



Formulation and Evaluation of Herbal Shampoo Bar

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ABSTRACT:

Herbal shampoo bar is to cleanse the hair and scalp. Despite being safer and more effective than synthetic shampoos, it is unlikely that herbal shampoos will be widely used in the current market. A more drastic strategy for making herbal shampoo more widely used would be to alter customer expectations by emphasizing effectiveness and safety. Shampoo bars have become more and more popular in recent years due to their environmental friendliness and sustainability. This study's main objective was to substitute safe natural ingredients like amla, reetha, shikakai for dangerous synthetic ones when making solid shampoo bars. The physicochemical features of the prepared shampoo bar were examined, including physical parameters, pH, lather test, foam ability, foam stability, and skin irritation test. The findings indicated that the formulation displayed strong lathering capacity, acceptable pH appropriate for scalp application, good foam ability, stable foam, and no skin irritation.

Keywords : Herbal shampoo bar, Natural ingredients, Shikakai, Reetha, Amla.

INTRODUCTION

Hair is one of the vital parts of the body, it has a significant influence on the body's aesthetic appeal in addition to being a health indicator. As a result, developments in hair science and hair care technologies have been documented in the literature as new strategies an invention for cosmetics and hair treatments.^[1,2] Shampoo is a hair care product which is described as a preparation of a surfactant (also known as a surface-active substance in an appropriate liquid, solid, or powder form that, when applied as directed, will remove skin debris, surface oil, and dirt from the hair, shaft, and scalp. Shampoo was necessary for effective yet delicate hair cleaning in order to maintain the health of the scalp and hair.^[3] Surfactants (synthetic) are included to synthetic shampoos primarily for their washing and foaming properties, but long-term usage of these surfactants causes major side effects such as eye irritation, scalp irritation, hair loss, and hair dryness.^[4] Today's market offers a wide range of shampoos, including synthetic, herbal, medicated, and non-medicated options. However, the popularity of herbal shampoos is increasing because of their natural qualities, which make them safer, increase consumer demand, and have no negative side effects.^[5] Since herbal shampoos are considered to be an alternative to synthetic ones. Herbal shampoos employ Ayurvedic herbs to cleanse the hair and scalp, similar to normal shampoo. Herbal shampoos are non-toxic, reduce allergic responses, and contain proven ingredients for long-term effectiveness.^[6] Shampoo bar is a solid version of the classic hair cleaner. Shampoo bars are manufactured using a variety of chemicals. Among the many unfavorable side effects of these synthetic bars include headache, nausea, itching, discomfort, increased scaling, and hair loss.^[7] Herbal shampoo bars are replacing synthetic shampoo bars as a result of growing consumer demand for natural and eco-friendly products.^[8] Herbal shampoo bars are solid formulations made with natural herbs like Shikakai, Amla, and Reetha that offer conditioning and washing without the use of artificial chemicals. The phytoconstituents present provide further advantages such as antibacterial properties, hair strengthening, and dandruff management. There are several benefits of using herbal shampoo bars versus liquid shampoo, such as saving water, having more effective chemicals, and reducing the use of plastic. Travel-friendly, environmentally friendly, gentle, much more natural, economical, and easy to use.^[9]

Table no.1: Ingredients profile [10,11,12,13]

SL NO	Plant profile	Figure	Medicinal Uses
1	<p>COCONUT OIL Family - Arecaceae Genus - Cocos Species - C nucifera Binomial name-Cocos nucifera L</p>		<ul style="list-style-type: none"> • Conditioner • Preventing split ends • Prevent frizz
2	<p>REETHA Family-Sapindaceae Genus- Sapindus Species - <i>S. mukorossi</i> Binomial name-Sapindus mukorossi Gaertn</p>		<ul style="list-style-type: none"> • Foaming agent • Cleanser • Removing lice from hair
3	<p>SHIKAKAI Family-Fabaceae Genus -Acacia Species-Acacia concinna Binomial name - Acacia concinna DC</p>		<ul style="list-style-type: none"> • Promotes hair growth • Reduces hair loss and breakage • Anti -dandruff
4	<p>AMLA Family -Phyllanthaceae Genus - Phyllanthus Species - <i>P. emblica</i> Binomial name-Emblica officinalis Gaertn</p>		<ul style="list-style-type: none"> • Reduces hair loss • Treat bacterial infection • Improve overall appearance of hair

MATERIAL AND METHOD:

Materials: This composition contains only herbal ingredients. The ingredients shikakai, amla, reetha, and coconut oil are obtained at a general store.

