

## FORMULATION AND EVALUATION OF HERBAL ANTI-DANDRUFF SHAMPOO

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### ABSTRACT

*A type of cosmetic product called a shampoo is used to clean hair by clearing the scalp and hair shaft of oil and debris. Shampoo removes built-up debris from hair without utilizing a lot of sebum. Despite the fact that natural shampoo works greater and is safety than artificial shampoo, given the present environment, it doesn't seem like purchasers will embrace it. Two negative effects of synthetic shampoos on the scalp and hair shaft are keratin loss and dry hair. Due to these causes, herbal shampoos were created as a secure and widely accepted substitute. Shampoos are a type of cosmetic product utilized for cleaning hair by removing debris and filth from the hair shaft and scalp. Without using a lot of sebum, shampoo is used to eliminate built-up debris from the hair. Despite the fact that herbal shampoo is safer and more effective than synthetic shampoo, given the current climate, it doesn't seem likely that customers would accept it. Keratin loss and dry hair are two negative consequences of artificial shampoo on the hair and scalp. These elements promoted the development of natural shampoos as a safe and well-liked substitute for synthetic shampoo.*

**Keywords:** *Herbal shampoo, cosmetics, Evaluation of shampoo, Natural &Healthy.*

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## INTRODUCTION

Human hair is essentially what makes a person beautiful. The main purpose of hair care products is to clean hair. In addition, it nourishes the hair, alters its texture, and gives the appearance of healthier hair. Human hair performs a variety of functions, such as sebum production, thermoregulation, apocrine sweat production, and defence against external stimuli. Shampoo is the most often used hair care product. It may be used to remove environmental pollutants, residual hair style product residue, and dirt from the hair and scalp. It is available as a powder or a thick liquid. Shampoos used to only be used to clean hair, but modern shampoos are much more than just scalp cleansers. It not only cleans the hair but also makes it easy to handle, comb through, and utilize. When rubbed to the scalp, hair products clean your hair as well as your scalp. Herbal shampoos are really beneficial for hair. Herbal shampoos are created from natural materials and work similarly to regular shampoo in terms of cleaning the scalp and hair. These shampoos are safer than artificial shampoos, more stable, and have fewer adverse effects because no surfactants are included. Artificial shampoo contains surfactants. Significant adverse effects of these surfactants include drying out the hair, hair loss, inflammation of the scalp, and irritation of the eyes. These elements have led to a rise in public interest in herbal cosmetics because of their low cost and little side effects.<sup>[1]</sup>

Shampoos, being a thick mixture of detergents with the right additives, preservatives, and active compounds, are presumably employed as beautifying items. Shampoos are most likely applied like makeup. The purpose of this daily hair care product is to clean the scalp and hair. They are used, among other things, to remove pollutants, oils, filth, and dandruff from the surroundings. It is often rubbed into damp hair and then rinsed off with water prior to application. Despite the wide variety of synthetic shampoos on the market today, both medicated and non-medicated, herbal shampoo has become more and more popular due to its safety, increased demand, and lack of negative side effects. Synthetic surfactants in shampoos are primarily used to wash and foam hair<sup>[2]</sup>

### REQUIREMENTS OF SHAMPOO

It should not be harmful and should not damage the hair or scalp.

It is important to remove environmental pollutants and sebum from scalp hair.

### ANATOMY OF HAIR

Keratin makes over 95% of the protein in hair. Every hair has a hair shaft and a hair root. Dermal follicles give rise to protein filaments that make up hair. Certain types of hair have medullas in addition to the cortex and cuticle cells that make up the hair shaft.<sup>[3]</sup>

### ISSUES WITH HAIR

#### Hair loss

The primary reasons of hair decrease are stress, hormone changes, negative effects from prescription medications, and a range of hair styling products.

#### Oily hair/ Oily hair

Excessive production of sebum, or natural oil, by the scalp is the cause of oily hair. Sebaceous glands, which have the capacity to "work overtime," create an excessive amount of oil and are the source of selenium.<sup>[4]</sup>

**Dry hair**

Dry hair can be caused by hormonal imbalances, birth control pills, menopause, anemia, and low-protein diets.

