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## Review Paper

# A Review on Formulation and Evaluation of Herbal Shampoo

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## ABSTRACT

The primary objective of this study is to formulate and evaluate a herbal shampoo, focusing on its physicochemical properties, as well as its safety, efficacy, and quality. Herbal shampoo serves as a natural hair care solution designed to promote hair growth, enhance strength and darkness, and eliminate dandruff and excess oil. Additionally, it provides luster, softness, and a silky texture to the hair. Conventional cosmetic shampoos are often composed of various chemical agents that can lead to several adverse effects, such as headaches, nausea, discomfort, increased flaking, hair loss, and irritation. Consequently, this study aims to develop a herbal shampoo that is free from such negative side effects.

## INTRODUCTION

**Herbal Shampoo:** Shampoos are recognized as the most commonly used cosmetic products for cleansing hair and scalps in our daily routines [1]. Like traditional shampoos, herbal shampoos are formulated with Ayurvedic herbs to effectively cleanse both hair and scalp. They aim to eliminate environmental pollutants, excess oils, dandruff, and dirt. Herbal shampoos are categorized as cosmetic products that utilize plant-derived ingredients rather than synthetic ones typically found in retail. Given the health benefits associated with herbal products, a growing number

of consumers are opting for them over chemical-based alternatives, underscoring the significance of herbal shampoos. The increasing appeal of herbal cosmetics can largely be ascribed to the perception that they are safe and devoid of adverse side effects. The necessity for shampoo stems from sebum, a natural oily substance produced by the scalp. This secretion serves to coat the hair and provide protection, contributing to a healthy shine. Excessive sebum production can result in a disheveled appearance.

### The Indian subcontinent's history

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Since ancient times, a wide range of herbs and their extracts have been utilized as shampoos throughout the Indian subcontinent. Using the filtered extract, Sapindus was boiled with dried Indian gooseberry (amla) and a variety of other herbs to create a very powerful early shampoo. Sapindus, a tropical tree that grows widely throughout India, is often referred to as soapberries or soapnuts [3]. Saponins, which are naturally occurring surfactants, have been documented in ancient Indian literature as being present in fruit pulp. In Indian scriptures, the lather produced by soapberry extract is referred to as phenaka [4]. It leaves the hair manageable, lustrous, and silky. Shikakai (*Acacia concinna*), hibiscus blossoms, ritha (*Sapindus mukorossi*), and arappu (*Albizia amara*) were additional hair-cleaning agents [5,6]. In the 16th century, Guru Nanak, the founder and first Guru of Sikhism, referenced soap and the soapberry tree. Early colonial traders in India indulged in cleansing with hair and body massage (champu) during their daily bath. They brought the newly acquired habits back to Europe, including the hair treatment they named shampoo [9].

### The ideal characteristics of a herbal shampoo include:

1. Thoroughly and effectively eliminating dust, dirt, excess sebum, other fatty substances, and loose corneal cells from the hair.
2. producing a good amount of foam to meet the user's psychological needs.
3. being easily removed upon rinsing with water.
4. leaving the hair non-dry, soft, lustrous, manageable, and with minimal flyaway.
5. Adding a pleasant fragrance to the hair.
6. Not irritating the skin or eyes.
7. Not making the hand rough and chapped [10,11].

## METHODS AND MATERIALS

### Extract preparation

Neem, Hibiscus flower, Aloe vera, Shikakae, liquorice, Amla, and soap nut powders, each weighing around 100 g, were homogenized. After four hours of boiling, the powdered material was removed using distilled water. Each plant material's extract was separated and allowed to evaporate.

**Table no. 1 Extraction of Herbal drugs**

Sr. No.	Drugs Name	Parts	Quantity for 100g
1.	Neem powder	Leaves	09%
2.	Hibiscus flower powder	Flower	12%
3.	Aloe vera powder	Leaves	07%
4.	Shikakai powder	Pods	22%
5.	Liquorice powder	Root	05%
6.	Amla powder	Fruit	25%
7.	Soap Nut	Nut	20%

### Preparation of an herbal shampoo

The herbal shampoo was created using the recipe listed in Table 1. The herbal extract was added to the 10% gelatine solution and thoroughly shaken every 20 minutes for 20 minutes. Additionally, 1

cc of lemon juice was added while being continuously stirred. A sufficient amount of essential oil (rose oil) was added to the formulation to boost its aroma, and gelatine was used to get the volume up to 100 ml.



