

Preparation and Evaluation of Natural Herbal Hair Conditioner

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Abstract: *Hair is an imperative part of the human body which protects the scalp. Hair Conditioner is a hair care product, which is applied to the hair and hair tips after shampoo in order to condition the hair and then it is rinsed out. Hair Conditioner is used to improve the manageability and to enhance lustrous look of hair. Its main purpose is to reduce friction between the hair strands to allow easier brushing and combing. The main objective is to develop the most effective hair care product to meet people's compliance, and to evaluate the prepared hair care product to establish desired effect on the user. In Herbal Hair Hair Conditioner powered Henna, Amla, Shikakai and Reetha were used as main ingredients. Formulation of Hair Conditioner was then evaluated and analyzed on the basis of various organoleptic properties and physicochemical parameters such as pH, Dirt Dispersion Test, Moisturising Time, Cleaning Action and Stability Testing.*

Keywords: Herbal Hair Conditioner, Organoleptic properties, Physicochemical Parameters, Stability testing

I. INTRODUCTION

Hair conditioner is a hair care product that is applied after shampooing in order to condition the hair. Conditioning helps protect your hair and restore it. Conditioner means a preparation used to improve the condition of hair. The product is beneficial to all types of hair. It works by restoring moisture, and smoothing the cuticles of the hair follicles. Hair conditioner comprising of powerful antioxidants can reduce UV damage to the hair including hair colour changes and protein damage. Herbal hair conditioner that helps to prevent the hair from breakage and makes the hair strong and lustrous. [1,2]

A hair care cosmetic product called a conditioner is used to enhance the feel, texture, look, and manageability of hair. Its primary function is to lessen friction between hair strands to enable gentler brushing or combing, which could otherwise harm the scalp. Herbal products have gained popularity in recent years, with 20-30% of the population using them. These products are complex mixtures of organic chemicals derived from various parts of plants, including leaves, flowers, stems, bark, and seeds. India, rich in medicinal plants, is encouraged by the World Health Organization (WHO) for its low cost and safety. Herbal hair conditioners, while better in performance and safer than synthetic ones, may not be popular with consumers. A more radical approach to popularizing herbal shampoos would be to change consumer expectations from conditioners, emphasizing safety and efficacy.[3]

NEED OF HAIR CONDITIONERS :

1. To add shine to your hair.
2. To keep it soft and flowing.
3. To Increase hair growth
4. To Makes hair more manageable and easier to comb.
5. To Leaves hairs of soft and moisturized.
6. To restore damaged hair.
7. To straightening curly hair.

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8. To revitalizes and replenishes hair strands.
9. To Prevents styling from UV rays and heat.[4]

ADVANTAGES :

1. Gives bounce to hair: Conditioning your hair after shampooing generally leaves a greasy layer of conditioner on it.
2. Nourishes the hair: Many conditioners help increase the keratin protein in the hair, adding softness and smoothness to it.
3. Maintains scalp cleanliness for longer: Shampooing after conditioningcleanses the scalp without drying the hair and helps the scalp stay clean for longer.
4. Adds shine to hair: Most hair conditioners contain ingredients that add life and luster to the hair. Shampooing your hair after using such conditioners will add shine to the hair without weighing your hair down.7
5. Reduces scalp oiliness: Conditioning before shampooing is also good for people who tend to have oily scalp or hair as it softens the hair without leaving it extra greasy.[4]

COMPOSITION

Ayurvedic hair conditioners are various Ayurvedic herbs and oilsused for strengthening, nourishing, and conditioning the hair. The Ayurvedic system of medicine mentions many herbs and oils which are considered good for hair conditioning. The main ingredients used are Henna which covers each hair shaft and builds a protective layer that safeguards the strands from damage. Amla strengthens hair follicles and reduces hair thinning. Shikakai strengthens the hair from roots ,Prevents split ends , breakage and hair fall. Reetha helps to control dandruff and promotes hair growth due to its Tridosha balancing property.[2]

BENIFITS OF HARBAL HAIR CONDITIONERS :

- Provides smoothness and luster ta hair.
- Cut down on split ends.
- Make things more manageable.
- Avoid breaking off hair.
- Guards against mechanical and chemical damage to hair.[5]



Fig.No. 1 : USE HAIR CONDITIONER



ANATOMY OF HAIR



Fig.No.2 : ANATOMY OF HAIR

The hair shaft of mammals is divided into three main regions:

1. Cuticle
2. Cortex
3. Medulla.[6]

1) Cuticle: The outermost layer, the cuticle, is made up of flat, overlapping cells resembling scales or shingles on a roof.

