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Research Paper

Formulation And Evaluation Of Heral Shampoo from Bael Extract

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ABSTRACT

Herbal shampoos have gained significant attention as safer and milder alternatives to synthetic hair care products. The present study focused on the formulation and evaluation of a herbal shampoo using bael (*Aegle marmelos*) extract as the primary active ingredient, along with reetha, shikakai, amla, and aloe vera. These herbs are traditionally known for their cleansing, nourishing, antimicrobial, and scalp-protective properties. The shampoo was prepared using aqueous herbal extracts and evaluated for various physicochemical parameters, including appearance, color, odor, pH, foam stability, viscosity, wetting time, dirt dispersion, and stability. The formulated shampoo exhibited good cleansing efficiency, satisfactory foaming ability, acceptable viscosity, and a pH suitable for scalp application. Stability studies indicated that the formulation remained stable under storage conditions without significant changes in its properties. Bael extract contributed additional benefits due to its antibacterial and antifungal activities, which may help reduce scalp infections, strengthen hair roots, and promote healthy hair growth. The incorporation of natural ingredients enhanced scalp nourishment while minimizing the risk of irritation associated with synthetic chemicals. Overall, the study demonstrated that the formulated bael herbal shampoo is a safe, effective, and eco-friendly hair care product suitable for regular use. The results suggest that it can serve as a promising natural alternative to conventional synthetic shampoos while meeting consumer demand for herbal cosmetic products.

INTRODUCTION

Hair care is an important aspect of personal hygiene and appearance. Shampoo is commonly used to clean the hair and scalp by removing dirt, excess oil, dandruff, and other impurities. However, prolonged use of synthetic shampoos

containing chemical surfactants, preservatives, and additives may cause scalp irritation, dryness, and hair damage. As a result, there has been growing interest in herbal shampoos, which are considered safer and more natural alternatives. [1] Herbal shampoos are formulated using plant-based ingredients that provide cleansing, conditioning,

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nourishment, and protection to the hair while maintaining the natural balance of the scalp. Their increasing popularity has encouraged the development of formulations using medicinal plants with proven therapeutic benefits. [2]

Bael (*Aegle marmelos*) is a medicinal plant known for its antibacterial, antifungal, antioxidant, and anti-inflammatory properties. Its leaves contain bioactive compounds that help improve scalp health, strengthen hair roots, and support healthy hair growth. These properties make bael a valuable ingredient in herbal hair care formulations. [3]

In the present study, a herbal shampoo was formulated using bael extract as the primary ingredient along with reetha, shikakai, amla, and aloe vera. Reetha acts as a natural cleanser, shikakai improves hair texture, amla provides nourishment and antioxidant benefits, while aloe vera moisturizes and conditions the hair and scalp. The formulated shampoo was evaluated for physicochemical parameters such as pH, viscosity, foam stability, wetting time, dirt dispersion, and cleansing ability to assess its quality, safety, and effectiveness. Herbal shampoos offer a gentle and natural approach to hair care and may be particularly beneficial for individuals seeking alternatives to chemical-based products. [4]

CLASSIFICATION OF SHAMPOO:

A]. Based on use or Function

- ☐ Conditioning shampoo
- ☐ Antidandruff shampoo
- ☐ Baby shampoo
- ☐ Clarifying shampoo

B]. Based on Appearance

- ☐ Powder shampoo
- ☐ Liquid shampoo
- ☐ Gel shampoo
- ☐ Oil shampoo

FUNCTIONS OF HERBAL SHAMPOO:

- ☐ It have not make the hand rough and chapped.
- ☐ It's not give any side effects or causes irritation to the eye.
- ☐ It produces a good amount of foam to satisfy the psychological requirements.

IDEAL CHARACTERISTIC OF HERBAL SHAMPOO:

- ☐ Should effectively and completely remove the dust, excessive sebum.
- ☐ Should effectively wash hair.
- ☐ Should leave the hair non dry, soft, lustrous with good, manageability.
- ☐ It should impart a pleasant fragrance to the hair.
- ☐ It should not have any side effects or causes irritation to the skin and eye.[5]

ADVANTAGES OF HERBAL SHAMPOO:-

- ☐ Natural Ingredients: Made from pure, organic sources.
- ☐ Reduced Side Effects: Gentle on the scalp and skin.
- ☐ Eco-Friendly: Biodegradable and sustainably produced.
- ☐ Cost-Effective: Long-term hair health reduces additional treatment costs.
- ☐ Treats Hair Conditions: Addresses dandruff, hair loss, and scalp issues.
- ☐ No Artificial Additives: Free from synthetic colors, fragrances, and preservatives.

