

To Formulate and Evaluate Anti Dandruff Herbal Hair Mask

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Abstract—Young generation is facing serious hair problems due to many lifestyle changes such as fatigue, stress, poor diet and different hair coloring techniques. Strengthening hair follicles is important for improving hair growth and preventing hair loss. Hair is the most fragile part of the body. Healthy hair improves the appearance of the individual. The most delicate area of the scalp is the hair. A significant and widespread issue in today's society is dandruff. In that situation, the skin on the scalp produces flakes, which itches. Chronic scalp condition that is severe because it affects a wide variety of scalp tissue. Fungal infections are caused by a variety of factors, including an oily scalp and poor hygiene, and they become more prevalent if hair is not cleaned for a week. Redness, flaking, and itching are signs of this chronic scalp condition, which can be treated naturally with herbal hair products. The use of natural herbs like Amla, Neem, and Shikakai is advised in the ancient Indian medical system Ayurveda. Based on both traditional systems and scientific justification for modern use, Amla, Bhringaraj, Hibiscus, Shikakai, Ginger, and other herbs were chosen to formulate the anti-dandruff herbal hair mask.

Index Terms—Anti-dandruff, herbal, hair mask, promotes hair growth

I. INTRODUCTION

The definition of a hair, which is an outgrowth from a follicle on the skin, is "improved epithelial structure formed as a result of keratinization of Germinative cells." The chemical components Carbon, Nitrogen, Sulphur, and Oxygen are found in keratin, which is the substance that makes up hair. This cyclical mechanism includes hair shaft synthesis, elongation, and eventual loss. Human hair is made up of follicles that are in the Anagen, Catagen, Telogen, and Exogen stages. If hair is left unwashed for a week, fungal infections become more prevalent due to an oily scalp and poor hygiene. Redness, flaking, and itching are signs of this chronic

scalp condition, which can be treated naturally with herbal hair products. If hair is left unwashed for a week, fungal infections become more prevalent due to an oily scalp and poor hygiene. Redness, flaking, and itching are signs of this chronic scalp condition, which can be treated naturally with herbal hair products.



Fig 1: stage of hair growth

Natural medicines are now used more frequently than ever before because of their safety and advises using natural herbs like Amla, Neem, and Shikakai. These plants are proven to boost hair follicles and nourish the scalp, resulting in thicker, more resilient hair. An herbal hair mask that fights dandruff helps you get rid of itchy, greasy, flaky skin on your scalp and gives you a healthy, nourished scalp. A hair mask is a type of hair product that deeply hydrates and nourishes hair from the roots to the tips. By reducing dandruff, herbal antidandruff hair masks help your hair smooth the itchy, greasy, and flaky scalp, offering you minimized effects as compared to items with a chemical base. Healthy hair can be achieved with the use of hair care products devoid of dangerous chemicals. For keeping healthy hair, the ancient Indian medical school of Ayurveda nutritious hair and an aesthetically pleasing, tingle-free scalp. Also, without endangering or changing hair, it serves as a conditioning agent.

The main ingredients in the preparation of the herbal mask are Amla, Bhringaraj, Hibiscus, Shikakai, Ginger, and other herbs have been chosen to create the herbal hair mask based on their traditional uses and their scientific support for modern applications. The current study report and formulation involve the creation of a multiherbal hair mask formulation.



Fig no.2: Causes of dandruff

Causes of Dandruff: Dandruff is primarily caused by a dry scalp and other underlying causes. It affects many people and is a common hair issue. The condition can irritate your scalp and make it itchy and flaky. Even though it is not a major health risk, it can make you feel awkward or self-conscious.

1. Dry Scalp
2. Lack of Good Hygiene
3. Skin Condition
4. Oily scalp
5. Poor hair hygiene

II. AIM AND OBJECTIVES

Aim: To formulation and evaluation antidandruff herbal hair mask.

