IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

# "FORMULATION AND EVALUATION OF HERBAL ANTI-DANDRUFF SHAMPOO USING POLYHERBAL EXTRACTS"

**Ms.Amruta Anand Ade, Ms. Akanksha Dipak Chaudhari Ms.Karina Ashok Ade, Ms.Pooja Kishor Adhao**

**Guidance By: Prof. Shubham Jaiswal**

**ABSTRACT:**

This study focuses on the formulation and evaluation of an effective herbal anti-dandruff shampoo using traditional medicinal plants known for their therapeutic properties. Natural ingredients such as Reetha, Shikakai, Amla, Aloe Vera, Neem, Tulsi, and Hibiscus were carefully selected based on their antifungal, antibacterial, and scalp-soothing abilities. The formulation aimed to create a chemical-free, scalp-friendly product that not only removes dandruff but also nourishes the hair. The prepared shampoo underwent thorough evaluations including pH balance, viscosity, foaming capacity, spreadability, and microbial analysis. Results demonstrated that the herbal shampoo possesses desirable physicochemical properties, maintains microbial safety, and exhibits effective dandruff control without harmful effects. This project highlights the potential of herbal formulations as a safe, sustainable, and consumer-friendly alternative to conventional shampoos.

**KEYWORDS:** Herbal shampoo, anti-dandruff, natural ingredients, scalp health, antifungal, eco-friendly, Reetha, Shikakai, Amla, Neem, Aloe Vera.

## Introduction:

Hair care has been an integral part of human hygiene and grooming practices for centuries. Among various hair care products, shampoo is the most commonly used formulation for cleansing the scalp and hair. Traditionally, hair was washed using natural substances such as clay, plant extracts, and herbal infusions. However, with advancements in cosmetic science, synthetic shampoos have become widely available, offering convenience and effective cleansing. Despite their popularity, many commercial shampoos contain harsh chemicals such as sulfates, parabens, silicones, and artificial fragrances, which may lead to scalp irritation, excessive dryness, hair fall, and environmental pollution. These concerns have driven an increasing preference for herbal and organic shampoos, which are formulated using natural plant-based ingredients known for their cleansing, conditioning, and therapeutic properties.

Herbal shampoos offer a gentle yet effective alternative to chemical-based formulations. Unlike synthetic detergents, which strip the hair of its natural oils, herbal shampoos maintain scalp health and hair moisture balance. The use of medicinal plants such as Reetha (Soapnut), Shikakai, Amla, Neem, Tulsi, Hibiscus, and Aloe Vera provides multiple benefits, including natural cleansing, nourishment, dandruff control, and hair strengthening. These ingredients have been traditionally used in Ayurveda and herbal

medicine, making them an ideal choice for safe and sustainable hair care. Additionally, herbal shampoos are biodegradable, eco-friendly, and free from harmful additives, reducing their impact on the environment.

The increasing awareness of natural and holistic beauty practices has led to significant growth in the herbal hair care market. Consumers are now seeking products that are free from toxic chemicals and enriched with plant-based nutrients. However, despite the numerous advantages, the formulation of herbal shampoos presents several challenges, such as achieving satisfactory foaming properties, shelf stability, and cleansing effectiveness comparable to synthetic shampoos. Therefore, scientific research and evaluation are essential to optimize herbal formulations, ensuring they provide the desired cleansing action, scalp nourishment, and long-term hair benefits.

**Objectives :**

- To formulate a natural shampoo using selected herbal ingredients.
- To utilize the cleansing and conditioning properties of Reetha, Shikakai, and Amla.
- To incorporate Aloe Vera, Neem, Tulsi, and Hibiscus for scalp nourishment and hair health.
- To evaluate the shampoo for physical properties like pH, viscosity, and foaming.
- To assess the stability and microbial safety of the prepared formulation.
- To develop a chemical-free alternative that is safe, eco-friendly, and effective for regular hair care.

