



# Formulation And Evaluation Of Herbal Anti-Dandruff And Anti-Hairfall Shampoo

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**Abstract:** Dandruff and hair fall are common scalp issues that affect a large portion of the population worldwide, causing discomfort and cosmetic concerns. The formulation process involved the selection and combination of herbal ingredients known for their antifungal, anti-inflammatory, and hair-strengthening properties. The herbal extracts were incorporated into a shampoo base using standardized procedures. The prepared herbal shampoo helps in cleansing and conditioning the scalp and hair, leaving it smooth, healthy, and free from dandruff, excess oil, dirt, and lice. One of the major advantages of herbal cosmetics is their non-toxic and natural origin, which minimizes allergic reactions and side effects. Herbal shampoos are cosmetic preparations that utilize traditional Ayurvedic herbs to cleanse the hair and scalp effectively, similar to regular shampoos. They help in removing excess oils, dandruff, dirt, and environmental pollutants while promoting hair health.

**keywords** - Cosmetic, Herbal shampoo, Anti-Hairfall shampoo, Anti- Dandruff Shampoo, Ayurvedic Herb.

## I. INTRODUCTION

Shampoos are primarily used as cosmetic products. They serve as essential hair care formulations designed to cleanse the scalp and hair in our daily routine. Generally, shampoos function as beautifying preparations composed of a viscous blend of detergents along with suitable additives, preservatives, and active agents. They are typically applied to wet hair, gently massaged to form lather, and then rinsed off with water. The main goal of using shampoo is to eliminate dirt and impurities accumulated on the hair while retaining an adequate amount of natural sebum. At present, a wide range of synthetic shampoos, both medicated and nonmedicated, are available in the market; however, herbal shampoos have gained popularity due to their natural origin, safety, and lack of adverse effects, making them increasingly preferred by consumers. In synthetic shampoos, surfactants (synthetic) are added mainly for their cleansing and foaming property, but the continuous use of these surfactants leads to serious effects such as eye irritation, scalp irritation, loss of hair, and dryness of hairs. Alternative to synthetic shampoo we can use shampoos containing natural herbals. Herbal anti-dandruff and anti-hair fall shampoos provide a natural way to address common hair concerns such as dandruff and hair thinning. Enriched with powerful herbal extracts, these shampoos cleanse the scalp and hair gently, without relying on harsh chemicals. They help maintain scalp health, encourage hair growth, and are suitable for all skin types. With their ecofriendly composition and mild formulation, herbal shampoos offer a safe, effective, and gentle cleansing experience while treating dandruff and hair fall. Formulated with natural, scalp nourishing ingredients, herbal shampoos effectively combat dandruff and hair loss while preserving the scalp's natural moisture balance. Free from sulfates and strong synthetic additives, they strengthen the

hair from root to tip. Their blend of soothing yet effective herbal extracts delivers a holistic hair care solution promoting healthier, stronger, and dandruff-free hair.

### **1.1. Dandruff & Hairfall**

Common hair issues such as dandruff and hair fall are discussed along with their symptoms and possible causes, which include dry scalp, fungal infections, hormonal fluctuations, stress, poor nutrition, and inadequate hair care practices. The text also highlights the widespread occurrence of dandruff, its connection to certain environmental factors and personal hygiene habits, and the various treatment methods available, including both herbal and chemical-based anti-dandruff shampoos

### **1.2. Treatment of Dandruff & Hairfall**

Shampoos are commonly used solutions for managing dandruff and hair fall, providing both preventive and restorative benefits. Specially designed to address these concerns, anti-dandruff and anti-hair fall shampoos contain active components that help relieve symptoms and tackle their root causes. For dandruff, such shampoos often include antifungal substances that fight the *Malassezia* fungus responsible for flaking. They also feature ingredients that calm the scalp, reduce irritation, and balance oil production. When it comes to hair fall, these formulations may contain agents that fortify hair follicles, improve blood circulation to the scalp, and nourish the hair strands to prevent breakage and shedding. Consistent use of these targeted shampoos, combined with a proper hair care routine, can greatly enhance scalp and hair health—resulting in stronger, healthier, and dandruff-free hair.

