Available online on 15.12.2025 at http://ajprd.com

Asian Journal of Pharmaceutical Research and Development

Open Access to Pharmaceutical and Medical Research

Open Access

Research Article

Formulation and Evaluation of Moringa Polyherbal Shampoo

Bindage Rohan*, Lohar Kiran, Mane Aditya, Chavan Dinesh, Todkar Rohit

Research scholar Rajarambapu college of pharmacy, Kasegaon 415404, Sangli, Maharashtra

A B S T R A C T

The objective of this study is to develop and formulate an herbal shampoo using safe, natural ingredients, and to evaluate its physicochemical properties to ensure both safety and effectiveness. Shampoo is a hair care product designed to cleanse the hair by removing dirt, oil, dead skin cells, environmental pollutants, and other impurities that accumulate on the scalp and hair. This particular formulation is enhanced with herbal extracts and contains no synthetic additives. The herbal extracts included in the formulation are moringa, shikakai, aloevera, bringraj, neem, amla, hydroxy ethyl cellulose, a herbal shampoo was formulated using a simple mixing technique and subsequently evaluated for various physicochemical properties. The assessment methods included visual inspection, pH measurement, cleansing efficiency, determination of solid content percentage, dirt dispersion, foaming capacity, skin irritation.

Keywords: Natural Ingredients, Polyherbal Shampoo, Evaluation of Shampoo, Hair Care.

A R T I C L E I N F O: Received 28 August 2025; Review Complete 19 Sept 2025; Accepted 05 Nov.2025 ; Available online 15 Dec. 2025

Cite this article as:

Bindage R, Lohar K, Mane A, Chavan D, Todkar R, Formulation and Evaluation of Moringa Polyherbal Shampoo, Asian Journal of Pharmaceutical Research and Development. 2025; 13(6):30-40, DOI: http://dx.doi.org/10.22270/ajprd.v13i6.1647

*Address for Correspondence:

Bindage Rohan, Research scholar Rajarambapu college of pharmacy, Kasegaon 415404, Sangli, Maharashtra.

INTRODUCTION:

Hair is a vital aspect of human attractiveness, and people have been using herbs to clean and adorn it since ancient times. Over time, synthetic agents have held a sizable share of the market, but consumers are growing increasingly aware of the harm they do to the skin, hair, and eyes [1]. Because they are safer and function better than their synthetic equivalents, polyherbal shampoos are becoming more and more popular. This pattern is motivated by the growing demand from consumers for natural products with few adverse effects. Similar to conventional shampoos, these shampoos are made using herbal plant extracts and are intended to cleanse hair and the scalp. Because they are safer and function better than their synthetic equivalents, polyherbal shampoos are becoming more and more popular. Growing customer demand for natural products with little adverse effects is the driving force behind this movement. Similar to conventional shampoos, these shampoos are made using herbal plant extracts and are intended to cleanse hair and the scalp [23] [9].

OBJECTIVES:

The formulation of herbal shampoos aims to meet the demands and preferences of the client. These goals emphasize the special advantages and uses of hair care products made from herbs:

1. **Natural Cleansing:** Using natural ingredients to effectively cleanse is one of the main goals of herbal shampoos. Herbal shampoos seek to eliminate product buildup, oil, and debris while preserving the hair's natural moisture balance, in contrast to conventional shampoos that could contain harsh sulfates [21].
2. **Nourishment and Protection:** By combining healthy botanicals, herbal shampoos are made to nourish and shield the hair and scalp. The moisturizing and conditioning qualities of ingredients like hibiscus and aloe vera encourage healthy hair growth and guard against damage [6].
3. **Enhancement of Scalp Health:** Improving the general health of the scalp is another important goal. Common scalp problems like dandruff, irritation, and itching can be addressed by using herbal shampoos that contain

antimicrobial and anti-inflammatory substances like neem and tea tree oil. Maintaining the vitality of hair requires this attention to scalp health [4] [13] [15].

