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Formulation and Evaluation of Herbal Shampoo

Mr. Sarthak D. Godge, Prof. Randhawan Bhagyashri B., Mr. Rahul P. Atkare, Mr. Bhagyesh V. Thorat, Mr. Ganesh D. Jagdale
Arihant College of Pharmacy, Ahilyanagar, India

Abstract: *This study involved formulating an herbal shampoo with various proportions of Hibiscus rosa-sinensis, Emblica officinalis, Acacia concinna, Sapindus indica, Eclipta prostrata, Aloe barbadensis, and Cassia auriculata to assess its physicochemical properties.*
Herbal shampoos are natural alternatives to synthetic hair cleansers, formulated using plant-derived ingredients known for their therapeutic properties. This study explores the formulation, preparation, and evaluation of herbal shampoo using extracts from medicinal plants such as Aloe vera,Hibiscus, and Amla. These ingredients are selected for their antimicrobial, anti-inflammatory, and hair-strengthening properties. The shampoo is evaluated for physicochemical parameters including pH, viscosity, foam stability, and cleansing efficiency. Results indicate that the herbal formulation is mild, eco-friendly, and effective in maintaining scalp health and improving hair texture without harmful side effects. This work supports the growing demand for natural and sustainable personal care products..

Keywords: Soap Nut, Amla, Shikakai, Hibiscus, Bhringraj, Senna, Aloe vera

I. INTRODUCTION

Shampoos, primarily used as cosmetics, are daily hair care products designed to cleanse the scalp and hair. These viscous detergent solutions contain additives, preservatives, and active ingredients, functioning largely as beautifying agents. Typically applied to wet hair, massaged in, and rinsed out, their purpose is to remove accumulated dirt without excessively stripping sebum. While numerous synthetic shampoos, both medicated and non-medicated, dominate the market, herbal shampoos are gaining popularity due to their natural origin, perceived safety, increasing consumer demand, and lack of side effects.

Synthetic shampoos use surfactants for cleaning and lather, but these can cause eye and scalp irritation, hair loss, and dryness with ongoing use. Natural herbal shampoos are an alternative, though formulating cosmetics entirely from natural sources is challenging. Many medicinal plants with hair benefits have been traditionally used globally and are now found in shampoos in various forms. Creating a single-natural-ingredient shampoo that is safer and milder than synthetic options, while maintaining good foam, cleansing power, and solid content, is difficult. Thus, we set out to detail the development of a pure natural cleanser using traditional techniques and everyday plant-based hair washing materials.

Shampoos are essentially detergent solutions with added ingredients for benefits like conditioning, lubrication, and medication. While the market offers synthetic, herbal, medicated, and non-medicated options, herbal shampoos are gaining popularity due to the perception of natural safety and lack of side effects. Synthetic surfactants, the primary foaming and cleansing agents in conventional shampoos, can cause hair dryness, hair loss, and scalp and eye irritation with regular use. Herbal formulations are seen as alternatives, but creating cosmetics entirely from natural sources is challenging. Numerous medicinal plants with reported hair benefits are traditionally used in shampoos, in forms ranging from powders to extracts. Developing a single-herb shampoo that is milder, safer, and performs as well as synthetic shampoos in terms of lather, cleansing, and consistency is extremely difficult. Therefore, we aimed to formulate a pure herbal shampoo using plant materials traditionally and commonly used for hair washing in India and the Gulf region, particularly Oman.

BENIFITS OF HEARBAL SHAMPOO:

• Enhanced Shine: Achieve a more radiant and glossy look.

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• Reduced Hair Loss: Experience less breakage and hair fall.
• Longer-Lasting Color: Maintain your hair color for an extended period.
• Stronger, Fortified Hair: Promote resilience and strength from root to tip.
• Purely Natural: Free from synthetic chemicals and additives.
• Gentle on Skin and Scalp: Less likely to cause irritation or sensitivity.
• Maintains Natural Oils: Helps preserve the scalp's healthy sebum balance.

FUNCTION OF HEARBAL SHAMPOO:

Herbal shampoos are designed to perform the following functions:
• Lubrication: To reduce friction and make hair smoother.
• Conditioning: To improve hair texture, softness, and manageability.
• Hair Growth: To stimulate and support the growth of healthy hair.
• Maintenance of Hair Colour: To help preserve and prolong hair color.
• Medication: To deliver therapeutic agents to the scalp when formulated as medicated shampoos.