2) Cortex: Located beneath the cuticle, the cortex forms the thickest part of the hair strand. It is composed of tightly packed keratin proteins and is responsible for the hair's strength, color, texture, and colour.

3) Medulla: The medulla is the innermost, often hollow layer of the hair shaft. It is more prominent in thick or coarse hair and may be absent in fine or light-colored hair.

INGREDIENT PROFILE

1. REETHA



Fig.No 3: REETHA



SYNONYMES:- Soapnut, Soapberry

BIOLOGICAL SOURCE:- It consist of dried Sapindus Mukorossi Gaertn.

FAMILY:- Sapindaceae

CHEMICAL CONSTITUENTS:- The major constituents present in Reetha are saponins, suga and mucilage.

USES:- Strengthens hair, Adds shine Hair Growth, and Dandruff, etc.[7]

2. AMLA :-



Fig.No. 4: AMLA

SYNONYMES:- Emblic, Myrobalan.

BIOLOGICAL SOURCE:- It Consist Of Dried Phyllanthus Emblica L.(Popular Known As Amla Or Indian Gooseberry) Is An Ephemeral Tree.

FAMILY:- Euphorbiaceae

CHEMICAL CONSTITUENTS:- Emblica Contain Gallic Acid, Chebulic Acid, Ellagic Acid, Kaempferol, Kaempferol-3-O-Glucoside, Gallo Tannin, And Rutin, Phosphoric Acid, Essential Oils, Linoleic Acid, Oleic Acid, Stearic Acid, Palmitic Acid, And Mystic Acid.

USES:- Antioxidants, Hair Care And Immunity, and Weight Management, etc.[7]

3. SHIKAKAI:-



Fig.No. 5 : SHIKAKAI

SYNONYMES:- Virala, Sari.

BIOLOGICAL SOURCE:- It consist of dried Acacia concinna.

FAMILY:- Shikakai, also known as Acacia concinna in scientific terms, is a shrub-like tree native to Central India.

CHEMICAL CONSTITUENTS:- Lupeol, spinasterol, acacicacid, lactone.

USES:- Hair treatment, and Hair growth, etc. [7]



4. HENNA :-



Fig.No. 6 : HENNA

SYNONYMES:- Tawny, Russet.

BIOLOGICAL SOURCE:- It consist of dried Lawsonia Inermis L., commonly known as Henna.

FAMILY:- Lythraceae

CHEMICAL CONSTITUENTS:- The traditional plant-derived henna contains the active ingredient called lawsone.

USES:- Promote healthy hair, Reduce inflammation, Natural hair dry and Baldness, etc.[7]

5. HIBISCUS :-



Fig.No 7 : HIBISCUS

SYNONYMES:- Red tea, Jamaica sorrel.

BIOLOGICAL SOURCE:- It consist of dried Hibiscus, (genus Hibiscus), genus of numerous species of herbs, shrubs, and trees.

FAMILY:- Mallows

CHEMICAL CONSTITUENTS:- The phytochemical analysis showed that Hibiscus rosa-sinensis contained tannins, anthraquinones, quinines, phenols, flavanoides.

USES:- Loss of appetite, Fluid retention and Stomach irritation, etc.[7]



6. OLIVE OIL



Fig.No. 8 : OLIVE OIL

SYNONYMES:- Salad oil, Vegetable oil.

BIOLOGICALSOURCE:- It consist of dried Oil extracted from the fleshy part of the ripened fruit of the olive tree, *Olea europaea*.

FAMILY:- Oleaceae.

CHEMICAL CONSTITUENTS:- Olive oil also constitutes a major component of the "Mediterranean diet." The chief active components of olive oil.

USES:- Moisturises hair, Natural hair smoothner, Treats split ends and Cures dandruff, etc.[7]

7. ROSE WATER



Fig.No. 9 : ROSE WATER

Synonym : -Gulab jal

Biological source:- It consists of dried Rose water is extracted from the flowers of *Rosa damascene*

Family : - Rosaceae

Chemical Constituents :- Rose flowers are rich in biologically active compounds, such as phenolics, flavonoids, anthocyanins, and carotenoids. Rose absolute contains chemicals such as phenyl ethyl alcohol, farnesol, stearoptene, a-pinene, β -pinene, citronellol, geraniol, nerol, linalool, a-terpinene, limonene, eugenol, methyl eugenol, rose oxide, neral, citronellyl acetate and geranyl acetate.