**Dandruff**

A minor, non-inflammatory skin condition which impacts the scalp and can cause hair loss is dandruff. It sticks to the hair root and is scaly.<sup>[5]</sup>

**Causes of Dandruff****Seborrheic Dermatitis**

This is one of the most common causes of dandruff. It involves red, greasy skin covered with flaky white or yellow scales. It can affect areas rich in oil glands, such as the scalp, eyebrows, sides of the nose, and behind the ears.

**Malassezia**

This yeast-like fungus lives on the scalps of most adults. Sometimes it can grow out of control and feed on the oils secreted by hair follicles, leading to increased skin cell turnover and dandruff.

**Dry Skin**

Flakes from dry skin are usually smaller and less oily than those from other causes of dandruff. Cold winter air combined with overheated rooms is a common cause of itchy, flaking skin.

**Not Shampooing Enough**

If you don't regularly wash your hair, oils and skin cells from your scalp can build up, causing dandruff.

**Sensitivity to Hair Care Products (Contact Dermatitis)**

Sometimes sensitivities to certain ingredients in hair care products or hair dyes can cause a red, itchy, scaly scalp.

**Other Skin Conditions**

Conditions like psoriasis and eczema can also lead to a flaky scalp and dandruff.<sup>[6]</sup>

**ADVANTAGES OF HERBAL SHAMPOO**

Organic and all-natural ingredients.

Free from negative responses.

No additional surfactants or SLS.

Free of synthetic preservatives.

Research with animals is prohibited.

Safe for the skin and surroundings.

Encourage the growth of hair.

Get rid of the dandruff<sup>[7]</sup>

**LIMITATIONS OF HERBAL SHAMPOO**

The quality and consistency of products are impacted by natural items.

For this reason, preservatives must be used.

Variations in plant components with the seasons.

Herbs for the scalp are available. Papaya, lemon, peppermint, and menthol, for instance.<sup>[8]</sup>

**Applications Of Herbal Shampoo**

Herbal shampoo can be used for daily hair care, providing effective cleansing by removing dirt, oil, and impurities.

It hydrates the hair, especially when it contains moisturizing ingredients like aloe vera or coconut oil.

Herbal shampoo helps control dandruff with its anti-inflammatory and antifungal ingredients such as tea tree oil, neem, and rosemary.

It soothes scalp irritation and reduces itching with calming ingredients like chamomile and lavender. By stimulating hair follicles with ingredients like ginseng, hibiscus, and fenugreek, herbal shampoo promotes hair growth.

It strengthens hair strands and reduces breakage, thanks to ingredients like henna, amla, and bhringraj. Herbal shampoo enhances the natural shine of hair due to nourishing ingredients like aloe vera and jojoba oil.

It softens the hair, making it more manageable and less prone to tangling.

For oily scalp, herbal shampoo with lemon, mint, and tea tree oil helps control excess oil production.

It provides deep conditioning and hydration for a dry scalp with ingredients like coconut oil, almond oil, and shea butter.

The natural ingredients in herbal shampoo reduce the risk of scalp irritation and allergic reactions.

It is environmentally friendly due to the biodegradable nature of its ingredients.

Rich in vitamins, minerals, and antioxidants, herbal ingredients nourish the scalp and hair.<sup>[9]</sup>

### **Functions Of Ingredients**

#### **Hibiscus (Rosa Sinesis)**

Hibiscus Conditioner for Smoother Hair: Hibiscus is a great conditioner since it feeds hair follicles, softens hair, and makes it easier to handle. Hibiscus contains amino acids (Keratin). To reap the nourishing benefits of Hibiscus for your hair, you can use conditioners that have Hibiscus as the key ingredient.



**Figure No.1: Hibiscus Flower (Rosa Sinesis)**

#### **Use Hibiscus Flower for Hair**

Stimulates hair growth

Has your hair lost its shine and volume over time? Hibiscus flowers contain naturally occurring amino acids that nourish hair and aid in hair development. The structural protein known as keratin, which serves as the building block of hair. Hair is less likely to break because keratin bonds the hair. Additionally, it makes hair more manageable and encourages the general thickness of hair strands. Thus, you may begin using Hibiscus on your hair in place of costly, hair-damaging keratin treatments.<sup>[10]</sup>

#### **Conditions hair**

The majority of shampoos include chemicals that deplete the hair of its natural oils. Have you noticed a dull, dryness in your hair? You can lock the natural moisture content of your hair and nurture it with Mucilage, which is abundant in hibiscus flowers and leaves, functions as a natural conditioner.