DISADVANTAGES OF HERBAL SHAMPOO:-

- ☐ Odor Issues: Natural ingredients may have distinct smells.
- ☐ Slower Results: Requires consistent use for noticeable effects.
- ☐ Variability: Seasonal changes can affect ingredient quality.
- ☐ Potential Sensitivities: Certain herbs can cause reactions in sensitive individuals.[6]



HAIR ANATOMY: -

- Hair is the derivative of epidermis consist of two parts -Follicle and the hair shaft.
- The hair root is in the skin and extends down to the deeper layers of the skin.
- Attached to a little muscle (arrector pili) that can make the hair arise. Many nervetermination at the hair follicle too.
- Hair produces from hair follicles located within the fatty cover of the scalp.

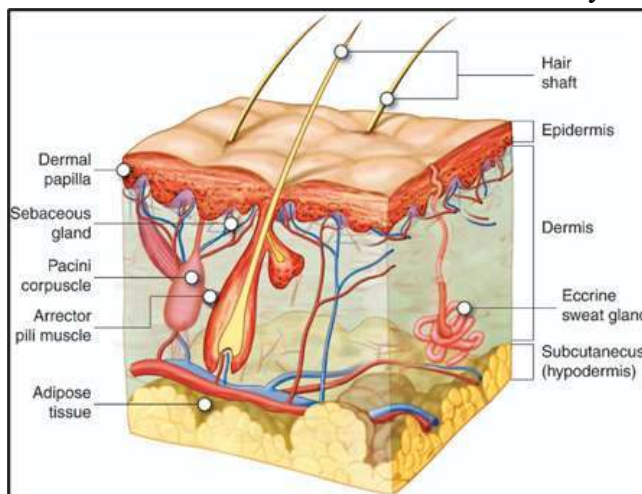


Figure 1:Anatomy of Hair

HAIR PROBLEMS:

Hair Loss: Hair loss is caused by stress, hormonal imbalance, poor diet, and improper hair care.

Dandruff: Dandruff is a scalp condition characterized by flaky skin, often caused by dry scalp, excess oil, poor diet, or product sensitivity.

Hair Colour Damage: Frequent hair coloring can cause dryness, breakage, split ends, and dandruff due to chemical exposure.

Oily Scalp: An oily scalp may result from genetics, hormonal changes, poor diet, or excessive washing, leading to excess oil production. [7]

BAEL:

Bael, also known as Shivaduma, is a sacred and medicinal plant widely used in traditional Indian medicine. Various parts of the plant, including the roots, leaves, fruits, seeds, and trunk, are used for treating different health conditions. [8]

Bael leaves help strengthen hair roots and promote hair growth due to their nourishing properties. The antifungal properties of bael help reduce dandruff and keep the scalp clean. Its anti-inflammatory

activity helps soothe scalp irritation, itching, and redness. Bael leaves act as a natural conditioner, improving hair softness and manageability. [9]

Bael leaves contain nutrients such as calcium, phosphorus, and iron, which support healthy hair growth and scalp nourishment. Topical application of bael leaf paste or oil provides direct nourishment to the scalp and hair follicles. [10]

How Bael Leaves Support Hair Growth ?

Bael leaves are traditionally used in Ayurveda to promote healthy hair growth and maintain scalp health. They nourish the scalp and strengthen hair roots. Their antibacterial and antifungal properties help reduce dandruff, itching, and scalp infections, which can contribute to hair fall. [11]

Bael leaves possess antioxidant activity that protects hair follicles from oxidative stress and environmental damage. Regular use of bael-based preparations may improve scalp blood circulation, support hair growth, reduce hair breakage, and enhance hair texture. [12]



Bael leaves contain limonene, a bioactive compound with antimicrobial, anti-inflammatory, and antioxidant properties that helps nourish and strengthen hair follicles. [13]

Benefits of Bael for Hair:

- Reduces dandruff and scalp irritation.
- Maintains a clean and healthy scalp.
- Nourishes and strengthens hair roots.
- Supports healthy hair growth.
- Improves hair texture and strength.
- Provides a soothing and cooling effect on the scalp.
- Useful as an ingredient in herbal hair care formulations. [14]

AIM AND OBJECTIVE:

Aim:

Formulation and Evaluation of Herbal Shampoo From Bael (Aegle marmelos) Extract.