**Table 2 Formulation of Herbal Shampoo**

Material required	Quantity	Medicinal use
Neem extract	0.5g	Antibacterial agent
Soap nut extract	0.5g	Foaming agent
Amla extract	0.5g	Antidandruff agent
Shikakai	0.5g	Detergent
Hibiscus	0.5g	Conditioning agent
Bhringraj extract	0.5g	Hair growth
Aloe vera	01g	Moisturizing agent
Gelatine	q.s	Gelling agent
Lemon juice	q.s	Antimicrobial
Rose oil	q.s	fragrance

### Evaluation of herbal shampoo

The formulated product underwent evaluation for performance, which includes sensory characteristics, pH, physicochemical characterization, and solid content. To guarantee product quality, standardized protocols were employed to conduct specific tests measuring surface tension, foam volume, foam stability, and wetting time.

**1. Visual assessment** - The formulated product was evaluated for color, clarity, scent, and froth content.

**2. pH determination** - The pH of the formulated herbal shampoo in distilled water (10% v/v) was measured using a pH analyzer at room temperature [12].

**3. Determination of solid content percentage** - The percentage of solid content was determined by weighing approximately 4 g of shampoo in a dry, clean, evaporating dish. To confirm the findings, specific tests were performed for surface tension, foam volume, foam stability, and wetting time using standardized protocols.

**4. Visual evaluation** - The developed product was assessed for its color, clarity, fragrance, and foam content.

**5. pH measurement** - The pH level of the prepared herbal shampoo in distilled water (10% v/v) was determined using a pH meter at ambient temperature [12].

**6. Determination of solid content percentage** - The percentage of solid content was determined by weighing approximately 4 g of shampoo in a dry, clean, evaporating dish. To verify the outcome, the procedure was repeated. The liquid part of the shampoo was evaporated in a dish on a hot plate. The percentage and weight of the solid contents in the shampoo were calculated after complete drying [13].

**7. Surface tension measurement** - The formulated shampoo in distilled water (10% w/v) was assessed for surface tension using a stalagmometer at room temperature [14].

**8. Testing of wetting** - Wetting time was recorded by observing the duration it took for the canvas paper to sink entirely [3]. A canvas paper weighing 0.44 g was cut into a disc with a diameter of 1 inch. The canvas paper disc was placed over the surface of the shampoo (1% v/v), and the time taken for the paper to sink was measured with a stopwatch.

**9. Foam stability test** - The foam stability was evaluated using the cylinder shake method. Approximately 50 ml of the formulated shampoo

(1%) solution was placed in a 250 ml graduated cylinder and shaken vigorously 10 times. Foam stability was assessed by recording the foam volume immediately after shaking and at 4 minutes, respectively [15]. The total foam volume was recorded after 1 minute of shaking.

**10. Dirt dispersion test** - Two drops of cleanser were added to 10 ml of distilled water and placed into a wide-mouthed test tube. One drop of Indian ink was added to the formulated shampoo, and the test tube was sealed with a stopper and shaken for 10 minutes. The volume of ink in the foam was assessed, and the result was categorized as none, slight, medium, or heavy [16].

**11 Assessment of conditioning performance** - A synthetic hair tress, procured from a salon and originating from Indian women, was divided into two sections, each measuring approximately 10 cm in length, each weighing 5 g. The control swatch was the one that had not been washed, while the test swatch was washed with the formulated shampoo. Each tress was immersed for 2 minutes in a mixture of shampoo and water in a ratio of 10:15 contained in a conical flask and rinsed with 50 ml of distilled water. Each tress was air-dried at room temperature, and the process was repeated for a maximum of 10 times. The conditioning effect of the formulated shampoo regarding softness and smoothness was assessed through a blind touch test involving 20 randomly selected student volunteers [17]. The efficacy of the shampoo was graded on a scale from 1 to 4 (4 - excellent, 3 - good, 2 - satisfactory, and 1 - poor) by instructing all the chosen students to touch the tress that had been washed with the formulated shampoo.

## RESULT-

The shampoo was created by blending equal parts of the aqueous extracts of all the ingredients with

soapnut (Table 1). The aforementioned plant extract contains phytoconstituents such as saponins, which are natural surfactants with detergent properties and foaming abilities. An optimal shampoo should possess sufficient viscosity, and numerous natural substances exhibit favorable viscosity. The gelatin solution (10%) acts as a pseudoplastic, resulting in clear solutions. Lemon juice (1 ml) included in the shampoo functions as an anti-dandruff agent, a natural antioxidant, and a chelating agent while maintaining the acidic pH of the formulation.

## CONCLUSION-

The current study was aimed at preparing an herbal shampoo that minimizes hair loss while promoting the growth and strength of hair. The herbal shampoo was developed using the aqueous extract of medicinal plants that have been traditionally utilized for hair cleansing. The use of conditioning agents (synthetic) leads to protein loss or hair damage. To achieve effective conditioning effects, this study utilizes shikakai, amla, and other plant extracts instead of synthetic agents.

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