Research Article

The Efficacy of Tulsi, Green Gram, Potato, Flaxseed in Hair Shampoo

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ABSTRACT

The present investigation aimed to formulate and evaluate herbal shampoo containing natural ingredients with an emphasis on safety and efficacy eliminating harmful synthetic chemical ingredients. The shampoo was formulated by adding Tulsi leaves extract, Green gram extract, Flaxseed mucilage, and potato juice in different proportions. A small amount of methyl paraben and propyl paraben was added as preservatives and pH was regulated with sodium citrate. Several tests such as organoleptic properties, pH, foam stability and ability, viscosity, and % solid content were performed to determine the physicochemical properties of formulated shampoo. The herbal shampoo formulation was transparent and enticing. It showed good cleansing and detergency, dirt dispersion, foam ability as well as stability and execution of good conditioning. The physicochemical evaluation of the formulated shampoo showed ideal results. However, to improve its quality, product performance, and safety, further development was required.

Keywords: Herbal, Shampoo, *Ocimum sanctum*, *Solanum tuberosum, Vigna radiata,* and *Linum Usitatissimum*.

INTRODUCTION

The Greek term "kosmotikos," which means to have the ability to arrange, power, and skill in decorating, is where the word "cosmetic" originated. In general, preparations intended for external usage are referred to as cosmeceutical or cosmetic compounds. Any object intended to be cleaned, beautified, enhanced in attractiveness, sprayed, sprinkled, poured on, or applied onto the human body hence it is referred to as a cosmetic. Comprises any item meant to be used as a part of makeup [1]

These cosmetics are divided into many types as per their use and the surface of application One of the most commonly used cosmetics that grabbed the market in the last decade is Shampoo. Shampoos come in various forms, including powder, clear liquid, lotion, solid gel, medicinal, and liquid herbal shampoos. These can be basic or plain shampoos, antiseptic shampoos, or nutritious shampoos with vitamins, amino acids, and proteins hydrolyzed, depending on the purpose and contents [2].

D. Manjula et al. conducted studies to prepare and evaluate a flaxseed herbal gel that nourishes and moisturizes hair. Rich in fatty acids and antioxidants, flaxseed, sometimes referred to as linseed, aids in the removal of pollutants and dead cells from the scalp. Several factors are taken into consideration while evaluating the formulation, including its physical appearance, pH, viscosity, spreadability, homogeneity, grittiness, and stability. Shampoos with natural herbal ingredients can be used as an alternative to synthetic shampoo. Many medicinal plants that have been utilized for years in various parts of the world for their possible benefits on hair are used in shampoo formulae. These therapeutic herbs can be utilized as extracts, powders, crude materials, or their derivatives. Shampoos are often used in the same way as cosmetics. These are viscous detergent solutions with appropriate additions, preservatives, and active substances that are most commonly used as beautifying agents [3]. We use this hair care product to clean our hair and scalps regularly. Shampoos are thick detergent solutions that are frequently used as cosmetics and contain the proper preservatives, additives, and active ingredients.

It is usually applied to damp hair, massaged in, and then rinsed with water. Shampoo is designed to get rid of build-up on hair without taking away too much of the natural oils. While many synthetic shampoos, both medicated and non-medicated, are available on the market, herbal shampoos are more popular due to their natural source, safety, growing consumer demand, and lack of negative effects. Instead of using synthetic shampoo, we can use herbal shampoo[4]. There are different types of shampoo kike powder shampoo, liquid shampoo, lotion shampoo, cream shampoo, jelly shampoo, aerosol shampoo, specialized shampoo, and conditioning shampoo.In the present study, shampoos with natural herbal ingredients to replace synthetic ingredients were prepared. Potato juice contains vitamins and minerals that help encourage hair development and luster[5].

It can help repair collagen, a protein that encourages quicker development of hair strands. The starch in potato juice can absorb extra oil from the scalp and hair follicles, reducing breakage and promoting healthy hair development. Additionally, potato juice contains anti-dandruff qualities [6]. This study aimed to develop a natural shampoo and determine its physical and chemical properties. The product that was developed was compared to a shampoo that is available in shops—numerous tests, such as those for pH, stability, foaming ability, and solid contents.

MATERIALS AND METHODS

Materials:

The leaves of *Ocimum Sanctum, Solanum Tuberosum, Vigna Radiata, and Linum Usitatissimum* were collected from the residential area of Karad, authenticated from Y.C. College Karad, and subsequently subjected to a drying process lasting three to four days.

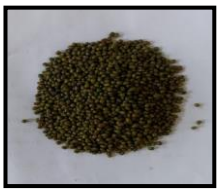
Sodium lauryl sulphate, sodium citrate,carbapol, methyl paraben, propyl paraben and glycerin received as gift samples from the Loba chemicals PVT LTD.

