

## Review Article-Herbal Shampoo

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### **Abstract: -**

Herbal shampoo, derived from traditional ayurvedic herbs, serves as a cosmetic preparation specifically designed for the purpose of cleansing both the hair and scalp, similar to regular shampoo. Its primary function is to eliminate excess oils, dandruff, dirt, and environmental pollutants that accumulate on the hair and scalp.

In addition to its cleansing properties, herbal shampoo also offers various benefits such as conditioning, smoothing, and promoting good hair health. The safety advantages of herbal shampoo are highly anticipated, as it is expected to be non-toxic and minimize the occurrence of allergic reactions. Moreover, the effectiveness of numerous ingredients used in herbal cosmetics has been proven over time. Consequently, our current research has identified several positive attributes of herbal shampoo, and further investigation is warranted to optimize its benefits for human use as a cosmetic product.

**Keywords:** Cosmetic, Herbal Shampoo, Hair Dandruff, Cleansing Action, Ayurvedic Herbs

### **Introduction: -**

“Herbal Shampoo: The Most Popular Hair Cleansing Product in Your Daily Routine. A shampoo is a solution containing a detergent and various additive to provide additional benefits such as hair conditioning, lubrication, and medication. In today’s market, there are numerous options available including synthetic, herbal, medicated, and non-medicated shampoos.” The use of shampoo in daily hair and scalp cleansing is a widespread practice, making it one of the most commonly utilized cosmetic products. A shampoo typically consists of detergent ingredients along with other additives that provide additional benefits such as hair conditioning, lubrication, and potentially medicinal properties. In today’s market, there is a wide range of shampoos available, including synthetic, herbal, medicated, and non-medicated options. <sup>(1)</sup> Herbal shampoos are available in various forms, including powder, liquid, lotion, cream, jelly, aerosol, and specialized types such as conditioning and antidandruff shampoos. Currently, a

plethora of shampoos, both synthetic and natural, are readily accessible in the market. However, the demand for herbal shampoos has been steadily increasing among consumers due to their conviction that these products, derived from natural sources, are devoid of any harmful side effects. While herbal formulations are viewed as a substitute for synthetic shampoos, creating cosmetics solely from natural ingredients poses a formidable challenge. Nevertheless, there exists a vast array of medicinal plants that are known to have advantageous effects on hair and are frequently utilized in the production of shampoos.<sup>(2)</sup> Shampoos are commonly employed as cosmetic products, serving as viscous solutions of detergents with additives, preservatives, and active ingredients.<sup>(3)</sup> The demand for herbal cosmetics is increasing due to the perception of their safety and lack of adverse.<sup>(4)</sup> Numerous medicinal plants have beneficial effects on hair and are commonly used in shampoo formulations. These plant products can be utilized in various forms, including powder, crude, purified extract, or derivative. Herbal shampoos naturally stimulate hair follicles, promoting hair growth. They are environmentally friendly due to their biodegradable materials, as opposed to harsh chemicals. Additionally, herbal shampoos are safe for all skin types, including sensitive and allergy-prone skin, as they contain all-natural ingredients.<sup>(5)</sup>