4. **Sustainability and Eco-Friendliness:** Herbal shampoos frequently seek to encourage environmentally. These items satisfy consumers who are concerned about the environment and favor eco-friendly solutions by utilizing naturally derived and biodegradable materials. This goal is in line with the personal care industry's increasing demand for sustainable goods [9].
5. **Cultural Authenticity:** Traditional herbal methods and expertise, including those found in Ayurveda and Traditional Chinese Medicine, are frequently incorporated into herbal shampoos. Offering products that respect cultural heritage and hair care customs while simultaneously offering contemporary advantages is the aim here [18].
6. **Consumer Education and Awareness:** Informing customers about the advantages of herbal substances and the significance of selecting natural products is a key goal. This entails raising awareness of the possible negative effects of artificial ingredients and supporting well-informed hair care decisions [23].

MATERIALS:

Selection of ingredients in polyherbal shampoo :

1. **Moringa :**

Known by many as the "miracle tree" or "tree of life," it is native to parts of Asia and Africa. It has been used in traditional medicine for generations and is highly regarded for its many health benefits. The leaves, seeds, blossoms, and roots of the Moringa tree are prized for their profusion of vital nutrients and antioxidants. Interestingly, it has high amounts of vitamin C, potassium, calcium, iron, and vitamin A. Moringa is well known for its ability to boost vitality, strengthen the immune system, and promote general wellbeing. Because of its high isothiocyanate content, moringa has anti-inflammatory qualities. These substances may reduce inflammation and provide defense against diseases like ulcerative colitis, asthma, and some metabolic disorders.

Moringa oleifera Lam is a member of the Moringaceae family [2].

Figure 1: Moringa Powder.

2. **Neem:**

Neem is made up of the seed oil and fresh or dried leaves of Azadirachta indica, a member of the Meliaceae family.
Add to herbal shampoo. cleans the scalp, unclogs clogged pores, and promotes hair development. It is also very important for treating dandruff. It has antibacterial and restorative qualities and can be used for a number of hair issues. Neem is also useful for treating dandruff. Ayurveda states that in order to promote hair development, the herbs Amla, Neem, Reetha, and Shikakai are necessary [4] [13].

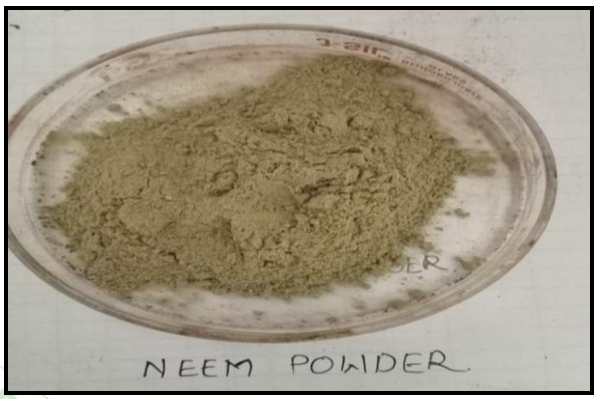

Figure 2: Neem Powder.

3. **Shikakai:**

It is made out of the fruits of the Leguminosae family plant Acacia concinna. adds bounce and luster to dull hair, fights dandruff, encourages hair growth, and regulates hair loss. It is used as a conditioner because it contains a lot of saponins, a natural foaming agent, and it keeps the environment around hair healthy [7].

Figure 3 Shikakai Powder

4. **Aloe vera:**

Aloe vera is the juice extracted through incision from the undersides of the leaves of different Asphodelaceae plants. In addition to reducing inflammation, this ingredient in herbal shampoo can aid those with itchy dandruff symptoms. Aloe vera's antifungal and antibacterial qualities can help reduce dandruff, balance the pH of the scalp, and promote hair growth.

Aloe vera effectively removed excess sebum and debris from the hair shaft [6].

Figure 4: Aloe Vera

5. Amla:

Amla is made up of the fruits of the Emblica-officinalis plant, which is a member of the Phyllanthaceae family strengthen the hair and scalp, promote hair growth, lessen hair loss, and stop or cure bacterial and fungal infections of the hair and scalp [2].

Figure 5: Amla Powder

6. Bhringraj:

Can grow up to 30 to 50 cm tall and is a periodic multibranched herbaceous factory. This factory might have a standing or prostrate shape. White hair is everywhere throughout the factory. Bhringraj, a member of the sunflower family, is a miracle remedy for hair care issues like unseasonable graying and hair loss. Ayurveda describes it as a "Rasayana" with unique properties for revivification and aging reversal. Bringadi oil or Bhringraj oil painting are the two most popular ways to apply Bhringraj to hair [2].

