

Formulation and Evaluation of Polyherbal Powder Shampoo

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Abstract

Shampoos are used for more than just cleaning hair; they also give hair a glossy finish and help keep it manageable and oily. There is a wide variety of shampoos available, such as antidandruff shampoo, lotion, solid gel, powder, liquid herbal, medical, and clear liquid shampoos. Concerning the herbal shampoos stability requirements. Depending on what's in them, they might be antibacterial, antidandruff, or just a regular shampoo. Using conventional hair care medications, the herbal shampoo powder developed in this work was created. Reetha powder, Bhringraj powder, Brahmi powder, Black tea powder, Amla powder, Beheda powder, and Neem powder were used to construct the preparation, and their organoleptic qualities, powder characteristics, foam test, and physical evaluation were assessed. The prepared shampoo performed perfectly in the physicochemical examination. The current study's outcome demonstrates that adding these medications active components to shampoo produces more stable, aesthetically pleasing goods. Shampoo pH has been demonstrated to be crucial for boosting hair's natural properties, reducing eye irritation, and maintaining the scalp's ecological balance. One of the current trends aimed at avoiding hair damage is the promotion of shampoos with a lower pH. To establish strong outcomes for usage and good results of the product, such results are estimated from a formulation.

Keywords: Herbal shampoo powder, organoleptic properties, formulation, evaluation methods, herbs.

Introduction

Hair essential component of human beauty is hair. Herbs have been used by humans to clean, style, and manage their hair since ancient times. Over time, synthetic substances have accounted for a significant portion of the market, but consumers are becoming more conscious of their negative effects on skin, hair, and eyes. These areas drew the population in with their herbal products because they were less expensive and had fewer adverse effects. Shampoos and hair cleansers are used for more than just cleaning, they also give hair gloss and help keep it manageable and oily for hairs [1]. Shampoos come in a wide variety of forms, such as medicated shampoo, lotion shampoo, solid gel

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shampoo, powder shampoo, and clear liquid shampoo. Regarding stability standards for herbal shampoos. Depending on the composition of the components, these can be basic or plain shampoos, antibacterial or anti-dandruff shampoos, or nutritious shampoos with vitamins, amino acids, and hydrolyzed proteins.¹ The ability of an ingredient to prevent and improve skin quality through skin cleansing, nourishing, and protection guides the selection of active ingredients for hair care powders, such as herbal shampoo powder. The development and assessment of a powdered herbal shampoo are discussed in this research. The present study aims to produce a powdered herbal shampoo that not only strengthens, darkens, and encourages hair growth, but also gets rid of oil,

dirt, and dandruff. It has conditioning properties as well. Without damaging or weakening hair, this herbal shampoo powder accomplishes all of these goals [2].

How Does a Shampoo Operate?

Shampoos are probably used similarly to cosmetics on the skin. We use it as a regular hair care product to keep our scalp and hair clean. Shampoos are generally employed as beautifying agents; they are a thick detergent solution with the right amounts of additives, preservatives, and active compounds. Usually, following application, it is rubbed into damp hair, and the hair is cleansed by running water over it. Shampoo works to remove trapped dirt and debris from hair without significantly lowering sebum production [3].

Definition of Herbal Shampoo

Herbal shampoos are most frequently used for cosmetic purposes. We use it every day as a hair care product to keep our scalp and hair clean. Shampoos are mostly employed as beautifying agents; they are sticky detergent solutions with the right amount of additives, preservatives, and active compounds. It is often rubbed into damp hair, massaged in, and then washed away with water. Using herbal shampoo aims to cleanse hair of dirt that causes makeup buildup while minimizing sebum removal. Both medicated and non-medicated synthetic shampoos are currently widely available on the market [4].

