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Rosemary hair growth serum

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Abstract

Rosemary hair serum is a natural hair care product formulated to promote hair health and vitality. It is known for stimulating properties that can help improve circulation to the scalp, strengthen hair follicles, and promote hair growth. When applied regularly, serum nourishes the scalp, conditions the hair strands, and adds shine and luster to dull and lifeless hair. Harnessing the antioxidant-rich properties of rosemary, this serum penetrates deep into the scalp to nourish hair follicles and stimulate circulation, thereby supporting healthy hair growth, its antimicrobial qualities help maintain scalp health, reducing dandruff and other scalp issues, with blend of botanical extracts and essential oils. Incorporating serum into a regular hair care routine can contribute to healthier, more resilient hair, providing a natural solution for individuals seeking to improve the overall condition of their hair.

Keywords: Rosemary, hair follicle, strengthening, essential oil, resilient hair

Introduction

Hairs are like crown of every human in different style and beauty of the person. Healthy hairs make the look more attractive towards people and absolutely stunning.

Introducing Rosemary Hair Serum!

Formulated with the natural goodness of rosemary extract, this serum is here to revolutionize your hair game. Say goodbye to dry, frizzy hair and hello to silky smooth locks that shine with radiance. Infused with nourishing ingredients, our rosemary hair serum deeply moisturizes your hair from root to tip, leaving it feeling soft, manageable, and oh-so-touchable. Whether you're battling humidity, heat styling, or just want to enhance your natural shine, this serum is your go-to solution. [1] Simply apply a small amount to damp or dry hair, and let the magic of rosemary work its wonders.

Rosemary: [2]

Rosmarinus officinalis, commonly known as garden rosemary or compass-weed, is a popular dense, evergreen shrub belonging to the Lemnaceae family. This aromatic plant is characterized by its fragrant, needle-like leaves and white flowers. It is typically grown in the mediterranean region and India. The chemical composition of rosemary includes essential oil with key components such as camphene, camphor, cineol, and borneol. Additionally, it is rich in flavonoids, bitter principles, tannins, and terpenoids. It is rich in antioxidants and anti-inflammatory compounds, which can help fight off disease and reduce inflammation in the body. Rosemary has also been used historically to improve memory and cognition, as well as to alleviate stress and anxiety.



Fig 1: Anatomy and physiology of hair

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Suitable types of hairs for using hair serum

1. Straight.
2. Wavy.
3. Curly [3].

Scope for rosemary hair serum

1. Hair health and nourishment

Rosemary is known for its nourishing properties, promoting hair growth and strengthening hair follicles [7]. Rosemary hair serum can cater to individuals looking to improve the overall health of their hair, addressing concerns such as dryness, breakage, and thinning.

2. Shine enhancement

Dull hair can benefit from the shine-enhancing properties of rosemary hair serum. By adding a healthy shine to the hair, the serum can boost confidence and elevate the overall appearance of the hair.

3. Scalp care

Beyond hair strands, rosemary hair serum can also contribute to scalp health. Massaging the serum onto the scalp can stimulate blood circulation, [8] potentially promoting hair growth and maintaining a healthy scalp environment.

4. Targeted hair care solutions:

Rosemary hair serum offers targeted solutions for common hair concerns such as frizz, dryness, and lack of shine. By addressing these specific issues effectively, the serum can appeal to a wide range of consumers with diverse hair types and textures [4].

5. Treat hair related problems

Increase the strength of hair roots and make the hairs stronger with healthier growth of hairs. Also help to treat itchy scalp, redness of scalp dandruff and other hair related problems.

6. Promote hair growth

Natural properties of rosemary boost hair growth by controlling hormonal changes that lead to hair loss, increase blood circulation to the hair follicles, also act as antioxidant and reduce inflammation on the scalp and also improve scalp health and strengthen hairs.

Advantages

1. Promotes hair growth

Rosemary contains properties that stimulate hair follicles, promoting hair growth.

2. Improves scalp health

It helps to balance oils on the scalp, reducing dandruff and promoting overall scalp health.

3. Strengthens hair

Regular use of rosemary hair serum can strengthen hair follicles, reducing breakage and split ends [4].

4. Natural antioxidants

Rosemary contains antioxidants that can protect hair from environmental damage, such as pollution and UV radiation.

5. Aromatic benefits

Rosemary has a pleasant scent that can help to relax and refresh the mind, making it a soothing addition to your hair care routine [5].

6. Protects against damage

Rosemary contains antioxidants that help to protect the hair from environmental damage and free radicals that can cause premature aging.

7. Adds shine and luster

The vitamins and minerals in rosemary can help to nourish and hydrate the hair, leaving it looking shiny and healthy. [6]

Disadvantages

1. Staining

The natural green color of rosemary oil may stain fabrics, so it's important to be cautious during application to avoid staining clothes or bedding.

2. Allergic reactions

Some individuals may be allergic to rosemary or other ingredients in the serum, leading to irritation, redness, or itching on the scalp. If any person has allergic reaction of rosemary, it causes skin problems on face or scalp. In some case also cause major hair falls.

