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Formulation and Evaluation of Multipurpose Herbals Solid Shampoo and Conditioner Soap

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Abstract

Hair is a health indicator and has a big impact on how lovely the body looks. Shampoo is one of the most often used beauty products for cleaning hair. The primary purpose of contemporary shampoo formulations is not limited to hair cleaning. Additional benefits including conditioning and surface smoothing of the hair are expected, along with healthy hair that is free of dirt, grease, dandruff, and lice. The main difference is that, while shampoo bars usually don't, liquid shampoos often include detergents that have the occasional tendency to strip hair of its natural oils. Shampoo formulations with anti-dandruff chemicals help treat dandruff, which reduces hair loss and promotes growth. In such a situation, the anti-dandruff qualities of plants and different herbs can be employed in place of highly damaging chemical products. Humans are the most common host of bacterial illnesses. The potential benefits of the herbs, including their anti-inflammatory, antibacterial, and antifungal qualities, have been studied for a long time and applied to a variety of human applications. The majority of hair repair and conditioning solutions available today work by coating hair fibers with intricate formulations made of combinations of macromolecules and surfactants. This causes the outermost region of capillary fibers to partially cover the damaged areas. This reduces friction between the fibers, making them easier to handle and more hydrated. The various physicochemical characteristics connected to the conditioning mechanism must be carefully examined in order to optimize shampoo and conditioner formulations.

Keywords: Herbal Solid shampoo, Herbal Hair conditioning, Antidandruff, Medicinal plants, Physico-chemical tools, etc.

INTRODUCTION

Since ancient times, people have utilized plants with therapeutic qualities in traditional medicine. Many medicinal plants' leaves, stems, and roots can be extracted, and this extract is used as a natural cure for a variety of illnesses. The safety and effectiveness of Ayurvedic products have set standards, even if many plant-based treatments have been supplanted by synthetic chemicals. The active ingredients that give these products their therapeutic qualities are applied topically in the form of creams, soaps, oils, and ointments to treat skin conditions such ringworm, acne, eczema, and wounds. They are also used as antimicrobial agents and for cosmetic purposes. [1] Hair not only indicates health but also greatly influences the attractiveness of the body. As a result, developments in hair science and hair care technologies have led to new ideas and approaches for cosmetics and hair treatments that

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have been documented in the literature. Shampoo was needed to clean hair effectively and gently in order to take care of the scalp and hair. But as time went on, people began to view shampoo as more than just a cosmetic item with cleansing properties. It also adds luster and makes hair easier to manage while maintaining its appearance and health. A shampoo is a surface active material (surfactant) preparation that, when used as directed, will safely remove skin debris, grease, and oil from the hair shaft and scalp without causing any harm to the user. It can be applied as a liquid, solid, or powder. A bar of shampoo is a concentrated version of the conventional hair wash. The primary distinction is that shampoo bars frequently lack the same detergents as many liquid shampoos, which have the tendency to deplete hair of its natural oils. Solid shampoo bars provide several advantages over liquid shampoo, including the ability to conserve water, contain more concentrated ingredients, and reduce the amount of plastic used. Easy to use, affordable, mild, environmentally friendly, and much more natural than before. Most indigenous groups around the world include traditional medicine into their traditions and health beliefs. Herbal shampoo bars are cosmetic items that use plant-based herbs to clean the hair and scalp, much like traditional shampoo preparations. This hair care is natural medical care intended to strengthen, darken, and promote hair growth in addition to eliminating oil, grime, and dandruff. Moreover, it provides lustre, smoothness, and softness to the hair as a substitute for the store-bought synthetic shampoo bars. Many drugs are used to make cosmetic shampoo bars. Many unwanted side effects, such as hair loss, increased scaling, itching, discomfort, nausea, and headaches, are associated with these drugs. Thus, an attempt is undertaken to develop an herbal shampoo blend devoid of negative effects. Using a herbal shampoo bar is the greatest way to address all of these problems as it will replace lost nutrients and repair any damage. [2-8]