### **Ideal properties: -**

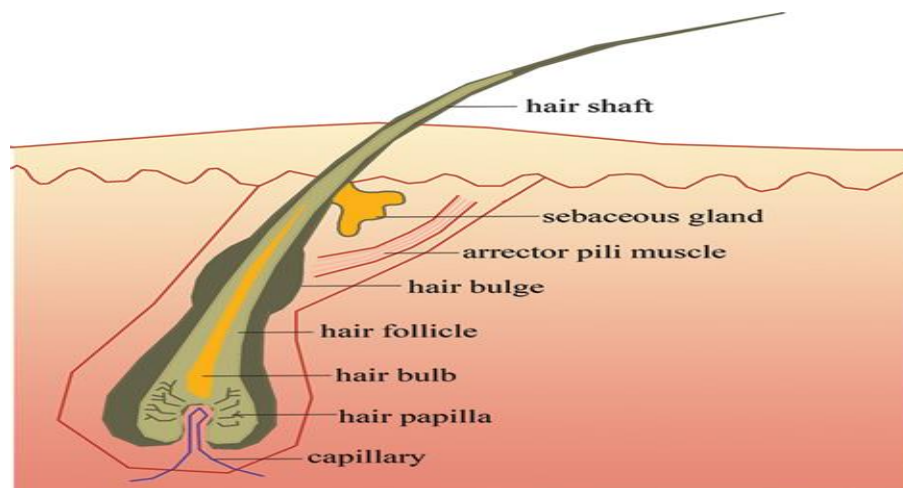
- (1) It should effectively and completely remove dust or soil, excessive sebum or other fatty substances and loose corneal cell from the hair.
- (2) It should impart a pleasant fragrance to the hair.
- (3) It should not cause any side effects or irritation to skin and eyes.
- (4) It should not make the hand rough and chapped. <sup>(6,7)</sup>
- (5) It should produce a good amount of foam and satisfy the psychological requirements of user.

### **Advantages: -**

- (1) Are bio-degradable and earth-friendly.
- (2) Skin-friendly- never cause irritation to the eyes.
- (3) Herbal shampoo are made out of pure and organic ingredients and there are no synthetic additives or surfactant and are free of any side effects.
- (4) These shampoos are not tested on animals, unlike synthetic shampoo brands.
- (5) Cost friendly- not much expensive.

**Disadvantage: -**

- (1) It can be lead to hair breakage.
- (2) The potential link to cancer.
- (3) Overuse can clog hair follicles.
- (4) Dry shampoo doesn't clean your hair.
- (5) Infrequent hair washing can cause dandruff and scaly skin.

**Anatomy and physiology of hair: -****Structure of hair: -**

**Fig.-Structure of hair**

**Parts of hair: -****Dermal papillae: -**

The dermal papilla plays a crucial role in regulating the hair cycle and growth, containing androgen receptors sensitive to DHT.

**Matrix: -**

The matrix envelops the dermal papillae and encompasses all the essential components necessary for hair growth and the formation of distinct segments of the hair, notably the outer root sheath, inner root sheath, and the hair shaft. Collectively, the matrix and dermal papillae constitute the hair structure.

**Bulb, outermost sheath: -**

The outermost component of the hair, known as the outer root sheath (ORS), is characterized by its keratinized nature. On the other hand, the internal root sheath (IRS) consists of three distinct layers: the Henley layer, Huxley layer, and Cuticle. <sup>(8)</sup>

**Anatomy of hair: -**

Hair follicles, located in the fatty layer of the scalp, grow hair in groups of 1-4 strands called “follicular units”. The growth mechanism for hair occurs at the hair bulb, located at the base of each follicle. Nourishment for the follicles is provided by blood vessels in the dermis, and the cells divide and develop to produce the hair shaft. During development beneath the epidermis, the hair remains soft, but once it emerges, the outer layer hardens into keratin. <sup>(9)</sup> Terminal hairs are basically found on the scalp, eyebrows, and eyelashes. Vellums hairs are found throughout the body. At birth, vellum hairs are present on the scalp and eyebrows, while vellum hair is present on the other parts of the body. During puberty, certain vellum hairs (e.g., beard hair, trunk hair, axilla hair, and genital hair) are distinguished by the presence of androgens. Vellum hair is long (> 2 cm), thick (~60 am), and pigmented. Vellum hairs are also medullated and have a bulb of the vellum hair. Vellum hair is thin (< 30 am), very short (< 2 mm), and mostly non-medullated hair. Vellum hair is divided into three major ethnic subgroups: Asian, African, and European. A recent study expands on this classification to include eight major subgroups by taking into account three parameters (curve diameter/curve index/number of waves). <sup>(9)</sup>

**Physiology of hair: -**

Hair growth is divided into three phases: Anagen (the Henley layer), Catagen (the transitional phase), and Telogen (the resting phase). Anagen is the time when most hair is growing. Each hair is in this phase for several years. Catagen stabilizes the hair over a few weeks. The hair follicle shrinks and the cuticle slows down. Telogen is the time when the old hair is pushed out and the new hair starts to grow. Telogen is made of dead hardened cells over months and gives the old hair protection from the follicle.