History

In many North Indian languages, shampoo originally meant head massage. Colonial India is credited with introducing both the name and the idea to Britain. The Hindi word "champ" is the source of the English term "shampoo." It was first used in English by Anglo-Indians in 1762. The word "champo" refers to head massages that are typically performed with hair oil in India. Bengali businessman Sake Dean Mahomed is credited for popularizing the phrase and its use in Britain in 1814 when he and his Irish spouse established a steam room known as "Mahomed's Indian Vapor Baths" in Brighton, England. His facilities resembled Turkish baths where patrons received therapeutic massages or the Indian practice of champi (shampooing).⁴ His contributions were valued, and he was bestowed with the distinguished title of "Shampooing Surgeon" by both George IV and William IV. The word's meaning changed in the 1900s from that of massage to that of washing one's hair with soap. Hair was washed with ordinary soap in the past. However, the hair looked unhealthy, was unpleasant, and was irritated by the dull film that the soap left on it [5].

Anatomy of hair

The hair follicle is an intricate epithelial structure encircled by an outer root sheath (ORS) that facilitates hair growth and an inner root sheath (IRS) that tracks the hair fiber to the sebaceous gland opening. Separating the inner and outer root sheaths is the companion layer. There are three separate

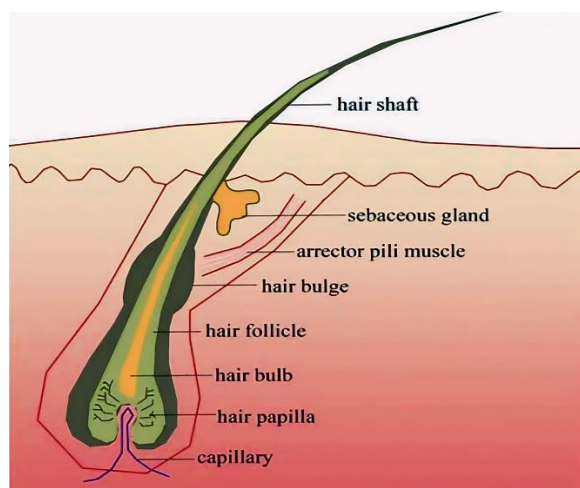


Figure 1. Anatomy of hair

layers inside the inner root sheath (IRS). Huxley's layer, Henle's layer and the inner root sheath cuticle. The hair follicles are made up of two dermal tissues (dermal papilla and dermal sheath) as well as four additional different epidermal layers (hair matrix, medulla, cortex, and cuticle) in addition to the layers of the outer and inner root sheaths shown in Figure 1. Because some hairs have no medulla at all and others have a comparatively large medulla, just the medulla is not always present in these layers. Every layer can consist of multiple distinct cell layers with distinct differentiation processes within each layer. There have been reports of regional differences in the rate of hair growth. The chin and scalp grow at the fastest rates. The surface hair grows at a pace of approximately 0.2 mm every day [6].

Physiology of Hair

- Anagen phase (Growth phase)
- Catagen phase (Transition phase)
- Telogen phase (Resting phase)
- Exogen phase (Shedding phase) [7].

Ideal characteristics of Shampoo

- Needs to produce a significant amount of foam.
- Ought to provide manageable, glossy, smooth, non-dry hair.
- Need to add a pleasant aroma to the hair.
- The hand must not become rough or chapped.
- Must not produce any adverse effects or irritate the skin or eyes.
- Slightly acidic (pH less than 7), as a basic environment causes the keratin disulfide links in hair to break, weakening the hair.Low toxic.
- No damage for hair.
- Good tonish after washing hair [8].

Advantages of Herbal Shampoo Over Chemical Shampoo

- Chemical shampoos may seem to be enhancing the length of hair's texture, but they ultimately harm the roots and result in:
 1. Early aging and hair graying
 2. Dryness and itching of the scalp
 3. Three split ends and a significant hair loss
 4. The best solution to all of these issues is to use a herbal shampoo, which can replenish lost nutrients and reverse any harm.

