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Research Article

Formulation And Evaluation Of *Murraya Koenigii* Herbal Hair Serum

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ABSTRACT

These days, a lot of individuals use cosmetics on a regular basis and they are in greater demand in daily life. Humanity employs a variety of things to accentuate grace and beauty in order to appear attractive and youthful. Thus, cosmetics are essential to human life. Due to the widespread idea that herbal cosmetics are safer and have fewer adverse effects, they are utilised extensively these days. One of the main body elements that serves as a protective appendage is hair. The main objective of our research was to develop an Herbal Hair Serum formulation consisting of *Murraya koenigii* extract for the treatment of various hair problems. By using *Murraya koenigii* extract formulation of herbal hair serum with different concentration of excipients have been developed. They were evaluated for its physical appearance, pH, viscosity, spreadability, skin irritation test, homogeneity test. All the parameters were found to be good and within the standards. Hair root activation is required to promote hair development and aid in hair loss. Since herbal clothing has less negative effects and a lower protection and safety profile, average people still wear it. The goal of this study was to create a herbal hair serum for general use using several sauces.

INTRODUCTION

Herbal cosmetics are composed of a number of approved cosmetic ingredients that serve as a foundation for the application of one or more herbal elements that have specific cosmetic benefits. The Greek word *cosmeticos*, which meaning to arrange, skillfully decorate, is where the word "cosmetic" originates. Herbal cosmetics are composed of a range of approved cosmetic elements that can be the foundation for the

application of one or more herbal substances to create specific cosmetic effects. Initially connected to magic, religion, warfare, and hunting, cosmetics were subsequently linked to medicine. The hair follicle is recognised as the most important organ in the mammalian system, influencing appearance, gender differentiation, extreme temperature protection, and self-defense. A hair care product called hair serum is usually used to protect hair from heat styling appliances

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like blow dryers and straighteners, add shine, and lessen frizz. Typically, a liquid with a silicone basis coats the hair shaft to give it a sleek and polished look. Certain serums moreover incorporate healthy components to fortify and hydrate hair. Herbal hair serums are typically formulated with natural ingredients such as plant extracts, oils, and vitamins to nourish, protect, and strengthen hair. They're often used to reduce frizz, add shine, and improve overall hair health. Popular herbal ingredients include aloe vera, coconut oil, argan oil, jojoba oil, and various botanical extracts like ginseng or green tea. These serums are generally applied to damp or dry hair and can be used daily or as needed. It's important to choose a serum that suits your hair type and specific needs for best results.

Benefits of Hair Serum :

Frizz Control:

By controlling frizz and flyaways, serums can give your hair a sleeker, more polished appearance.

Improving Sheen: They give your hair a glossy lustre that makes it appear healthier and more vibrant.

Protection from Heat:

A lot of hair serums include components in them that create a barrier to protect the hair shaft from heat styling appliances like blow dryers and straighteners.

The moisturising lock: Certain serums have moisturising components that work to trap moisture in your hair, preventing it from drying out and keeping it nourished.

Untangling:

Hair serums can reduce tangles and knots in your hair, making combing and brushing easier.

Preventing Split Ends: Serums can aid in smoothing the hair cuticle.

Types of hair serum :

Smoothing Serum:

Developed to control flyaways and frizz, leaving hair sleek and polished.

sheen Serum:

Enhances the look and brightness of hair by giving it a glossy sheen.

Heat Protectant Serum:

Reduces breakage and damage by acting as a barrier against heat styling tools.

Moisturising Serum:

Restores moisture balance by nourishing and hydrating dry or parched hair.

Repairing Serum:

Lowers breakage and split ends while strengthening and repairing damaged hair.

Serum for Colour Protection: keeps coloured hair vibrant and free from fading and dullness.

Volume-Boosting Serum:

Gives hair body and volume to give the appearance of fuller hair.

Serum Anti-Frizz:

prevents frizz and flyaways brought on by humidity, maintaining manageable and smooth hair.

Properties of good quality Herbal Hair Serum :

Natural Ingredients:

Herbal extracts, essential oils, and plant-based substances with strengthening and nourishing effects on hair should all be included in the formulation.