## Benefits of herbal shampoo :

- Gentle and Mild Cleansing
- Nourishes and Strengthens Hair
- Prevents Hair Fall and Promotes Growth
- Maintains Scalp's Natural pH Balance
- Controls Dandruff and Scalp Infections
- Delays Premature Graying
- Eco-Friendly and Biodegradable

## Functions of Herbal Shampoo :

- Natural Cleansing Action
- Strengthening Hair Roots
- Promoting Hair Growth
- Acting as a Natural Conditionert
- Preventing Dandruff and Dryness
- Delaying Premature Graying
- Reducing Hair Fall

## Herbal Ingredients Used in Formulation:

### 1. Reetha

Other Common Names: Soapnut, Aritha, Ritha, Indian Soapberry Biological Source:

Sapindus mukorossi

Key Constituents: Saponins, flavonoids, tannins

Uses: Natural cleanser; produces mild lather; removes oil and dirt; maintains scalp hygiene.

**Fig 1 : Reetha**

### 2. Shikakai

Other Common Names: Hair Fruit, Soap Pod, Seekaikai (in Tamil), Sigge (in Kannada) Biological Source:

Acacia concinna

Key Constituents: Saponins, tannins, vitamins A, C, D, E, and K

Uses: Gentle cleanser; strengthens roots; adds shine; acts as a natural detangler and conditioner.

**Fig 2 : Shikakai**

**3. Amla**

Other Common Names: Indian Gooseberry, Nellikai (in Tamil), Usirikaya (in Telugu), Awla Biological

Source: Phyllanthus emblica

Key Constituents: Vitamin C, tannins, gallic acid, polyphenols
Uses: Strengthens hair follicles; enhances growth; delays graying; adds volume and shine.

**Fig 3 : Amla**

**4. Aloe Vera**

Other Common Names: Ghritkumari, Gwar Patha, Indian Aloe Biological Source:

Aloe barbadensis miller

Key Constituents: Polysaccharides, amino acids, vitamins (A, C, E, B12), enzymes

Uses: Moisturizes scalp; soothes irritation; reduces dandruff; promotes hair growth.

**Fig 4 : Aloe Vera**

**5. Tulsi**

Other Common Names: Holy Basil, Vrinda, Tulasi, Sacred Basil Biological Source:

Ocimum sanctum (also known as Ocimum tenuiflorum) Key Constituents: Eugenol,

ursolic acid, flavonoids, rosmarinic acid

Uses: Antibacterial; improves blood circulation; treats dandruff and scalp infections.

**Fig 5 : Tulsi**

**6. Neem**

Other Common Names: Indian Lilac, Nimba, Veppam (in Tamil), Nim (in Hindi & Bengali) Biological

Source: Azadirachta indica

Key Constituents: Azadirachtin, nimbin, nimbolide, quercetin

Uses: Antiseptic; treats dandruff; controls scalp oiliness; fights bacteria and fungi.

**Fig 6 : Neem**

**7. Hibiscus**

Other Common Names: Shoe Flower, China Rose, Jaswand (in Marathi), Gurhal (in Hindi), Chembaruthi (in Tamil)

Biological Source: Hibiscus rosa-sinensis

Key Constituents: Anthocyanins, flavonoids, mucilage, amino acids

Uses: Enhances hair volume and texture; prevents hair fall and graying; deeply conditions hair.

**Fig 7 : Hibiscus**

| Sr No. | Ingredients | Quantity | Properties |
|---|---|---|---|
| 1 | Reetha | 10g | Natural cleanser, foaming agent |
| 2 | Shikakai | 8g | Adds shine, promotes hair growth |
| 3 | Amla | 8g | Strengthen roots, rich in vitamin c |
| 4 | Aloe vera | 7g | Moisturizes scalp, soothes irritation |
| 5 | Tulsi | 6g | Antimicrobial |
| 6 | Neem | 5g | Antibacterial, treats dandruff |
| 7 | Hibiscus | 6g | Conditions hair, reduce hair fall |

**Table 1 : List of materials.**

**Method Of Preparation:**

**1. Powdering:**
Dry all the herbal ingredients (Reetha, Shikakai, Amla, Neem, Tulsi, and Hibiscus) and grind them into a fine powder.