- **This herbal formulation's benefits include:**

1. No negative side effects
2. Lack of surfactants, such as SLS,
3. Natural ingredients only.
4. Robust stability.
5. They pose less of a risk than store-bought shampoos

Disadvantages of dry shampoo or powder shampoo:

1. A buildup of residue from overusing or often using dry shampoos can give your hair a rough texture.
2. Overuse can also cause the hair to become more brittle by dehydrating it and preventing natural oils from penetrating the hair.
3. Remaining dry shampoo residue can clog the scalp's pores, leading to outbreaks or inflammation.
4. Furthermore, the leftover material could provide the perfect conditions for the development of dandruff.
5. Certain scalps may become irritated by perfumed products [9,10].

MATERIALS AND METHODS [11,12,13]

- **Materials**

1. **Amla**

Biological source: Dried ripe fruits of *Embelica officinalis*.

Family: Euphorbiaceae

Uses: Darkening of hairs and hair Growth promoter.

2. **Reetha**

Biological source: Dried fruits of *Sapindus mukorossi*.

Family: Sapindaceae

Uses: Detergent, cleansing agent and antidandruff.

3. **Bhringraj**

Biological source: Leaves of *Eclipta alba* Linn.

Family: Asteraceae

Uses: It is a great treatment for hair loss brought on by stress. Bhringraj oil eases tension and anxiety by bringing your head down.

4. **Neem**

Biological source: Dried leaves of *Azadirachta indica*.

Family: Miliaceae

Uses: Prevent the dryness of hairs and Flaking of hairs.

5. **Beheda**

Biological source: *Terminalia bellirica*

Synonym: *Myrobalanus bellirica*

Family: Combretaceae

Uses: Baheda helps in promoting hair growth and controlling dandruff.

6. **Tea powder**

Biological source: Tea is known by its botanical name, *Camellia sinensis*. It is a shrub that belongs to the genus *Camellia* and is evergreen.

Family: Theaceae

Uses: Tea powder contains iron and vitamin E, two elements that are vital for healthy hair, are included in tea powder. By maintaining a healthy scalp, vitamin E encourages hair growth, while iron aids in the synthesis of red blood cells, which transport nutrients and oxygen to the hair follicles.

7. **Brahmi**

Biological source: Brahmi is the fresh or dried herb of *Centella Asiatica* (L.)

Synonym: *Hydrocotyl asiatica* Linn.

Family: Umbelliferae

Uses: Brahmi strengthens hair and feeds its follicles and lengths from the inside out.

- **Method**

Drying: Every powder has been ground and is in a dry state.

Weighing: Each of the necessary herbal powders for making shampoo was weighed separately.

Size reduction: After gathering the raw materials, each one was given a hand-cranked mixer to minimize its size.

Mixing: To create a uniform fine powder, all of these fine materials were carefully combined using a mixer.

Sieving: This fine powder was then passed through sieve number 80 to get a suitable amount of fine powder.

Labeling and packaging: Once packaged, it was appropriately labeled. 100 g of herbal powder shampoo was prepared using the following quantity.

Formula for preparation of Polyherbal Powder Shampoo

Polyherbal powder shampoos harness the natural properties of multiple herbs to cleanse and nourish the hair. The following formulas outline two distinct samples of polyherbal powder shampoo, detailing the percentage of each ingredient utilized shown in Table 1.

Table 1. Formula for preparation of polyherbal powder shampoo.

S.N.	Ingredients	Quantity (Sample No. 1)	Quantity (Sample No. 2)
1.	Amla	25%	30%
2.	Reetha	20%	25%
3.	Bhringraj	10%	15%
4.	Beheda	15%	20%
5.	Neem	1.5%	2%
6.	Tea powder	1.5%	2%
7.	Brahmi	4%	6%

EVALUATION PARAMETERS [14–17]

Organoleptic Properties

Organoleptic evaluation involved the evaluation of color, taste, smell, and texture color and composition were assessed using vision and tactile sensibility, respectively. A group of five individuals who are perceptive to taste and smells was assembled to evaluate odors and tastes, and a representative sample was taken.

General Powder Characteristics

Typical properties of the powder include the assessment of variables that will impact external characteristics (such as appearance, packing requirements, flow characteristics, etc.).