Objectives:

1. To formulation herbal hair mask using natural ingredients for dandruff control
2. Anti-dandruff herbal hair is a hair care product that absorbs deep into hair to provide hydration and nourishment from the roots to the tips.
3. The present study showed that the main ingredients which have been selected for the formulation of herbal hair mask on the basis of conventional wisdom and scientific evidence is Amla, Neem, Shikakai, Reetha, Ginger, Bhringaraj, Tulsi, and Rose water. Hair masks take care of hair.

4. Hair masks take care of hair that provide a holistic hair care that addresses multiple hair concerns.
5. Regular use of this herbal hair mask can result in stronger, healthier, and more shining waves.
6. A hair mask is totally free from hazardous substances.
7. to dry and chapped lips. 7.To avoid harmful synthetic chemicals by using herbal components.

Need of antidandruff herbal hair mask:

- The Anti-dandruff herbal hair mask in which the ingredients used in the mask have natural anti-fungal and anti-inflammatory properties that help soothe and heal the scalp. Regular use of this mask can also improve overall hair health and promote hair growth.
- This makes it a great choice for those who want to address multiple hair concerns at once. Additionally, the use of natural ingredients ensures that the mask is gentle on the scalp and free from harsh chemicals.
- The composition of an anti-dandruff herbal hair pack was shown to be risk-free, more effective, and commercially viable. It also possesses all the positive traits of an ideal herbal hair mask.

Advantage of hair mask: There are many benefits to using a hair mask, and the advantages vary depending on the ingredients and your hair type. Generally speaking, the advantage of using a hair mask include.

- 1) shinier, softer hair
- 2) added moisture
- 3) reduced hair breakage and damage
- 4) less frizz
- 5) help in reducing dandruff and scalp irritation
- 6) stronger hair
- 7) less environmental and product damage
- 8) nourishes hair and scalp and improves hair health

Disadvantage of hair mask

1. Results may take longer compared to chemical treatments
2. Shorter shelf life because it contains natural ingredients
3. Preparation and storage need proper care to avoid contamination

III. DRUGS AND EXCIPIENTS

Sr.no	Ingredients	Benefits	Quantity
1	Amla powder	Hair growth and hair loss	1.5 tbsp
2	Reetha powder	Remove dandruff	1 tbsp
3	Shikakai powder	Help in hair shine softness	2 tbsp
4	Rose water	Helping in repairing damage hair	1 tbsp
5	Aloe vera powder	Anti-dandruff antifungal	2 leaves
6	Coconut oil	To provide moisture	1tbsp
7	Hibiscus powder	Reduce dandruff	2 tbsp
8	Neem leaves powder	Prevent thinking of hair	2 tbsp

1. Amla Powder

Amla powder is a natural herbal powder derived from the fruit of the Emblica Officinalis tree. This fruit has the highest natural vitamin C content, and we use it in several Ayurvedic medicines. Amla fruits are largely used in Indian medicine. Fruit also used in preparation of inks, hair oils and hair shampoo it is reported that fixed oil from fruits possesses the property of promoting hair growth.



Fig 3: amla

▪ Advantage of amla powder:

1. Amla provides shine and smoothness
2. Work as a natural conditioner
3. Reduce dandruff
4. Treat head lice
5. Hair growth and hair loss
6. Boosting health hair growth

2. Reetha:

Reetha provides cooling effects and seems to be particularly beneficial for washing the skin. It

preserves the scalp's hydration and stops the hair from drying out. The advantages of applying Reetha to the skin are outstanding. It makes the scalp softer and silkier. In addition, it is applied to the head to remove cell flakes.



Fig 4 reetha

Advantage of Reetha powder:

1. Prevent dry mess
2. Good for hair growth
3. Reetha increases the silkiness of hair
4. Cleaning properties
5. Strengthening the hair roots

3. Shikakai:

Shikakai has a special capacity to wash the scalp without irritating it, making it effective as an anti-dandruff remedy. It is very beneficial for treating persistent dandruff caused by an excess of scalp oil. It benefits by taking away excess oil from the scalp. Decrease dandruff when used regularly. One of the most effective Ayurveda medicines for hair-related issues, including hair fall, is Shikakai. Shikakai aids in cleaning the scalp of debris and surplus oil and encourages hair development.