Uses : Help with irritated scalp; reduce stress, Diminish shine and tone of hair. [8]



8. GLYCERIN



Fig.No. 10 : GLYCERIN

Synonym:- Glycerol, 1.2.3-Propanetriol, Glycerin.

Biological Source:- It consist of dried Glycerin is produced from the hydrolyses of fats and oils, and is a by-product of biodiesel production. It can be obtained either from animal fats or botanical sources such as palm, coconut, or soybean oil.

Uses:- Due to its strong conditioning properties, glycerin can help soften and smooth down the hair cuticle providing the appearance of additional shine and lustre, etc.[9]

METHODOLOGY

Preparation Method:-

1. Weigh accurate amount of henna powder and dissolve it in sufficient amount of water to make a paste.
2. Weigh Reetha powder, Shikakai powder and Amla powder separately and dissolve them in water to make paste in different beakers.
3. Now mix all the pastes together in a beaker and add hibiscus extract (Boil Hibiscus flowers in a beaker on water bath for 30 minutes and then filter the extract).
4. Add measured amounts of Glycerin to it, to make it in the form of slurry.
5. Olive Oil is added in the mixture with the help of dropper. and add rose water . [4]

SR. NO.	INGREDIENTS	F1
1.	Reetha (gm)	1 gm
2.	Amla (gm)	1 gm
3.	Shikakai (gm)	1 gm
4.	Henna (gm)	1 gm
5.	Hibiscus (ml)	3 ml
6.	Glycerin (ml)	15 ml
7.	Olive Oil (ml)	5 ml
8.	Rose Water (ml)	q.s.
9.	Purified Water (ml)	q.s.

Table No.1: FORMULATION OF HERBAL HAIR CONDITIONER

EVALUATION TEST :-

Formulations each of Herbal Hair conditioner, Synthetic Hair Conditioner and Ayurvedic Hair Conditioner were made and evaluated by the following evaluation tests.[2]

1. **Organoleptic Character :-** Evaluate color, odour, texture and smells of formulation.[2]



2. **pH Test :-** The pH meter was calibrated and then the electrode was dipped in Hair Conditioner.[2]
3. **Dirt Dispersion Test :-** 2 drops of conditioner were added in large test tube contain 10 ml of distilled water, 1 drop of India ink was added, the test tube was stoppered and shakes it 10 times. The amount of ink present in the foam was estimated as none, light, moderate (or) heavy.[2]
4. **Cleaning Action :-** 5gm of wool yarn were placed in Grease after that it was placed in 200ml of water containing 1gm of conditioner in a flask. Temperature of water was maintained at 3500 c. The flask was shaken for 4min at the rate of 50times in a minute. The solution was removed and the sample was taken out, dried & weighed. The amount of grease removed was weighed on a weighing scale.[2]
5. **Stability Testing :-** Store the Herbal Hair Conditioner, Synthetic Hair Conditioner and Ayurvedic Hair Conditioner at 37 degree celcius for 6 weeks and observe for any changes in color and viscosity.[2]
6. **Foam Evaluation and Foam Stability :-** In this method a dilute solution is dropped from a fixed height into a pool of the same dilute solution and the foam volume is measured. This test produces an airy foam but mainly it is used by the suppliers of surfactants. It does not give an accurate on foam volume, foam density or foam.[2]
7. **Washability :-** After applying formulations to the hair, the comfort and scope of water washing was personally verified.18
8. **Sensitivity :-** Not Sensitive. [9]
9. **Viscosity Test :-** It use a Brookfield Viscometer at room temperature. Test the viscosity at different shear rates. [10]

RESULTS

PREPARATION METHOD OF HERBAL HAIR CONDITIONER :- Herbal hair conditioner was prepared by using given formula and preparation method



Fig. No. 11 : EXTRACTION OF HIBISCUS

EVALUATION TEST OF HERBAL HAIR CONDITIONER :-

Results should have immersed from the methods described :-

1. ORGANOLEPTIC CHARACTERS :- Color, odour, texture and smells were used to evaluate the prepared conditioner's organoleptic qualities. The prepared mixture had a brownish. Its odour is strong pleasant and texture is smooth and it smells nice.

SR.NO	PARAMETER	OBSERVATION
1.	Colour	Colour Brownish
2.	Odour	Strong Pleasant
3.	Texture	Smooth
4.	Smell	Nice

Table No. 2 : OBSERVATION OF ORGANOLEPTIC CHARACTERS



2. **pH Test** :-The formulation of herbal hair conditioner shows a pH of 4.5 - 5.5 which is within the prescribed limit.

