

FORMULATION AND EVALUATION OF HERBAL SHAMPOO

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ABSTRACT

The current study set out to create and assess a herbal shampoo that uses natural elements, with a focus on safety and effectiveness, in order to mitigate the potential risks associated with chemical compounds. This study's primary goal was to replace dangerous synthetic components in shampoo formulas with safe natural alternatives. An effort has been made to incorporate cutting-edge formulation technology with a natural ingredient base. It helps to remove oil, debris, and dandruff while strengthening, darkening, and promoting hair growth. In addition, it functions as a conditioning agent and does all of these things without harming or compromising hair. The extracts of Aloe Vera, Hibiscus, Amla, Shikakai, and Neem were used to make the shampoo.

Performance tests, physicochemical analyses, and organoleptic property evaluations were completed. The outcomes suggested that this might be used as a viable substitute for synthetic sources when it comes to effectively and naturally washing and managing hair. The investigation's conclusions show that consumers have occasionally experienced negative side effects from chemicals. The current study verified that making herbal shampoo using natural ingredients may be done successfully. Every ingredient that goes into making shampoo is safer, and the physicochemical analysis produced perfect results.

Keyword: Herbal shampoo, Aloe Vera, Shikakai, Neem

INTRODUCTION

Shampoo is a hair care product that removes dirt, dandruff, and other residues from the scalp and hair. It's typically made from a surfactant in liquid, solid, or powder form, and is designed to remove surface grease, dirt, and skin debris from the hair shaft and scalp without harming the user.

Types of shampoo:

- Powder shampoo
- Liquid shampoo
- Lotion shampoo
- Cream shampoo
- Jelly shampoo
- Conditioning shampoo
- Baby shampoo

The main ingredients of herbal shampoo:

- Surfactant
- Preservatives
- Fragrance

The goal of the current study is to develop and assess a multipurpose herbal shampoo containing a variety of plants by removing all conventionally added synthetic chemicals. This shampoo strengthens, darkens, and removes dandruff, sebum, and filth from hair while encouraging hair growth. Additionally, it serves as a conditioning agent. All of these functions are carried out by this herbal shampoo powder without harming or compromising hair [1]. One of the body's exterior gauges of inside problems is hair. It is a vital component of the human body that is made of ectoderm and is connected to the sweat and sebaceous glands as protective appendages. Products for hair care are preparations designed to cleanse, alter the texture, alter the color, nourish the hair, and give the hair a healthy appearance. Shampoo is defined as a cosmetic preparation used to remove buildup of sebum, dirt from the scalp, and residue from hair grooming products. Similar to ordinary shampoo, herbal shampoo is a cosmetic preparation

made from herbs derived from plants and is used to wash hair and scalp [2]. Alopecia and scalp treatments are more adhered to by patients when hair cosmetics are used. Shampoos unquestionably prevent damage to the hair shaft in addition to cleaning the scalp. Active chemicals are added to shampoo formulations to treat a variety of scalp ailments. It is preferable that the hair strands be kept visually pleasing, maintaining their softness, compatibility and gloss while treating the scalp, regardless of the illness or condition (dermatitis, seborrhea, alopecia, psoriasis, etc.). Although there are shampoos with as few as four components, most shampoos include between ten and thirty chemicals [3].

Shampoos are typically composed of 10–30 ingredients although products with as few as four ingredients are available.

The products are grouped into:

- (1) Cleansing agents
- (2) Additives that contribute to the stability and comfort of the product
- (3) Conditioning agents, intended to impart softness and gloss, to reduce flyaway and to enhance disentangling facility
- (4) Special care ingredients, designated to treat specific problems, such as dandruff and greasy hair.

→ **HAIR ANATOMY:**

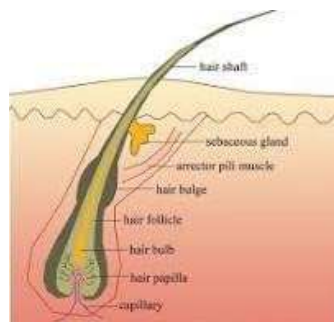


Fig No. 1 Hair Anatomy

Hair shaft: The visible part of the hair that sticks out of the skin. It has three layers:

- **Medulla:** The innermost layer, which is soft, fragile, and nearly invisible. It's only present in thick hair and consists of a thin core of transparent cells and air spaces. Some mammals don't have a medulla in their hair.
- **Cortex:** The middle layer, which makes up 90% of the hair fiber's weight and gives it strength, color, and texture. Damage to the cortex can make hair brittle and weak, which can lead to breakage.
- **Cuticle:** The outer layer, which is thin and colorless. It's made up of overlapping cells that face downwards, similar to fish scales or roof tiles. A healthy cuticle is smooth and flat, and protects the inner layers of hair from damage, gives hair shine, and maintains its hydration balance and flexibility.