Hydration:

The serum should adequately hydrate the hair to prevent frizz and dryness and to promote manageability and smoothness.

Nutrient-Rich:

It should include antioxidants, vitamins E, B vitamins, and omega fatty acids, as well as minerals and vitamins that promote healthy hair.

Non-Greasy:



The serum should be easily absorbed and styled, with a light, non-greasy consistency that doesn't weigh down the hair or leave residue.

UV Protection:

To preserve the hair from the damaging effects of sun exposure, it should ideally provide protection against UV damage.

Supporting Scalp Health:

An effective herbal hair serum should also take care of problems with the scalp, such as dryness, itching, and dandruff.

Strengthening:

It ought to increase general hair resilience, lessen breakage, and strengthen hair follicles.

Fragrance:

A pleasing aroma that comes from plant extracts or essential oils can improve the user experience.

Free of Harsh Chemicals:

It must be devoid of silicones, parabens, sulphates, and other harsh chemicals that could irritate or harm the scalp and hair.

Clinically Tested:

If at all feasible, clinical testing and verification of the serum's efficacy and safety are required.[3,12]

MATERIALS AND METHODS

Methyl paraben, Tween 20 and Xanthum gum were taken from Dr. D. Y. Patil College of Pharmacy Akurdi Pune. All other chemicals and reagents used in this study were of analytical grade and procured from an authorized dealer.

MATERIALS:

1. MURRAYA KOENIGII (CURRY PLANT):



Figure 1: Murraya koenigii

Due to its unique scent and potential to aid in digestion, curry leaves are a popular leaf spice that are used in very small amounts. "Let medicine be your food and let food be your medicine." Folk medicine has been using natural and herbal remedies for ages in all cultures around the world. As more researchers and healthcare providers become aware of the genuine health advantages of these treatments, their interest in this area has grown. In addition to being affordable, efficient, and readily available, medicinal plants are said to offer significant safety benefits when used therapeutically for a range of illnesses. Curry leaf is a significant leafy vegetable (*Murraya koenigii*). Its leaves are frequently used to spice meals in Indian cooking. The leaves are faintly acidic, bitter, and somewhat spicy, and they keep their flavour and other characteristics even after drying. In addition, curry leaf is a common ingredient in Indian Ayurveda and Unani medicines.

Classification:

- Kingdom – Plants
- Sub-Kingdom - Tracheobionta
- Super division - Spermatophyta
- Division – Mangnoliophyta
- Class – Mangnoliospsida
- Sub-Class – Rosidae
- Order - Sapindales

Family - Rutaceae

Genus - Murraya

Species - M. koenigii

Binomial name - Murraya koenigii (L.)

Sprengel[3]

2. ALMOND OIL:

The oil is extracted from the fruits of *Prunus amygdalus*, a plant native to South America and the Middle East. This oil is said to have aphrodisiac properties in Ayurveda. Almond oil is extracted from almonds and is rich in vitamins E and A, as well as monounsaturated fatty acids. It's known for its moisturizing properties and is used in skincare and haircare products. It's also used in aromatherapy and as a carrier oil for essential oils. Additionally, almond oil has been studied for its potential health benefits, including improving heart health and aiding digestion.



Figure 2: Almond Oil

3. TOCOPHEROL:

Because vitamin E contains natural antioxidants that may aid in sustaining hair development, it may support healthy hair and crown health. The antioxidant packages in vitamins may help lower the amount of oxidative stress and release revolutionaries that cause the cells that make up a person's crown hair follicles to degrade.[11]



Figure 3: Tocopherol

4. Methyl Paraben:

Preservatives like methylparaben are frequently found in hair serums and other cosmetics. Its function is to prevent the formation of microorganisms like fungi and bacteria in the product, hence preserving its safety and increasing its shelf life. Methylparaben helps keep hair serums fresh and safe for customers by keeping them from rotting and getting contaminated over



Figure 4: Methyl Paraben

5. Tween 20:

Tween 20 acts as an emulsifier, solubilizer, and texture modifier to improve ingredient stability, homogeneity, and hair and scalp delivery.