Fig 5: shikakai

▪ Advantage of shikakai Powder

1. Hair growth
2. Cleanser
3. Anti-fungal and anti-bacterial properties
4. Heals wounds
5. Promotes hair growth

2. Rose water:

World Journal of Pharmaceutical Research Rose water is the hydrosol portion of the distillate of rose petals. Rose water, itself a byproduct of the production of rose oil for use in perfume, is used to flavour food, as a component in some cosmetic and medical preparations, and for religious purposes throughout Europe and Asia. Rose syrup is made from rose water, with sugar added.



Fig 6: rose water

Advantage of rose water:

1. Control oily scalp
4. Reduce dryness
5. Repair hair damage
6. Improve hair growth
7. Reduces dandruff

3. Aloe vera:

It is used in many consumer products, including beverages, skin lotion, cosmetics ointments or in the form of gel for minor burns and sunburns. The name derives from Latin as aloe and vera ("true"). aloe vera is the most beneficial for our hair



Fig 7: aloe vera

▪ Advantage of aloe vera:

- Stimulate hair growth
- Add shine and strength
- Hydrate hair
- Reduces dandruff
- Soothes irritated scalp

4. Coconut oil:

Coconut oil is edible oil derived from the wick, meat, and milk of the coconut palm fruit. Coconut oil is a white solid fat melting at warmer room temperature of around 25°C (78 °F), in warmer climates during the summer months it is clear thin liquid oil. Unrefined varieties have a distinct coconut aroma. It is used as food oil, hair and beauty treatment and in industrial applications for cosmetics and detergent production. Due to its high levels of saturated fat numerous health authorities recommend limiting its consumption as a food.



Fig 8: coconut oil Advantage of coconut:

- Moisturize
- Repair damaged hair
- Prevent dandruff
- Improves scalp health

7. Hibiscus:

Hibiscus is an excellent herb for hair care. Hibiscus is rich in Calcium, Phosphorus, Iron, Vitamin B1, Vitamin C, Riboflavin and Niacin, which promotes hair growth and decrease premature graying of hair. This reduces dandruff. Hibiscus exhibits antioxidant properties by producing flavonoids such as anthocyanins and other phenolic compounds. It can be used to rejuvenate the hair by conditioning it.



Fig 9: hibiscus

- Advantage of Hibiscus:
 - Proper hair care
 - Reduce dandruff
 - Stimulate hair growth
 - Prevent premature greying

8. Neem leaves:

Curry leaves contain proteins and beta carotene which help to prevent thinning of hair and hair fall and helps to restore natural color of hair. Curry leaves are also rich in antioxidants; these anti-oxidants neutralize free radicals and keeps the hair health and strong.



Fig 10: neem leaves

- Advantage of curry leaves
 1. Promotes speedy hair growth
 2. Control hair loss
 3. Repair damage hair
 4. Reduce dandruff
 5. Improve scalp health

IV. PROCEDURE

Procedure for Preparation of Herbal Hair Mask Powder

1. Preparation of Herbal Ingredients

All herbal ingredients were collected in dry form. The

raw materials were cleaned properly to remove dust and impurities. After cleaning, the ingredients were dried completely and ground into fine powder using a grinder.

2. Weighing of Ingredients

The required quantity of each herbal powder was accurately weighed separately with the help of a digital balance. Proper weighing was carried out to maintain the correct formulation and uniformity of the hair mask.

3. Mixing of Powders

All the weighed herbal powders were transferred into a clean mixing container and mixed thoroughly using a mechanical mixer. Mixing was continued until a homogeneous and uniform fine powder mixture was obtained.

4. Sieving Process

The prepared powder mixture was passed through sieve number 80 to obtain smooth and uniform particle size. Sieving helped in removing coarse particles and improved the texture and quality of the herbal hair mask powder.