METHODOLOGY:

Table no.2: General chemicals required for herbal shampoo bar preparation.

Sl.no.	Chemicals	Source
1.	Stearic acid	Laboratory reagent
2.	Sodium hydroxide (Lye solution)	Laboratory reagent
3.	Glycerin	Laboratory reagent
4.	Alcohol (Ethanol)	Laboratory reagent
5.	Propylene glycol	Laboratory reagent

PREPARATION OF HERBAL POWDERS: ^[14,15,16]

Soapnuts, shikakai and amla were purchased from a general store and dried in an oven at 50°C for two days. The dried soap nuts, shikakai and amla were then ground into a powder with a grinder, and the resulting particles were sieved to produce fine particles that were later employed in the formulation.



Fig no.1: Preparation of herbal powders.

FORMULATION OF HERBAL SOAP BAR: ^[17]

The required ingredients were weighed accurately using a digital balance. Subsequently, 6.41 gm of sodium hydroxide (lye) was transferred into a beaker containing 14 mL of distilled water, dissolved, and set aside for 15 minutes. In the next step, 35 mL of coconut oil was added to a steel pot and heated for 5 minutes. Then, 10 g of stearic acid was added to the coconut oil, mixed well, and heated for 2-3 minutes. The prepared lye solution was then added to the mixture and heated for another 5 minutes. Following this, 8.5 mL of glycerin and 3 mL of alcohol were added, the steel pot was covered, and the mixture was heated for 5 minutes. After heating, propylene glycol was added, the pot was covered again, and the mixture was heated for an additional 2 minutes. The mixture was then subjected to stirring for 6-8 minutes until a creamy texture was achieved. The mixture was heated by the double boiling method for 5–10 minutes until a semisolid consistency appeared, herbal ingredients such as shikakai, amla, and reetha powder were added with continuous stirring to form a homogeneous mixture. Finally, the mixture was poured into a soap mould and allowed to solidify.