**2. Extraction**:
Mix the powdered herbs in distilled water and boil for 30–45 minutes to extract active compounds.

**3. Filtration:**
Allow the decoction to cool, then filter using muslin cloth or filter paper to remove residues.

4. Aloe Vera Gel Addition:
Add fresh Aloe Vera gel to the filtrate and stir well to combine.

**5. Blending:**
Mix all the ingredients thoroughly until a uniform, smooth shampoo base is formed.

**6. Cooling & Storage:**
Let the shampoo cool completely and transfer it into clean, dry bottles for storage.

**Formulation Of Herbal Shampoo:**

The formulation of herbal shampoo involves the use of natural plant-based ingredients such as Reetha, Shikakai, Amla, Aloe Vera, Neem, Tulsi, and Hibiscus. These herbs are selected for their cleansing, conditioning, and antimicrobial properties. The dried herbal powders are boiled in water to extract their active components. The decoction is then filtered and combined with fresh Aloe Vera gel to create a smooth, foaming shampoo base. This formulation is free from synthetic surfactants, making it a gentle and eco-friendly alternative for scalp and hair care.

**Fig 8 : Herbal Shampoo**

**EVALUATION PARAMETERS:**

The formulation was evaluated for different pharmaceutical parameters.

**1. Physical Appearance**

Checks the clarity, color, texture, and homogeneity of the shampoo.

**2. Odor**

Ensures the shampoo has a pleasant and natural fragrance, free from any foul smell.

**3. pH Value**

Determines the acidity or alkalinity; ideal range is 4.5 to 6.5 for scalp compatibility.

**4. Foaming Ability**

Measures the amount and stability of foam produced during use.

**5. Viscosity**

TAssesses the thickness and flow behavior of the shampoo using a viscometer.

**6. Spreadability**

Evaluates how easily the shampoo spreads on the scalp and hair surface.

**7. Wetting Time**

Time taken for a cotton swab to sink in the shampoo solution; indicates cleansing efficiency.

**8. Solid Content**

Measures the total amount of solid constituents present in the shampoo.

**9. Surface Tension**

Determines the tension reduction property of the shampoo in contact with water.

**10. Dirt Dispersion Test**

Checks the shampoo's ability to disperse and lift dirt particles from the scalp.

**11. Stability Test**

Observes product stability over time under various storage conditions.

**12. Microbial Load Test**

Ensures the absence of harmful microbial growth in the shampoo formulation.

**Result:**

The formulated herbal shampoo was evaluated based on various physicochemical and microbial parameters, and the results confirmed its suitability for cosmetic use. The shampoo exhibited a uniform and smooth texture with a natural herbal color and pleasant fragrance, free from any synthetic additives. The pH of the formulation was found to be between 5.0 and 6.0, which is ideal for scalp and hair health, ensuring it does not cause irritation or dryness. It showed good foaming ability with stable lather formation, indicating efficient cleansing action even without synthetic surfactants. The viscosity of the shampoo was moderate, which allowed for easy application and rinse-off, while also supporting even spreadability across the scalp and hair strands.

In the wetting time test, the cotton swab sank within a few seconds, suggesting good penetration and cleansing efficiency. The solid content was within the acceptable range, reflecting an adequate concentration of active herbal constituents. The shampoo also demonstrated a lower surface tension, enhancing its ability to remove oils and dirt effectively. During the dirt dispersion test, the shampoo was able to keep dirt particles suspended in the foam rather than allowing them to redeposit, which further supports its cleansing efficiency.

| EVALUATION PARAMETERS | OBSERVATION |
|---|---|
| Appearance | Smooth, uniform |
| Colour | Natural brown colour |
| Odour | Pleasant,mild herbal fragrance |
| PH | 5.5 |
| Foaming Ability | Moderate and stable foam produced |
| Viscosity | Medium viscosity<br>Easy to apply and rinse |
| Spreadability | Evenly spreads over scalp |
| Wetting time | Cotton sank within 2-3 seconds |
| Stability | Stable for 30 days under various conditions |
| Microbial load | No microbial growth detected |

**Table 2 : Result**

**Summary :**

The formulation and evaluation of the herbal anti-dandruff shampoo using natural ingredients like Reetha, Shikakai, Amla, Aloe Vera, Tulsi, Neem, and Hibiscus aimed to create a safe, effective, and eco-friendly alternative to chemical-based shampoos. Each ingredient was selected for its known therapeutic benefits such as cleansing, antifungal, antibacterial, conditioning, and scalp-nourishing properties. The shampoo was prepared using a simple and cost-effective method without any synthetic additives or preservatives.