Objectives:

- To develop a herbal shampoo using natural ingredients that hydrate and nourish hair follicles.
- To strengthen hair roots and promote healthy hair growth.
- To maintain the natural oil balance and pH of the scalp for healthy hair.
- To protect the hair and scalp from environmental damage and infections through natural antiseptic properties.
- To prepare a formulation that is safe and suitable for different skin types with minimal risk of irritation.
- To improve hair strength, shine, softness, and overall hair health.
- To help maintain the natural hair color while promoting a healthy scalp and attractive hair appearance. [15]

PLANT PROFILE: -

BAEL FRUIT: - Main ingredient of formulation



Figure 2:- Aegle marmelos

Synonyms: Bael

Botanical Name: Aegle Marmelos

Biological source: Bael also known as golden apple, Japanese bitter orange, stone apple, wood apple & found in Himalayan tract and throughout India.

Family: Rutaceae

Chemical constituent:

- Vitamins: Certain vitamins, such as biotin (vitamin B7), are often included in hair care products. Biotin is believed to promote hair growth and improve hair health.
- Protein: Proteins, such as keratin and hydrolyzed wheat protein, are commonly found in hair care Products. These proteins can help strengthen the hair strands and improve their overall appearance.

Uses:

- Promotes hair growth
- Bael for hair is it reduces hair loss, fights against dandruff.

Part Use: Fruit pulp powder

Category: Promoting hair Growth.

ALOVERA:



Figure 3: Alovera

Synonyms: Alovera

Botanical Name: Aloe Barbadensis

Biological Source: Dried juice of the leaves of various species of the genus Aloe & Aloe Barbadensis

Family: liliaceae

Chemical Constituents: Anthraquinones and chromones

Uses:

- Increase hair growth
- Balance the pH level

Part Use: Pulp

Category: Smoothing Agent & pH balance.

Biological Source: It consists of dried fruit of Acacia Concinna

Family: Leguminosae

Chemical Constituents: Lupeol, Spinasterol, Acacic Acid, Lactones, Glucose, Arabinose, Rhamnose and Ascorbic acid

Uses:

- ☐ Foaming
- ☐ Antidandruff
- ☐ Antifungal
- ☐ Antibacterial & Anthelmintic

Part Use: pod powder

Category: Antifungal, Nourish, Follicles, Curb Dandruff.

REETHA:



Figure 5: Reetha

SHIKAKAI:



Figure 4: Shikakai

Synonyms: Shikakai, sap-pod

Botanical Name: Acacia concinna

Synonyms: Aritha, arishta, Soapnut, washnut, Kumbhabeja

Botanical Name: Sapindus mukorossi

Biological Source: It consist of dried fruits of Spindus Mukorossi

Family: Sapindaceae

Chemical Constitution: Saponins, Hederagenin, Oleanolic acid, Sapindic acid

Uses:

- Antifungal and Antibacterial Properties make Them an Excellent
- Treatment for Hair fall
- Foaming and detergent

Part Use: Fruit powder

Category: soapberry, Soapnut, Washnut, Amla contains:
Aritha.[16]

AMLA:-

Scientific name: *Phyllanthus emblica* Linn.

Synonym: *Emblica officinalis* Gaertn.