Hair follicle: A tube-like structure (pore) that surrounds the root and strand of a hair. It's located in the top two layers of the skin and is connected to a sebaceous gland.

Hair root: Located in the skin and extends down to the deeper layers.

Shampoo is a poly herbal mixture made of Aloe Vera gel Shikakai, Amla, Hibiscus and Neem extracts. These herbs have been chosen with consideration for both modern applications and scientific rationale in accordance with an established framework. There are currently a lot of synthetic shampoos available on the market, both medicated and non-medicated [4]. However, herbal shampoo has gained popularity because it comes from a

natural source, is safer, and has no negative side effects. Shampoos are arguably the most widely used beauty product in our daily lives for washing our hair and scalps. Herbal shampoos are cosmetic preparations made using common ayurvedic herbs that are meant to cleanse the hair and scalp similarly to a regular shampoo. They are utilized to remove filth, oils, dandruff, pollutants from the environment, etc. Herbal shampoo is a type of beauty product that replaces chemical shampoo available in the market with herbs derived from plants [5]. Natural shampoo is essential since people choose natural products over chemical ones these days since they have been shown to improve health. One of the external indicators of internal body issues is hair. It is a vital stage of the human body that is formed from ectoderm and protects bodily appendages connected to sweat and sebaceous glands. Hair care products are products used to clean, style, color, and nourish hair while also giving it a healthy appearance. Shampoo is defined as a cosmetic product used to cleanse hair of accumulated oil, debris from the scalp, and leftovers from hair styling products. The current search effort aims to exclude all historically integrated artificial elements in order to design and evaluate a multipurpose natural shampoo with a variety of herbs. This shampoo strengthens, darkens, and removes sebum, filth, and dandruff while encouraging hair growth. It also serves as a conditioning agent in addition. All these tasks are completed by this natural shampoo powder, with the exception of damaging or harming hair [6]. There are a lot of synthetic, herbal, medicated, and non-medicated shampoos on the market these days, but customers are becoming more and more interested in herbal shampoo because they think that since it comes from natural sources, it is safe and doesn't have any negative effects. Herbal shampoo recipes are thought to be an alternative to synthetic ones, but making cosmetics with just natural ingredients is challenging. Many medicinal herbs are employed in the manufacture of shampoos because they are said to have positive effects on hair [7]. Toxic chemical ingredients included in synthetic shampoos, such as sodium lauryl sulfate and parabens are to harm hair. The usage of natural herbal shampoos rather than synthetic shampoos is growing in popularity as a solution to this problem [8]. These herbs have been chosen with consideration for both scientific validation and traditional usage in the contemporary world. There are currently a lot of synthetic shampoos available on the market, both medicated and non-medicated. However, herbal shampoo has gained popularity because it comes from a natural source, is safer, and has no negative side effects [9]. Herbal shampoos are cosmetic preparations that, like regular shampoos, are meant to cleanse the hair and scalp by utilizing common ayurvedic herbs. They are utilized to remove filth, oils, dandruff, pollutants from the environment; etc. Herbal shampoo is a type of beauty product that replaces chemical shampoo available in the market with herbs derived from plant [10].

Drug profile

→ Hibiscus

- **Synonyms:** Chaina rose
- **Scientific name:** Hibiscus rosa-sinensis

- **Family:** Malvaceae
- **Chemical constituents:** Flavonoids, Anthocyanins, Alpha-hydroxy acids (AHAs), Hydroxycitric acid (HCA), Hibiscus protocatechuic acid, Amino acids
- **Biological source:** The red hibiscus, or *Hibiscus rosa-sinensis*, is a tropical hibiscus that is native to Vanuatu
- **Uses:**
 - 1) Make hair look healthy and lustrous
 - 2) Prevent premature graying
 - 3) Thicken hair and add volume
 - 4) Treat dandruff
 - 5) Condition against frizz, dryness, and breakage
 - 6) Prevent split ends
 - 7) Soothe the scalp and reduce inflammation
 - 8) Improve blood circulation to hair follicles
 - 9) Restore elasticity in hair
 - 10) Prevent dandruff and itchy scalp