Anagen, the growth phase of hair, consists of three parts: the Henley layer, Huxley layer, and phase. The majority of hair is in the Anagen phase at any given time. The Henley’s and Huxley’s layers are capsular layers that interlock with each other to provide stability to the hair. This phase lasts for several years.

Catagen, the transitional phase, occurs over a few weeks. During this phase, hair growth slows down and the hair follicle, specifically the cuticle which is the innermost part closest to the hair shaft, shrinks.

Telogen, the resting phase, lasts for several months. During this phase, hair growth ceases and the old hair detaches from the hair follicle. A new hair then begins the growth phase, pushing the old hair out. The cuticle, composed of dead hardened cells, provides added protection to the hair shaft. Together with the capsular layers of the Henley's and Huxley's layers, it ensures the hair's security and allows for its growth.<sup>(9)</sup>

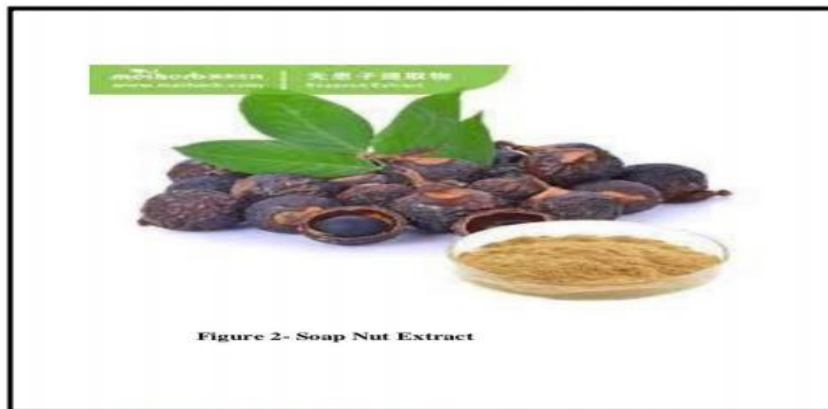
### **Historical development of Shampoo: -**

In the Indian subcontinent, the utilization of various herbs and their extracts as shampoos dates back to ancient times. One particularly effective early shampoo was produced by boiling Sapindus, commonly known as soapberries or soapnuts, with dried Indian gooseberry (amla) and a selection of other herbs. The resulting strained extract, known as ksuna, was widely used. Sapindus, a tropical tree prevalent in India, contains saponins in its fruit pulp, which serve as a natural surfactant. The extract derived from soapberries produces a lather referred to as phenaka in Indian texts, leaving the hair soft, shiny, and manageable. Additionally, other hair cleansing agents such as shikakai (Acacia concinna), hibiscus flowers, ritha (Sapindus mukorossi), and arappu (Albizia amara) were commonly employed. Notably, Guru Nanak, the founder and first Guru of Sikhism, made references to the soapberry tree and soap in the 16<sup>th</sup> century.<sup>(10)</sup> The original Herbal Essences scent has undoubtedly left a lasting Impression, as evidenced by the continued requests from women to bring it back, according to Zipperian. In the Indian subcontinent, a diverse range of herbs and their extracts have been utilized as shampoos since ancient times. One particularly effective early shampoo was produced by boiling Sapindus with dried Indian gooseberry (amla) and a variety of other herbs, and then utilizing the strained extract. Sapindus, also known as soapberries or soapnuts, is a tropical tree that is widely distributed in India and is referred to as ksuna.<sup>(11)</sup> The ancient Indian texts mention the presence of saponins in soapberries, specifically in their fruit pulp, which serve as a natural surfactant. The utilization of soapberry extracts results in the formation of a foamy lather, referred to as "phenaka" in these Indian texts.<sup>(5)</sup> The practice of utilizing hair and body massage, commonly referred to as champu, as a means of cleansing during one's daily bath was a luxury indulged in by early colonial traders in India. Upon their return to Europe, these traders introduced the newly acquired customs, which included the hair treatment now known as shampoo.<sup>(12)</sup>

## **Use of ingredients: -**

### **(1) Soap Nut Extract:**

- Stop hair fall.
- Prevent dandruff.
- Fight against scalp infection.