### **1.3. Herbal Shampoo**

Shampoos are perhaps the most commonly used cosmetic products for cleaning the hair and scalp in daily life. A shampoo is essentially a solution of detergents combined with suitable additives that provide additional benefits such as conditioning, lubrication, and therapeutic effects. Nowadays, a wide variety of shampoo synthetic, herbal, medicated, and nonmedicated—are available in the market. The herbal shampoos are safe and free from side effect. Herbal shampoos is widely unstable product. all over the world it has been used form many years. Some international researchly said that the chemicals of herbal shampoos also responsible for cancer herbal shampoos are defined as preparation of a surfactant in suitable form liquid, solid or powder which when used under the condition specified will remove surface grease, dirt & skin debris from the hair shaft & scalp. Herbal shampoos are available in various forms such as powder, liquid, lotion, cream, gel, aerosol, and specialized types like conditioning and anti-dandruff shampoos. These shampoos are made entirely from natural ingredients and herbal extracts. They help enhance hair quality by improving moisture, promoting growth, increasing thickness, and strengthening hair roots. The most significant advantage of herbal shampoos is that they have no harmful side effects. Compared to synthetic shampoos, herbal ones are safer and perform better, as they are completely natural and free from harsh chemicals.

### **1.4. Need of Shampoo**

The skin on our head produce a greasy fluid called sebum. It is produced to protect the hair by coating itself all over the head. This give the hair a healthy shine but when secretes in large amount it makes the hair look dirty.

### 1.5. Benefits of Herbal Shampoo

- More Shine
- Less Hair Loss
- Long Lasting Color.
- Stronger and More Fortified Hairs
- All Natural, No Chemicals
- Won't Irritate Skin or Scalp
- Keep Healthy Natural Oils

### 1.6. Function of Herbal Shampoo

- Lubrication
- Conditioning
- Hair Growth
- Maintenance of Hair Colour
- Medication

### 1.7. Ideal Properties of Herbal Shampoo

- It should efficiently and thoroughly eliminate dirt, grease, excess oil, and loose dead cells from the hair and scalp.
- It should create an adequate amount of lather to meet the user's psychological satisfaction.
- It should rinse off easily with water without leaving any residue.
- It should make the hair soft, shiny, manageable, and free from dryness or static.
- It should provide a pleasant and refreshing fragrance to the hair.
- It should be gentle and cause no irritation or adverse effects on the skin or eyes

### 1.8. Advantage of Herbal Shampoo

- Pure and Organic Ingredient
- Free from Side Effects
- No Surfactants
- No Animal Testing
- Earth And Skin Friendly
- No Petroleum based Ingredients

## 2. Human hair

### 2.1. Parts of Hair

- **Dermal Papillae:**

The dermal papilla is responsible regulating the hair cycle and hair growth, and is also comprised Of androgen receptors that are Sensitive to the presence of DHT.

- **Matrix:**

The matrix surrounds the dermal papillae and contains all the active cell needed for hair Growth and for the development of the different Parts of the hair, particularly the outer root sheath, The inner root sheath and the hair shaft. Combined, the matrix and the dermal papillae make up the hair.

- **Bulb Outer Root Sheath:**

The outer root sheath, or, is the outermost part of the hair and is Keratinized. Inner root sheath: internal root sheath is comprised of three parts: the Henley layer, Huxley layer, and Cuticle.