Formula:

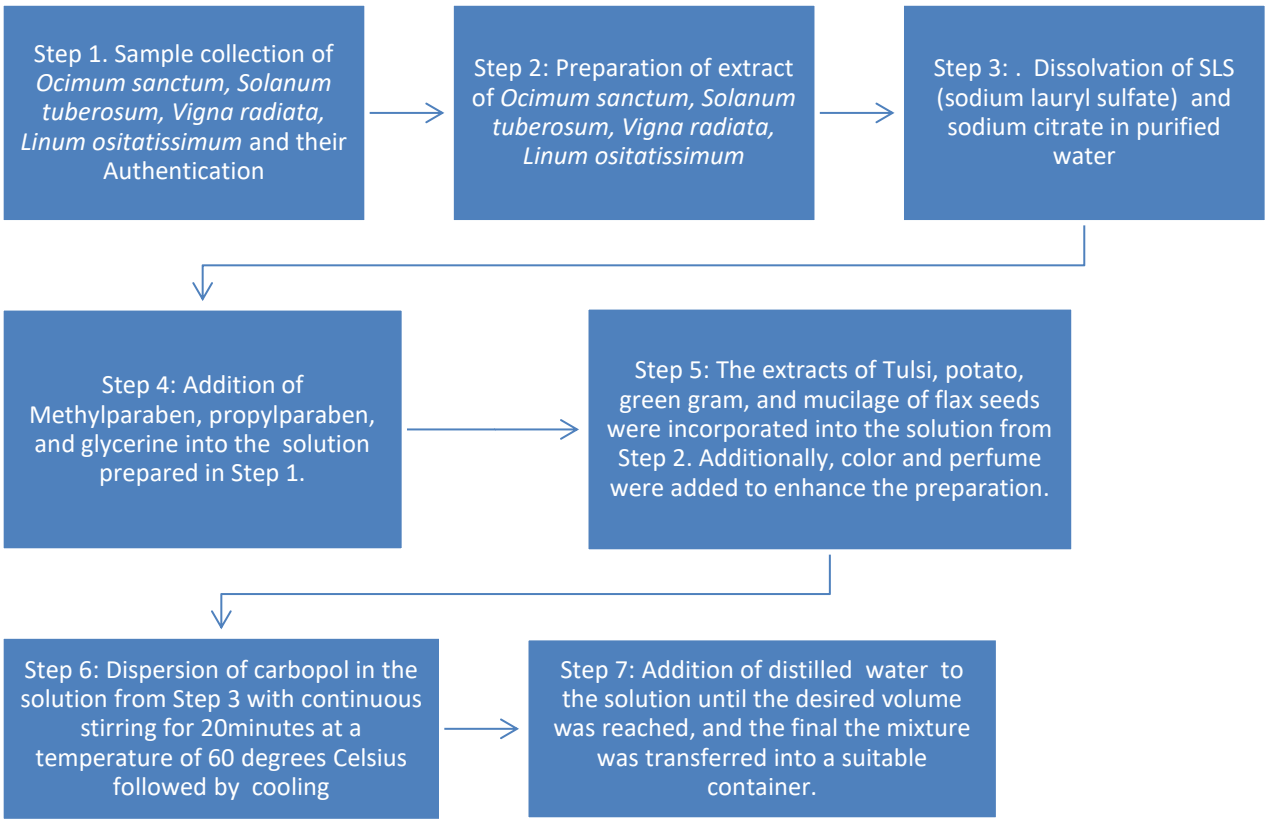
Ingredients	Quantity
Tulsi leaves extract	10 ml
Potato juice	10ml
Green gram extract	8ml
Flaxseed mucilage	5ml
Sodium lauryl sulfate (SLS)	10gm
Sodium Citrate	1gm
Glycerine	5gm
Methyl Paraben	0.18gm
Paraben	0.18gm
Carbapol	7gm
Perfume	Q. S
Colour	Q. S

Materials used:

Table 1: List of herbal ingredients used in Shampoo

Herbal entity	***Ocimum Sanctum***  Figure 1***: Ocimum sanctum***	***Solanum Tuberosum***  Figure 2***: Solanum tuberosum***	***Vigna Radiata***  Figure 3***: Vigna radiata***	***Linum Usitatissimum***  Figure 4***: Linum usitatissimum***
Kingdom	Plantae	Plantae	Plantae	Plantae
Division	Magnoliophyta	Tracheobionta	Magnoliophyta	Magnoliophyta
Class	Magnoliopsida	Magnoliophyta	Magnoliophyta	Magnoliopsida
Order	Lamiales	Solanales	Fabales	Malpighiales
Family	Lamiaceae	Solanaceae	Fabaceae	Linaceae
Genus	Ocimum	Solanum L.	Vigna	Linum
Species	*Ocimum Sanctum*	*Solanum Tuberosum*	*Vigna Radiata*	*Linum Usitatissimum*
Chemical Constituent	Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Linalool ß caryophyllene	Starch, Protein, Vitamin C, B2, B6, K	Phenolic acids, Flavonoids, Tannins Carbohydrate, Proteins, Vitamins, Minerals	Linolenic acid, Oleic acid, Stearic acid, Palmitic acid
Use	• Strengthens hair follicles and roots of hair. • Reducing hair thinning. • Increases hair growth [7].	• Help with hair nourishment by strengthening the hair follicles and promoting hair growth. • Potato juice helps in cleansing the scalp by absorbing sebum and sweat 8.	• Reduce hair breakage. • Help in hair growth. • Prevents dandruff and promote shine9.	• Protecting hair from heat damage. • Promoting healthy hair growth. • Reducing frizz 10.

