

# Formulation and Evaluation of Herbal Anti Dandruff Hair Mask

Miss. Ankita. P. Jadhav\*<sup>1</sup>, Miss. Mrunal. T. Wakale<sup>1</sup>, Mr. Ganesh. M. Telangi<sup>1</sup>, Miss. Pratiksha. V. Varpe<sup>1</sup>,  
Mr. Rahul Lokhande<sup>2</sup>

\*<sup>1</sup>Samartha Institute of Pharmacy, Belhe, Pune, Maharashtra, India

<sup>2</sup>Assistant Professor, Samarth Institute of Pharmacy, Belhe, Pune, Maharashtra, India

## ABSTRACT

Herbal anti dandruff hair mask helps you smoothen the irritating, oily and flaky scalp by controlling dandruff thus giving you itch free healthy scalp and nourished hairs. The dandruff is a major problem of hair, which cannot be fully cured with the aid of chemical. This chemicals causes split ends and weakens the hair. Hairs are the delicate part of the body. So, accordingly to take care of them we made the formulation of hair mask. The ingredients in the hair mask are added by knowing their benefits to hairs. The purpose of using hair mask is to remove dirt and dandruff, strengthens and darkens the hairs. The formulation of hair mask that is completely free of chemicals. It only contains the natural ingredients which does not harm you hairs.

**Keywords-** Hair, Herbal, Anti Dandruff, Neem, Shikakai.

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## I. INTRODUCTION

keep The Product which is use for cleansing, modifying the texture, changing of the color, giving life to the stressed hair, providing the nourishment to the hair and giving the healthy look to the hair is called as hair care products. This products in day-to-day life causes dandruff, it is a major and common problem nowadays. The main reason of dandruff is not visible properly, but there are many factors such as oily scalp, poor hygiene leading to fungal infections and it become more often if hair is not washed for a week. In this condition flakes on scalp produces, causes itching on skin. There are some type of hair like normal hair, oily hair, dry hair vary from human to human. In most dermatological skin problem

dandruff is a non inflammatory and chronic condition related to the scalp that is eminent by an excessive range of scalp tissue being affected. The families who can't afford anti-dandruff tools and uses dirty water this causes dandruff frequently. A yeast like fungus, *malassezia*, feeds on oils on the scalp of most adults, dry skin, sensitivity of hair care products or contact dermatitis, other skin conditions such as psoriasis and eczema are also the causative factors behind dandruff. Dandruff causes hair loss and embarrassment in public places on the skin in various areas because of dandruff a high level of sebum occurs. Its symptoms are redness, flakes, and itching of the scalp.

This formulation are herbal based with viable substituent for synthetic drugs. There are many herbal formulations available in market containing

herbal ingredients like extracts of plants and essential oils. In recent few days, natural products have shown a huge growth in herb based cosmetics. Various preparations used in hair care are present in various forms of creams, dyes, powders, tonics, etc. Hence, the knowledge from Ayurveda and Herbals will be enhanced by information on the evidence basis of these plants. These herbal drugs are easily available, cost effective, safe, effective and have very less side effects. Due to the less side effects and natural effect demand in the market of herbal products is increasing. The underlying research deals with the preparation and assessment of poly-herbal antidandruff formulation containing the goodness of Amla, Bhringraj, Reetha, Hibiscus, Neem, Tulsi, Ginger, Shikakai and Nagarmotha.

### 1.1 Benefits of Herbal Anti-Dandruff Hair Mask-

1. Stimulate hair growth.
2. Cleansing.
3. Remove dandruff.
4. Reduce hair fall.
5. Prevent premature graying.

### 1.2 Uses of Herbal Plants-

#### A. Amla-

Amla known as source of vitamin C. It is packed with many health benefits. Powdered amla is used as a gooseberry. Amla is a rich essential ingredient in hair tonic to promote hair growth and improve hair pigmentation. It strengthens and nourishes the roots, improves the colour and radiance. Applying amla oil to the roots of hair improves hair growth and color. A very popular application is to reduce baldness and hair loss. This quality is due to the tannin content in the form of antioxidants.

#### B. Neem-

Neem helps to cleanse the scalp. It removes clogged pores and improves hair growth. Regenerative properties are very important for the treatment of dandruff. It provide with preservatives and healing properties and can be used for a variety of hair problems. Dandruff can remove by using neem leaves as a rinse. The most common uses of neem can be

found in our hair care rituals. According to Ayurveda, Amla, Lisa, Neem and Acacia it is a necessary herb for healthy curls, promoting hair growth, reducing hair loss, and making hair more voluminous.