Fig No: 2 Hibiscus Flower

→ **Neem**

- **Synonyms:** Margosa
- **Scientific name:** *Azadirachta indica*.
- **Family:** Meliaceae
- **Chemical constituents:** nimbin, nimbanene, 6-desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, n-hexacosanol, amino acid, 7-desacetyl-7-benzoylazadiradione, and 7-desacetyl-7-benzoylgedunin.
- **Biological source:** Neem, also known as *Azadirachta indica*, is a natural herb that comes from the seeds of the neem tree.

- **Uses:**

- 1) Promotes hair growth
- 2) Anti-dandruff
- 3) Hair conditioner



Fig No: 3 Neem Plant

→ **Aloe vera**

- **Synonyms:** Aloe indica Royle
- **Scientific name:** Aloe barbadensis Miller
- **Family:** Asphodelaceae
- **Chemical constituents:** amino acids, vitamins, lipids, sterols, tannins, and enzymes, phenol, saponin, and anthraquinones
- **Biological source:** The biological source of Aloe Vera is the dried juice of the leaves of the Aloe barbadensis Miller plant, also known as Curacao aloe
- **Uses:**
 - 1) Calming an itchy scalp: Aloe Vera's fatty acids reduce inflammation in the scalp. Treating dandruff: Aloe Vera can unclog hair follicles that are blocked by excess oil, which reduces dandruff.
 - 2) Promoting hair growth: Aloe Vera contains vitamins C, E, B-12, folic acid, and choline, which can help hair grow. It also strengthens hair follicles by regulating blood supply to the roots.
 - 3) Maintaining moisture: Aloe Vera shampoo helps maintain moisture on the scalp, which can keep hair healthy.
 - 4) Deep hydrating: Aloe Vera can hydrate hair, making it look shinier.
 - 5) Preventing breakage: Aloe Vera extracts can help prevent hair breakage and smooth hair.

6) Reducing bacterial and fungal issues: Aloe Vera has antibacterial and antifungal properties that can help prevent dandruff and other bacterial and fungal issues in the scalp.



Fig No: 4 Aloe Vera plant

→ **Amla**

- **Synonyms:** Avala
- **Scientific name:** *Phyllanthusemblica* Linn
- **Family:** Phyllanthaceae
- **Chemical constituents:** Gallic acid, ellagic acid, chebulinic acid, chebulagic acid, apeigenin, quercetin, corilagin, Minerals, amino acids, fixed oils, and flavonoids, vitamin C.
- **Biological source:** biological source is the dried and fresh fruits of the *Emblicaofficinalis* Gaerth (*Phyllanthusemblica* Linn.) plant.
- **Uses:**
 - 1) Helps in faster hair growth
 - 2) Makes hair darker
 - 3) Strengthen the hair
 - 4) Purifies blood and improves circulation
 - 5) Prevents dandruff
 - 6) Nourishes, conditions, and softens the hair
 - 7) A proven remedy for premature graying
 - 8) Makes the scalp healthier and conducive to faster hair growth



Fig No: 5Amla

→ **Shikakai**

- **Synonyms:** Satala
- **Scientific name:** *Acacia concinna*
- **Family:** Leguminosae
- **Chemical constituents:** Vitamins A, C, E and K
- **Biological source:** It is the dried gummy exudation of stem and branches of *Acacia Arabica*.
- **Uses:**
 - 1) Promote hair development
 - 2) Control hair fall
 - 3) Battle dandruff
 - 4) Add bounce and sheen to lifeless hair
 - 5) Strengthen hair roots
 - 6) Prevent premature greying
 - 7) Calm down inflammation or itching on your scalp
 - 8) Soften and smooth hair
 - 9) Maintain hair silky and lustrous
 - 10) Restore hair's glossy texture, thickness, and length



Fig No: 6Shikakai

Materials and methods

→ Materials:

SR. NO.	INGREDIENTS	Uses
1	Hibiscus (Extract)	Conditioning and moisturizing
2	Neem (Extract)	Stop hair fall
3	Aloe Vera (Extract)	Cleansing the scalp
4	Amla (Extract)	Help to improve scalp blood circulation
5	Shikakai (Extract)	Antidandruff and hair growth
6	Castor oil	Promote hair growth
7	Polyethylene glycol (PEG 400)	Relief of burning and irritation
8	Glycerine	Hydrating agent
9	Methyl paraben	Antimicrobial and preservative
10	Acacia	Moisturizer and shiner
11	Tragacanth	Thickening agent
12	Essential oil (Lavender oil)	Promote hair growth
13	Citric acid solution	Improve hair appearance

→ Collection and authentication of plant material:

FORMULATION TABLE:

SR. NO.	INGREDIENTS	QUANTITY
1	Herb extract	10 ml
2	Castor oil	4 ml
3	Polyethylene glycol (PEG 400)	8 ml
4	Glycerine	2 ml
5	Methyl paraben	1 ml
6	Acacia	3 gm
7	Tragacanth	2 gm
8	Essential oil (Lavender oil)	q.s.
9	Citric acid solution	q.s.

EVALUATION PARAMETER

- Physical appearance
- PH
- Viscosity
- Surface tension
- Foaming ability
- Dirt dispersion

1) **Physical appearance**

- ✓ Colour
- ✓ Odour
- ✓ Texture

2) **pH:** The pH of formulated shampoo, falling within the ideal pH range for shampoo which is between 5 to 7. The formulated shampoo is acid balanced which is near to the skin PH. The pH of shampoo is important for improving and enhancing the qualities of hair, minimizing irritation to the eyes and stabilizing the ecological balance of the scalp.

3) **Viscosity:** The viscosity of shampoo plays an important role in determining its shelf life stability, the ease of flow on removal from packing and spreading on application to hair and product consistency in the package. The viscosity of formulated shampoo was found to be 50 mill poise which was good enough for its applicability.

4) **Surface tension:** Measurements were carried out with a 10% shampoo dilution in distilled water at room temperature. Thoroughly clean the stalagmometer using chronic acid and punitive water. Because surface tension is highly affecting with grease or other lubricants.

5) **Foaming ability:** 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. From the consumer point of view, foam stability is one of the important needs of a shampoo. Important parameter that was considered in the shampoo evaluation was determination of foaming stability. The foam volume produced by the formulated

shampoo is above 50 ml. The prepared shampoo generates uniform, small sized, compact, denser, and stable foam. The foam volume remains same throughout the period of about 5 min showing that the generated foam by the shampoo has good stability.

6) Dirt dispersion: The dirt should stay in water. Dirt that stays in the foam will be difficult to rinse away, it will deposited on hair. All two prepared shampoos showed similar results. These result indicate that no dirt would stays in the foam, so prepared and marketed formulations are satisfactory.

Result: The herbal shampoo formulation was prepared from Neem, Amla, Shikakai, Aloe Vera and Hibiscus natural ingredient and small amount of synthetic ingredient. At the trial phase of formulation three batches were performed due to the problem like foamability, PH and Viscosity the two batches discarded permanently and only single batch was selected for next steps. The formulated herbal shampoo showed the foamability with good anti dandruff activity.

Sr. No.	Parameters	Observation
1	Physical Appearance a) Colour b) Odour c) Texture	a) Slightly Red b) Pleasant c) Smooth
2	pH	6.2
3	Viscosity	22.49 N s m ⁻²
4	Surface tension	14.12 dyn/cm
5	Foaming ability	Passed
6	Dirt dispersion	Passed

Conclusion:

The main purpose behind this investigation was to develop a stable and functionally effective shampoo. The present study was carried out with the aim of preparing the herbal shampoo that provides smooth and straight effect to hairs, safer than the chemical conditioning agents. Herbal shampoo was formulated with the aqueous extract of medicinal plants that are commonly used for cleansing and smoothening hair traditionally.

To provide the effective conditioning effects, the present study involves the use of mooring, Aloe Vera, Hibiscus, Shikakai and Neem and Amla instead of synthetic cationic conditioners. The factors like UV radiations, use of harsh chemical products have direct and indirect impact on the hair. The present work focuses on the potential of herbal extracts from cosmetic purposes. Hence we conclude that the formulation of mooring herbal shampoo

is effective in providing smoothening and shiny effect and better conditioning effect.

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