3. Scalp sensitivity

Rosemary serum can be quite potent and for individuals with sensitive scalps, it may cause irritation or discomfort. [3] Scalp type is different person to person and it may cause symptoms such as burning, itching, numbness and stinging. In some case it may cause infection to hairs.

4. Oiliness

Rosemary hair serum is typically oil-based, and using too much or not rinsing it out properly can lead to oily or greasy hair. Naturally scalp produce oil and the serum is oil-based it usually caused sticky and greasy hairs or scalp.

Material and methods

The following ingredients were used for the preparation of the herbal hair serum formulation.

Ingredients of hair serum

1. Rosemary leaves

Rosemary leaves are often used in hair serums and other hair care products due to their beneficial properties for hair health. The leaves contain antioxidants that can help protect the hair and scalp from damage caused by free radicals [18]. They also have anti-inflammatory properties that can help soothe irritation on the scalp. Also, rosemary has good supply of calcium, minerals and nutritional fibers. Rosemary improves the blood stream to the brain, enhancing memory and concentration.



Fig 2: Rosemary leaves

2. Fenugreek seeds

One of the very promising uses of fenugreek leaves is its natural application to the skin to procure skin, because of its

anti-inflammatory compounds which are present in the leaves. The leaves are anti-bacterial properties rich in proteins & fiber nutrients, and therefore are consumed by humans which contains that would be effectively functioning to get rid of the bad bacteria. Another benefit of fenugreek oil pertaining to the skins is the elimination of dandruffs, as it helps to nourish the scalp. Daily massaging with fenugreek oil would be effectual for scalp treatments ^[9].



Fig 3: Fenugreek seeds

3. Mint leaves

Mint leaves have numerous benefits for hair, including promoting hair growth, preventing dandruff and adding shine to the hair. Incorporating mint leaves into a hair serum can enhance these benefits even further. Mint leaves have natural antiseptic and anti-inflammatory properties that can help soothe an itchy scalp and reduce inflammation. The essential oils present in mint leaves can also stimulate hair follicles, leading to increased hair growth ^[9].



Fig 4: Mint leaves

4. Vitamin E Capsule

Vitamin E is a powerful antioxidant that is commonly used in hair serums to help nourish and protect the hair and scalp. Vitamin E capsules can be broken open and added to your favorite hair serum to boost its nourishing properties. When applied topically, vitamin E can help strengthen and moisturize the hair, promote hair growth, and add shine and smoothness to the hair strands.



Fig 5: Vitamin E capsule

5. Lavender essential oil

Lavender essential oil is known for its soothing and calming properties, making it a popular ingredient in hair serums.

When used in a hair serum, lavender oil can help promote hair growth, strengthen hair follicles, and improve the overall health of your hair. Lavender oil can also help reduce dandruff and dry scalp, thanks to its anti-inflammatory and moisturizing properties ^[10]. It can also help improve the texture and shine of your hair, making it look healthier and more vibrant.



Fig 6: Lavender oil

6. Geranium oil

Vitamins A and C, which are believed to improve hair health, are abundant in geranium oil. It is well renowned for having antifungal and anti-inflammatory qualities that may improve the general health of hair. Because of this, it's a great choice for a hair product. Geranium oil is a rich source of nutrients that revitalizes and renews your skin and hair.



Fig 7: Geranium oil

7. Coconut oil

Coconut oil is a popular natural hair serum that is known for its ability to nourish and moisturize the hair. It is rich in vitamins, minerals, and fatty acids that help to strengthen and repair damaged hair, promote hair growth, and add shine and softness. When used as a hair serum, coconut oil can help to tame frizz and flyaway, smooth down the hair cuticle, and protect the hair from heat damage ^[10]. It can also be used as a deep conditioning treatment to help restore moisture and vitality to dry, brittle hair.



Fig 8: Coconut oil

8. Rose water

As a moderate astringent, rose water can help lessen oiliness and dandruff. Because of its anti-inflammatory qualities, it might be helpful for some scalp diseases, similar to eczema and psoriasis. Rose water is a go-to product for many ladies with curly hair since it can reduce frizz and add shine.



Fig 9: Rose water

Procedure of herbal hair serum formulation

1. Prepare the herbal infusion

- Take 3gm of rosemary dried leaves and 5-10 mint leaves and wash mint leaves thoroughly.
- Place the rosemary and mint leaves in a beaker with 1gm fenugreek seeds and cover them with purified water.
- Bring the water to a boil and then let it simmer for about 10-15 minutes to create an herbal infusion^[8].
- Allow the infusion to cool completely before proceeding to the next step.

2. Extract geranium oil

Using Soxhlet apparatus for geranium oil extraction from geranium leaves.