#### C. Reetha-

Reetha shows cooling effects and acts like a very good thing for cleansing of the skin. It prevent the scalp from drying out and keep the skin soft. A mixture of reetha and chana when applied to the skin, it gives excellent results on skin. It makes the skin soft and gental. It is also used to remove cell flakes from the head.

#### D. Bhringraj-

Bhringraj is a herb that promote hair growth. A popular Ayurvedic ingredient used for hair growth. It helps increase blood flow to the scalp by stimulating and inducing hair growth, which is probably lost due to dandruff. It also prevents scalp problems caused by dandruff and irritation and does not affect hair growth.

#### E. Tulsi-

Tulsi, or Holy Basil, has been used in religious works for centuries. Contributes to blood circulation, smoothens the scalp, reduces irritation and dandruff, and promotes hair growth. Used in the form of paste to prevent dandruff and keep the base of the scalp clean.

#### F. Ginger-

Ginger is an excellent hair conditioner rich in minerals and essential oils that makes your hair easy to comb, soft and shiny. Helps relieve itching, dryness and flaky scalp. It has natural anti-inflammatory and antiseptic properties that help keep the scalp healthy and clean.

#### G. Hibiscus-

Hibiscus or "Gudar" is the most beneficial ingredient in hair. It is used for hair growth, it regrowth and hair loss. Hibiscus contains amino acids, vitamins A and C, alpha hydroxy acids, and other nutrients that are very beneficial to hair and scalp. Keeps your scalp healthy and minimizes the risk of dandruff.

## H. Shikakai-

Shikakai is useful as an anti-dandruff agent due to its unique ability to cleanse the scalp without irritating it. It is especially useful in combating chronic dandruff caused by excess oil on the scalp. It removes excess oil from the scalp and helps reduce dandruff during normal use. Shikakai is one of the most useful ayurvedic herbs that is used for hair related problem especially hair fall. Shikakai helps to remove dirt and excess oil from the scalp as well as promote hair growth. This is because of its astringent property.

## I. Nagarmotha -

Nagarmotha is commonly known as Nut grass .It mainly use for the scalp disorder. It is effective in controlling dandruff. This is because dandruff is a fungal disease and nagarmotha is effective against dandruff causing fungus. Regular use of the nagarmotha improves hair texture, adds shine and stimulates hair growth. Effectively it also prevents hair fall and premature graying of hair.

## II. MATERIALS AND METHODS

### 2.1 Materials-

All the natural materials used in the present study i.e., Amla, Bhringraj, Neem, Reetha, Hibiscus, Tulsi, Ginger, Shikakai and Nagarmotha were purchased from local market, in the form of dried powder. The details of the plant material used for the formulation of hair mask are mentioned.

### 2.2 Method of Preparation-

#### • Preparation of the Herbal Powder

All the herbal ingredients are in dry form and grinded to make fine powder.

#### • Weighing

All the required herbal powders for hair mask preparation were accurately weighed individually by using digital balance.

#### • Mixing

All these fine ingredients were mixed thoroughly by mixer to form a homogenous fine powder.

#### • Sieving

This fine powder was passed through sieve no. 80, to get the sufficient quantity of fine powder.

#### • Collection and storage

The powder mixture was collected and store in suitable plastic container and used for doing evaluation parameters.

We have took four batches of antifungal activity. n which the best result showing antifungal activity was shown by batch C. The batch C was showing best zone of inhibition.

Table 1- Formulation of Anti-dandruff Hair mask.

Sr. No.	Name of Ingredient	Batch A	Batch B	Batch C	Batch D
1.	Amla	9gm	11gm	10 gm	11gm
2.	Neem	12gm	14gm	15gm	17gm
3.	Reetha	14gm	10gm	10gm	10gm
4.	Bhringraj	8gm	13gm	10gm	8gm
5.	Tulsi	8gm	9gm	10gm	10gm
6.	Ginger	8gm	11gm	10gm	12gm
7.	Hibiscus	13gm	10gm	10gm	11gm
8.	Shikakai	14 gm	12 gm	15gm	12gm
9.	Nagarmotha	14gm	10gm	10gm	9gm



Fig 1:- Anti Dandruff Hair Mask Formulation

### 2.3. Evaluation Parameter –

The prepared herbal anti-dandruff hair mask was evaluated by following parameters.