Figure 5: Tween 20

6. Xanthum Gum:

A typical thickening and food additive is xanthan gum. It mimics the feel of gluten in gluten-free baking by stabilising, thickening, and emulsifying food. It can also be found in processed meals, sauces, and salad dressings. Additionally, by keeping ingredients from separating, it can extend shelf life.



Figure 6: Xanthum Gum

METHODS:

Extraction of *Murraya koenigii* Extract

Murraya koenigii fresh leaves were gathered, cleaned with water, and then dried in the shade. Plant leaves were dried, then roughly powdered and stored in an airtight container. A leaf powder weighing about 100g was steeped in 500ml of ethanol and allowed to macerate for four to five days. The extract was concentrated after maceration and used in subsequent formulations.[2]

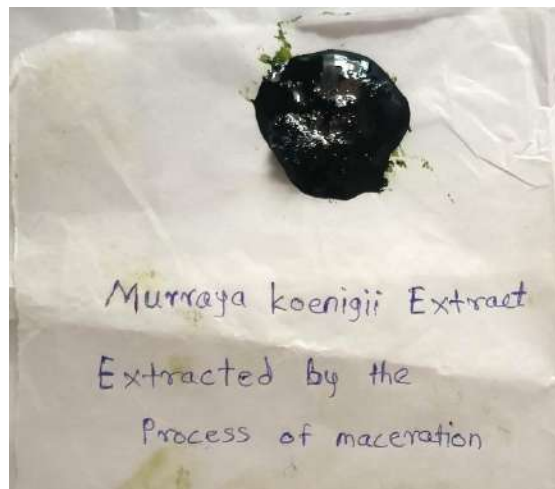


Figure 7: Extract of *Murraya koenigii*

Evaluation of *Murraya koenigii* extract:

1. UV analysis of *Murraya koenigii* extract

10 mg of *Murraya koenigii* extract was weighed accurately and transferred to the 50 ml of volumetric flask separately. It was dissolved in 10 ml ethanol. From this stock solution 1ml and 2 ml aliquots were pipette out and diluted upto 10 ml with distilled water. Further it was scanned between 400-200 nm and absorbance maxima was checked. The absorbance of *Murraya koenigii* extract of sample 1 ml and 2 ml at 296nm and 451nm wavelength was 0.781 and 0.368 respectively.[2]

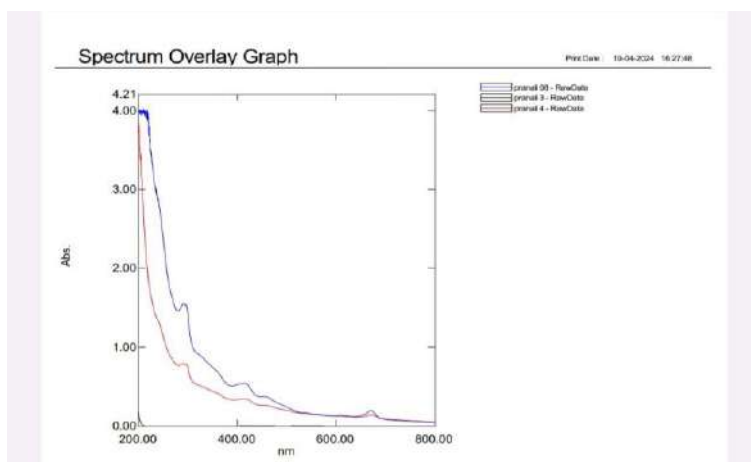


Figure 9: UV analysis

2. Solubility of *Murraya koenigii* extract:

Table 2: Solubility of *Murraya koenigii* extract

Sr No	Solvent	Solubility
1	Distilled water	Insoluble
2	Ethanol	Soluble
3	Acetate	Soluble
4	Benzene	Soluble
5	Ethyl acetate	Soluble
6	Chloroform	Soluble

3. pH of *Murraya koenigii* extract:

Table 3: pH of *Murraya koenigii* extract

Sr No	Solvent	pH
1	Distilled water	7.1
2	Ethanol	5.5
3	Acetate	5.3
4	Ethyl acetate	7.5
5	Benzene	8.2