Figure 6: Bhringraj Powder

7. Rose Oil:

Because of its many health benefits, rose oil—especially rose essential oil—can be a useful component of shampoos. Rose oil can prevent dryness and improve the general condition of the hair by hydrating the scalp and hair [12].

Figure 7: Rose Oil

8. Hydroxy ethyl cellulose :

Because of its advantageous qualities, hydroxyethyl cellulose (HEC) is frequently included in shampoos and other personal care products. HEC gives shampoo a desired texture by adjusting its viscosity [8].

FORMULATION TABLE :

Table: 1. Ingredients of Polyherbal Shampoo [3] [24].

Sr. No.	Ingredients	F1(W/V)	F2(Extract)	Role
1.	Moringa	05%	10 ml	Anti-Oxidant
2.	Bhringraj	05%	10 ml	Nutritional
3.	Shikakai	05%	10 ml	Cleanser
4.	Amla	05%	05 ml	Strengthener
5.	Aloe - Vera	05%	10 ml	Nourishing
6.	Neem	05%	05 ml	Anti-Microbial
7.	Hydroxy Ethyl Cellulose	0.1 %	1 gm (1%)	Thickner
8.	Methyl Paraben	0.5 ml	0.5 ml (1%)	Preservative
9.	SLS	1%	1.5 gm	Foaming agent
10	Rose Oil	02 drops	02 Drops	Fragnence
11.	Water	q. s.	q.s.	Vehicle

METHODOLOGY:

For F1 Preparation:

Grab a bowl and mix in moringa, bhringraj, neem, shikakai, and amla.

⇩

Blend them thoroughly to achieve equal competition.

⇩

Mix all the components for 15-20 mins with aloe vera gel.

⇩

Warm the entire mixture and filter it. Incorporate Hydroxy ethyl cellulose as a thickening agent and methyl paraben as a preservative.

⇩

Allow the mixture to cool before incorporating the rose water. Once mixed thoroughly, transfer the product into a container

⇩

Allow the mixture to cool before incorporating the rose water. Once mixed thoroughly, transfer the productinto a container.

For F2 Preparation :

Fill an appropriate container with the decoctions of moringa powder, amla powder, aloe vera extract, neem powder, shikikai powder, and bhringraj powder.

⇩

To make the mixture thicker, include hydroxy ethyl cellulose. Stir constantly to guarantee even mixing. Stir constantly as you add sodium laurial sulphate.

⇩

Add a sufficient amount of rose oil to the recipe to improve its aroma.

⇩

Make sure to add enough water to bring thmake sure all the components are mixed together nicely.
e final amount down to 100 ml. Give the mixture a good stir to

⇩

After proper mixing, fill product in container [25] [8].

EVALUATION OF POLYHERBAL SHAMPOO:

To evaluate the prepared formulations, several quality control tests were conducted, including :

1. **Physical Appearance/Visual Inspection**.

   Clarity, color, odor, and washability of the formulation were assessed [14] [20].

2. **Determination of pH.**

   A calibrated pH meter was used to measure the pH of a 10% v/v shampoo solution that had been made in distilled water. Because it impacts the skin and surface they are used on, the product's pH balance is crucial. Our shampoo's pH is within the optimal range (5-7) for shampoo formulation [17] [15].

3. **Foaming index**

   After precisely weighing one gram of the powder, it was added to a 250 ml conical flask with 100 ml of boiling water. After 30 minutes of gentle warming, it is cooled and filtered and filled a standard volumetric flask to a capacity of 100 ml. Ten test tubes are filled with this extract in successive portions of one, two, three,.5 ml, and the remaining volume is filled with water to equal 10 ml. After that, the test tubes were shaken for 15 seconds at a speed of two frequencies per second in a longwise motion. After that, the tubes are let to stand for fifteen minutes. The foam's height wasmeasured [25]

   Foaming Index = 1000/a

4. **Percentage of solid contents:**

   A dry, clean evaporating dish was covered with four grams of the prepared shampoo. Weighing was done on the shampoo-containing evaporating dish.utilizing an electronic balance, and W_1 was the total weight. The evaporating dish was then put on a hot air oven set to 50 °C and left there until all of the liquid had evaporated. The cooled evaporating dish containing the solid material was then weighed and designated as W2 [8].