- Crush the quantity of geranium leaves to fine powder using a mortar and pestle.
- Accurately weigh out approximately 10 g of powder into a Soxhlet extraction thimble and place this in extraction apparatus.
- Soxhlet extractor is placed onto a flask containing the 100ml ethanol as solvent. Soxhlet equipped with a condenser.
- The solvent is heated to reflux.
- The solvent vapour travels up a distillation arm and floods into the chamber housing the thimble of geranium powder.
- Geranium powder in chamber slowly fills warm solvent.
- Desired compound dissolves in the warm solvent.
- When the Soxhlet chamber is almost full, the chamber is emptied by the siphon. The solvent running back down to the distillation flask.
- This cycle may be allowed to repeat many times, over hours or days.
- During each cycle, a portion of the compound dissolves in the solvent.
- After many cycles (72 hours) the desired geranium oil is concentrated in the distillation flask.
- After extraction the solvent is removed, yielding the extracted compound.
- The non-soluble portion of the extracted solid remains in the thimble, and is usually discarded.

3. Mixing the ingredients

- In a separate beaker, take 0.5ml coconut oil.

- To add vitamin E oil, cut the capsule and mix it with lavender and coconut oil mixture.
- Add 1.5ml of lavender essential oil for fragrance and additional hair benefits.
- Add these ingredients in the prepared herbal infusion for nourishment and herbal properties^[11].

4. Preservation: Add 0.5 ml geranium oil which is used as preservative to the main beaker containing the serum ingredients and mix well to ensure even distribution.

5. Bottling

- Carefully pour the prepared rosemary hair serum into clean, sterilized plastic bottles using measuring cylinder to avoid spills.
- Seal the bottles tightly to prevent air and contaminants from entering.

6. Storage: Store the bottled serum in a cool, dry place away from direct sunlight. Properly stored, the serum should last for several weeks.

7. Usage

- Shake the bottle well before each use to ensure the ingredients are evenly distributed.
- Apply a few drops of the serum onto your fingertips and massage it into your scalp and hair, focusing on the ends.
- Use it as a leave-in treatment or overnight treatment for best results^[6].

Formulation table

Table 1: Formulation Table of Rosemary Hair Growth Serum

Sr. No.	Ingredients	F ₁	F ₂	F ₃
1.	Rosemary leaves	3 gm	3 gm	2 gm
2.	Fenugreek seeds	1 gm	1 gm	1 gm
3.	Mint leaves	8-10 leaves	5 leaves	7 leaves
4.	Vitamin E capsule	1 capsule	1 capsule	1 capsule
5.	Lavender essential oil	1 ml	1.5 ml	1.5 ml
6.	Geranium oil	1 ml	0.5 ml	0.5 ml
7.	Coconut oil	1 ml	0.5 ml	0.5 ml
8.	Rose water	5 ml	7 ml	6 ml
9.	Purified water	q.s.	q.s.	q.s.

Evaluation parameters of hair serum

1. Physical Appearance

The physical appearance, color, and feel of the prepared herbal hair serum are visually tested.^[12]

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^[13].

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: Viscosity of polyherbal hair serum check by the viscometer in a different - different rpm for it the hair serum keeps in beaker and check by viscometer^[12].

5. Spread ability

Spread ability was measured by the place the formulation between to slides and keep a suitable weight above of plate and measured the spread ability. 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. Spread ability was calculated using the following formula:

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

Where,

S= Spread ability

M= Weight in the pan (tied to the upper slide)

L= Length moved by the glass slide

T = Time (in sec) taken to separate the slides completely

6. Irritancy test

The most common problems observed with fragrance ingredients, either through use of a hair serum or a fragranced consumer product, are skin allergies and skin irritations.^[14] Many people complain about intolerance or rashes to scalp due to serum.

7. Microbial Contamination

Change in color or odor of the serum and any type of lumps are formed in the serum are checked after 7 days of the preparation^[15, 16].

8. Hair Growth Activity Test

The hair tonic preparations were applied to the backs of rabbits to conduct the hair growth activity test.^[19] Afterwards, measurements were taken for hair length, hair thickness, hair weight, and hair density^[17].

Result and Discussion

Sr. No.	Test	Result
1.	Physical Appearance	
	Colour	Reddish brown
	Odour	Lavender type
	Texture	Smooth
	State	Liquid
2.	Homogeneity	Fine
3.	pH Test	4-5
4.	Viscosity	Little thickener
5.	Spread ability	Complete
6.	Irritancy test	Non-irritant
7.	Microbial Contamination	No microbial contamination
8.	Hair Growth Activity Test	Moderate

Discussion

The serum provides therapeutic as well as hair growth benefits to hair and scalp. It's anti-inflammatory, antimicrobial property's protect scalp, enhance hair growth and provide essential nutrition's with aromatic fragrance of the serum.

Conclusion

This study has determined that various polyherbal extracts including rosemary leaves, mint leaves, fenugreek seeds, rose water, vitamin E capsule, lavender essential oil and coconut oil, were combined in different formulations to provide multiple benefits for the scalp and hair. These benefits include antimicrobial properties, reduction of hair loss, promotion of hair growth and follicle health, prevention of hair loss, and

protection against scalp damage. The main goal of this study was to create an herbal hair serum that addresses various scalp and hair follicle issues. This serum is designed to stimulate hair growth, promote healthy hair follicles, and combat bacterial and fungal infections. This hair serum is designed to help maintain healthy hair growth, reverse gray hair to black, and supply essential nutrients needed to support the proper function of the sebaceous glands.

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