#### A. Organoleptic Evaluation -

By utilizing sensory organs like eyes or nose, the examination of the formulation is performed under

this evaluation, and it includes macroscopic characteristics of the drug or product, such as colour, odour, texture and appearance.

## **B. Physicochemical Evaluation –**

### **a) pH –**

pH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant.

### **b) Loss on Drying –**

Weigh about 1.5 gm of the powdered drug into a weighed flat and thin porcelain dish. Dry in the oven at 100°C or 105°C, until two consecutive weighing do not differ by more than 0.5 mg. Cool in desiccators and weigh. The loss in weight is usually recorded as moisture.

### **c) Ash Content –**

#### **Total Ash Value –**

Place about 2-4 gm of the ground air-dried material, accurately weighed, in a previously ignited and tared crucible (usually of platinum or silica). Spread the material in an even layer and ignite it by gradually increasing the heat to 500-6000C until it is white, indicating the absence of carbon. Cool in a desiccator and weigh. If carbon-free ash cannot be obtained in this manner, cool the crucible and moisten the residue with about 2 ml of water or a saturated solution of ammonium nitrate. Dry on a water-bath, then on a hot-plate and ignite to constant weight. Allow the residue to cool in a suitable desiccator for 30 minutes and then weigh without delay. Calculate the content of total ash in mg per gm of air-dried material.

## **C. Phytochemical Evaluation-**

Various tests were performed, to identify the phytoconstituents present in the products and their effect is shown on the body. Every plant exhibits certain phytochemical properties, which show a number of beneficial effects.

### **a) Detection of carbohydrate-**

#### **I. Molisch's Test:-**

To 2-3 ml aqueous extract, add few drops of alpha-naphthol solution in alcohol, shake and add conc.

H<sub>2</sub>SO<sub>4</sub> from sides of the test tube violet ring is formed at the junction of two liquids.

### **II.Fehling's Test-**

Mix 1ml fehling A and 1 ml fehling B solutions, boil for 1min. Add equal volume of test solution. Heat in boiling water bath for 5-10 min. First yellow, then brick red ppt is observed.

### **b) Detection of alkaloids-**

#### **I. Hagers Test-**

2-3 ml filtrate with hagers reagent gives yellow ppt.

#### **II. Mayer's Test-**

2-3 ml filtrate with few drops mayers reagent gives creamy ppt.

### **c) Detection of Volatile Oil-**

2 to 4 gm of hair mask on treatment with alcoholic solution of sudan III develops red colour in the presence of volatile oils.

### **d) Detection of Protein-**

**Biuret Test-** To 3 ml T.S. add 4% NaOH and few drops of 1% CuSO<sub>4</sub> solution. Violet or pink colour appears.

### **e) Foam Test-**

shake the drug extract or dry powder vigorously with water. Persistent stable foam observed.

## **D. Rheological Evaluation –**

### **a) Tapped Density –**

Tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass readings are taken until little further volume or mass change was observed. It was expressed in grams per milliliter.

Tapped Density = Mass / Tapped Volume

### **b) Bulk Density –**

Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder

is measured. Then the powder is weighed. This is repeated to get average values.

Bulk Density = Mass / Bulk Volume

### c) Angle of Repose –

It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow.

It required amount of dried powder is placed in a cylindrical tube open at both ends is placed on a horizontal surface. Then the funnel should be raised to form a heap. The height and radius of the heap is noted and recorded. For the above method, the angle of repose ( $\theta$ ) can be calculated by using the formula.

$$\theta = \tan^{-1} (h/r)$$

Where  $\theta$  – Angle of repose,

h – Height of the heap,

r– Radius of the base

### d) Hausner's Ratio –

Hausner's Ratio = Tapped Density / Bulk Density

### e) Carr's Index –

$$\text{Carr's Index} = \frac{\text{Tapped Density} - \text{Bulk Density}}{\text{Tapped Density}} \times 100$$

### E. Stability Studies-

The powdered formulation was stored for some time under different temperatures (35 °C and 40 °C) and humidity conditions, and the change in the physical properties was observed.

### F. Microbial Assay-

For anti fungal activity *Candida albicans* were used by cup plate method. The culture was maintained on agar slants. The test stain of 0.25 ml was inoculated into the media after the medium solidified, a two wells were made in the plates of 6 mm. One well was loaded with sample and the another was filled with fungus *Candida albicans*. The plates were incubated at 37°C for 24 hrs. the anti fungal activities were evaluated by measuring the zone of inhibition.

