedensis, aloe Perryi, aloe spicata, aloe African

KINGDOM: Plantae

ORDER: Asparagales

FAMILY: Liliaceae

GENUS: Aloe L.- aloes

CHEMICAL CONSTITUENTS: Aloe vera are measure source of anthraquinoneglycoside. Aloevera contain aloin, barbaloin, aloe-emodin.

USES:

To make stronger hair, it provides antioxidant properties and also act an emollient,

Improve texture of hair, Repair dead skin on the scalp, aloe vera gel is slightly viscous & clear Liquid having good moisturizing properties.



MATERIAL AND EQUIPMENT :

Material	Equipment
Aloe vera	Soxholet Apparatus
Rose water	Weighing balance ,hot air oven, beaker ,stirrer, measuring cylinder
Almond oil	Digital PHmeter,
Vit E	Brookfield viscometer
Curry leave	



Sr. No.	Name of Chemicals
1	Ethanol (Extraction) Methanol
2	Ferric Chloride
3	Sodium Hydroxide
4	Mayers Reagent

Phytochemical tests alternanthera sessilis:



Sr.No	Test Name	Test	Observation	Conclusion
1.	Test for tannins	1ml plant extract+2ml 5% ferric chloride	Dark blue or greenish black	Tannins are present
2.	Test for saponins	2ml plant extract+2ml distilled water shaken for 15 minutes	1cm layer of foam	Saponins are present
3.	Test for carbohydrate	2 ml plant extract+1ml Molisch's reagent+few drops of conc. Sulphuric acid	Purple or reddish colour	Carbohydrate are present
4.	Test for flavonoids	2ml plant extract+1ml of 2N sodium hydroxide	Yellow colour appeared	Flavonoids are present
5.	Test for Alkaloids	2ml plant extract+2ml conc. hydrochloric acid+few drops of Mayer's reagent	Green colour or white precipitate	Alkaloids are present



Preparation of Rose water Extract:

Steps:-

Add your clean rose petals to the glass bottle. Add enough distilled water to just cover the petals. Don't add Too much water, or you'll dilute your rose water. Place the glass bottle in the sunlight for 2 days. After the First day, add 1 to 2 drops of water. Simmer until the petals lose their colour. Strain the water into a sprayBottle or jar. Refrigerate and use for up to a month.

Preparation of Rose water Extract

Preparation of Herbal Hair Serum (30ml)

STEP 1 :-

In a beaker, add 5g flaxseeds in 50ml distilled water and apply heat. Continue heating until clear, slight viscousGel is formed. Filter the gel using muslin cloth.To the obtained gel. Mix the solution using magnetic stirrer For 30 minutes.

STEP 2 :-

In a beaker, add 1g of dried fenugreek seeds in 20ml of distilled water and boil the solution for 5 mins. Filter The solution and add about 5g of aloe vera gel and keep the mixture at room temperature. Additionally, add Distilled water to the solution in order to make a solution free from any lumps.

STEP 3:-

In a beaker, add solution 1 and solution 2 with continuous stirring with a stirrer. Then, add the alternant HeraSessilis leaves extract continue stirring with a glass rod. To this solution, add about 0.02 gm 1ml of sodium Benzoate that acts as a preservative. Added 1-2 drops of rose water which acts as perfuming agent. Mix the Solution using magnetic stirrer for 15 minutes. Store serum in well closed container.

EVALUATION OF HERBAL HAIR SERUM:

Physical Appearance: The set herbal hair serum is visually evaluated for appearance, colour, and texture.

Homogeneity Test: The hair serum was applied to a dry, clean object glass, and then a cover glass was Bonded over it. Investigated was the appearance in the presence of some coarse particles or homogeneity.

Herbal hair serum was visually inspected for homogeneity and the presence of lumps, flocculates, or Aggregates.

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

pH :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

Skin Irritation Test: After applying the serum to the skin, it is checked for any redness or itching after Two hours.