Particle Size

Particle size is a factor that affects granularity, spreading, and other characteristics. By using a conventional I.P. to mechanically churn the particles, the size of the particles was determined. sieve for ten minutes, using the sieve procedure.

The Angle of Repose

The powder's flow properties are influenced by the angle of repose. The glass funnel method was used to determine this. The powder's bottom and the grid paper are separated by 2 cm. In this, the glass funnel was involved. The battery's upper section keeps flowing until it hits the bottom of the funnel.

Bulk Density

This is a useful benefit for product packaging. Weighted amounts of powder were applied to a 100 ml graduated cylinder to calculate bulk density. The cylinder was placed on an apparent density scale to determine the apparent density.

Tapped Density

The apparent density of a powder sample obtained by mechanically tapping a container is known as “tapped density”. A minute is spent mechanically tapping the graduated cylinder or vessel once the initial powder volume or mass has been determined. Readings of mass or volume are then kept until the subsequent change in mass or volume. The unit of measurement for this is g/cm³ or grams per cubic centimeter.

Physicochemical Evaluation

pH

We measured the pH of a 10% shampoo solution in distilled water at room temperature or 25°C. The digital pH meter was used to measure the pH.

Washability

Following formulation, the degree and ease of washing with water were personally assessed. Were put on the skin and washed with water.

Solubility

The solubility of the solute dissolves its potential. A beaker is filled with 100 mL of water and one gram of powder, which has been carefully weighed. It was heated and given a good shake to increase solubility. After chilling and sifting them, the residue that remains is weighed and noted.

Ash value

Before use, a silicon plate weighing and burning roughly two grams of powdered medicine was used. The heat was applied little by bit till the temperature became crimson. After it has burned all the way through, the ash is cooled and weighed.

Dirt Dispersion

In a large test container, 10 ml of water is combined with 2 drops of one percent shampoo powder. A drop of Chinese ink was placed, the test piece was closed, and it was then moved ten times. There was no light, medium, or thick ink in the foam at all. Check it is light, moderate and heavy.

Determination of Moisture Content

In a hot air oven, 10 grams of powdered herbal shampoo are evaporated and baked at 105° Celsius. After another half hour of drying, gradually reduce your weight. The moisture content of every sample was calculated.

Foaming Capacity

The trial version of the herbal powder shampoo by employing 2 grams of powder and 50 milliliters of water in a graduated cylinder for varied times, foam stability experiments were used to assess the foaming capability.

Results

Formulation 1 and Formulation 2 have similar organoleptic properties, solubility, and skin safety shown in table 2. However, Formulation 2 offers better foaming capacity, lower angle of repose, and easier washability. Formulation 1 has lower moisture content and dirt dispersion, making it potentially more suitable for specific needs.

Table 2. Evaluation Parameters for Formulation 1 and Formulation 2.

S.N.	Evaluation parameters	Formulation 1	Formulation 2
1.	Organoleptic properties Colour Odour Taste Texture	Greenish brown Slight pleasant Characteristics Fine smooth	Greenish brown Slight pleasant Characteristics Fine smooth
2.	pH	5.15	5.42
3.	Angle of repose	38.65°	24.33°
4.	Bulk density	0.57 gm/ml	0.59 gm/ml
5.	Tapped density	0.64 gm/ml	0.65 gm/ml
6.	Washability	washable	Easily washable
7.	Skin irritation	No irritation or no harmful effect on skin	No irritation or no harmful effect on skin
8.	Solubility	Soluble	Soluble
9.	Foaming capacity	Good (130)	Excellent (140)
10.	Total Ash value	4.0	4.5
11.	Moisture content	0.58%	0.67%
12.	Dirt dispersion	Low	Moderate