## III. RESULT AND DISCUSSION-

Following evaluation parameters were performed to ensure superiority of prepared hair mask.

### 3.1 Organoleptic Evaluation –

Herbal hair mask was evaluated for organoleptic parameter showed in the Table 2. The colour of formulation was greenish brown. The odour of prepared formulations was characteristic which is desirable to cosmetic formulations texture and appearances were acceptable as per requirement of cosmetic formulations.

Table 2- Organoleptic Evaluations

Sr. No.	Parameters	Observations
1.	Colour	Greenish Brown
2.	Odour	Characteristic
3.	Texture	Fine
4.	Appearance	Coarse Powder

### 3.2 Physicochemical Evaluations-

Herbal hair mask was evaluated for physicochemical parameters showed in the Table 3. The pH of formulation was found to be 6.5. The ash content and moisture content were within the limit.

Table 3- Physicochemical Evaluations

Sr. No.	Parameter	Observation
1.	pH	6.5
2.	LOD(loss on Drying)	1.36% w/w
3.	Ash value	3.6% w/w

### 3.3 Phytochemical Evaluations

Herbal hair mask was evaluated for phytochemical parameter showed in the Table 4. It was the found to be presence of phytoconstituents such as carbohydrates, proteins, alkaloids and volatile oils.

Table 4- Phytochemical Evaluations

Sr. No.	Test	Purpose for Detection	Result
1.	Molisch's test	Presence of carbohydrate	Positive

2.	Fehling's test	Presence of carbohydrate	Positive
3.	Hager's test	Presence of Alkaloid	Positive
4.	Mayer's test	Presence of Alkaloid	Positive
5.	Volatile oil test	Presence of Volatile oil	Negative
6.	Biuret test	Presence of Proteins	Negative
7.	Foam test	Presence of Saponin	Positive

### 3.4 Rheological Evaluation (Powder Property)-

Herbal hair mask was evaluated for rheological evaluation (powder property shown in the Table 5. Rheological finding justified the flow (Powder) properties of the herbal hair mask. It was found to be a free-flowing and little sticky in nature.

Table 5- Rheological Evaluation

Sr.No.	Parameters	Observations
1.	Tapped density	0.5
2.	Bulk density	0.41
3.	Angle of Repose	39.41°
4.	Hausner's ratio	1.21
5.	Carr's index	18

### 3.5 Stability Studies-

The result of stability was shown in Table. No 6. change in colour, odour, texture and appearance was observed.

Table 6- Stability Test

Sr. No.	Parameter	Result
1.	Change in colour	Nil
2.	Change in odour	Nil
3.	Change in texture	Nil
4.	Change in appearance	Nil

### 3.6 microbial Assay-

The antifungal activities were evaluated by measuring the zones of inhibition (in mm).

The results of evaluations are shown in Table no.7

Table 7- Antimicrobial Assay

Sr. No.	Fungus	Zone of inhibition (in mm)
1.	Candida Albicans	26 mm



Fig 2:- Zone of inhibition.

## IV. CONCLUSION

This study presents a number of plant drugs with proven efficacy in hair care preparation. A herbal hair mask treats dandruff from the hair in very easy manner. Herbal based cosmetics are popular for their non toxic nature. This hair mask helps to nourishes the skin of the scalp. It treats dandruff by removing excess oil from the scalp. Oily Scalp and poor hygiene leads to dandruff in the hair. If this mask used regularly it leads to healthy and dandruff free hair. Nowadays natural remedies are used in more amount in all over world, because of their safe and less side effects compared to chemical based products. Herbal formulations can be prepared at home with the use of available ingredients. It is an try to prepare the herbal anti dandruff hair mask with the rich qualities of plants which are available easily and use for hair care formulations. The stability study assures the shelf life of herbal antidandruff hair mask. Different parameters like Organoleptic evaluation, Ph, Loss on

drying, Ash Content, Colour, Odour, Texture, Phytochemical evaluation, Stability Studies and Microbial assay is use for evaluation and which shows the significant results. In the batch C more significant results are obtained than other batches. The prepared formulation shows the antifungal activity against candida albicans. Tis study shows the safety of product. The study of amla and shikakai by evaluation study shows the antidandruff activity. This study shows that the prepared formulation of herbal antidandruff hair mask is safe and use as the cosmeceutical.

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