The slimy texture of crushed hibiscus flowers and leaves is a result of this naturally occurring conditioner. For hair, hibiscus flowers and leaves.

### **Treats dandruff and itchy scalp**

Does your scalp produce too much oil, which leads to issues like dandruff and scalp irritation? Hibiscus inhibits the glands' production of oil by acting as an astringent. Hibiscus leaves have a generally calming and cooling impact on hair while also preserving the pH balance of the strand.<sup>[11][12]</sup>

### **Reetha (Sapindusmukorossi)**

Reetha is a common ingredient in shampoo formulations; the powdered dried fruit is utilized as a foaming agent, cleans the greasy secretions in the skin, and may be used as a natural lather-forming hair tonic and cleanser as well as a lice remover.



**Figure No.2: Reetha (Sapindusmukorossi)**

### **Uses of Reetha**

Reetha is found in India's mountainous Himalayan areas. Indian Ayurvedic medicine has been using Reetha's fruit for decades.

Ayurvedic shampoos and cleansers frequently contain reetha as an ingredient.

It may be used every day to feed the scalp of the hair and encourage the growth of new hair.<sup>[13][14]</sup>

### **Neem (Azadirachta indica)**

Neem, known scientifically as *Azadirachta indica*, has been used traditionally in various cultures as a remedy for dandruff due to its antifungal, antibacterial, and anti-inflammatory properties. Here's how neem can be effectively used as an anti-dandruff agent.

### **Benefits of Neem**

#### **Antifungal Properties**

Neem is effective against the fungus *Malassezia*, which is a common cause of dandruff.

#### **Anti-inflammatory**

Neem helps to soothe an irritated scalp, reducing redness and itching.

#### **Antibacterial**

It prevents scalp infections that can exacerbate dandruff.

#### **Moisturizing**

Neem helps to moisturize the scalp, preventing dryness that can lead to flaking.<sup>[15][16]</sup>

## FORMULATION OF HERBAL SHAMPOO

### Procedure

#### Preparation of Herbal Extracts

Take fresh neem and hibiscus leaf, prepare extracts by boiling the leaves in distilled water and then straining the liquid to obtain a concentrated extract.

#### Mixing the Powders

In a separate bowl, mix the shikakai powder and Retha powder with a small amount of distilled water to form a smooth paste.

#### Combining the Ingredients

In a large mixing bowl, combine the neem extract, hibiscus extract, aloe vera gel, coconut oil, glycerines, and essential oil.

#### Thickening the Shampoo

add acacia gum to the mixture, stirring continuously to avoid clumps. Allow it to hydrate fully for about 10-15 minutes.

#### Incorporating the Powders

Add the shikakai and Retha paste to the mixture and blend well to ensure all ingredients are thoroughly combined.

#### Dilution

Add the remaining distilled water to the mixture, stirring continuously to achieve a uniform consistency.

#### Adding the Preservative

Finally, add the preservative vitamin E capsule and mix thoroughly to ensure even distribution.

#### Final Mixing and Bottling

Once all ingredients are well combined, transfer the shampoo into a clean, sterilized bottle using a funnel. Ensure the bottle is sealed tightly.

Ingredients	Quantity	Role
Hibiscus powder	2gram	Antidandruff agent
Neem powder	2gram	Antibacterial agent
Aloe vera gel	5ml	Moisturising agent
Coconut oil	2ml	Moisturising agent
Shikakai powder	2gram	Cleaning agent
Retha powder	2gram	Foaming agent
Essential oil (castor oil)	1ml	Flavouring agent
Water	80ml	Base
Acacia gum	1gram	Thickening agent
Vitamin E capsule	1 capsule	Preservative agent
Glycerine	2ml	Humectant

**Table No. 1: Formulation Table**

## EVALUATION OF ANTIDANDRUFF HERBAL SHAMPOO

### Organoleptic evaluation/ visual assessment

A number of attributes, such as colour and clarity, are evaluated for the generated formulations.

### PH determination

The pH level of the shampoo is measured using a pH meter.