5. Collection of Final Product

After sieving, the fine powder was carefully collected in a clean and dry container. The final product was inspected for uniformity, color, texture, and absence of lumps.

6. Storage of Herbal Hair Mask

The prepared herbal hair mask powder was stored in a suitable airtight plastic container to protect it from moisture, contamination, and environmental factors. The stored formulation was then used for further evaluation studies and application purposes.

V. EVALUATION PARAMETERS OF HAIR MASK

The following criteria were used to evaluate the herbal anti-dandruff hair mask that had been prepared.

A) Organoleptic Evaluation:

Under this evaluation, the formulation is examined using sensory organs like the eyes or nose, and it covers macroscopic features of the drug or product, such as colour, smell, texture, and appearance.

B) Phytochemical Evaluation:

- I. pH: A calibrated digital pH metre was used to measure the pH of the formulation's 1% aqueous solution.
- II. Loss on Drying: Place 1.5 g of the drug's powdered form in a porcelain dish that has been sealed and is flat and thin. Dry in the oven at 100°C or 105°C, checking that the difference in weight between any two measurements is no more than 0.5 mg. In desiccators, cool, then weigh. The weight loss is often noted as moisture.
- III. Ash Content: In a previously lit and tared crucible (often made of platinum or silica), add 2-4 grammes of the pulverised, air-dried material. Spread the substance out evenly, then gradually raise the heat to 500–6000°C until it ignites and becomes white, showing a lack of

C) Phytochemical Evaluation:

Several experiments were carried out to determine the phytoconstituents present in the product and how they affect the body. Every plant demonstrates specific phytochemical traits, which have a variety of advantageous impacts.

a) Carbohydrate detection tests:

- i) Molisch's Test: A violet ring forms at the intersection of two liquids when a few drops of alpha naphthol solution in alcohol are added to 2-3 ml of aqueous extract, which is then shaken.



Fig: Molisch test

Fehling's Test: Boil the mixture of the fehling A and fehling B solutions for one minute. Add the test solution in an equal amount. Heat in a pot of boiling water for 5–10 minutes. Brick red and then first yellow streaks are seen.

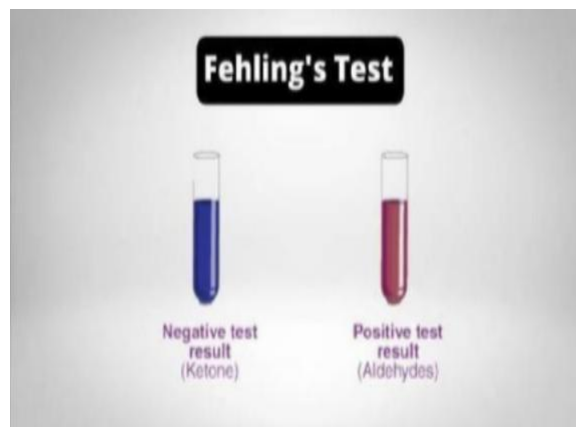


Fig 12: fehlings test

(b) Detection of Alkaloids

- i) Hager's test: When using Hagers reagent, 2-3 ml of filtrate produces yellow ppt.

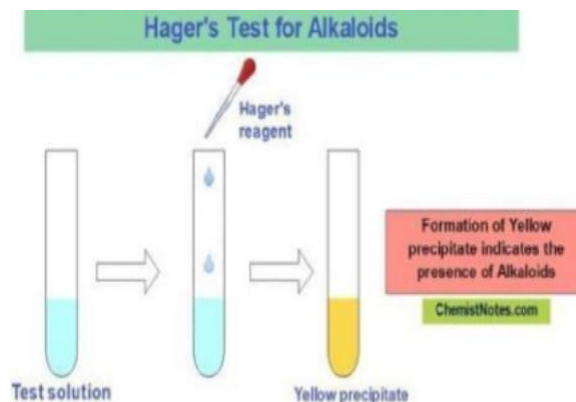


Fig 13: hagers test

- ii) Mayer's Test: A creamy ppt is produced using 2-3 ml filtrate and a few drops of Mayers reagent