   The solid content percentage (%) was computed using the formula $[(W_1\text{-}W_2) \div W_1] \times 100$

5. **Dirt Dispersion:**

   A test tube with 10 milliliters of polyherbal shampoo was filled with two drops of purified water. After adding one drop of ink, the test tube was shook. It was visually determined that there was none, light, moderate, or strong ink scattered throughout the foam [5].

6. **Test for Skin Irritation:**

   A test for skin irritation was carried out by using the prepared polyherbal shampoo. for five minutes on the skin. After the shampoo was removed, the skin was checked for indications of inflammation or irritation. This test aids in determining whether the substance is safe to apply topically [5].

RESULT AND DISCUSSION:

Table 2: Evaluation of Sahampoo

Sr.No	Evaluation test	Formulated shampoo 1	Formulated shampoo 2
1	Colour	Brown	Brown
2	Odour	Rose like	Rose like
3	Appearance	Turbid	Turbid
4	pH	7.26	7.04
5	Foaming index	500	333
6	% Solid Content		3.75%
7	Dirt Dispersion	Light	Light
8	Skin irritation	Nil	Nil

The analysis of the four polyherbal shampoo formulations revealed that formulation F2 had the best overall performance. performance, with optimal stability, a pleasant scent, a pleasing look, and suitability for consumer use. Let's talk more about the findings in more detail [19] [22].

1. Physical Appearance:

Formulation F1 was observed as a brown, glossy liquid with a pleasant fragrance, reflecting its visually and sensorially appealing nature [14].

F1

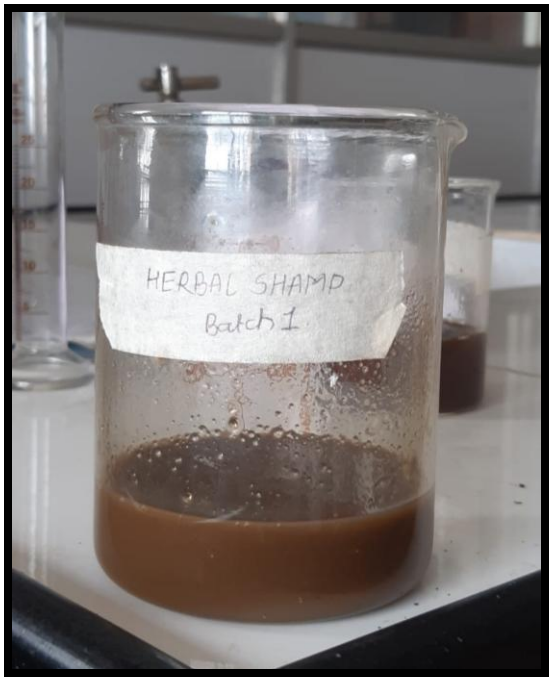

Figure 8: Formulation 1

F2

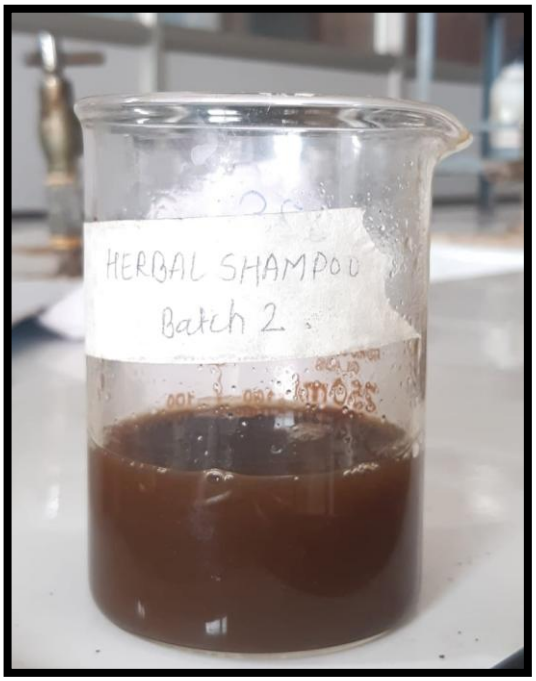

Figure 9: Formulation 2

2. pH:

The pH of formulation F2 was recorded as 7.26 and 7.04, both of which fall within the optimal range for shampoos. This close-to-neutral pH plays an important role in improving hair health, reducing the risk of irritation, and preserving the natural balance of the scalp [17].