DESIRED PROPERTIES OF HEARBAL SHAMPOO:

Herbal shampoos ideally should have the following properties:
• Ease of Application: Simple and convenient to use.
• Effective Debris Removal: Thoroughly cleanses dirt and buildup.
• Easy Wet Combing: Reduces tangles and makes hair easier to comb when wet.
• Pleasant Fragrance: Provides an appealing scent.
• Low Level of Irritation: Gentle on the scalp and eyes.
• Well Preserved: Maintains its quality and effectiveness over time.
• Good Stability: Retains its intended properties and consistency.

ADAVANTAGES OF HERBAL SHAMPOO:

The advantages of using herbal shampoo include:
• Pure and Organic Ingredients: Made with natural and organically sourced components.
• Free from Side Effects: Generally gentler and less likely to cause adverse reactions.
• No Surfactants (e.g., SLS): Formulated without harsh cleansing agents like Sodium Lauryl Sulfate.
• No Synthetic Additives: Free from artificial colors, fragrances, and preservatives.
• No Animal Testing: Cruelty-free and not tested on animals.
• Earth and Skin Friendly: Gentle on the environment and less irritating to the skin.
• No Petroleum-based Ingredients: Made without components derived from petroleum.

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INGREDIENTS –

Materials required	Quantity to be weighed
Soap nut extract	0.5 g
Amla extract	0.5 g
Shikakai extract	0.5 g
Hibiscus	0.5 g
Bhringraj extract	0.5 g
Senna extract	0.5 g
Aloe vera	1 g
Gelatin	q.s
Lemon juice	q.s
Rose oil	q.s

USE OF INGREDIENTS:

1. Soap Nut Extract –

Soap Nut Extract provides the following benefits for hair:

• Stops Hair Fall: Helps to reduce hair loss.

• Prevents Dandruff: Aids in keeping the scalp free from flakes.

• Fights Against Scalp Infection: Helps to combat infections on the scalp

2. Amla Extract:

i. Strengthen the Scalp and Hair.

ii. Reduce premature pigment loss from hair, or greying.

iii. Stimulate Hair Growth.

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iv. Reduce Hair Loss.
v. Prevent or treat dandruff and dry scalp.
vi. Prevent or treat Fungal and Bacterial hair and Scalp infections.
vii. Improve overall appearance of Hairs.

3.Shikakai Extract –

Shikakai extract is beneficial for hair in several ways:
• It cleanses the hair effectively.
• It can add more shine to your hair.
• It helps prevent graying.
• It reduces hair loss.
• It can prevent lice, psoriasis, eczema, and scabies.
• It nourishes the hair and promotes healthy and rapid hair growth.
• It helps prevent split ends.

4. Hibiscus-

Hibiscus offers the following benefits for your hair:
• It can stimulate hair growth and help restore hair volume and shine that may have been lost over time.
• It conditions the hair.
• It helps prevent baldness, similar to the action of Minoxidil and Finasteride.
• It can treat dandruff and itchy scalp.
• It helps prevent premature graying.

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5. Bhringraj Extract-

Benefits of Bhringraj extract

: i. It can help with baldness and encourage hair to grow.

ii. It makes hair look shiny and healthy.

6. Senna Extract –

i. Strong Hairs.

ii. Great Conditioner.

iii. Combats Hair Loss.

7. Aloe Vera-

i. Calms an itchy scalp.

ii. Deep cleans oily hairs.

iii. Strengthens.

iv. Aloe vera contains proteolytic enzymes which repairs dead skin cells on scalp.

v. Promote hair growth.

vi. Smooth natural curls.

vii. Reduce frizziness .

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8. Gelatin –

i. Gelatin Can improve hair thickness and growth.
ii. Gelatin supplement or placebo for 50 weeks to 24 people with alopecia.
iii. It gives thickness to hairs.
iv. For strengthening of Hairs.

9. Lemon Juice –

i. Add More shine.
ii. Get rid of dandruff
iii. Split ends
iv. Reduces Hair fall
v. Gives Natural colour to hair
vi. Detox the scalp
vii. Promotes the growth of hairs
viii. Great hair mask for dry and damage hairs

10. Rose Oil –

i. It repairs hair damage.
ii. Improves hair growth.
iii. Reduces dandruff.
iv. Gives fragrance to the shampoo.