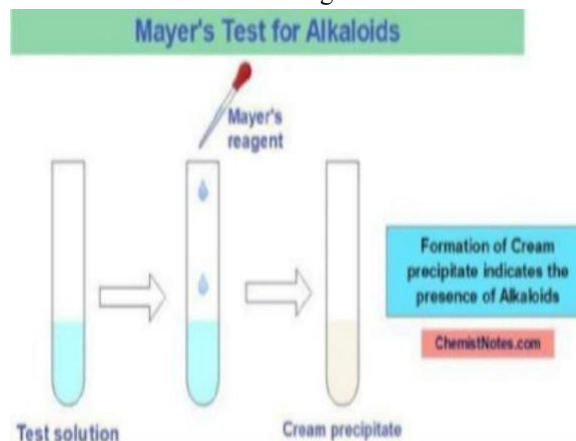


Fig 14: mayers test

iii) Detection of Volatile oils:

When treated with an alcoholic sudan III solution, 2 to 4 gm of hair mask becomes crimson due to the presence of volatile oils



Fig: Tapped density

ii) Bulk Density:

The ratio of a powder's mass to its bulk volume is known as bulk density. The necessary amount of powder is dried and poured into a 50 ml measuring cylinder until it reaches the 50 ml mark. The cylinder is then dropped from a height of 1 inch at intervals of 2 seconds onto a hard wood surface. The powder's volume is calculated. The powder is then weighed. Repeating this will get average results.

$$\text{Bulk Density} = \text{Mass} / \text{Bulk Volume}$$

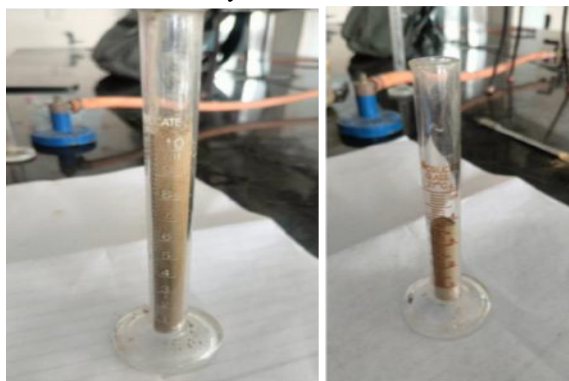


Fig: Bulk Density

iii) Angle of Repose:

It is described as the highest angle that may be formed between the powder pile's surface and the horizontal flow. A cylindrical tube with both ends open that contains the necessary amount of dry powder is put on a flat surface. The funnel should then be lifted in order to create a heap. It is noticed and documented what the heap's height and radius are. The formula may be used to get the angle of repose (θ) for the approach described above. $\theta = \tan^{-1}(h/r)$

Where

θ – Angle of repose

H – Height of the heap Radius of the base



Sr.No.	Method	Height of heap (h in cm)	Radius of heap (r in cm)	Tan $\theta = H/R$	Ave rage Tan $\theta =$	$\theta = \tan^{-1}(h/r)$	Flow properties
1.	Funnel	3.5	5.2	0.67	0.68	33°5'	Good
	Method	cm 3.3cm	cm 4.9cm	300.67 34	21		flow property
		3.5cm	5.0cm	0.7			

Hausner's Ratio:

$$\text{Hausner's Ratio} = \text{Tapped Density} / \text{Bulk Density}$$

(C) Stability Studies:

The physical characteristics of the powdered

formulation changed after being kept for a while at two different temperatures (35 °C and 40 °C) and humidity levels.

(F) Microbial Assay:

Candida albicans was utilised via the cup-and-plate technique to combat fungus. The agar slants were used to sustain the culture. After the medium had a chance to solidify,

0.25 ml of the test stain was added. Two 6 mm wells were then formed in the plates. A sample was placed in one well, while *Candida albicans* was placed in the other. The plates were incubated for 24 hours at 37 °C. The zone of inhibition was measured in order to assess the antifungal activity.