Common name: Amla / Indian Gooseberry

Family: Phyllanthaceae



Figure 6: Amla

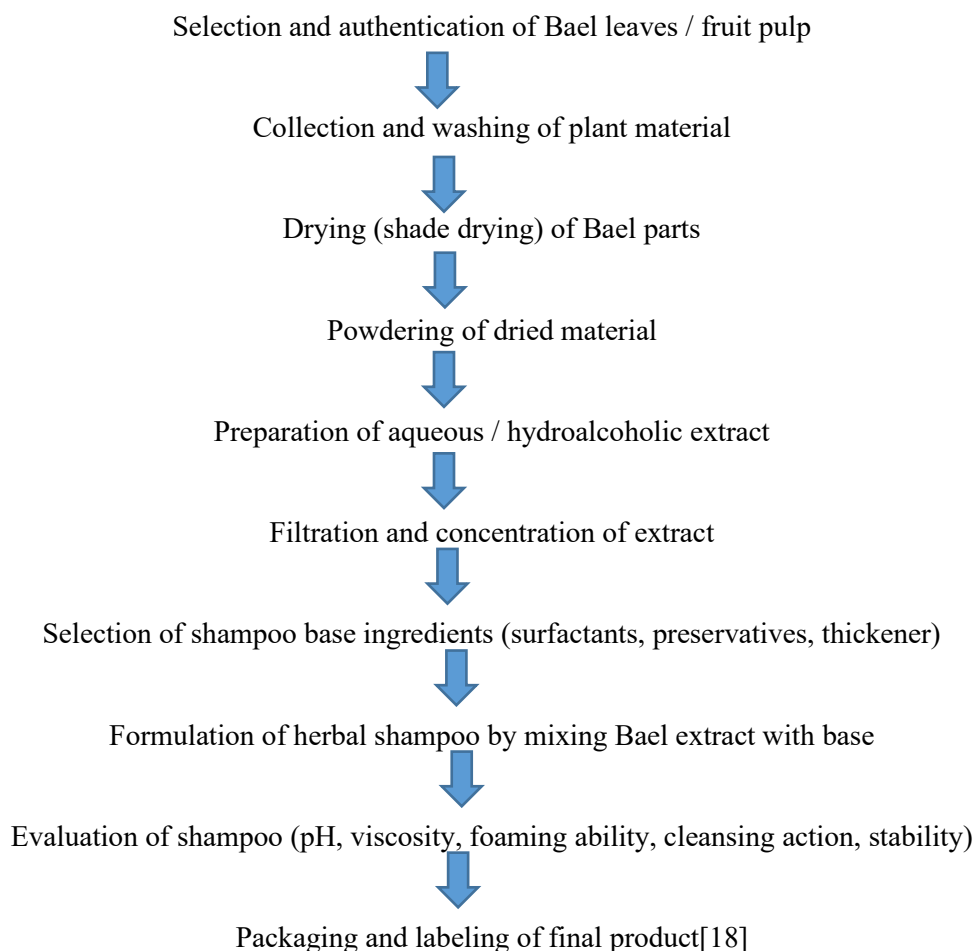
- Vitamin C (Ascorbic acid)
- Tannins
- Gallic acid
- Ellagic acid
- Flavonoids
- Polyphenols

Uses of Amla:

- Promotes hair growth
- Helps reduce dandruff
- Strengthens hair roots
- Acts as a natural conditioner
- Used in shampoos, oils, and hair tonics
- Possesses antioxidant and antimicrobial properties. [17]

PLAN OF WORK:

Chemical Constituents



MATERIAL AND MRTHOD:

The materials used for the formulation of herbal shampoo from Bael are listed in the table below.

Materials:

Table 1: Formulation Table of Heral Shampoo

Sr No	Ingredients	Quantity	Role
1.	Bael Fruit Pulp Extract	10ml	Main herbal ingredient
2.	Reeta extract	25ml	Natural cleansing agent
3.	Shikakai extract	15ml	Hair conditioning agent
4.	Amla extract	10ml	Hair nourishing agent
5.	Aloe vera gel	10ml	Moisturizing and smoothing agent
6.	Glycerin	5ml	Humectant
7.	Sodium benzoate	0.5g	Preservative
8.	Citric acid solution (1%)	q.s	pH adjustment
9.	Distilled water	q.s to 100ml	Vehical
10.	Essevtial oil	3-5 drops	Fragrance

Method of Preparation of Herbal Shampoo:

Preparation of Herbal Extracts:

- Bael fruit pulp, Reetha, Shikakai, and Amla were dried, powdered, and extracted using distilled water.
- The mixture was heated, cooled, and filtered to obtain clear aqueous herbal extracts.

Preparation of Herbal Shampoo:

- Bael, Reetha, Shikakai, and Amla extracts were mixed thoroughly.
- Aloe vera gel was added for moisturizing and soothing effects.
- Glycerin was incorporated to improve conditioning and smoothness.
- Sodium benzoate was added as a preservative to enhance stability and shelf life.
- Citric acid solution was used to adjust the pH close to that of the scalp.
- Distilled water was added to make the final volume up to 100 mL.

- Essential oil was added for fragrance.
- The mixture was stirred until a uniform, homogeneous shampoo was obtained and then stored in an airtight container for evaluation.[19]

Evaluation Parameters of Herbal Shampoo :

Organoleptic Evaluation:

The shampoo was evaluated for colour, odour, appearance, texture, and consistency. The formulation showed brown colour, pleasant odour, smooth texture, and uniform appearance without phase separation or foreign particles.

Determination of pH:

A 10% shampoo solution was prepared and its pH was measured using pH paper or a digital pH meter. The pH was found to be 5–6, which is suitable for maintaining scalp and hair health and helps prevent irritation and dryness.





Figure 7: Determination of pH of Prepared Herbal Shampoo

Foamability and Foam Stability Test:

A 1% shampoo solution was shaken vigorously, and the foam volume was measured immediately and after a few minutes. The prepared herbal shampoo showed good foamability and satisfactory foam stability, indicating effective cleansing performance.