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Description of the Ingredients-

S. No.	Common name	Pictures	Botanical name	Parts used
1	Hibiscus		*Hibiscus rosa-sinensis*	Flower
2	Amla		*Emblica officinalis*	Fruit
3	Shikakai		*Acacia concinna*	Powder
4	Soapnut		*Sapindus indica*	Fruit
5	Cassia		*Cassia auriculata*	Leaves
6	Bhringraj		*Eclipta prostrata*	Leaves, flower
7	*Aloe vera*		*Aloe barbadensis*	Leaf

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FORMULATION OF HERBAL SHAMPOO –

The herbal shampoo was formulated following the proportions outlined in Table 1. A 10% gelatin solution served as the base. Herbal extract was incorporated into this solution through continuous shaking at 20-minute intervals to ensure thorough mixing. One milliliter of lemon juice was also added while stirring constantly. To enhance the shampoo's scent, an adequate amount of rose essential oil was included, and the final volume was adjusted to 100 ml using the gelatin solution.

EVALUATION OF HERBAL SHAMPOO –

The prepared shampoo formulation underwent evaluation to assess its performance characteristics, including its sensory properties (organoleptic characters), pH level, physicochemical properties, and solid content. To confirm the quality of the product, specific tests were conducted following standard procedures to determine surface tension, foam volume, foam stability, and wetting time.

Visual assessment –

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

PH determination –

The pH of the prepared herbal shampoo in distilled water (10% v/v) was evaluated by means of pH analyzer at room temperature.

Surface tension measurement –

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

Testing of wetting –

Wetting time was calculated by noting the time required by the canvas paper to sink completely [3]. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch.

Foam stability test –

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.

Dirt dispersion test –

To 10 ml of refined water two drops of cleanser were included and taken in a wide-mouthed test tube. To the formulated shampoo, added one drop of Indian ink and shaken for 10 min after closing the test tube with a stopper. The volume of ink in the froth was measured and the result was graded in terms of none, slight, medium, or heavy.

Conditioning performance evaluation-

An artificial hair tress of Indian women was received from a salon and divided into two swatches of length 10 cm approximately, weighing 5 g. The control swatch was the one without washing and the test swatch using the formulated shampoo was washed with. Each tress was added for 2 min to the combination of shampoo in water in the proportion 10:15 taken in a conical flask and washed using 50 ml of distilled water. Each tress was air dried at room temperature and the procedure was repeated for maximum of 10 times. The conditioning effect of the prepared shampoo in terms of softness and smoothness was determined using a blind touch test using volunteers of student 20 numbers selected

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randomly . The conditioning performance of the shampoo was rated in terms of Score 1–4 (4 - excellent, 3 - good, 2 - satisfactory, and 1 - poor) by asking all the selected students to touch the tress washed with prepared shampoo.

PHYSICOCHEMICAL PROPERTIES OF HEARBAL SHAMPOO-

Evaluation test	Formulated shampoo
Color	Brown
Transparency	Clear
Odor	Good
pH of 10% solution	7
Solid contents (%)	23.25
Foam volume (ml)	25
Foam type	dense, small
Surface tension (dynes/cm)	35.18
Wetting time (s)	120 s

LIMITATIONS OF HEARBAL SHAMPOO –

1. Vary in consistency from batch to batch.
2. Natural products affect product uniformity, Quality control.
3. Less stable, So preservatives should be added.
4. Seasonal variation of plant constituents.

RESULT

The shampoo was formulated by admixing the equal amount of the aqueous extracts of all the ingredients with soapnut (Table 1). The above plant extract contains phytoconstituents like saponins which is a natural surfactant having detergent property and foaming property. An ideal shampoo must have adequate viscosity and many natural substances possess good viscosity. The gelatin solution (10%) behaves as a pseudoplastic forming clear solutions. Lemon juice (1 ml) added to the shampoo serves as anti-dandruff agent, natural antioxidant, and chelating agent and maintains the acidic pH in the formulation.

Evaluation of formulated shampoo –

- Physical Appearance
- pH
- Solid Content
- Surface Tension
- Wetting Time
- Foaming ability and Foaming Stability
- Dirt Dispersion Test
- Net Content
- Conditioning Performance

II. CONCLUSION

The present study was carried out with the aim of preparing the herbal shampoo that reduces hair loss during combing, safer than the chemical conditioning agents as well as to strengthen the hair growth. Herbal shampoo was formulated with the aqueous extract of medicinal plants that are commonly used for cleansing hair traditionally. Use of conditioning agents (synthetic) reduces the protein or hair loss. To provide the effective conditioning effects, the present study involves the use of shikakai, amla, and other plant extracts instead of synthetic cationic conditioners. The

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main purpose behind this investigation was to develop a stable and functionally effective shampoo by excluding all types of synthetic additives, which are normally incorporated in such formulations. To evaluate for good product performance of the prepared shampoo, many tests were performed. The results of the evaluation study of the developed shampoo revealed a comparable result for quality control test, but further scientific validation is needed for its overall quality.