Method:



Procedure for extraction:

Solanum tuberosum (potato) was diced into small pieces and ground using a mixer grinder. The resulting mixture was then squeezed through a muslin cloth to extract the desired components.

The powdered form of Tulsi leaves was introduced into a solvent, specifically water, for extraction. The extraction process was done using the decoction method, utilizing a hot plate apparatus.

Vigna radiata (green gram) The green gram was ground into a powder using a mixer and then added to boiling water. The mixture was allowed to boil for 30 minutes at a temperature of 60°C. Afterward, the mixture was strained through a muslin cloth to extract the desired components.

Linum usitatissimum (flaxseed) was added in boiling water until the mucilage was formed and squeezed through a muslin cloth.

Figure 6: Prepared formulation of shampoo

Evaluation of herbal shampoo:

1. Determination of organoleptic properties:

The color, odor, and appearance of shampoo were checked.[11,12]

2. Determination of pH:

The pH of 10 % shampoo solution in distilled water was measured by using Ph at room temperature and also the pH was measured by checking pH paper.[11,12]

3. Foaming ability and foaming stability:

15 ml of shampoo was taken in the measuring cylinder and shaken well for 10 minutes.

Continuously checked the volume of foam [12].

4. Determination of solid content:

A clean, dry porcelain dish was weighed, and 5 g of shampoo was added. The dish with Shampoo was weighed. The extract weight of shampoo was calculated. The porcelain dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight after drying was calculated.[11,12]

5. Measurement of Viscosity:

The viscosity of the shampoo was determined by using a Brookfield viscometer.[9,13,15].

RESULT AND DISCUSSION

1. Determination of organoleptic properties:

Sr. No.	Test	Prepared Formulation	Marketed Formulation
1	Color	Pink	Purple
2	Odor	Aromatic	Aromatic
3	Appearance	Opaque	Opaque

A visual comparison indicated that both shampoos exhibited similar or distinct colors. When comparing the organoleptic properties of the tested shampoo with the marketed herbal shampoo, it was observed that color, odor, and appearance show similarities with the marketed formulation.

2. Determination of pH:

The pH of prepared herbal shampoo was 7, and the pH of the marketed shampoo was 7. Ph is considered one of the significant parameters for the effectiveness of the hairs. The normal pH of herbal shampoo ranges from 6-7.

The pH of prepared shampoo and marketed shampoo was found to be the same.

3. Foaming ability test:

Min.	Prepared formulation (cm.)	Marketed formulation (cm.)
0	8	8
1	8	8
2	7.8	7.9
3	7.6	7.7
4	7.5	7.6

The tested shampoo exhibited satisfactory foaming ability. The foam persisted for a reasonable duration, allowing for effective cleansing and distribution of the product throughout the hair and scalp.

4. Determination of solid content:

Value of prepared shampoo	Value of marketed shampoo
Weight of empty dish = 66.06	Weight of empty dish = 64.2
Weight of shampoo = 5 gm	Weight of shampoo = 5 gm
Weight of dish + weight of shampoo = 70.06	Weight of dish + shampoo = 69.3
Weight of solid content = 0.34 gm	Weight of solid content = 0.7

This indicates that the tested shampoo contains a suitable concentration of solids, which mayinclude active ingredients, botanical extracts, and other components contributing to the formulation's efficacy.

5. Measurement of viscosity:

Rpm	Cp (prepared shampoo)	Cp (Marketed shampoo)
50	451	453
30	590	583
20	690	691
10	760	767

The viscosity of the shampoo was determined using a Brookfield Viscometer, and the results were compared with a commercially available herbal shampoo. Upon comparison with the viscosity of the marketed herbal shampoo, it was observed that the tested shampoo exhibited similar viscosity. The viscosity of the shampoo

plays a crucial role in its application, as it affects ease of spreading, lathering, and rinsing.

CONCLUSION

The formulation and evaluation of herbal shampoo involve the incorporation of herbal extracts known for their hair care benefits into a gentle and effective shampoo formulation.

The comprehensive evaluation process ensures the physical and chemical characteristics of the shampoo meet the desired specifications.

This study contributes to the development of natural and sustainable hair care options, offering consumers an appealing alternative to conventional synthetic shampoos.

The results of the evaluation and comparison suggest that the herbal shampoo holds promise as a natural alternative in the hair care market.

Positive outcomes in terms of physical characteristics, and efficacy support the potential of the herbal shampoo to meet consumer expectations for a high-quality and environmentally friendly hair care product.

However, further studies and consumer feedback are necessary to optimize the formulation enhance its performance, and address any specific preferences or requirements.

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