Figure 8: Foamability Test of Herbal Shampoo

Viscosity Determination:

The viscosity of the herbal shampoo was measured using a Brookfield viscometer at room temperature to assess its consistency and ease of application. The prepared shampoo exhibited acceptable viscosity and good consistency, making it suitable for use.

Dirt Dispersion Test:

India ink was added to the shampoo solution, and the distribution of ink in the foam and water was observed. The prepared herbal shampoo demonstrated good dirt dispersion and satisfactory cleansing ability, indicating effective removal of impurities.

Cleansing Action:

The cleansing ability of the shampoo was evaluated on hair strands containing oil and dirt. The prepared herbal shampoo effectively removed dirt and oil, leaving the hair clean, soft, and smooth after washing.

Stability Study:

The formulated shampoo was stored at room temperature and monitored for changes in colour, odour, pH, and consistency. No significant changes were observed during the study period, indicating good stability of the formulation. [20]

RESULT

The formulated herbal shampoo prepared using Bael extract was evaluated for various physicochemical parameters. The prepared shampoo showed satisfactory characteristics such as good cleansing action, adequate foam formation, and acceptable consistency. The pH of the formulation was found to be in the range suitable for scalp application, indicating it is mild and non-irritating in nature. The product also showed good stability during the observation period with no phase separation.

CONCLUSION

This study shows that the herbal shampoo prepared using Bael extract is effective and suitable for use. The shampoo has good cleansing ability and produces adequate foam. It also has a smooth and acceptable consistency, making it easy to apply. The pH of the shampoo is suitable for the

scalp, so it is mild and does not cause irritation. During storage, no phase separation was observed, which shows that the formulation is stable. The natural compounds present in Bael are helpful for maintaining scalp health. Overall, this herbal shampoo is a safe, natural, and better alternative to synthetic shampoos.

REFERENCES

1. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. Nirali Prakashan; 2019.
2. Sharma PP. Cosmetic Formulation, Manufacturing and Quality Control. Vandana Publications; 2018.
3. Kirtikar KR, Basu BD. Indian Medicinal Plants. International Book Distributors; 2005.
4. Mithal BM, Saha RN. A Handbook of Cosmetics. Vallabh Prakashan; 2012.
5. Shinde GS, Kale MA, Jagtap PV, Waghmode YD. Polyherbal shampoo: formulation and evaluation. International Journal of Creative Research Thoughts. 2023;11(8):g147-g154.
6. Tekale S, Jiddewar A. "A Comprehensive Review on Herbal Shampoo." International Journal of Pharmaceutical Sciences. 2025;3(1):159–165. doi:10.5281/zenodo.14588612.
7. Formulation and Evaluation of Herbal Shampoo." International Journal of Creative Research Thoughts (IJCRT). 2025;13(8).
8. <https://www.1mg.com/ayurveda/bael-96?wpsrc=Google+Organic+Search>
9. Tekale S, Jiddewar A. "A Comprehensive Research on Herbal Anti Dandruff Shampoo: Formulation Mechanism and Efficacy." International Journal of Pharmaceutical Sciences (IJPS).
10. <https://ask-ayurveda.com/questions/10987-how-do-bael-leaves-support-hair-growth>
11. Kirtikar KR, Basu BD. Indian Medicinal Plants. International Book Distributors; 2005.
12. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. Nirali Prakashan; 2019.
13. <https://keralaayurveda.com/blogs/news/baelfruit?srltid=AfmBOoqRnJV1VKwkJhhMIuGJVmkT2FN6hoi1VBJ7ZObkeHanbAVaw9yy>
14. Pharmacognosy — Kokate C.K., Purohit A.P., Gokhale S.B. Pharmacognosy. Nirali Prakashan
15. Formulation and Evaluation of Herbal Shampoo." International Journal of Creative Research Thoughts (IJCRT). 2025;13(8).
16. Formulation and Evaluation of Herbal Shampoo." International Journal of Creative Research Thoughts (IJCRT). 2025;13(8).
17. Indian Materia Medica, Popular Prakashan, Mumbai.
18. Indian Materia Medica Popular Prakashan, Mumbai.
19. Ali HS, Kadhimi MJ. "Formulation and evaluation of herbal shampoo from plant extracts." International Journal of Research in Pharmaceutical Sciences.
20. Sharma R.M., et al. "Preparation and Evaluation of Herbal Shampoo." Journal of Pharmacognosy and Phytochemistry.

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