FORMULATION TABLE

Table 4: Formulation Table

Ingredients	Quantity taken	Role
Curry leaves extract	10 mg	For Conditioning
Almond oil	1 ml	For nourishment, Perfume
Vitamin E	1 ml	Hair growth
Methyl paraben	0.42 gm	Preservative
Tween 20	0.5	Emulsifying agent
Xanthium Gum	0.5	Thickening agent
Distilled water	q.s	Solvent

Formulation method:

1. As per SOP, thoroughly clean and dry all glassware.



2. Accurately measure out the *Murraya koenigii* extract and pour it into a beaker.
3. Add small amount of ethanol to dissolve *Murraya koenigii* extract.
4. Add the necessary amount of water to the extract and heat that solution for 5 min.
5. Add measured xanthum gum into that beaker and mix them properly.
6. Add vitamin E and almond oil in another beaker and mix them.
7. Add oil phase into water phase beaker and add other measured excipients into solution.
8. After that, use a magnetic stirrer to agitate the mixture.
9. Pour the mixture into a measuring cylinder and top it out with 30 millilitres.
10. Fill the container with the finished solution.[1,6,7,8]

Evaluation of Herbal Hair Serum:

Physical appearance:

The prepared herbal serum's physical characteristics, color, and texture were examined.

Homogeneity test:

The herbal serum was applied on a dry, clean glass slide, and then covered with a glass cover. We looked into the appearance in the light. Additionally, the serum was examined visually for homogeneity, clumps, and floccules.

pH:

The pH 4 and pH 7 buffer solutions were used to calibrate the digital pH meter. Following the electrode's immersion in serum, measurements were monitored until they became steady. The pH of formulation was found to be 7.48.



Figure 12: Ph

Viscosity:

Using a Brookfield viscometer, the prepared formulation's viscosity was ascertained. About 100 milliliters of hair serum were placed in a beaker, and the viscosity was determined. The prepared herbal's viscosity was measured with a Brookfield viscometer and spindle number 4 at 60 rpm, 29.0 C temperature, 5.0% torque and viscosity observed was 115.8 cps.



Figure 13: Viscosity

Spreadability:

Through the use of the parallel plate method, spreadability was assessed and quantified. A tiny quantity of serum was spread on the glass slide and the sample was spreadable easily.



Figure 14: Spreadability Test

Skin Irritation Test:

Two hours after the serum is applied, the skin is examined for signs of redness or itching

Sensitivity Test:

Apply the serum to the skin, let it sit in the sun for ten minutes, and then look for any redness or irritation.[11,12]

RESULT AND DISCUSSION:

Physical Appearance:

The created herbal hair serum’s physical attributes, including colour and feel, were

evaluated visually. Not a single foreign particle was present. The colour was yellowish green with a translucent finish that applied smoothly and cleanly.

Homogeneity:

The homogeneity of the serum was assessed visually by looking for lumps, flocculates, or clumps. It was noted that the produced serum had high uniformity.

pH:

It was found that the prepared herbal serum had a pH of 7.48 which is appropriate for formulation.

Viscosity:

The prepared herbal’s viscosity was measured with a Brookfield viscometer and spindle number 4 at 60 rpm and viscosity observed was 115.8 cps.

Skin irritation test:

No redness and itching occurred.

Sensitivity test:

After ten minutes in sunlight no redness and irritation was observed.[11]

Parameters	Result
Physical appearance	Yellowish green translucent solution
Homogeneity	Good
pH	7.48
Viscosity (cps)	60 rpm 115.8 cps
Spreadability	Good
Skin irritation	No

CONCLUSION

The primary objective of the study was to develop an innovative *Murraya koenigii* herbal hair serum that provide smoothness, lustre and keep them frizz free. This hair serum utilizes blend of almond oil, *Murraya koenigii* extract and vitamin E, all of which are renowned for their nourishing, conditioning and hair growth properties. These ingredients not only contribute to conditioning property but also provide additional benefits such

as pleasant and natural fragrance and anti-bacterial properties. The *Murraya koenigii* herbal hair serum was prepared and evaluated for various parameter. According to results, herbal hair serum offers the vibrant, necessary nutrients needed to maintain the healthy operation of the sebaceous glands and promote the growth of natural hair.