Sr.No	Test	Purpose for detection	Result
1.	Molish	Presence of carbohydrates	Positive
2.	Fehlings	Presence of carbohydrates	Positive
3.	Mayer's	Presence of alkaloids	Positive
4.	Hager's	Presence of alkaloids	Positive

VI. RESULTS AND DISCUSSION

The following assessment criteria were used to confirm that the developed hair mask was excellent. Organoleptic evaluation: Organoleptic properties like colour, odour, texture and appearance are evaluated and the results are listed below

	Parameter	Result
1	Colour	Greenish brown
2	Odour	Characteristics
3	Texture	Fine
4	Appearance	Powder

a). Physicochemical Evaluation

Physicochemical properties like pH, Loss on drying and Ash content are determined and the results are listed below.

No	Parameters	Result
	PH	6.7
	Loss on Drying	1.28%w/w
	Ash content	28%w/w

b) Rheological Evaluation

Rheological properties like Tapped density, Bulk density and Angle of repose are determined and the results are mentioned below.

C) Stability Studies: The stability result was displayed in table a change in look, fragrance, colour, and texture.

Sr.No	Parameter	Result
1	Alteration in colour	Nil

2	Alterations in odour	Nil
3	Alteration in taste	Nil

VII. RESULT

Over the past few years, there has been a noticeable growth in the use of herbal products by consumers. according to a study of global hair care market trends. The hair is affected both directly and indirectly by factors like UV radiation and the use of harsh chemicals. The current study was conducted to develop an herbal anti- dandruff hair mask that will shine and encourage hair growth in order to solve this issue. We come to the conclusion that the formulation of the herbal hair mask lessens dandruff without irritating the scalp or having any other negative effects. This research lists some herbal medicines that have been successfully used to make hair care products. In a very simple way, A herbal hair mask removes dandruff from the hair. Herbal-based cosmetics are well-liked for being non-toxic. This hair mask aids in nourishing the scalp's skin. Through the removal of extra oil from the scalp, it relieves dandruff. Poor hygiene and an oily scalp cause dandruff in the hair. Regular usage of this mask results in healthy, dandruff-free hair.

Natural medicines are now utilised more frequently than chemical-based ones all around the world since they are safe and have fewer adverse effects. The use of readily available substances allows for the preparation of herbal formulations at home. An effort is being made to create a natural anti-dandruff hair mask using the beneficial properties of plants that are widely accessible and used in hair care products. The herbal anti- dandruff hair mask's shelf life is confirmed by a stability study. Different assessment criteria, including organoleptic evaluation, Ph, loss on drying, ash content, colour, odour, texture, phytochemical evaluation, stability studies, and microbial test, are used, and the results are important. More significant findings than in the previous batches are seen in batch C. Against *Candida albicans*, the developed formulation exhibits antifungal efficacy. This study demonstrates the product's safety. The assessment research on amla and Shikakai reveals their anti-dandruff properties. This study demonstrates the safety and efficacy of a herbal anti-dandruff hair mask formulation for cosmeceutical usage.

Features of Antidandruff Herbal Hair Mask
Antidandruff herbal hair mask is a natural formulation prepared by using various herbal ingredients that help in treating dandruff and improving scalp health. It provides nourishment to the hair and scalp without causing harmful side effects. The important features of antidandruff herbal hair mask are explained below:

1. Natural and Herbal Formulation

The hair mask is prepared using natural herbs such as neem, aloe vera, hibiscus, fenugreek, amla, tea tree oil, and other plant-based ingredients. These herbs are safe, gentle, and effective for scalp care.

2. Effective Control of Dandruff

The herbal ingredients possess antifungal and antibacterial properties that help in reducing dandruff caused by fungal infections or dry scalp conditions. Regular use helps in preventing recurrence of dandruff.