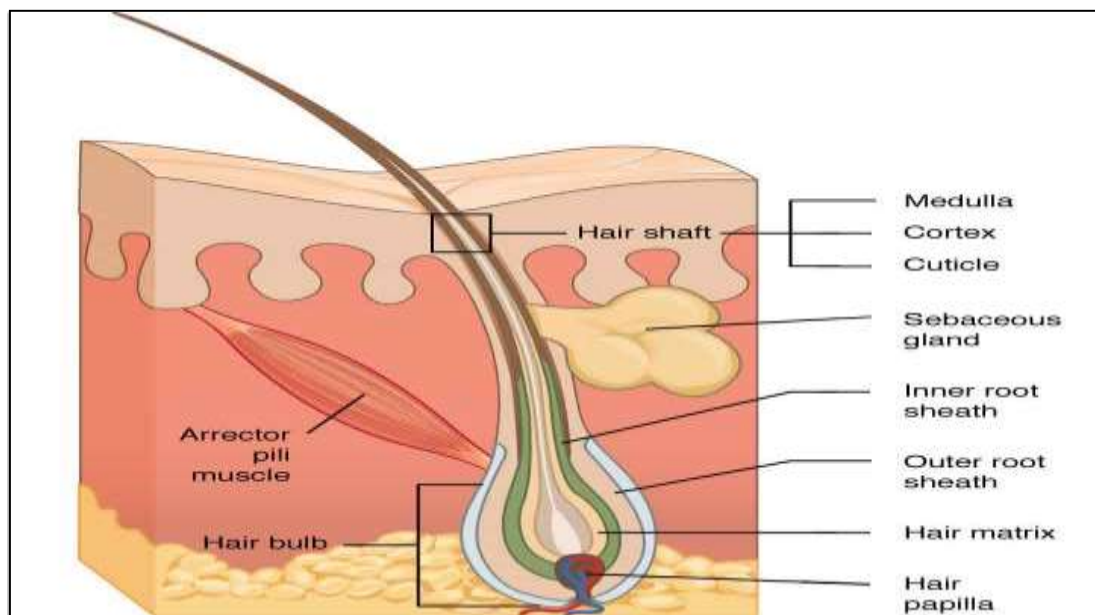


Fig Human Hair

### 3.Literature review:

Sr no	Title	Description	Author	Publication
1.	Treatment of dandruff with 5% tea tree oil shampoo	5% tea tree oil shampoo produce 41% improvement in dandruff	A.C. Satchell et al.	Journal of American academy of dermatology (clinical trials) 2002.
2.	Essential oils as potential source of anti-dandruff agents.	Systematic review of in-vitro and in-vivo evidence on essential oils (tea tree, rosemary, lemongrass etc) showing antifungal activity against dandruff	S. Jain & colleagues	PubMed, 2022
3.	Effect of neem leaf paste on dandruff	Clinical/field study evaluating topical neem leaf paste on scalp dandruff in students; reports reduction in flakin/itch with topical neem application	P. B. Dani (and co-authors)	PMC / open access article, 2025.
4.	Formulation and evaluation of polyherbal anti-dandruff shampoo (Reetha, shikakai, amla )	Formulation study: polyherbal shampoo prepared from Reetha (Sapindus), Shikakai (Acacia concinna), Amla (Emblica officinalis) shows satisfactory cleansing, foam, pH and in-vitro anti-dandruff/antifungal	S. Lonkar (and co-authors)	IJ/SRT / Research article, 2025.



		activity		
5.	Formulation and evaluation of herbal neem and aloe vera anti-dandruff shampoo	Formulated Shampoo showed acceptable Physicochemical Properties and Anti Fungal and Anti Microbial Activities.	Bolkar Swapnil Rajendra	Inrd paper (formulation study)

## 4. Materials and Method

### 4.1. Material

- Reetha
- Amla
- Shikakai
- Neem
- Teatree oil
- Aloe vera
- Bhringraj
- Hibiscus
- Fenugreek seeds
- Curry leaves
- Flaxseeds
- Lemon juice
- Gelatine

### 4.2. Uses of materials

#### • Reetha

1. Stops Hair fall
2. Prevents Dandruff.
3. Fight against scalp Infection
4. acts as a natural cleanser
5. its saponins gently removing dirt and oil while its anti-fungal and antibacterial properties combat scalp infections
6. control dandruff, and reduce itching
7. Reetha also soothes the scalp
8. improves blood circulation to hair follicles, and stimulates healthy hair growth.



F.g.2 Reetha

**• Amla Extract**

1. Strengthen the scalp and Hair.
2. Reduce Hair Loss.
3. Stimulate Hair Growth.
4. Prevent or treat dandruff and dry scalp.
5. Improve overall appearance of Hairs.
6. Prevent or treat fungal and Bacterial hair and scalp infections



F.g. 3 Amla

**• Shikakai Extract**

1. Prevents Grays.
2. Add more shine to the Hairs.
3. Cleanses Hair.
4. Crubs Hair Loss.
5. Prevents Lice, Psoriasis, Eczema & Scabies.