HERBAL HAIR CONDITIONER

The majority of hair problems are supposed to be treated by herbal conditioners. Given that natural conditioners don't include any chemicals. The main ingredients included are Coconut milk, Aloe Vera, Honey, Rose water. A hair care product called hair conditioner is used to condition hair after shampooing. Conditioning aids in both repairing and protecting your hair. Conditioner is a term for a preparation intended to enhance hair condition. All hair types benefit from the product. It functions by replenishing moisture and reducing roughness in the hair follicles' cuticles. Strong antioxidant-rich hair conditioners help lessen UV damage to hair, including colour changes and protein deterioration.[9]

HERBAL HAIR SHAMPOO

The main ingredients included are Neem, Amla, Brahmi, Jata mansi, Shikakai, Baheda .Shampoos are likely the most popular cosmetic item used on a regular basis to clean your hair and scalp. In essence, a shampoo is a detergent solution with appropriate additions for additional uses like lubrication, medication, hair conditioning, etc. There are a lot of synthetic, herbal, medicated, and non-medicated shampoos on the market these days.[10] Figure 1, 2, 3.

Aims and Objectives

Aims

Formulation and Evaluation of herbal solid shampoo and conditioner.

Objective of shampoo [11]

1. To create the shampoo using herbs.
2. To review the shampoo made of herbs.
3. The leaves, fruits, and roots are the parts employed in the formulation.
4. To lessen the adverse effects of the chemical composition.
5. To enhance the texture of hair.
6. To make the hair color darker.
7. To give hair a glossy appearance and to keep it manageable and greasy.

Objectives of conditioner

1. Designed to give your hair more shine.

2. To maintain its flow and softness.
3. To promote the growth of hair.
4. To make hair simpler to comb and more manageable.
5. To leave hair feeling hydrated and silky.
6. To repair hair damage.
7. To straighten hair that is curly.
8. To restore and regenerate hair fibers.
9. To keep styles from heat and UV radiation.

Figure 1. F1 Shampoo and Conditioner

Figure 2. F2 Shampoo and Conditioner.

Figure 3. F3 Shampoo and Conditioner.

Material and Method

A) Material

Neem, Amla, Brahmi, Jata mansi, Shikakai, Behada, Honey, Aloe, Rosewater, was obtained from P.S.G.V.P. Mandals College of pharmacy, Shahada, India. Soap base and Coconut millk was purchase from local market of shahada.

B) Formulation of solid Shampoo and Conditioner:

We bought the soap base from the neighborhood market. A little over 20g of soap base was chopped up and heated to a liquid state in an oven. Aqueous extracts of each item were added to it. After pouring the slurry into a cast, it was left to dry.

Table 1. Formulation of Solid Shampoo

S.N.	**Ingredients**	**Shampoo**		
		F1	*F2*	*F3*
1	Neem	0.5ml	0.3ml	0.2ml
2	Amla	0.5ml	0.3ml	0.2ml
3	Brahmi	0.1ml	0.1ml	0.1ml
4	Jata mansi	0.1ml	0.1ml	0.1ml
5	Shikakai	0.2mg	0.1mg	0.1mg
6	Behada	0.1ml	0.1ml	0.1ml
7	Soap base	q.s	q.s	q.s

Table 2. Formulation of Solid Conditioner

Sr. no	**Ingredients**	**Conditioner**		
		F1	*F 2*	*F3*
1	Honey	1ml	0.5ml	0.3ml
2	Aloe	1ml	0.5ml	0.3ml
3	Rosewater	1ml	0.5ml	0.3ml
4	Coconut milk	1ml	0.5ml	0.3ml
5	Soap base	q.s	q.s	q.s

