

## A COMPREHENSIVE LITERATURE REVIEW AND ANALYSIS OF HERBAL ANTI – DANDRUFF SHAMPOO POWDER

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### 1. INTRODUCTION

#### General

They include skincare creams, lotions, powders, perfumes, lipsticks, nail polish, makeup, hair dyes, hair sprays, deodorants, baby products, bath oils, bubble baths, and many more. These products are popular in both developing and developed countries. Herbal cosmetics are becoming more popular worldwide and are considered a valuable gift from nature. There are many types of herbal beauty products that are safe for the skin and hair. People have been using herbs for food, medicine, and beauty for a long time. However, with the growth of science and technology, the use of natural ingredients has decreased. But now, herbs are being used again in both medicine and cosmetics.

#### Background and Importance

It causes flakes of dead skin to fall from the scalp. The main reasons for dandruff include fungal infections, dry skin, too much oil, or sensitivity to hair products. It can cause itching, irritation, and embarrassment. Many anti-dandruff shampoos are available, but they often contain strong chemicals that can lead to side effects like dryness, hair fall, and scalp irritation.

In recent years, herbal formulations have gained attention as natural, safe, and effective alternatives for hair and scalp care. Herbal anti-dandruff shampoo powders have emerged as a promising solution due to their organic ingredients, eco-friendly nature, and the absence of harmful synthetic chemicals. The incorporation of herbal ingredients in shampoo powders provides antimicrobial, antifungal, and anti-inflammatory benefits, thereby addressing the root causes of dandruff while promoting overall scalp health.

**DANDRUFF**

Dandruff is a common scalp condition that causes flakes, itching, and redness due to the shedding of dead skin cells. It affects almost half of the population, especially during puberty, and can occur in both men and women. People from all regions experience dandruff at some point in their lives. It can be frustrating and often leads to discomfort. Dandruff tends to get worse in winter.

The word "dandruff" comes from the combination of "ten," meaning "letter," and "drof," meaning "dirty scalp." Normally, about 487,000 skin cells per square centimeter are shed after washing with shampoo, but in dandruff cases, this number increases to 800,000. Dandruff happens when the scalp becomes too dry or too oily, causing white flakes to appear in the hair or on the shoulders. While it is not a serious condition, it can be annoying and embarrassing.

**Causes of Dandruff**

Dandruff can be triggered by multiple factors, including: 1. *Malassezia* Fungus – A naturally occurring yeast-like fungus that thrives on the scalp and causes excessive skin cell shedding. 2. Dry Scalp – Insufficient moisture leads to flaking and itchiness. 3. Excess Oil Production (Seborrheic Dermatitis) – Overproduction of sebum creates an environment for fungal growth. 4. Product Buildup – Excessive use of hair products can cause residue accumulation, leading to irritation. 5. Poor Hygiene – Infrequent hair washing allows oil, dirt, and dead cells to accumulate. 6. Dietary Deficiencies – Lack of essential nutrients like zinc, vitamin B, and healthy fats can contribute to dandruff. 7. Stress and Hormonal Changes – Emotional and hormonal imbalances can increase scalp sensitivity and dandruff information.

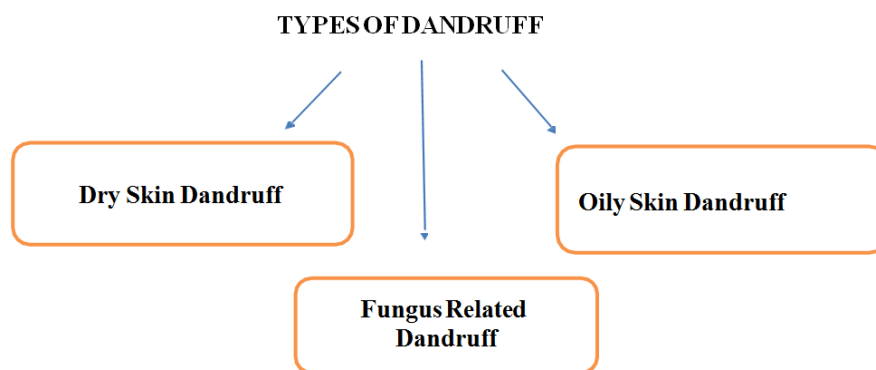
**Common signs of dandruff include**

White or yellow flakes on the scalp, hair, or shoulders - Itchy and irritated scalp - Red or inflamed skin (in severe cases) - Greasy patches on the scalp - Dryness and rough texture of hair

**Prevention and Management**

To prevent and manage dandruff effectively:

- Use herbal shampoos with antifungal and soothing properties.
- Maintain proper scalp hygiene by washing hair regularly.
- Avoid harsh chemicals like sulfates and parabens in hair products.
- Moisturize the scalp using natural oils like coconut or tea tree oil.
- Eat a balanced diet rich in essential vitamins and minerals.
- Reduce stress levels through meditation and relaxation techniques.