**Fig. 1- Soap Nut Extract**

### **2) Amla Extract: -**

- Reduce hair loss.
- Strengthen the scalp and hair.
- Stimulates hair growth.
- Prevent or treat dandruff and dry scalp.
- Improve overall appearance of hair.
- Prevent or treat Fungal and Bacterial hair and scalp infection.



**Fig.2- Amla Extract**



### (3) Shikakai Extract: -

- Prevent Grays.
- Add more shine to the hair.
- Cleanses hair.
- Curbs hair loss.
- Prevent Split hair.
- Prevent Lice, psoriasis, Eczema, Scabies.



**Fig. 3- Shikakai Extract**

### (4) Hibiscus Flower: -

- Prevent premature greying.
- Treat Dandruff and Itchy scalp. Condition hair.
- Stimulate hair growth and Lost hair volume.



**Fig. 3- Hibiscus Flower**

#### (5) Bhringraj Extract: -

- Makes hair Lustrous.
- Treats baldness and help in growth of hair.



**Fig. 4- Bhringraj Extract**

#### (6) Senna Extract: -

- Combats hair loss.
- Great conditioner.
- Strong hair.



**Fig. 5- Senna Extract**



**7) Aloe Vera: -**

- Strengthen.
- Deeply cleans oily hairs.
- Calm an Itchy scalp.
- Promote hair growth.
- Smooth natural curls.
- Reduce fizziness.



**Fig. 6- Aloe Vera**

**Materials and Methods: -**

- **Preparation of Extract: -**

Approximately 100 grams of various powdered plant materials, including Neem, Hibiscus flower, Aloe Vera, Shikakai, Liquorice, Amla, and Soap nut, were subjected to homogenization. Subsequently, the powdered material was subjected to extraction using 2 from extracted and evaporated materials are presented in Table 1

**Table 1- Extraction of Herbal drug**

Sr. No	Drugs Name	Parts For	Quantity
1]	Neem Powder	Leaves	09%
2]	Hibiscus Flower	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%

### **Formulation of herbal shampoo: -**

The formulation of the herbal shampoo was conducted in accordance with the formula provided in Table 1. The herbal extract was added to a gelatin solution (10%) and mixed by continuous shaking at 20-minute intervals. Additionally, 1 ml of lemon juice was incorporated into the mixture with constant stirring. In order to enhance the fragrance of the formulation, an adequate amount of essential oil (rose oil) was added, and the volume was adjusted to 100 ml using gelatin.<sup>(13)</sup>

SR.NO.	MATERIAL REQUIRED	QUANTITY	MEDICINAL USE
1	Neem	0.5g	Antibacterial agent
2	Soap Nut Extract	0.5g	Foaming agent
3	Amla Extract	0.5g	Antidandruff agent
4	Shikakai Extract	0.5g	Detergent
5	Hibiscus	0.5g	Conditioning agent
6	Bhringraj Extract	0.5g	Hair growth

7	Aloe Vera	0.1g	Moisturizing agent
8	Gelatin	q. s	Gelling agent
9	Lemon juice	q. s	Antimicrobial agent
10	Rose oil	q. s	Fragrance

**Table 2- Ingredients****Function of Herbal shampoo: -**

- (1) Lubrication
- (2) Conditioning
- (3) Hair growth
- (4) Maintenance of hair colour
- (5) Medication <sup>(14)</sup>

**Benefits of herbal shampoo: -**

- (1) More shine
- (2) Less hair loss
- (3) Long lasting colour
- (4) Stronger and more fortified hairs
- (5) All natural, No chemicals
- (6) Keep healthy natural oils
- (7) Wont irritate skin or scalp

**Composition of Shampoo: -**

- (1) Principal surfactant
- (2) Secondary surfactant
- (3) Antidandruff agents

- (4) Conditioning agents
- (5) Pearlescent agents
- (6) Thickening agent
- (7) Colours, perfumes, preservatives <sup>(15)</sup>

### **(1) Principal surfactant: -**

Surfactants are a class of cleaning agents that serve as substitutes for soap. Their mechanism of action involves the disruption of physicochemical forces that facilitate the binding of impurities and residues to the hair. By dissolving these impurities, surfactants effectively prevent them from adhering to the hair shaft or scalp. The efficacy of a shampoo's cleansing ability is contingent upon its capacity to effectively remove grease, which is influenced by the type and quantity of surfactants employed.