C) Method

Extraction of Neem

To make a rough powder, fresh neem leaves were gathered, cleaned, dried in the air, and crushed. Additionally, ethanol was macerated with crude powder for two days. In order to create viscous extracts, the filtrate was then evaporated at 50°C using a rotary evaporator. [12]

Extraction of Brahmi

After macerating the dried plant material in 95% ethanol for a period of time at room temperature, the extract was filtered through filter paper (Whatman no.1).The same process was used twice more to obtain the filtration residue. After combining the filtrates, they were dried out by evaporating under low pressure.[13]

Extraction of Jatamansi:

Rhizome in ethanol in a Soxhlet device for five hours. After drying, the extract was again mixed in a sufficient amount of an ethyl alcohol-based solvent mixture. After that, every extract was freeze-dried and condensed using a rotary evaporator.

Extraction of Amla

Using a soxhlet extractor and 50% ethanol, the dried fruits of E. officinalis were ground into a coarse powder. A syrupy substance was obtained by concentrating the extract while the pressure was lowered. The extract was used throughout the research and kept in a refrigerated, airtight container.[14]

Evaluation of Solid shampoo and conditioner:*[15]*

1. Physicochemical evaluation of herbal solid shampoo and conditioner

Organoleptic characteristics like as texture, colour, and smell were assessed either physically or manually.

2. Determination of pH

Firstly, 2g of the finished soap was dissolved in 10ml of distilled water and stirred till sample completely dissolved. Using a pH metre, the pH was found Figure 4.

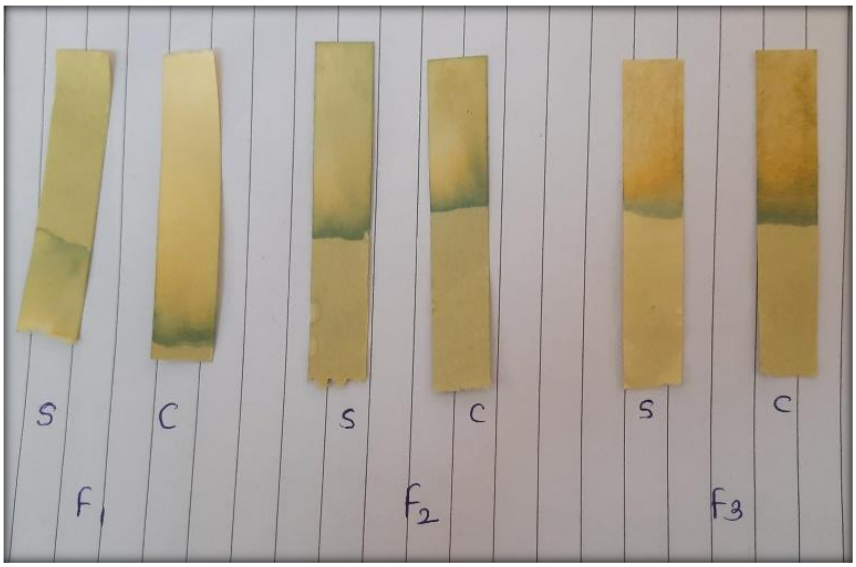

Figure 4. PH determination

3. Determination of foaming ability

In a 100 ml measuring cylinder, 2g of soap was dissolved in 50 ml of distilled water and strongly shaken for 2 minutes. After 10 minutes of standing, the height of the foam was determined. After 3 repetitions, the mean was calculated. Figure 5, 6.

Figure 5. Foaming ability of Conditioner.

Figure 6. Foaming ability of Shampoo.

4. Determination of total fatty matter (TFM)

The soap and acid are reacted in the presence of hot water to perform the total fatty matter test, and the resulting fatty acids are then measured. After weighing out about 1 g of the finished soap, 15 ml of distilled water was added and boiled. In 0.5 ml of sulfuric acid, the soap was dissolved, increasing the content to 10 ml. While heating up until a transparent liquid was achieved. After adding 0.7g of bee wax and heating the mixture, the fatty acids on the surface hardened. In order to make cake, the setup was allowed to cool. The cake was taken out, allowed to dry, then weighed to determine its total fat content.