F1

Figure 10

F2

Figure 11

3. Foaming Index:

Table 3: Foaming Index

Test tube no.	1	2	3	4	5
Shampoo (ml)	1ml	2ml	3ml	4ml	5ml
Water (ml)	9ml	8ml	7ml	6ml	5ml

Table 4: Foaming Index of Polyherbal Shampoo [25].

Sr.No	No Of Test Tube (Ml Of Solution)	Height Of Foam F1	Height Of Foam F2
1	1ml	0.8 Cm	0.8 Cm
2	2ml	2.0 Cm	0.5 Cm
3	3ml	2.7 Cm	1.7 Cm
4	4ml	1.8 Cm	4.9 Cm
5	5ml	3.0 Cm	3.5 Cm

F1

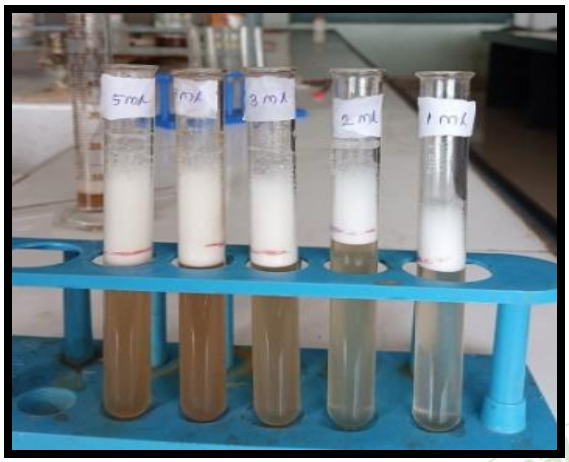

Figure 12:

F2

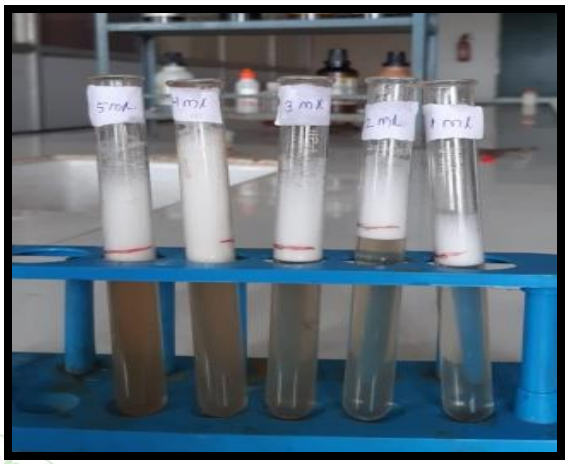

Figure 13:

CALCULATION :

➢ **Formula :**

Foaming Index = 1000 / A

A = Volume of decoction having extract 1 cm height

F1 = 1000/2

F1 = 500

F2 = 1000/3

F2 = 333

- **% Solid Content :**
  Formulation F2 showed a solid content of 4%, indicating that it can be easily washed off without leaving residue or complicating the application process [8].

F 1

Empty dish (A) = 30.40
After evaporation (B) = 30.48
Weight of sample = B – A
= 30.48 - 30.40
= 0.8

Percent solid content
= (B – A) /4 x 100
= 0.8 / 4 x 100
= 20%

F 2

Empty dish (A) = 30.40
After evaporation (B) = 30.56
Weight of sample = B – A
= 30.56 – 30.40
= 0.16

Percent solid content
= (B – A)/4 x 100
= 0.16 /4 x 100
= 4%

F1

Figure 14

F2

Figure 15

Empty Weight

Figur .16

Dirt Dispersion :

Formulations demonstrated effective dirt dispersion, evidenced by the minimal ink present in the foam, which confirms efficient rinsing and cleaning performance.