SR.NO	FORM. CODE	OBSERVATION
1.	F1	4.79

Table No. 3 : OBSERVATION OF pH TEST



Fig. No. 12: pH TEST

3. **DIRT DISPERSION TEST** :-The formulation of herbal hair conditioner passes Dirt Dispersion Test by showing Light foam, which is within the prescribed limit.

SR.NO	FORM. CODE	OBSERVATION
1.	F1	Light Foam

Table No. 4 : OBSERVATION OF DIRT DISPERSION TEST



Fig. No. 13 : DIRT DISPERSION TEST

4. **CLEANING TEST** :-The formulation of herbal hair conditioner passes Cleaning Test having result within the prescribed limit

SR.NO	FORM. CODE	OBSERVATION
1.	F1	4.15gm

Table No. 5: OBSERVATION OF CLEANING TEST





Fig. No. 14 : CLEANING TEST

5. FOAMING INDEX :-The formulation of herbal hair conditioner passes Foaming Index having result within the prescribed limit.

SR.NO	FORM. CODE	OBSERVATION
1.	F1	333.3

Table No. 6 : OBSERVATION OF FOAMING INDEX

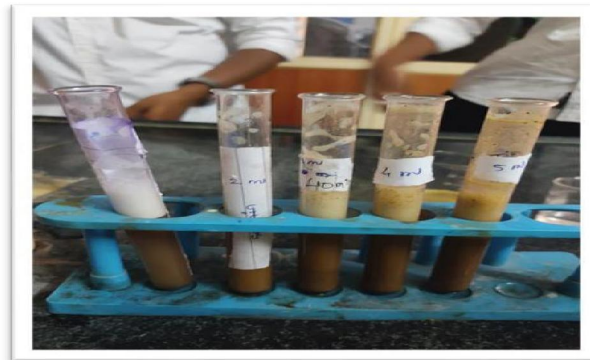


Fig. No. 15 : FOAMING INDEX

6. STABILITY TEST:-Hair Conditioner i.e. After the formulation underwent long-term stability tests, lasting roughly ten days, it was discovered that the conditioner's pH, color, odour, texture and viscosity remained unchanged.

7. WASHABILITY:- It was simple to remove the conditioner from hair by just washing with tap water.

8. SENSITIVITY :- Not Sensitive..

9. VISCOSITY TEST :-The formulation of herbal hair conditioner shows a ideal range 5000-20000 cps within the prescribed limit.

SR.NO	FORM. CODE	OBSERVATION
1.	F1	6000 cps

Table No. 7 : OBSERVATION OF VISCOSITY TEST

DISCUSSION

A natural hair conditioner must be made and evaluated in a few steps. First, choose suitable herbal ingredients that are known for nourishing hair. After that, you'll create a recipe taking into account variables like viscosity, pH equilibrium,



and component compatibility. Following manufacturing, you will assess the conditioner's performance in terms of hair softening, detangling, and nourishment. The present study focused on the preparation and evaluation of a herbal hair conditioner using natural ingredients such as reetha, amla, shikakai, henna, hibiscus, glycerin, olive oil, and rose water. The formulation was designed to provide effective conditioning while avoiding the harmful effects associated with synthetic chemicals. The prepared formulation (F1) exhibited satisfactory organoleptic characteristics, including a brownish color, pleasant odor, and smooth texture, which are desirable attributes for consumer acceptance. These properties indicate that the combination of herbal ingredients resulted in a stable and aesthetically acceptable product. The pH of the formulation was found to be 4.79, which falls within the ideal range (4.5–5.5) for hair care products. Maintaining this slightly acidic pH is important as it helps in closing the hair cuticle, reducing frizz, and improving hair shine and manageability.

The dirt dispersion test showed light foam formation, indicating that dirt is effectively removed without excessive foaming. This is a positive outcome, as excessive foam is not necessary for cleansing and may sometimes indicate harsh surfactants, which are absent in this herbal formulation. The cleaning action test demonstrated effective removal of grease (4.15 g), suggesting that the formulation has good cleansing ability while maintaining mildness. This can be attributed to the presence of natural saponins in reetha and shikakai. The foaming index (333.3) was within acceptable limits, confirming moderate foaming ability. Herbal conditioners typically produce less foam compared to synthetic ones, which supports the natural composition of the formulation. The viscosity of the formulation (6000 cps) was found to be within the ideal range (5000–20000 cps), indicating appropriate consistency for easy application and spreading on hair. Stability studies revealed no significant changes in color, odor, pH, or viscosity over the testing period, confirming that the formulation is stable under normal conditions. Additionally, the product showed good washability and no sensitivity reactions, indicating its safety for use on the scalp and hair.