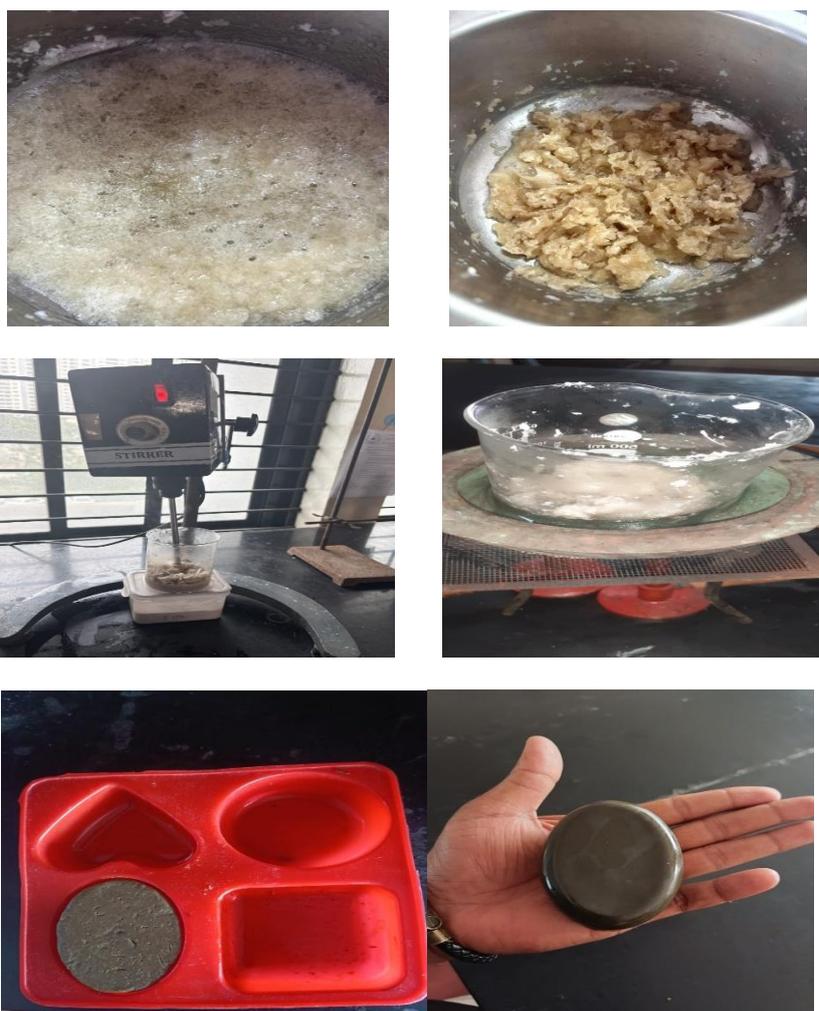


Fig no.2: Preparation of herbal shampoo bar.

Table no.3: Formulation table for herbal shampoo bar preparation. ^[17]

SL.NO	INGREDIENTS	FORMULATION			USES
		F1	F2	F3	
1	Coconut oil	35g	35g	35g	Cleansing agent
2	Stearic acid	10g	10g	10g	Hardening agent
3	Sodium hydroxide	6.41g	6.41g	6.41g	Saponifying agent
4	Distilled water	14ml	14ml	14ml	Solvent
5	Glycerine	8.5ml	8.5ml	8.5ml	Humectant
6	Alcohol	3ml	3ml	3ml	Anti-microbial
6	Propylene glycol	17ml	15ml	13.5 ml	Humectant
7	Shikakai	2.5g	2.5g	2.5g	Anti-dandruff
8	Reetha	1.5g	3.5g	5g	Foaming agent
9	Amla	2.5g	2.5g	2.5g	Prevents hair loss
10	Lavender oil	1 drop (0.05ml)	1 drop (0.05ml)	1 drop (0.05ml)	Fragrance



EVALUATION OF HERBAL SHAMPOO BAR:

- 1. Physical parameters:** The appearance, consistency, homogeneity and colour were observed by visual examination.[18]
- 2. pH Test:** The pH is measured with a pH strips, two drops of water added on the shampoo bar and rubbed to obtain lather, pH paper was placed on the shampoo bar and the resulting color was compared with the standard pH chart.[18]
- 3. Lather Test:** The lather is evaluated by rubbing the bar between wet palms and watching the froth for. Shampoo bars should have a rich, creamy lather that is stable. [19]
- 4. Foam Forming Ability:** The foaming ability was evaluated using the Cylinder Shake Method. 25 ml of a 1% sample solution transferred to a 50 ml measuring cylinder and gave it ten vigorous shakes. Measure the height of the foam that formed and noted the total amount of foam after a minute of shaking. [19]
- 5. Foam Stability:** The foaming stability was evaluated using the Cylinder Shake Method. 25 ml of a 1% sample solution transferred into a 50 ml measuring cylinder. Ten hard shakes were given to the cylindrical container while it was covered with the hand. After 5 minutes, the foam's volume was computed. [20]
- 6. Skin Irritation Test:** Apply a soap sample to clean skin, wash the hands with water and observe for indications of irritation, such as redness, burning, or itching. Monitor for 24 hours. [21]

RESULTS:

Table no.4: Physical Appearance

SL.NO	Test	Formulation		
		F1	F2	F3
1	Appearance	Greenish brown	Greenish brown	Greenish brown
2	Odour	Lavender	Lavender	Lavender
3	Consistency	Solid	Solid	Solid
4	Homogeneity	Homogeneous	Homogeneous	Homogeneous

Table no.5: Skin irritation

SL.NO	Test	Formulation		
		F1	F2	F3
1	10mins.	No reaction	No reaction	No reaction
2	1hrs.	No reaction	No reaction	No reaction
3	2hrs.	No reaction	No reaction	No reaction



Fig no.3: Skin irritation test.