The final product underwent a series of evaluations to determine its physical, chemical, and microbiological properties. Results showed that the shampoo had a pleasant appearance, a mild herbal fragrance, and an ideal pH suitable for scalp health. It produced stable foam, spread evenly, and showed effective dirt dispersion. The formulation remained stable over time and showed no microbial contamination, confirming its safety and shelf-life.

Overall, the herbal shampoo was found to be effective, skin-friendly, and environmentally safe, making it a suitable choice for regular hair care and dandruff control without the side effects of synthetic products.

**Conclusion:**

The present study successfully demonstrates the formulation and evaluation of an effective herbal anti-dandruff shampoo using natural ingredients like Reetha, Shikakai, Amla, Aloe Vera, Neem, Tulsi, and Hibiscus. The combination of these herbs provided a synergistic effect, offering cleansing, conditioning, antimicrobial, and scalp-soothing benefits without the use of harmful chemicals. The prepared formulation met all key evaluation criteria, including appropriate pH, good foaming capacity, spreadability, viscosity, and microbial stability.

The findings confirm that the herbal shampoo is safe for regular use and can serve as a natural alternative to commercial shampoos, which often contain synthetic surfactants and preservatives. With further standardization and long-term studies, such herbal formulations hold significant potential for large-scale production and market acceptance. Thus, this herbal shampoo aligns with current consumer preferences for natural, skin-friendly, and eco-conscious hair care solutions.

**References:**

1. Anitha, A. et al. (2020). Formulation and Evaluation of Herbal Shampoo Containing Natural Ingredients. International Journal of Pharmaceutical Sciences Review and Research, 65(1), 45-50.

2. Bhatia, S. C. (2017). Perfumes, Soaps, Detergents and Cosmetics. CBS Publishers & Distributors Pvt. Ltd.

3. Singh, R. and Mittal, V. (2019). Herbal Cosmetics: A Safe and Effective Approach. Journal of Herbal Medicine Research, 3(2), 22-29.

4. Kaur, R. et al. (2021). Amla and Shikakai Based Herbal Hair Cleansers – An Overview. Research Journal of Topical Sciences, 9(4), 38-44.

5. Kamboj, V. P. (2000). Herbal Medicine in India: Current Status and Future Scope. Current Science, 78(1), 35-39.

6. Sharma, P. and Saini, S. (2018). Comparative Study of Synthetic and Herbal Shampoos. International Journal of Research in Cosmetic Science, 8(3), 15-20.

7. Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2019). Pharmacognosy. Nirali Prakashan.

8. Jain, S. et al. (2017). Evaluation of Herbal Shampoo Formulated with Traditional Indian Plants. Journal of Herbal Pharmacotherapy, 16(2), 102–110.

9. Khan, A. et al. (2020). Formulation and Characterization of Natural Shampoo Using Herbal Extracts. Journal of Ayurveda and Integrative Medicine, 11(1), 23-28.

10. Ali, M. (2008). Textbook of Pharmacognosy. CBS Publishers.

11. Verma, R. et al. (2016). Antimicrobial Properties of Herbal Shampoo Prepared Using Neem and Tulsi. Indian Journal of Natural Products and Resources, 7(4), 125–129.

12. Nema, R. K., et al. (2012). Preparation of Herbal Shampoo Using Different Herbs and Evaluation of its Quality Parameters. International Journal of Pharmaceutical Sciences and Research, 3(6), 1603-1608.

13. Pratibha, D. et al. (2021). Natural Surfactants from Herbal Sources: An Alternative to Sulfates in Hair Cleansers. International Journal of Green Pharmacy, 15(2), 100-106.

14. Rathi, D. et al. (2015). Comparative Evaluation of Herbal and Synthetic Shampoos. International Journal of Pharmacy and Technology, 6(3), 7256–7263.

15. World Health Organization (2004). Guidelines for the Assessment of Herbal Medicines. WHO Publications.