Both formulations showed satisfactory dirt dispersion indicated light amount of ink in the foam [5].

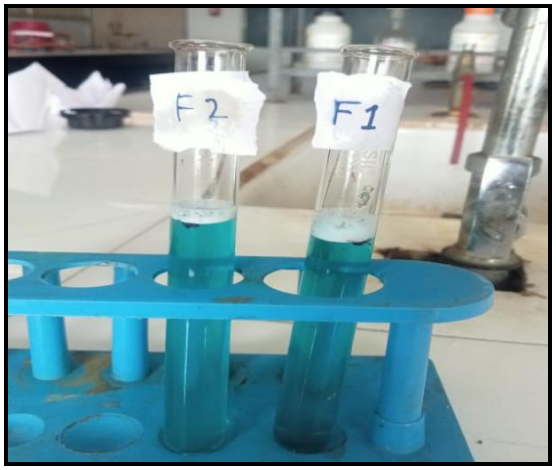

Figure 17

Skin Irritation :

A skin irritation test was performed by applying the formulated polyherbal shampoo to the skin for 5 minutes. After rinsing it off, the skin was inspected for any signs of irritation or inflammation. This evaluation aids in determining the product's skin compatibility [5].

Figure 18 During applying

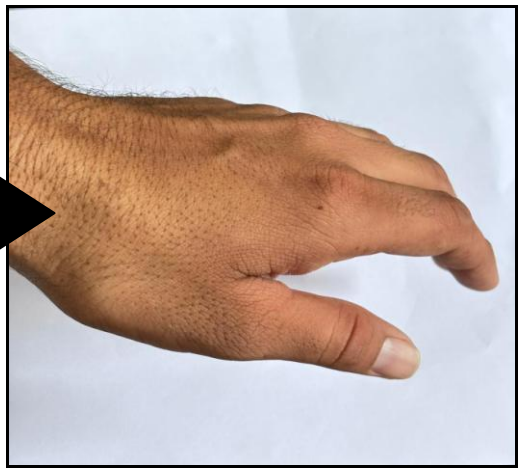

Figure 19 After Application

Future Aspects of Herbal Shampoo:

1. Environmental Sustainability and Green Packaging [9]
2. Tailored Formulations and Individualized Care [21].
3. Advancements in Natural Ingredients and Formulations [2].
4. Alignment with Holistic Health and Wellness Movements [18].
5. Evolving Regulations and Industry Standards [17].

CONCLUSION:

The global market is increasingly shifting toward herbal remedies for both health and cosmetic applications, particularly in hair care [23]. India, known for its diverse climate and rich tradition in herbal medicine, plays a key role in the cultivation and production of herbal ingredients [18]. This study focused on developing a herbal shampoo using traditional Indian herbal extracts commonly used for hair cleansing. The resulting formulation incorporates ingredients that are considered safer than many commercially available herbal shampoos [10]. In addition to cleansing, the shampoo provides added benefits through the inclusion of herbs like shikakai recognized for its anti-dandruff properties, moringa for their anti-oxidant property and neem valued for its antibacterial and antimicrobial effects [7] [2] [4]. By harnessing the natural properties of these herbs, the shampoo not only purifies the hair but also supports scalp health. This comprehensive approach to hair care reflects the rising consumer demand for herbal and natural alternatives in the beauty and wellness sector, offering a safe and effective option for maintaining strong, healthy, and beautiful hair [22] [9].

REFERENCES:

1. Al Badi K, Khan SA. Formulation, evaluation and comparison of the herbal shampoo with the commercial shampoos. *Beni-Suef Univ J Basic Appl Sci.* 2014 Dec 1;3(4):301–5.
2. AlQuadeib BT, Eltahir EK, Banafa RA, Al-Hadhairi LA. Pharmaceutical evaluation of different shampoo brands in local Saudi market. *Saudi Pharm J.* 2018 Jan 1;26(1):98–106.
3. Arora P, Nanda A, Karan M. Shampoos based on synthetic ingredients vis-a-vis shampoos based on herbal ingredients: a review. *Int J Pharm Sci Rev Res.* 2011;7(1):41–6.
4. Chandran S, Vipin KV, Augusthy AR, Lindumol KV, Shirwaikar A. Development and evaluation of antidandruff shampoo based on natural sources. *J Pharm Phytother.* 2013;1(4):2321–5895.
5. Dandekar VR, Garhwani YD, More A, Pote P, Kore P. Formulation and evaluation of polyherbal anti-dandruff shampoo. *Int J Ayurvedic Med.* 2022;13(22):365–9.
6. Devidas PV, Hingne DL. Formulation and evaluation of herbal shampoo from *Piper betel* and *Psidium guajava* leaves. *Int J Res Appl Sci Eng Technol.* 2022;10(6):3792–800.
7. Dubey A, Bhaiji A, Agrawal OP. Development and characterization of poly-herbal shampoo formulation. *[Journal name not available].*
8. Gorantla N, Sai Prasad K, Thimma Reddy VT, Ragadeepika J, Hajarabi T, Ahad HA. Formulation and evaluation of herbal shampoo containing chamomile, rose and orange peel. *Int J Med.* 2013;1:192–7.
9. 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.
10. Gunjkar PM. Formulation and evaluation of herbal shampoo. *[Journal name not available].*
11. Halith SM, Abirami A, Jayaprakash S, Karthikeyini C, Pillai KK, Firthouse PM. Effect of *Ocimum sanctum* and *Azadirachta indica* on the formulation of antidandruff herbal shampoo powder. *Pharm Lett.* 2009;1(2):68–76.
12. Herbal shampoos. *Int J Cosmet Sci.* 2000 Oct;22(5):385–91.
13. Khanpara K, Renuka V, Harisha C. A detailed investigation on shikakai (*Acacia concinna* Linn.) fruit. *J Curr Pharm Res.* 2012;9(1):6–10.

14. Lodha G. Formulation and evaluation of polyherbal shampoo to promote hair growth and provide antidandruff action. *J Drug Deliv Ther*. 2019 Jul 3;9(4-A):296–300. Available from: https://youtu.be/rNK20zOtehg

15. Pagar DS, Tapkire NA, Jadhav NS, Kamble VN, Raut BB. Formulation and evaluation of Ayurvedic shampoo tablet by using herbal ingredients. *Int J Sci Res Technol.* 2024 Sep 27.

16. Prashanthi P, Elumalai A, Eswaraiah MC, Rao YN, Ahamed J. Assessment on general parameters for formulation and evaluation of herbal shampoo. *Res J Top Cosmet Sci*. 2012;3(2):31–3.

17. Preethi PJ, Padmini K, Srikanth J, Lohita M, Swetha KP, Rao PV. A review on herbal shampoo and its evaluation. *Asian J Pharm Anal.* 2013;3(4):153–6.

18. Sharma RM, Shah K, Patel J. Evaluation of prepared herbal shampoo formulations and comparison with marketed shampoos. *Int J Pharm Pharm Sci.* 2011;3(4):402–5.

19. Vijayalakshmi A, Sangeetha S, Ranjith N. Formulation and evaluation of herbal shampoo. *Asian J Pharm Clin Res.* 2018;11(4):121–4.

20. Vlavi SM, Patil AD, Yeowle HM, Jain VH, Pawar SP. Formulation and evaluation of herbal shampoo powder. *Int J Pharm Chem Res.* 2017 Jul;3(3):492–8.

21. Zambare KK, Gonge SB, Shewale GB, Pawar PS. Preparation and evaluation of polyherbal shampoo. *Res J Top Cosmet Sci.* 2019;10(2):41–4.

22. YouTube. Herbal Shampoo Formulation Video Tutorial. Available from: https://youtu.be/jZXqPcvExx8

23. YouTube. Polyherbal Shampoo Preparation Demo. Available from: https://youtu.be/r0j3wLaOlPc

24. Murray PR, Zeitinger JR. Evaluation of Mueller-Hinton agar for disk diffusion susceptibility tests. Journal of clinical microbiology. 1983 Nov;18(5):1269-71.

25. .Bisen NM, Anande HA, Dhote MG, Zode KD, Handekar SA, Lade UB. Sapindus Mukorossi (Areetha)-The Natural Foaming Agent: An Overview.