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REFERENCES

1. Nishan M, Subramanian P. *Murraya koenigii* (curry leave)-A review on its potential. *Int. J. PharmTech Res.* 2015;7(4):566-72.
2. Ashok R. Gautam, Kalyani B. Sahare, Milind J. Umekar, Neha S.Raut. foenum- gracum and *Murraya koenigii* Extract Herbal Gel: Formulation and *Trigonella* Development. *International journal of PharmTech Research*
3. Singh S, More PK, Mohan SM. Curry leaves (*Murraya koenigii* Linn. Sprengal)-a mircale plant. *Indian Journal of Scientific Research.* 2014;4(1):46-52.
4. Gahlawat DK, Jakhar S, Dahiya P. *Murraya koenigii* (L.) Spreng: an ethnobotanical, phytochemical and pharmacological review. *Journal of Pharmacognosy and Phytochemistry.* 2014;3(3):109-19.
5. Aaqueeb S, Shehzad SK, Siddiqui A, Khaled S, Majaz Q, Khan GJ. Preparation and evaluation of Herbal hair serum containing capsaisin
6. Mkandawire M, Selvam G, Khedkar MG, Deshmukh VH, Inamdar Saniya N, Badhekar Akansha S, Shinde Pallavi M, Datkhile Sachin V, Bhat RH, Bhat SM, Shingote K. Preserving Security, Privacy of Health Passport Over Patient in Cloud Fanny Chatola and Dr. G. Glorindal DMI-St Eugene University, Chibombo, Zambia.
7. Saini L, Kumar A, Naaz A, Ali A, Saxena P, Singh V. Herbal Hair Serum: Design, Development & Evaluation.
8. Review on Formulation and Evaluation of Herbal Hair Serum; Pawan Shankar B, Shinde Pallavi M, Datkhile Sachin V; International journal of Research in Engineering and Science.
9. Deshmukh PB, Khatode RR, Gaikwad S. Formulation and evaluation of herbal hair serum. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT).* 2022 Jun;2(5).
10. Shrinivas MR, LD MH. Preparation and evaluation of hair serum. *International Journal of Advances in Engineering and Management (IJAEM).* 2022 Jun;4(6):2389-93.
11. Penkar GM, Salkar MR, Chavan PS, Ambade MS, Parab SA, Sawant MM, Jaggap VA. Formulation and evaluation of herbal hair serum in treatment of various hair-related problems. *Research Journal of Pharmacognosy and Phytochemistry.* 2023;15(2):105-10.
12. Tiwari R, Tiwari G, Yadav A, Ramachandran V. Development and evaluation of herbal hair serum: A traditional way to improve hair quality. *The Open Dermatology Journal.* 2021 Aug 11;15(1).
13. Formulation, Development and Evaluation of Herbal Hair Serum: A Classical Approach to Enhance Hair Quality; Rohan R. Vakhariya, Shrusti A. Oza, Chaitanya S. Bhingardeve, Smita J. Patil, Sofiya F. Mujawar and Dr. S. K. Mohite; *International journal of Pharmaceutical Sciences Review and Research.*
14. Jog CS, Asnani AJ, Gulkari V. Formulation and evaluation of antifungal herbal hair gel. *World J Pharm Res.* 2020 Mar 24;9(6):1543-52.
15. Handral HK, Pandith A, Shruthi SD. A review on *Murraya koenigii*: multipotential medicinal plant. *Asian Journal of pharmaceutical and clinical research.* 2012 Nov;5(4):5-14.



16. Kapoor M, Tandon C. Curry leaf and its health benefits.
17. Gahlawat DK, Jakhar S, Dahiya P. *Murraya koenigii* (L.) Spreng: an ethnobotanical, phytochemical and pharmacological review. *Journal of Pharmacognosy and Phytochemistry*. 2014;3(3):109-19.
18. Banerjee K, Kamat N, Pearline D, Thiagarajan N, Thiagarajan P. Synthesis and Characterization of *Murraya koenigii* Linn Formulation for Potential Topical Application. *Advanced Science Letters*. 2018 Aug 1;24(8):5891-6.
19. Ramakrishna S, Gopikrishna UV. Formulation and Evaluation of Herbal Hair Gel. *Sch Int J Tradit Complement Med*. 2022;5(2):28-32.

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