### **(2) Conditioning agent: -**

Conditioners are employed to reduce friction, untangle the hair, minimize frizz, and enhance combability. They function by neutralizing the negative electrical charge of the hair fiber through the addition of positive charges, as well as by lubricating the cuticle to decrease the hair's hydrophilicity.

### **3) Colours, perfumes, preservatives: -**

The color options available for shampoos are often restricted due to the prevalent use of surfactants that possess a straw/yellow hue. Consequently, the range of achievable colors is limited. Among the available options, obtaining green, yellow, and orange shades is relatively easier compared to pastel tones. However, a significant challenge in incorporating color into shampoos lies in maintaining the stability of the desired hue. Blue shades have a tendency to transform into green, while red shades tend to shift towards orange, and green shades tend to become yellow. These color alterations can occur as a result of exposure to UV light or simply due to the effects of heat and aging. <sup>(15)</sup>

### **4) Secondary surfactant: -**

Enhanced cleansing efficacy, foam formation, and hair conditioning are desired attributes in hair care products. To achieve these qualities, conditioning agents such as lanolin, mineral oil, fenugreek, herbal extracts, and Henna egg derivatives are commonly employed.

## **Evaluation of herbal shampoo: -**

The formulated preparation underwent an assessment to determine its efficacy in terms of product performance, encompassing organoleptic properties, pH level, physicochemical attributes, and solid content. In order to ensure the quality of the products, specific examinations were conducted to measure surface tension, foam volume, foam stability, and wetting time, following established protocols.

### **1) Visual assessment: -**

The prepared formulation was assessed for color, clarity, odor, froth content.

### **2) Determination of solid content percentage: -**

The initial weight of the evaporating dish was measured after ensuring it was clean and dry. Next, 4gm of shampoo formulation (not the 1% solution) was placed in the dish and the combined weight of the dish and shampoo was recorded. The weight of shampoo only was then calculated and recorded. The dish with the shampoo was then placed on a hot plate until the liquid portion had evaporated. After drying, the weight of the dish and solid shampoo was measured and the results were noted.<sup>(16)</sup>

### **3) Viscosity: -**

The determination of viscosity was carried out through the utilization of an Ostwald viscometer.

### **4) Determination of PH: -**

The PH of 10% shampoo solution in distilled water was determined at room temperature 25°C.<sup>(18)</sup>

### **5) Surface tension measurements: -**

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

### **6) Testing of wetting: -**

The wetting time was determined by observing the duration it took for the filter paper to fully submerge. A circular piece of canvas paper weighing 0.44 g and measuring 1 inch in diameter was prepared. This filter paper disc was placed on the surface of a shampoo solution with a concentration of 1% v/v. Using a stopwatch, the time it took for the paper disc to sink completely was recorded.

## **7) Foam stability test: -**

The Cylinder Shake Method was employed to assess the foaming capacity. A 250 ml graduated cylinder was filled with 50 ml of a 1% shampoo solution, and the cylinder was covered with a hand and shaken precisely 10 times. The resulting foam content volume was measured after 1 minute of shaking. Subsequently, the foam volume was exclusively calculated. Following the shaking process, the foam volume was recorded at 1-minute intervals for a duration of 4 minutes.

## **Conclusion: -**

The results obtained during experimentation clearly indicate a promising formulation of quality enhance herbal shampoo with a unique aroma, colour and potential for cleaning and foaming ability. The elimination of surface grime and dirt from the hair shaft and scalp is a crucial function of shampoo.

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