REFERENCES

[1]. Mainkar AR, Jolly CI. Formulation of natural shampoos. Int J Cosmet Sci .
[2]. Aghel N, Moghimipour B, Dana RA. Formulation of a herbal shampoo using total saponins of Acanthophyllum squarrosum. Iran J Pharm Res.
[3]. Potluri A, Asma SS, Rallapally N, Durrivel S, Harish GA. Review on herbs used in anti-dandruff shampoo and its evaluation parameters. Indo Am J Pharm Res.
[4]. Shinde PR, Tatiya AU, Surana SJ. Formulation development and evaluation of herbal antidandruff shampoo. Int J Res Cosmet Sci .
[5]. Firthouse PU. Effects of Ocimum sanctum and Azadiracta indica on the formulation of antidandruff herbal shampoo powder. Der Pharm Lett .
[6]. Pooja A, Arun N, Maninder K. Shampoos based on synthetic ingredients vis-à-vis shampoos based on herbal ingredients: A review. Int J Pharm Sci Rev Res.
[7]. Kapoor VP. Herbal cosmetics for skin and hair care. Nat Prod Radiance .
[8]. Khushboo PS, Jadhav VM, Kadam VJ, Sathe NS. Psoralea corylifolia Linn.-"Kushtanashini". Pharmacogn Rev .
[9]. Srivasuki KP. Nutritional and health care benefits of amla. J Pharm .
[10]. Roy RK, Thakur M, Dixit VK. Hair growth promoting activity of Eclipta alba in male albino rats. Arch Dermatol Res.
[11]. Tarun J, Susan J, Suria J, Susan VJ, Criton S. Evaluation of pH of bathing soaps and shampoos for skin and hair care. Indian J Dermatol.
[12]. Badi KA, Khan SA. Formulation, evaluation and comparison of the herbal shampoo with the commercial shampoo. Beni-Suef Univ J Basic Appl Sci .
[13]. Gaud RS, Gupta GD. Practical Physical Pharmacy. 1st ed. New Delhi: C.B.S. Publisher and Distributer; .
[14]. Mainkar AR, Jolly CI. Evaluation of commercial herbal shampoos. Int J Cosmet Sci .
[15]. Klein K. Evaluation of shampoo foam. Cosmet Toilet Mag .
[16]. Ali HS, Kadhim RB. Formulation and evaluation of herbal shampoo from Ziziphus spina leaves extract. Int J Res Appl Pharm.
[17]. Boonme P, Pakpayat N, Yotmanee K, Kunlawijitrungsee S, Maneenuan D. Evaluation of shampoos containing silicone quaternary microemulsion. J App Pharm Sci .
[18]. Baran R, Maibah HI. Cosmetic dermatology in children. In: Text Book of Cosmetic Dermatology. 2nd ed. London: CRC Press; .
[19]. Ireland S, Carlino K, Gould L, Frazier F, Haycock P, Ilton S, et al. Shampoo after craniotomy: A pilot study. Can J Neurosci Nurs.
[20]. Sarath C, Vipin KV, Ann RA, Lindumol KV, Arun S. Development and evaluation of antidandruff shampoo based on natural sources. J Pharm Phytother .
[21]. Teltscher, Kate (2000). "The Shampooing Surgeon and the Persian Prince: Two Indians in Early Nineteenth-century Britain". Interventions: International Journal of Postcolonial Studies. 2 (3): 409–23.
[22]. ChemViews (2012). "Shampoo Science". ChemViews.
[23]. American Heritage Dictionary of the English Language, 4th Edition, See Shampoo; Also see Shampoo. Hobson-Jobson (1903), University of Chicago.
[24]. Robbins, Clarence R., Chemical and physical behavior of human hair, 4th ed (Springer Verlag: New York) 2002.

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International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
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[25]. The World of Hair, A Scientific Companion by Dr. John Gray, Macmillan Press Limited, 1977, pp. 23–24.
[26]. Gitanjali, Deokar; Prajakta, Pethkar; Swati, Bakshe; Kiran, Erande; Rajendra, Bhambar (15 July 2014). "Antimalassezia Activity of Medicated Antidandruff Shampoo Formulated with Microwave Dried Garlic Powder with Improved Allicin Stability". The Natural Products Journal.
[27]. Method for shampooing a pet using a foam-dispensed pet shampoo composition", issued 1997-04-23