CONCLUSION

It was discovered that the medicinal plants used to make herbal shampoo were a rich source of innovative medications. These plants, which have been shown to promote hair development and conditioning, include Amla powder, Beheda powder, Neem powder, Bhringraj powder, Brahmi powder, Black tea powder and Reetha powder. Every parameter produces a positive outcome. The current study's outcome demonstrates that adding these medications active components to shampoo produces more stable, aesthetically pleasing goods. Shampoo pH has been demonstrated to be crucial for boosting hair's natural properties, reducing eye irritation, and maintaining the scalp's ecological balance. One of the current trends aimed at avoiding hair damage is the promotion of shampoos with a lower pH. To establish strong outcomes for usage and good results of the product, such results are estimated from a formulation. Despite having a fantastic wetting capability, the product is in a dry state, which is advantageous for storage. The evaluation parameters, which included the nature of the hair after washing, general powder characteristics, physicochemical evaluation, cleaning action, foaming, and wetting agent, were completed and found to be within the standard range.

REFERENCES

1. Mithal BM, Saha RN. A handbook of cosmetics. Vallabh Prakashan, New Delhi. 2000;141:110–2.
2. More MA, Chaudhari MV, Pawar MA, Kapkar MA, Thakare MJ, Jadhav MA. preparation and evaluation of herbal powder shampoo. International Journal of All Research Writings. 2021 Apr 11;3(11):11–7.
3. Panda S, Nayak M, Biswas N. Formulation and evaluation of herbal powdered shampoo. J. Emerg. Technol. Innov. Res. 2018;5:108–13.
4. Dubey S, Nema N, Nayak S. Preparation and evaluation of herbal shampoo powder. Ancient science of life. 2004 Jul 1;24(1):38–44.
5. Gubitosa J, Rizzi V, Fini P, Cosma P. Hair care cosmetics: From traditional shampoo to solid clay and herbal shampoo, a review. Cosmetics. 2019 Feb 19;6(1):13.
6. Arora P, Nanda A, Karan M. Shampoos based on synthetic ingredients vis-a-vis shampoos based on herbal ingredients: a review. International Journal of Pharmaceutical Sciences Review and Research. 2011;7(1):41–6.
7. Gubitosa J, Rizzi V, Fini P, Cosma P. Hair care cosmetics: From traditional shampoo to solid clay and herbal shampoo, a review. Cosmetics. 2019 Feb 19;6(1):13.

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8. Soundarya M, Ravichandran S. formulation and evaluation of poly herbal shampoo.
 9. Kumar A, Mali RR. Evaluation of prepared shampoo formulations and to compare formulated shampoo with marketed shampoos. *Evaluation*. 2010 Jul;3(1):025.
 10. Remington JP. Remington: the science and practice of pharmacy. Lippincott Williams & Wilkins; 2006.
 11. Momin NM, Disouza JI, Tatke PA, Gonsalves M. Marker based standardization of novel herbal dental gel. *Research Journal of Topical and Cosmetic Sciences*. 2011;2(1):25–9.
 12. Nikam NR, Patil PR, Jadhav RP, Vakhariya RR, Magdum CS. Formulation and evaluation of herbal shampoo: A comparative study. *Research Journal of Topical and Cosmetic Sciences*. 2019;10(2):61–4.
 13. Subrahmanyam CV. Text Book of Physical Pharmacy. Vallabh Prakashan. 2000;2:221–4.
 14. Deswal G, Kriplani P. Formulation and evaluation of poly herbal powder shampoo. *Pharma research bulletin*. 2018;20–4.
 15. Jacob R, Sakthivel KM, Kannan N, Guruvayoorappan C. Formulation of cost-effective herbal shampoo powder: A comparative study with market shampoos. *International journal of current research*. 2015;7(2):12645–9.
 16. Ishii MK. Objective and instrumental methods for evaluation of hair care product efficacy and substantiation of claims. *Hair and hair care*. 2018 Dec 19:261–302.
 17. Arora P, Nanda A, Karan M. Shampoos based on synthetic ingredients vis-a-vis shampoos based on herbal ingredients: a review. *International Journal of Pharmaceutical Sciences Review and Research*. 2011;7(1):41–6.