3. Reduces Itching and Irritation

Dandruff often causes itching, redness, and irritation on the scalp. Herbal ingredients provide a cooling and soothing effect, which helps in reducing discomfort and inflammation.

4. Nourishes Hair and Scalp

The mask provides essential nutrients, vitamins, proteins, and minerals required for healthy hair growth. It strengthens hair roots and improves scalp condition.

5. Improves Hair Texture

Regular application of the herbal hair mask makes hair soft, smooth, silky, and shiny. It also reduces dryness and roughness of hair.

6. Controls Excess Oil

Some herbal ingredients help in balancing scalp oil secretion. This prevents accumulation of excess oil, dirt, and dandruff on the scalp.

Scope of Antidandruff Herbal Hair Mask

The scope of antidandruff herbal hair mask is very broad because dandruff is one of the most common hair problems affecting people of all age groups. The increasing demand for herbal cosmetics and natural healthcare products has increased the importance of herbal hair masks in cosmetic and pharmaceutical industries.

1. Growing Demand for Herbal Cosmetics
Nowadays, people prefer herbal and natural products because they are considered safer than synthetic chemical products. This increases the market demand for herbal antidandruff hair masks.

2. Alternative to Chemical Products

Chemical shampoos and hair treatments may cause side effects such as dryness, irritation, and hair damage. Herbal hair masks provide a natural alternative with better safety and fewer adverse effects.

3. Wide Use in Hair Care Industry

The formulation has great importance in cosmetic industries, beauty salons, and personal care sectors. It can be manufactured commercially as creams, masks, gels, or powders.

VIII. DISCUSSION

The present study was carried out to formulate and evaluate an anti-dandruff herbal hair mask using natural ingredients having antifungal, cleansing, conditioning, and nourishing properties. The prepared herbal hair mask showed satisfactory physicochemical characteristics and was found suitable for cosmetic application on hair and scalp.

The formulation contained herbal ingredients such as neem, hibiscus, aloe vera, fenugreek, amla, and multani mitti, which are traditionally used for hair care. Neem exhibited strong anti-dandruff and antimicrobial activity, while aloe vera provided soothing and moisturizing effects to the scalp. Fenugreek and hibiscus helped in conditioning the hair and reducing hair fall. Amla acted as a natural antioxidant and improved hair strength.

During evaluation, the herbal hair mask showed good appearance, smooth texture, pleasant odor, and acceptable consistency. The pH of the formulation was found to be near neutral, indicating that it is safe and non-irritating to the scalp and hair. The spread ability and washability tests confirmed easy application and removal of the mask. The formulation also showed good homogeneity without any lump formation.

The anti-dandruff activity of the formulation may be due to the presence of bioactive compounds such as flavonoids, tannins, alkaloids, and phenolic compounds present in herbal ingredients. These compounds help in reducing fungal growth

responsible for dandruff formation. The formulation also improved scalp cleanliness and reduced itching and dryness after application.

Stability studies indicated that the formulation remained stable under normal storage conditions without any significant change in color, odor, texture, or pH. Hence, the prepared herbal hair mask can be considered physically and chemically stable.

The study supports the use of herbal cosmetics as safer alternatives to synthetic hair care products because herbal formulations produce fewer side effects and provide additional nutritional benefits to hair and scalp.

IX. CONCLUSION

From the present study, it can be concluded that the formulated anti-dandruff herbal hair mask was successfully prepared using natural herbal ingredients and showed satisfactory evaluation parameters. The formulation possessed good anti-dandruff activity, acceptable pH, good consistency, spread ability, washability, and stability.

The herbal ingredients used in the formulation effectively helped in reducing dandruff, nourishing the scalp, improving hair texture, and promoting healthy hair growth. The formulation was found safe, economical, easy to prepare, and suitable for regular use.

Therefore, the developed anti-dandruff herbal hair mask can be considered an effective herbal cosmetic preparation for the management of dandruff and maintenance of healthy hair without causing harmful side effects associated with synthetic products.

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