The effectiveness of the formulation can be attributed to the synergistic action of the herbal ingredients. Amla provides antioxidant benefits and strengthens hair follicles, reetha and shikakai act as natural cleansers, hibiscus offers conditioning and promotes hair growth, while glycerin and olive oil contribute to moisturization and softness. Overall, the results indicate that the formulated herbal hair conditioner is effective, stable, and safe, and it can serve as a suitable alternative to synthetic conditioners.

II. CONCLUSION

It is clear from the research mentioned above that hair conditioner has superior conditioning qualities. Conditioners are used to smooth hair, enhance luster, and restore worn, mechanically damaged hair. They are applied to hair after washing. The present study successfully focused on the preparation and evaluation of a herbal hair conditioner using natural ingredients such as reetha, amla, shikakai, henna, hibiscus, glycerin, olive oil, and rose water. The formulation aimed to provide a safe, effective, and alternative to synthetic hair conditioners. The prepared herbal conditioner demonstrated satisfactory physicochemical properties, including an appropriate pH range (4.5–5.5), good viscosity, stability, and acceptable organoleptic characteristics. Evaluation tests such as dirt dispersion, foaming index, cleaning action, and washability confirmed that the formulation meets the essential requirements of an ideal hair conditioner.

The presence of herbal ingredients contributed to improved conditioning performance by enhancing hair smoothness, shine, strength, and manageability while reducing dryness, frizz, and hair breakage. Additionally, the absence of harmful synthetic chemicals makes the formulation suitable for regular use and minimizes the risk of scalp irritation or damage. Overall, the study concludes that the formulated herbal hair conditioner is safe, effective, stable, and economical. It can serve as a promising natural alternative to commercially available synthetic conditioners. Furthermore, this work highlights the growing potential of herbal formulations in cosmetic science and encourages the use of plant-based ingredients for healthier hair care solutions.



REFERENCES

- [1]. Miss B. Jyothi, Shaguftha Naaz, S. Lahari, D. Anil, A. Gowthami, A. Sreeja St.Pauls College of Pharmacy, Turkayamjal, Rangareddy district, Telanagana, www.ijprajournal.com june 2021.
- [2]. Nancy Jeffries. Global Hair Care Report : afeel forInnovation. In Hair Care : From Physiologyto Formulation, Editedby Angela Kozlowski, Allured Publishing, Carol Stream, Illino is 2008; pp 23.
- [3]. Sonawane KH, Chaure GS, Jagtap BT. Formulation and Evaluation of Herbal Hair Conditioner. International Journal of Pharmaceutical Sciences. 2023 Jun 14;1(05):1-1.
- [4]. Pros and Cons of Using Hair Conditioners, 2024 (Accessed on 18/04/2024) available from <https://www.apollo247.com/blog/article/pros-and-cons-using-hair-conditioners>.
- [5]. Neha Y.Bansod, Sunil S.Bhagat ,Dr . Swati P.Deshmukh ,Dhanashree V. Darade, International Journal of Creative Research Thoughts (IJCRT) www.ijcrt.org, 2023 IJCRT | Volume 11, Issue 10 October 2023 | ISSN: 2320-2882.
- [6]. Dumbare PB, et al. Formulation and evaluation of hair conditioner. Into J Creat Res Thoughts. 2023; 11.
- [7]. Pharmacognosybook byC.K. Kokate, A.P. Purohit,SB. Gokhale. 51th edition.
- [8]. Ms. Jagritianil Keskar, Ms. Pradnya Amol Gawarshettiwar, Ms. Shabnam Rahim Sheikh, Ms. Swarupa Vyankatesh Guddetwar, Mr. Saylankhan Gaffar Khan, students in Ishwar Deshmukh Institute of Pharmacy, Digras, Maharashtra, India in www.ijcrt.org 2024.
- [9]. Ms. Jagritianil Keskar, Ms. Pradnya Amol Gawarshettiwar, Ms. Shabnam Rahim Sheikh, Ms. Swarupa Vyankatesh Guddetwar, Mr. Saylankhan Gaffar Khan, students in Ishwar Deshmukh Institute of Pharmacy, Digras, Maharashtra, India in 2024.
- [10]. Sanika Venkat Mukke, Mr.Gosavi G.P., Kalekar Vaishali Dhananjay,Mote SaloniLaxman By student Assistant Professor, Department Of Pharmaceutical ChemistryDipartment of Pharmacognosy, Shivlingeshwar College Of Pharmacy, Almala, Maharastra, India 2025 March.