F.g.4 Shikakai

**• Neem**

1. Antifungal and antibacterial properties
2. Reducing flakes and scalp irritation
3. Anti-inflammatory qualities soothe an itchy scalp
4. Nourish the scalp and strengthen hair follicles
5. Reducing dryness



F.g. 5 Neem

**• Tea tree oil**

1. Antiseptic, Antifungal, and Anti-inflammatory Agent
2. Soothe an itchy scalp
3. Control oil production
4. Promote healthy hair growth by stimulating follicles and unblocking pores
5. Remove excess oil and impurities



F.g. 6 Tea tree oil

• **Aloe vera**

1. Calms an itchy scalp.
2. Deep cleans oily hairs.
3. Strengthens
4. Aloe vera contains proteolytic enzymes which repairs dead skin cells on scalp.
5. Promote hair growth
6. Smooth natural curls
7. Reduce frizziness



F.g. 7 Aloe vera

• **Bhringraj**

1. Makes Hair Lustrous.
2. Treats baldness and help in growth of hairs
3. Promote hair growth
4. Reduce hair fall
5. Delay premature graying
6. Nourish hair follicles and strengthen roots
7. Soothes itchy scalp
8. Improves hair texture
9. Natural conditioner for smoother





F.g.8 Bhringraj

- **Hibiscus**

1. Stimulate Hair Growth & Lost hair volume & Luster over the years.
2. Treat Dandruff & Itchy scalp. Conditions Hairs.
3. Prevents premature greying.
4. Improve hair texture
5. Moisturizes and conditions



F.g. 9 Hibiscus

- **Fenugreek seeds**

1. Stimulate hair growth by nourishing follicles
2. Control dandruff
3. Improve hair texture and shine
4. Promote a healthy, soothed scalp



F.g. 10 Fenugreek seeds

- **Curry leaves**

1. Help to control dandruff
2. Reducing dandruff and itchiness
3. Clean scalp and healthy hair
4. Moisturize your scalp, promote hair Growth
5. Preventing Hair fall, Premature Hair Graying



F.g. 11 Curry leaves

- **Flaxseeds**

1. Nourish hair follicles
2. Moisturize the scalp
3. Anti-inflammatory properties that reduce dandruff and combat hair fall
4. Help balance scalp oil production
5. Reduce irritation
6. Provide essential nutrients to the hair follicles for healthier growth.



F.g. 12 Flaxseeds

- **Lemon juice**

1. Get rid of dandruff
2. Reduces Hair fall
3. Detox the scalp

4. Great hair mask for dry and damage hairs
5. Reducing oiliness
6. Cleanses the scalp



F.g.13 Lemon Juice

- **Gelatine**

1. Helps strengthen the hair shaft
2. Improve thickness
3. Reduce breakage



F.g. 14 Gelatine

### 4.3. Methods

#### 4.3.1. Preparation of extract

About 100 g of each powdered plant materials, namely Amla, Shikakai, Reetha, Neem, Aloe vera, Bhringraj, Hibiscus, Fenugreek seeds, Curry leaves, Flax seeds were homogenized. The powdered material was extracted with distilled water by boiling for 4hr. The extract of each plant material was separated and evaporate.

Sr. no	Drugs	Quantity For 100g	Part used	Botanical name
1.	Amla	11%	Fruits	Phyllanthus emblica
2.	Shikakai	16%	Pods	Acacia concinna
3.	Reetha	21%	Nuts	Sapindus mukorossi
4.	Neem	8%	Leaves	Azadirachta indica L.
5.	Aloevera	10%	Leaves	Aloe barbadensis miller
6	Bhringraj	8%	Leaves	Eclipta prostrata
7	Hibiscus	8%	Flowers	Hibiscus rosa-sinensis Trigonella
8.	Fenugreek seeds	8%	Seeds	Foenum-graecum
9.	Curry leaves	5%	Leaves	Murraya koenigii
10.	Flax seeds	5%	Seeds	Linum usitatissimum

#### 4.3.2. Formulation of herbal shampoo

Formulation of the herbal shampoo was done as per the formula given in Table 1. To the gelatin solution (10%), added the herbal extract and mixed by shaking continuously at the time interval of 20 min. 1 ml of lemon juice was also added with constant stirring. To improve aroma in the formulation, sufficient quantity of essential oil (tea tree oil) was added and made up the volume to 100 ml with gelatin.

