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Original Article

Preparation and Evolution of Herbal Anti-Fungal Shampoo

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ABSTRACT

The present study focuses on the development and evaluation of a natural herbal shampoo formulation using six well-known plant-based ingredients like amla (Emblica officinalis), ritha (Sapindus mukorossi), shikakai (Acacia concinna), guava leaf (Psidium guajava), lemon (Citrus limon), and aloe vera (Aloe barbadensis). These ingredients were chosen based on their traditional use and scientifically established benefits in hair care, including cleansing, conditioning, antimicrobial action, and scalp nourishment. The objective was to create a shampoo that not only cleanses the hair and scalp effectively but also supports hair growth, reduces dandruff, prevents dryness, and enhances hair texture without the use of synthetic surfactants, parabens, or artificial fragrances. The herbal shampoo was prepared using aqueous extraction and cold blending techniques to retain the bioactivity of all components. It was then subjected to extensive physicochemical and biological evaluation, including tests for pH, foam stability, surface tension, dirt dispersion, solid content, detergency, and microbial inhibition. The results demonstrated that the shampoo had a near-neutral pH, good foaming capacity, effective dirt dispersion due to the inclusion of guava leaf and lemon. The formulation of herbal shampoo indicates a safe, eco-friendly, and effective. It also aligns with the increasing consumer demand for natural and sustainable personal care products.

Keywords: Herbal shampoo, Amla, Ritha, Shikakai, Aloe vera, Anti-Fungal

INTRODUCTION

In the modern era, personal grooming and cleanliness have become crucial facets of everyday living, with hair care being a particularly major concern. Shampoo is one of the most important hair care products. [1] Traditionally, shampoos are defined as cleansing formulations designed to remove dirt, oil, environmental pollutants, and microbial load from the scalp and hair. [2] However, the commercial shampoo industry has predominantly relied on synthetic detergents, preservatives, and fragrances. While these synthetic products offer instant cleansing, they often lead to adverse effects such as scalp irritation, hair dryness, follicular damage, and allergic reactions over long-term use. [3] This increasing awareness of the harmful effects of synthetic cosmetic products has fuelled a global trend toward natural and herbal alternatives. Consumers today seek products that not only fulfil cosmetic functions but also support holistic well-being. [4] Herbal shampoos are emerging as a safe and effective substitute. Herbal shampoos are typically made using plant-derived ingredients that provide mild cleansing while nourishing the scalp and promoting hair health. [5] The Indian subcontinent has a rich heritage in the use of herbal formulations for personal care. Herbs like amla (*Emblica officinalis*), ritha (*Sapindus mukorossi*), and shikakai (*Acacia concinna*) have been traditionally used as natural hair cleansers and conditioners. [6] These ingredients not only clean the scalp but also strengthen hair roots, prevent dandruff, and promote shine. Recent innovations have expanded herbal formulations to include ingredients like guava leaf (*Psidium guajava*) for its antibacterial and antifungal properties, lemon (Citrus limon) for its astringent and pH-balancing effects, and aloe vera (Aloe barbadensis) for its soothing, moisturizing, and regenerative capabilities.[7] Despite their proven advantages, herbal shampoos face challenges in market acceptance primarily due to consumer expectations shaped by synthetic products-such as excessive foaming and bright colouring-which are often misinterpreted as signs of superior cleansing power. Nevertheless, the move toward sustainability, safety, and organic living

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has created a favourable environment for herbal cosmetics to grow and thrive.[8] In this, the present study is aimed at the formulation and comprehensive evaluation of herbal shampoo using a synergistic blend of amla, ritha, shikakai, guava leaf, lemon, and aloe vera.[9] The goal is to develop a product that provides effective cleansing, imparts shine and softness to hair, maintains scalp health, and eliminates the use of harmful synthetic additives. This research emphasizes scientific evaluation alongside traditional knowledge to validate the effectiveness and quality of the herbal formulation.