### Percentage of solid content determination

To get the shampoo to evaporate, set a pre-weighed evaporated dish via 4g of shampoo on a hot plate. The final weight is noted. The percentage of solid ingredients in shampoo that is still present after entire evaporation is calculated.<sup>[17] [18]</sup>

### Foaming ability and Foaming stability

A cylinder shaking technique is used in stability tests and foaming ability testing. This method involves hand-covering a 250 ml graduated cylinder after 50 ml of the 1% shampoo solution has been added. The cylinder is then shaken ten times. A single minute at a time, the amount of the foam produced by the shaking is recorded for five minutes.<sup>[19]</sup>

### Dirt dispersion test

Fill the test tube with one percent shampoo and a drop of India ink. After stopping, shake the test tube for 10 minutes. There are four different strengths of bubble ink: not at all, a medium, light, and heavy.<sup>[20]</sup>

## RESULT

Sr No	Parameter	Observations
1	Colour	Brown
2	Clarity	Clear
3	PH	6.72
4	Skin Irritation Test	No Irritation scalp
5	Foaming Ability	Dense
6	Dirt Dispersion	Light

**Table No.2: Result**

### Colour

The product has a brown colour. This could be due to the ingredients used in the formulation, such as natural extracts, dyes, or other components.

### Clarity

Despite its brown colour, the product is clear, meaning it doesn't have suspended particles or cloudiness. This clarity can be an indicator of purity and the absence of contaminants.

### pH

The pH of the product is 6.72, which is slightly acidic but very close to neutral (pH 7). This pH level is generally suitable for skin and hair care products as it is close to the natural pH of human skin, which ranges from 4.5 to 6.5. A pH in this range is typically gentle and non-irritating.

### **Skin Irritation Test**

The product has been tested for skin irritation and shows no signs of causing irritation on the scalp. This is an important result indicating that the product is likely safe for use on sensitive skin and does not cause adverse reactions.

### **Foaming Ability**

The product has a dense foaming ability, meaning it produces a rich and thick lather. This characteristic is often desired in shampoos and cleansers as it helps in spreading the product evenly and provides a satisfying cleansing experience.

### **Dirt Dispersion**

The product has a light dirt dispersion ability, indicating that it effectively removes dirt and impurities but does so gently. This balance is important to avoid stripping the skin or hair of natural oils while still providing adequate cleaning.

## **DISCUSSION**

The synthesized anti-dandruff herbal hair formulation isolated with the goodness of natural herbs along with the active Phyto-constituents. It nourishes hair mildly by acting as an anti-dandruff agent. It effectively removes excess oil from the scalp, which is the major root cause behind dandruff. Include natural ingredients like amla, Retha, shikakai, green tea, neem, Tulsi, hibiscus etc. for your haircare and forget about hair troubles. The formulated shampoos were not only safer than the synthetic shampoo, but also greatly reduce the hair loss during combing as well as strengthen the hair growth. The pH value plays an important role in minimizing damage to the hair. pH of the shampoo is slightly acidic and which is near to skin pH. the herbal formulation has a cleaning percentage similar to that of synthetic shampoo. Foaming also called lathering does not have much to do with the cleaning process. The natural shampoo is not comparable with synthetic shampoo, but the study proves that herbal shampoo can generate sufficient foam due to the presence of shikakai and Retha. It can be used as a natural cleanser for washing hair as it contains saponins that act as foaming agents. Amla supplies more nutrients and antioxidant content to nourish hair, also prevents free radical damage to hair follicles because of dandruff. Amla with its vitamin C, anti-inflammatory and anti-bacterial properties can stop dandruff formation. Neem treats clogged pores and increases hair growth.

## **CONCLUSION**

The development of an herbal antidandruff shampoo incorporating neem and hibiscus offers a promising natural solution for scalp health. Neem, renowned for its antifungal and antibacterial properties, effectively combats the *Malassezia* fungus responsible for dandruff. Its anti-inflammatory characteristics also soothe the scalp, reducing irritation and flakiness. Hibiscus complements neem with its rich nutrient profile, providing essential vitamins and amino acids that nourish the scalp and strengthen hair follicles. Together, neem and hibiscus create a synergistic effect that not only addresses dandruff but also promotes overall hair health. This natural formulation avoids the harsh chemicals found in conventional shampoos, making it a gentler, yet effective, alternative for those seeking to maintain a healthy, dandruff-free scalp.



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