## SHAMPOO

Shampoo is a liquid or gel-based cleansing product designed for washing and cleaning hair. It is typically used to remove dirt, oil, and product buildup from the scalp and hair. Here's a breakdown of key details.

**1. Ingredients:** - **Surfactants Cleansers:** These are the primary ingredients responsible for removing oils and dirt. - **Conditioning Agents:** These help soften the hair, making it easier to manage. Examples include silicones dimethicone or natural oils argan oil. - **Preservatives:** Ingredients like parabens or phenoxyethanol prevent microbial growth and extend the shelf life of the shampoo. - **Fragrances:** Artificial or natural scents added for a pleasant smell. - **Active Ingredients:** Depending on the shampoo's purpose, active ingredients might include proteins keratin, vitamins biotin, botanical extracts aloe vera, or other elements targeted at specific hair concerns e.g., dandruff or hair loss.

**2. Types of Shampoos:** - **Clarifying Shampoo:** Deep cleans hair and removes buildup, often used before treatments or if hair feels weighed down. - **Moisturizing Shampoo:** Adds hydration and is ideal for dry or damaged hair. - **Volumizing Shampoo:** Adds body and fullness, often formulated for fine or limp hair. - **Dandruff Shampoo:** Contains antifungal or medicated ingredients (e.g., zinc pyrithione ketoconazole) to help control dandruff. - **Color-Protecting Shampoo:** Designed for color-treated hair, these shampoos help preserve hair dye by preventing fading. - **Sulfate-Free Shampoo:** Does not contain sulfates, which can be harsh and drying, ideal for sensitive or curly hair. - **Baby Shampoo:** Gentle formulas designed for babies and people with sensitive skin.

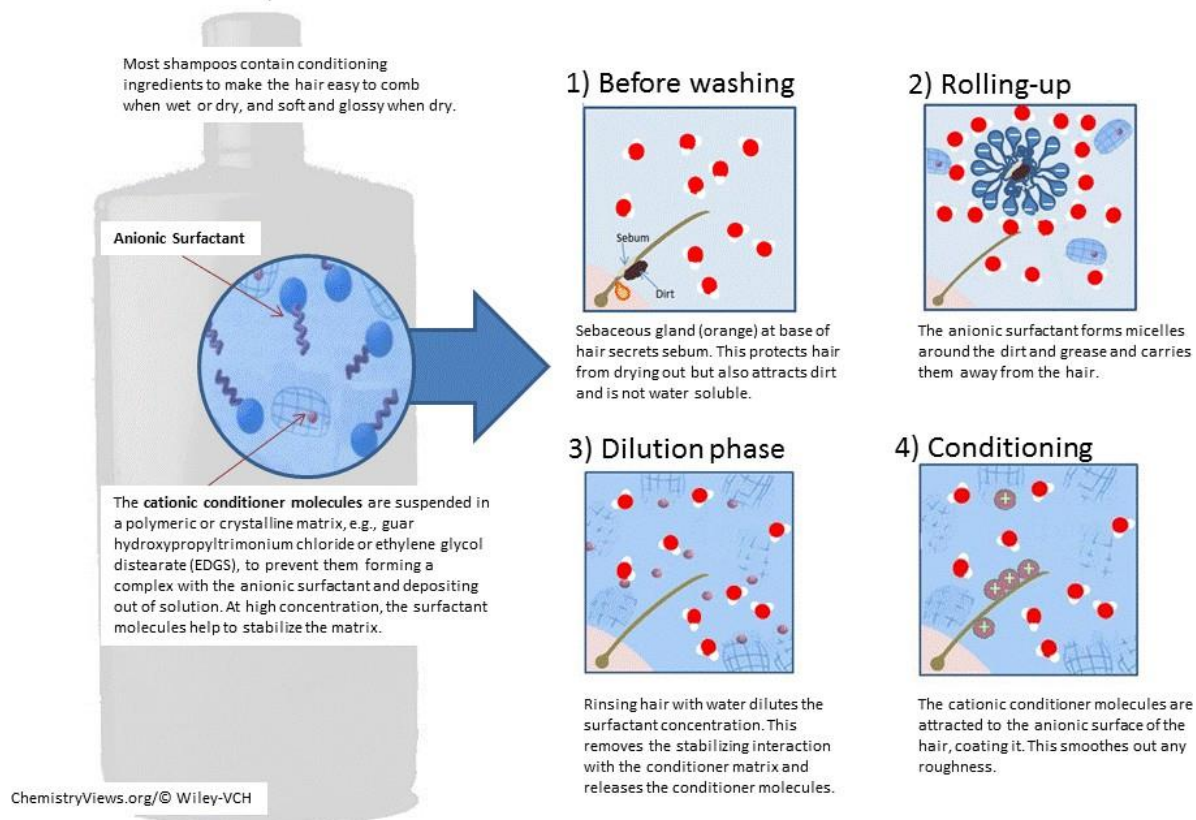
**3. Usage Instructions:** - Apply to wet hair.