MATERIALS & METHODS:

1. Chemicals & Plant Materials

Sodium Lauryl Sulfate (SLS), Methyl Paraben, Propyl Paraben, Distilled water, Amla, Ritha Shikakai, Guava, Leaf, Lemon and Aloe Vera were collected from the chemical store of School of Pharmacy, Seacom Skills University, Birbhum, West Bengal, India.

2. Procedure

a. Preparation of Retha extract

It is prepared by cold maceration method. 10 gm of Ritha powder in 70% ethyl alcohol (30mL) then filter it using filter-paper. [10]

b. Preparation of Amla extract

10 gm of Amla powder in 50 ml water and boil it using hot water bath and then filter it using filter-paper. [11]

c. Preparation of Shikakai extract

10 gm of Shikakai powder boiled in 50 ml water using hot water bath cool it at room temperature and then filter it using filter-paper. [12]

d. Preparation of Aloe vera extract

Fresh aloe vera leaves were washed, and the gel was scooped out and blended. The gel was filtered through muslin cloth to obtain a clear extract and used immediately. [13]

e. Preparation of Guava extract

10 gm of dried guava leaf powder was added to 50 mL of distilled water and boiled using a hot water bath for 20 minutes. The mixture was then filtered using filter-paper to obtain the extract. [14]

f. Preparation of Lemon Extract

Fresh lemon juice was manually extracted from ripe lemons and squeeze it and filter it using filter-paper. 5 mL of filtered juice was used directly in the formulation as a natural pH adjuster and antimicrobial agent. [15]

g. Preparation of the Herbal Shampoo

Amla, Ritha, Shikakai, Guava leaf, Lemon juice and Aloe vera gel herbal extracts were measured and mixed in a clean beaker. Then, 10 gm of sodium lauryl sulfate, 1 gm of methyl paraben, 1 gm of propyl paraben and 2-3 drop of rose water were added in this mixture. After that, the mixture was blended thoroughly using a mortar and pestle until a uniform, homogenous paste was obtained. This manual mixing ensures even dispersion of both herbal and chemical components without heat. Then transferred the blended mixture into a 100 mL measuring cylinder and final volume up to 100 ml. Then, the final herbal shampoo formulation was stored in a sterile, amber-coloured bottle at room temperature for further evaluation. [10, 16]

EVALUATION TESTS:

a. pH Determination

The pH was measured using a calibrated digital pH meter by diluting 1 ml of shampoo in 9 ml of distilled water. [17]

b. Foam Ability Test

5 mL of shampoo was added to a 50 ml measuring cylinder with 25 mL distilled water. Then, the cylinder was stoppered and shaken 10 times vertically and foam height was measured immediately (Figure 1). [17]

Figure 1: Foam ability test

c. Foaming Index Test

Prepare a 1% shampoo solution and take 10 ml of this solution into 5 test tubes. Shake each test tube 10 times vertically then measure foam height immediately and after 5 minutes using a ruler. [18]

d. Solid Content Determination

4 ml of shampoo was weighed and placed in a pre-weighed evaporating dish and heat on a hot plate until completely dry. Then, measured the weight of residue (Figure 2).[18]

Figure 2: Solid Content Determination

e. Dirt Dispersion Test

2 drops of shampoo and 1 drop of India ink were added to 10 mL of distilled water in a test tube. The tube was stoppered and shaken 10 times. The location of ink dispersion was observed (Figure 3).[18]

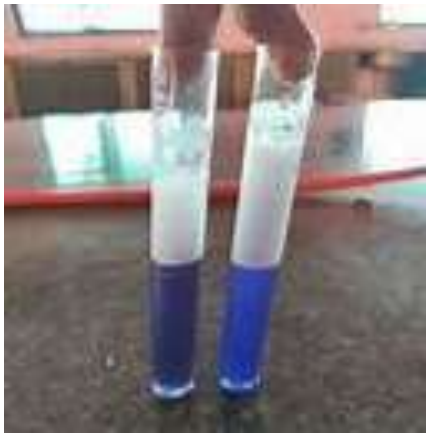

Figure 3: Dirt Dispersion Test

f. Foam Persistence

Prepare a 1% shampoo solution then pour 10 ml of this solution into each of the 5 test tubes. Close each test tube with a stopper or cover with parafilm. Shake each test tube 10 times vigorously and measure the height of foam in each tube. Allow the tubes to stand undisturbed for 10 minutes. After 10 minutes, measure the remaining foam height and record the data (Figure 3).[19]