Sr No	Material required	Quantity	Medicinal use
1.	Amla	2.0g	Anti-dandruff
2.	Shikakai	2.0g	Detergent
3.	Reetha	2.5g	Foaming agent
4.	Neem	1.0g	Anti fungal agent
5.	Aloevera	4.0g	Moisturizing agent
6.	Bhringraj	1.0g	Hair growth
7.	Hibiscus	0.8g	Conditioning agents
8.	Fenugreek seeds	1.0g	Control dandruff
9.	Curry leaves	0.5g	Control dandruff
10.	Flax seeds	1.0g	Moisturizing scalp
11.	Tea tree oil	q.s.	Anti inflammatory
12.	Lemon juice	q.s.	Reduce oiliness
13.	Gelatine	q.s.	Improve thickness



## **5. Evaluation of herbal shampoo**

The prepared formulation was evaluated for product performance which includes organoleptic characters, pH, physicochemical characterization, and for solid content. To guarantee the nature of the items, particular tests were performed for surface tension, foam volume, foam stability, and wetting time using standard protocol.

### **5.1. Visual assessment**

The prepared formulation was assessed for colour, clarity, odour, and froth content.

### **5.2. pH determination**

The pH of the prepared herbal shampoo in distilled water (10% v/v) was evaluated by means of pH analyser at room temperature.

### **5.3. Determination of Solid Content Percentage**

The percentage of solid substance was determined by weighing about 4 g of shampoo in a dry, clean, and evaporating dish. To confirm the items, particular tests were performed for surface tension, foam volume, foam stability, and wetting time using standard protocol.

### **5.4. Surface tension measurement**

The prepared shampoo in distilled water (10% w/v) was evaluated for surface tension using stalagmometer in room temperature.

### **5.5. Testing of Wetting**

Wetting time was calculated by noting the time required by the canvas paper to sink completely [3]. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch.

### **5.6. Foam Stability Test**

The stability of the foam was determined using cylinder shake method. About 50 ml of formulated shampoo (1%) solution was taken in a graduated cylinder of 250 ml capacity and shaken for 10 times vigorously. Foam stability was measured by recording the foam volume of shake test after 1 min and 4 min, respectively. The total foam volume was measured after 1 min of shaking.

### **5.7. Dirt dispersion test**

To 10 ml of refined water two drops of cleanser were included and taken in a wide-mouthed test tube. To the formulated shampoo, added one drop of Indian ink and shaken for 10 min after closing the test tube with a stopper. The volume of ink in the froth was measured and the result was graded in terms of none, slight, medium, or heavy.

### **5.8. Conditioning performance evaluation**

An artificial hair tress of Indian women was received from a salon and divided into two swatches of length 10 cm approximately, weighing 5 g. The control swatch was the one without washing and the test swatch using the formulated shampoo was washed with. Each tress was added for 2 min to the combination of shampoo in water in the proportion 10:15 taken in a conical flask and washed using 50 ml of distilled water. Each tress was air dried at room temperature and the procedure was repeated for maximum of 10 times. The conditioning effect of the prepared shampoo in terms of softness and smoothness was determined using a blind touch test using volunteers of student 20 numbers selected randomly. The conditioning performance of the shampoo was rated in terms of Score 1–4 (4 - excellent, 3 - good, 2 - satisfactory, and 1 - poor) by asking all the selected students to touch the tress washed with prepared shampoo.

## 6. Conclusion

The formulation of herbal shampoo is effective in addressing various hair concerns, particularly dandruff and hair fall, while providing additional benefits such as conditioning, shine, and manageability. The study highlights the increasing consumer preference for herbal products in the global hair care market. The herbal shampoo formulation aims to overcome these problems by utilizing herbal extracts and powders known for their hair care properties. The conclusion emphasizes the effectiveness of the shampoo in reducing dandruff without causing irritation, promoting hair growth, smoothing hair, and offering better conditioning effects compared to conventional products. Furthermore, the conclusion emphasizes the importance of traditional knowledge in formulating the shampoo and developing parameters for quality, stability, and purity. In summary, the conclusion asserts that the formulation and evaluation of the herbal antidandruff shampoo have resulted in a stable and effective product that meets the demands of consumers for herbal-based solutions to hair care concerns.

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