Using a formula

%TFM = (A –X)/W x 100 Where; A= weight of wax+ oil, X= Weight of wax, W= weight of soap. Figure 7, 8.

Figure 7. TFM of Shampoo

Figure 8. TFM of Conditioner

5. Determination of moisture content

A little over 5 g of sample under investigation were precisely weighed, moved to known weight china dish, & heated to between 100 -105°C for an hour in hot air oven. In order to determine true weight of tarred china dish, sample & dish were weighed together. To determine percentage moisture content, the substance's weight was recorded. Figure 9

Moisture content = (Difference in weight/initial weight) x 100

Figure 9. Moisture content of Shamoop and conditioner

6. Total Alkali

By titrating excess acid present in the aqueous phase with a standard volumetric NaOH solution, this was ascertained. After weighing 1 gm of the final soap, 5 ml of ethanol, and 0.5 ml of a 1M H2SO4 solution, the mixture was boiled until the soap sample was dissolved. The test solution was titrated using phenolphthalein as an indicator against 1.0M NaOH. The entire alkali was discovered. Figure 10.

% alkali = [(VA-VB)/W] × 3.1

Figure 10. Total Alkali of shampoo and contioner.

7. Antibacterial properties

There was an Agar well diffusion method. Staphylococcus aureus and Escherichia coli were cultured for 24 hours on petri plates with 20 millilitres of Mueller Hinton agar. There were five wells made, one of which served as the control and the other four of which had various extract concentrations added to them. For 24 hours, the plates were incubated at 37°C. It was determined what the inhibitory zone was.

RESULTS AND DISCUSSION

Organoleptic characters for Shampoo Bar			
	Colour	***Odour***	***Texture***
F1	Dark brown	Pleasant	Solid & smooth
F2	Brown	Pleasant	Solid & smooth
F3	Light brown	Pleasant	Solid & smooth

Organoleptic characters for Conditioner Bar			
	Colour	***Odour***	***Texture***
F1	Transparent white	Pleasant	Solid & smooth
F2	Transparent white	Pleasant	Solid & smooth
F3	Transparent white	Pleasant	Solid & smooth

Evaluation Parameters for Shampoo Bar				
S. N.	***Evaluation Parameters***	***F1***	***F2***	***F3***
1.	Determination of pH	8	9	8
2.	Determination of Foaming ability	27	29	25
3.	Determination of Total Fatty Matter (TFM)	20%	70%	60%
4.	Determination of Moisture content	1.9	1.3	4.8
5.	Total Alkali	0.03%	0.05%	0.06%

Evaluation Parameters for Conditioner Bar				
S. N.	***Evaluation Parameters***	***F1***	***F2***	***F3***
1.	Determination of pH	9	9	8
2.	Determination of Foaming ability	28	27	29
3.	Determination of Total Fatty Matter (TFM)	30%	40%	50%
4.	Determination of Moisture content	1.8	2	1
5.	Total Alkali	0.02%	0.02%	0.03%

Evaluation of antimicrobial properties for shampoo				
Organisms	***Zone of inhibition of (Neem, Behada, Amla, Jatamansi, Brahmi) mm***	***Zone of inhibition of solid shampoo***		
		F1	*F2*	*F3*
Staphylococcus	20	20	22	23
E.coil	28	15	17	18

CONCLUSION

On the basis of above research work we conclude that our herbal shampoo soap and conditioner is non-chemical and have good properties as compared to synthetic shampoo and conditioner. In this research we prepared the three formulation of herbal shampoo soap and conditioner i.e F1, F2 and F3 depending on concentration of multiple herbal drugs and excipient and on the basis of evaluations criteria like pH, Foaming ability, Moisture content and antimicrobial activity we optimized the formula i.e F3 shows good as compared to F1 and F2.

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