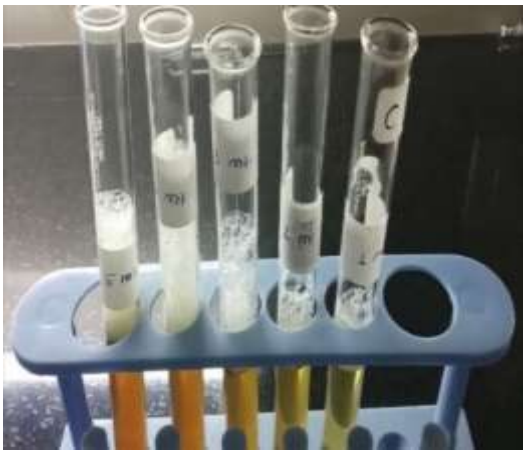

Figure 4: Foam Persistence Test

g. Odour test

Observe the odour of the soap.

h. Color test

Observe the color of the soap.

RESULTS:

Evaluation parameter and outcome result

Parameter	Result	Interpretation
pH	6.2	Ideal for scalp (4.5-6.5)
Foam Height	45 mL	Good foaming ability
Foaming Index	45 mm	Excellent foam stability
Solid Content	8.2%	Within acceptable range (6-12%)
Dirt Dispersion	No ink in foam	Effective cleansing without redeposition
Foam Persistence	Confirmed	Supports natural cleansing action
Odour	Herbal with floral note	Pleasant and non-irritating
Color	Light brown, stable	Aesthetically acceptable

CONCLUSION:

The present study successfully formulated and evaluated a herbal shampoo using a synergistic combination of six traditional plant-based ingredients: amla, ritha, shikakai, guava leaf, lemon, and aloe vera. These were selected for their proven benefits in hair care, such as cleansing, conditioning, antimicrobial action, and scalp nourishment. To enhance functionality and stability, controlled quantities of sodium lauryl sulfate (SLS), methyl paraben, and propyl paraben were incorporated along with a few drops of rose water for fragrance. The shampoo was prepared using simple, cost-effective methods, including aqueous extraction, ensuring minimal degradation of bioactive constituents. Comprehensive evaluation tests demonstrated that the formulation possessed desirable properties including pleasant appearance, acceptable pH, good foaming capacity, fast wetting time, efficient dirt dispersion and stability of foam and solids content. The presence of natural saponins and essential phytoconstituents contributed to the effectiveness of the product. Overall, the findings validate that this herbal shampoo is not only effective as a natural cleanser but also safe, gentle, and environmentally friendly. It combines the wisdom

of traditional ayurvedic knowledge with modern formulation practices to offer a viable alternative to synthetic shampoos. Its non-toxic nature and promising results, this shampoo has significant potential for commercial production and further development into value-added herbal cosmetic products.