- Rinse thoroughly with water
- Repeat if needed especially with clarifying or deep-cleansing shampoos

**4. Benefits:** - Cleanses hair and scalp, removing oils, dirt, and product buildup. - Keeps hair manageable and smooth, depending on conditioning ingredients. - Some shampoos provide additional benefits like promoting hair growth, preventing.

## ACTION OF SHAMPOO

### How a Shampoo Works



**Fig n.1.1**

## 2. Literature review

- 1. Gupta et al. (2024):** investigated the use of biodegradable ingredients in anti-dandruff shampoos, addressing environmental concerns related to synthetic chemicals. Their review emphasized the shift toward eco-friendly formulations containing plant-based surfactants and natural oils, such as rosemary and lavender oils, which are effective against *Malassezia* without contributing to environmental pollution.
- 2. Morris & Lee (2024):** focused on innovations in anti-dandruff technology, including the use of probiotics and prebiotics to balance the scalp's microbiome. They concluded that enhancing the scalp's microbial balance can help prevent fungal overgrowth, which is one of the primary causes of dandruff.
- 3. Pandey & Singh (2023):** examined the efficacy of pyrithione zinc, a common antifungal

agent, in reducing dandruff caused by *Malassezia*. Their study found that pyrithione zinc continued to be one of the most effective agents, particularly In combination with salicylic acid for exfoliation and ketoconazole for more severe cases.

4. **Kumar & Sharma (2023):** explored the rising interest in herbal anti-dandruff shampoos. Ingredients like neem, tea tree oil, and aloe vera were highlighted for their antifungal and soothing properties. Herbal formulations have seen increased popularity due to their reduced risk of side effects and their ability to support scalp health.
5. **Das & Mehta (2023):** looked into the use of cannabidiol (CBD) oil in anti- dandruff formulations. Their study highlighted CBD's anti-inflammatory properties, which can soothe scalp irritation and reduce flaking. While still a niche ingredient, its popularity is expected to grow in the coming years.
6. **Ahmed, F., & Kaur, P. (2022):** Focused on pH-balanced antidandruff shampoos. The researchers argued that maintaining a slightly acidic pH (around 5.5) helps prevent excessive oil production and fungal growth on the scalp, reducing dandruff occurrence.
7. **Sharma, N., & Verma, S. (2021):** Explored the use of herbal extracts like neem, tea tree oil, and aloe vera in shampoo formulations. The study emphasized the benefits of herbal components for scalp health and their ability to reduce dandruff with side effects compared to chemical ingredients.
8. **Mehta, A., & Verma, R. (2021):** Examined the combination of pyrithione zinc and salicylic acid. The findings suggested that pyrithione zinc reduced fungal growth, while salicylic acid exfoliated the scalp, making this combination highly effective for long- term dandruff control.

#### 4.1 METHOD OF PREPARATION

##### Preparation Steps

1. Collecting Ingredients – All the ingredients were purchased in dry form.
2. Weighing – Each herbal powder was measured using a digital scale.
3. Grinding – The raw ingredients were crushed into smaller pieces using a mortar and pestle.
4. Mixing – The crushed ingredients were blended well in a mixer to form a fine, uniform powder.
5. Sieving – The powder was passed through a fine sieve (No. 100) to get a smooth texture.
6. Final Weighing – After sieving, the final powder was weighed again.

## 4.2 PROCEDURE

### Herbal Anti-Dandruff Shampoo Powder

#### Detailed Preparation Procedure

This herbal anti-dandruff shampoo powder is made using natural ingredients known for their cleansing, antifungal, and scalp-nourishing properties.