Table no.6: pH test

SL.NO	Formulation		
	F1	F2	F3
1	7pH	7pH	7pH

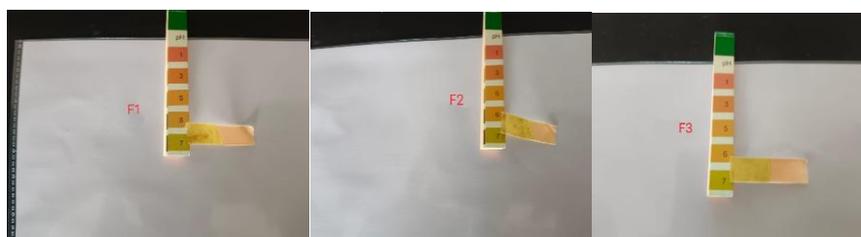


Fig no.4: pH test results.

Table no.7: Foaming ability

Sl. No	Foam ability test	Formulation		
		F1	F2	F3
1	Height	15ml	21ml	25ml

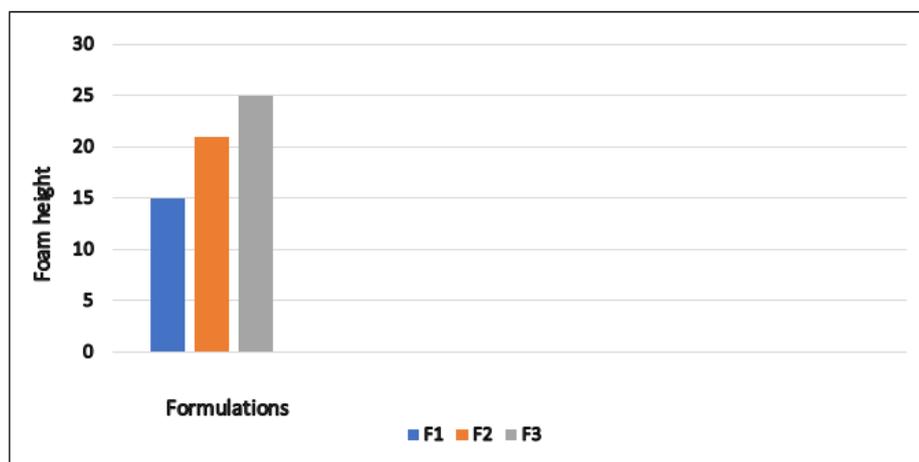


Fig no.5: Foaming ability chart.



Fig no.6: Foaming ability

Table no.8: Foaming stability

Sl. No	Foam stability test	Formulation		
		F1	F2	F3
1	Time(5mins)	Stable	Stable	Stable

Table no.9: Lather test

Sl. No	Lather test	Formulation		
		F1	F2	F3
1	Lather formation	Good	Very good	Excellent



Fig no.7: Lather test results

Discussion:

The herbal shampoo bar composed with Shikakai, Amla, and Reetha demonstrated efficient cleaning and conditioning characteristics. Shikakai offered moderate cleaning and antibacterial activity, Amla added promotes hair growth and conditioning properties, and Reetha improved foaming and functioned as a natural surfactant. Together, these nutrients preserved scalp health, strengthened hair, and reduced the need for synthetic chemicals. The herbal shampoo bar created with Shikakai, Amla, and Reetha received favorable evaluations, including an appropriate pH (7.0,7.0,7.0) F1, F2, F3. Foam ability and foam stability both are stable in (F1, F2, F3) formulation. No skin irritation in F1, F2, F3. Lather formation is more in F3 formulation than the F1&F2. Overall, the composition displayed balanced cleaning and conditioning characteristics with eco-friendly benefits, making it a possible natural alternative to synthetic shampoos.

Conclusion:

An herbal shampoo bar made with amla, shikakai, and reetha was found to provide a natural and efficient commercial shampoo based on evaluation test studies and observation. Every component was chosen because of its advantageous qualities for hair health. While eliminating the harsh chemicals present in synthetic shampoos, the combination of these elements in a shampoo bar offers deep cleansing, scalp nourishment, and hair strengthening. Additionally, the shampoo bar format reduces plastic waste, making it environmentally friendly. Herbal shampoo bars F1 F2 F3 were prepared in different amounts and assessed for their physicochemical properties. According to the study, formulation F3 worked well since it had more reetha.

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