REFERENCE

1. Kamaliroosta, L., Gharachorloo, M., Kamaliroosta, Z., & Alimohammad Zadeh, K. H. (2012). Extraction of cinnamon essential oil and identification of its chemical compounds. J. Med. Plants Res, 6(4), 609-614.
2. Gubitosa, J., Rizzi, V., Fini, P., & Cosma, P. (2019). Hair care cosmetics: From traditional shampoo to solid clay and herbal shampoo, a review. Cosmetics, 6(1), 13.
3. Cornwell, P. A. (2018). A review of shampoo surfactant technology: consumer benefits, raw materials and recent developments. International journal of cosmetic science, 40(1), 16-30.
4. Alnuqaydan, A. M. (2024). The dark side of beauty: an in-depth analysis of the health hazards and toxicological impact of synthetic cosmetics and personal care products. Frontiers in public health, 12, 1439027.
5. Sang, S. H., Akowuah, G. A., Liew, K. B., Lee, S. K., Keng, J. W., Lee, S. K., ... & Chew, Y. L. (2023). Natural alternatives from your garden for hair care: Revisiting the benefits of tropical herbs. Heliyon, 9(11).
6. Lonkar, S., Bhagwat, A., Apar, G., Palve, U., Teke, A., & Javvji, R. (2025). Formulation and Evaluation of a Polyherbal Anti-Dandruff Shampoo Using Ritha, Shikakai, And Amla Extracts. International Journal of Scientific Research and Technology.
7. Bhambar, R. S. (2021). A Review on Antimicrobial Activity of Psidium guajava L. leaves on different microbial species, antioxidant activity profile and herbal formulations. Journal of Pharmaceutical Sciences and Research, 13(7), 406-411.
8. Kubba, R., Ahluwalia, D., Kumar, A., & Warkar, S. G. (2021). Flavonoid-Based Surfactants. In Surfactants from Renewable Raw Materials (pp. 97-132). CRC Press.
9. Lonkar, S., Bhagwat, A., Apar, G., Palve, U., Teke, A., & Javvji, R. (2025). Formulation and Evaluation of a Polyherbal Anti-Dandruff Shampoo Using Ritha, Shikakai, And Amla Extracts. International Journal of Scientific Research and Technology.
10. Powar, P. V., & Kanade, K. (2018). Formulation and in vitro evaluation of gel based polyherbal vaginal wash. Indian Drugs, 55(8).
11. Madhavi, N., Kumar, D., Naman, S., Singh, M., Singh, P. A., Bajwa, N., & Baldi, A. (2019). Formulation and Evaluation of Novel Herbal Formulations Incorporated with Amla Extract for Improved Stability. Journal of Drug Delivery & Therapeutics, 9(4).
12. Khan, F. A., Swarnkar, C. P., & Sharma, S. R. Anthelmintic Activity of Extracts of Shikakai (Acacia Concinna).
13. Hu, Y., Xu, J., & Hu, Q. (2003). Evaluation of antioxidant potential of Aloe vera (Aloe barbadensis Miller) extracts. Journal of agricultural and food chemistry, 51(26), 7788-7791.
14. Seo, J., Lee, S., Elam, M. L., Johnson, S. A., Kang, J., & Arjmandi, B. H. (2014). Study to find the best extraction solvent for use with guava leaves (Psidium guajava L.) for high antioxidant efficacy. Food science & nutrition, 2(2), 174-180.
15. Ali, J., Das, B., & Saikia, T. R. I. D. E. E. P. (2017). Antimicrobial activity of lemon peel (Citrus limon) extract. International Journal of Current Pharmaceutical Research, 9(4), 79-82.
16. Maurya, P., Maury, S., Yadav, P., Yadav, M. K., Maurya, S., & Jaysawal, S. (2021). A review article on herbal shampoo. Journal of Emerging Technologies and Innovative Research, 8(5), g366-g375.
17. Vijayalakshmi, A., Sangeetha, S., & Ranjith, N. (2018). Formulation and evaluation of herbal shampoo. Asian Journal of Pharmaceutical and Clinical Research, 11(4), 121-124.
18. Al Badi, K., & Khan, S. A. (2014). Formulation, evaluation and comparison of the herbal shampoo with the commercial shampoos. Beni-Suef University Journal of Basic and Applied Sciences, 3(4), 301-305.
19. Moghimipour, E., Jasemnezhad, M., Mohammad Soleymani, S., & Salimi, A. (2021). Preparation and evaluation of a free surfactant herbal

shampoo with Acanthophyllum Squarrosum Saponins. Journal of Cosmetic Dermatology, 20(1), 181-187.

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