#### Ingredients & Their Benefits

1. Shikakai (*Acacia concinna*) - 100g
  - Natural cleanser, strengthens hair, prevents dandruff.
2. Reetha (Soapnut) - 100g
  - Lathers naturally, removes excess oil and dandruff.
3. Amla (Indian Gooseberry) - 50g
  - Rich in Vitamin C, promotes scalp health, fights dandruff.
4. Neem Leaves (Dried) - 50g
  - Antifungal and antibacterial, treats dandruff and scalp infections.
5. Fenugreek Seeds (Methi) - 25g
  - Soothes the scalp, reduces itching and dryness.
6. Aloe Vera Powder - 25g
  - Moisturizes scalp, prevents flaking and irritation.
7. Hibiscus Flower Powder - 25g
  - Conditions hair, prevents dryness, and supports scalp health.
8. Bhringraj Powder - 25g
  - Strengthens hair, reduces hair fall, and fights dandruff.
9. Tulsi (Holy Basil) Leaves Powder - 25g
  - Antibacterial, purifies the scalp, and controls dandruff.

#### Preparation Procedure

##### Step 1: Drying the Ingredients

- If using fresh herbs, wash them thoroughly and dry them under shade for 4-5 days until crisp.
- Ensure no moisture remains, as it may lead to fungal growth in the powder.

##### Step 2: Grinding the Ingredients

- Grind each dried ingredient separately into a fine powder using a grinder.

- Sieve the powders to remove coarse particles.

#### Step 3: Mixing the Powders

- In a large, dry mixing bowl, combine all the powdered ingredients in the specified quantities.
- Mix thoroughly to ensure uniform blending.

#### Step 4: Storage

- Store the final herbal shampoo powder in an airtight container.
- cool dry and keep sunlight and moisture form the space.

#### Usage Instructions

##### 1. For Regular Use

- Take 2-3 tablespoons of the powder in a bowl.
- Mix with warm water or yogurt to form a paste.
- Apply to the scalp and hair, massage gently, and leave for 5-10 minutes.

##### 2. For Intense Dandruff Treatment

- Mix with aloe vera gel or diluted lemon juice for extra antifungal benefits.
- 15 minutes before leave on for washing off.

#### Shelf Life

If stored properly in an airtight container, the herbal shampoo powder can last for 6-12 months.

### 4.3 EVALUATION STUDIES

#### Evaluation of Herbal Shampoo Powder

##### 1. Organoleptic Characteristics Evaluation

The **color, taste, smell, and texture** of the shampoo powder were examined.

##### 1. General Powder Characteristics

- Angle of Repose** – This test checks how the powder flows. It is done by letting the powder fall from a funnel onto a surface and observing the angle it forms.
- Bulk Density** – This measures how much space the powder takes up in a container. A weighed amount of powder was placed in a **100 ml measuring cylinder**, and its volume was recorded.
- Tapped Density** – This checks how compact the powder becomes after tapping. The measuring cylinder was tapped for **1 minute**, and the powder's volume was recorded.



d. **Hausner's Ratio & Compressibility Index** – These values were calculated based on bulk and tapped density to determine how well the powder packs together.

e. **Particle Size** – The size of the powder particles was checked by shaking it through a standard sieve for 10 minutes.

## 2. Physicochemical Evaluation

a. **pH** – The acidity or alkalinity of a 10% shampoo solution in distilled water was measured using a digital pH meter at 25°C.

b. **Washability** – The shampoo's ability to clean was tested by applying it to the skin and washing it off with water.

c. **Solubility** – This test checked how much of the powder dissolves in a liquid. The amount of powder that dissolves in a given volume of liquid was recorded.

d. **Moisture Content** – 10g of shampoo powder was dried in a hot air oven at 105°C. It was dried for 30 minutes until no more weight loss was observed.

e. **Ash Value** – 2g of shampoo powder was burned on a silicon plate. The ash was weighed after it had fully burned.

f. **Acid Insoluble Ash** – The ash from the previous test was boiled with 25 ml diluted hydrochloric acid (HCl) for 5 minutes. The remaining solid was filtered, washed, burned again, and weighed

## 3. Additional Evaluations

a. **pH (Repeated Measurement)** – The pH of a 10% shampoo solution was again measured using a digital pH meter at 25°C.

b. **Foaming Capacity** – The ability of the shampoo to produce foam was tested by mixing 2g of powder with 50 ml of water in a measuring cylinder. Foam stability was observed over different time periods.

## 4. CONCLUSION

Herbal medications contribute to the beauty of the worldwide market, health care, hair preparation, and hair study in today's world. As a review, we've come to the conclusion that the powdered herbal shampoo decreases swelling, minimises side effects, and promotes conditioning. These are preliminary experiments, however the assessment value provided for the honesty of herbal powder shampoo will be useful. we have study this and the result of this project will be shown in next semester.



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