Sensitivity Test: The procedure involves putting the serum to the skin, exposing it to sunlight for 10 Minutes, and checking for rashes or itching

Spreadability: A similar plate procedure that is frequently used to evaluate and measure the spreadability Of semisolid medicines was utilised to measure spreadability. One gramme of hair serum was compressed Between two 20 x 20 cm vertical plates, the upper of which weighed 125 g. After one minute, the spread Periphery was measured. Spreadability was calculated using the following formula:

$$S = M \times L / T$$

Where, S = Spreadability

M = Weight in the visage (tied to the upper slide).

L = The glass slide changed the length.

T = Time (in sec) taken.

Stability:

Three months were spent storing the herbal hair serum at two different temperatures of 42 °C and 302 °C, With 65 RH. After three months, the herbal hair serum's pH and density were measured and compared to Their initial values



II. RESULT AND DISCUSSION

Physical appearance:

The physical appearance, odor and texture of the prepared herbal hair serum are visually tested.

Parameter	Batch F1	Batch F2	Batch F3	Batch F4	Batch F5
Color	Light Yellowish Brown	Yellowish Brown	Yellowish Brown	Dark Brown	Dark Brown
Odor	Rose type	Rose type	Rose type	Rose type	Rose type
Texture	Smooth	Smooth	Smooth	Smooth	Smooth

2. pH ,Homogeneity and Spreadability Test :

The pH scale is used to specify the acidity basicity of a product in order to ensure that it is safe to use.

Parameter	Batch F1	Batch F2	Batch F3	Batch F4	Batch F5
pH	5	5	5.5	6	6.5
Homogenicity	Good	Good	Very Good	Good	Very Good
Spreadability	Easily spreadable	Easily spreadable	Easily spreadable	Easily spreadable	Easily spreadable

3.Viscosity

RPM	10 rpm	20 rpm	50rpm	100rpm
CPS	6700	2950	1760	1110

III. CONCLUSION

Herbal cosmetics have been a cornerstone of traditional beauty and personal care routines for centuries, and their popularity endures even today. The appeal of herbal cosmetics lies in their perceived safety and efficacy, with many users believing that they offer a gentler and more natural approach to beauty. Unlike synthetic cosmetics, which can contain harsh chemicals and artificial fragrances, herbal cosmetics are often seen as a more benign option, with fewer side effects and a lower risk of adverse reactions.

Benefits of Herbal Cosmetics:-

The benefits of herbal cosmetics are numerous, and include:

- Fewer Side Effects*: Herbal cosmetics are generally considered to be safer and less likely to cause adverse reactions, making them an attractive option for individuals with sensitive skin.
- Greater Protection and Safety Profile*: Herbal cosmetics often contain natural ingredients that provide antioxidant, anti-inflammatory, and antimicrobial properties, which can help protect the skin and hair from damage.
- Natural and Sustainable*: Herbal cosmetics are often more environmentally friendly and sustainable than synthetic cosmetics, making them a popular choice among eco-conscious consumers.



Current Research and Developments:-

-Current research has revealed that herbal formulations can be effective in enhancing hair consistency, promoting hair growth, and improving skin health. Some of the key benefits of herbal cosmetics include:

-Hair Care: Herbal extracts such as ginseng, saw palmetto, and rosemary have been shown to promote hair growth, improve hair texture, and reduce hair loss.

-Skin Care: Herbal extracts such as aloe vera, green tea, and chamomile have been shown to have anti-inflammatory, antioxidant, and antimicrobial properties, making them effective in improving skin health and reducing the appearance of skin disorders.

-Natural Ingredients: Herbal cosmetics often contain natural ingredients such as plant extracts, essential oils, and herbs, which provide a range of benefits for the skin and hair.

Future Directions:-

As the demand for herbal cosmetics continues to grow, researchers are exploring new and innovative ways to harness the power of natural ingredients. Some of the key areas of research include:

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