



Research Article

Formulation and Evaluation of Herbal Shampoo Using Natural Plant Extracts

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The present study aimed to formulate and evaluate a herbal shampoo using natural plant ingredients possessing cleansing, conditioning, antimicrobial, and hair-strengthening properties. The herbal shampoo was prepared using Peepal leaves (*Ficus religiosa*), Hibiscus (*Hibiscus rosa-sinensis*), Shikakai (*Acacia concinna*), Reetha (*Sapindus mukorossi*), methyl cellulose, sodium lauryl sulfate, jasmine oil, and menthol. The prepared formulation was subjected to physicochemical and performance evaluation tests, including organoleptic properties, pH determination, foaming ability, foam stability, surface tension, and cleaning action. The shampoo exhibited acceptable color, pleasant odor, smooth consistency, and homogeneous appearance. The pH was found within the desirable range of 5.5–6.8, indicating compatibility with scalp and hair. The formulation demonstrated satisfactory foaming properties, significant reduction in surface tension, and effective cleansing action comparable to commercial shampoos. The findings suggest that the formulated herbal shampoo is safe, effective, and suitable for routine hair care applications and may serve as a natural alternative to synthetic shampoos.

Keywords: Herbal shampoo, Shikakai, Reetha, Hibiscus, Hair care, Herbal cosmetics, Formulation and evaluation.

INTRODUCTION

Hair care products play a significant role in maintaining scalp hygiene and enhancing aesthetic appearance. Shampoos are cosmetic preparations primarily used for cleansing hair and removing dirt, excess sebum, and environmental pollutants. Conventional shampoos commonly contain synthetic surfactants and preservatives that may cause dryness, irritation, hair breakage, and scalp disorders upon prolonged use. The increasing demand for natural and eco-friendly cosmetic products has encouraged the development of herbal formulations. Herbal shampoos are formulated using medicinal plants and natural ingredients that provide cleansing along with therapeutic benefits. Unlike synthetic shampoos, herbal shampoos are biodegradable, mild, and compatible with long-term use. Traditional medicinal systems such as Ayurveda have long recommended

herbs like Shikakai, Reetha, Hibiscus, Neem, and Aloe vera for maintaining healthy hair and scalp. Shikakai and Reetha contain natural saponins that act as cleansing and foaming agents, while Hibiscus exhibits conditioning and hair growth-promoting activities. Peepal leaves possess antimicrobial and antioxidant properties that help maintain scalp health. The present study was therefore undertaken to formulate and evaluate a polyherbal shampoo using selected medicinal plants and suitable pharmaceutical excipients to obtain a safe and effective hair care preparation.

MATERIALS AND METHODS

MATERIALS

The following ingredients were used in the formulation of herbal shampoo:

Ingredient	Quantity
Peepal Leaves	10 g
Hibiscus	15 g
Shikakai	20 g
Reetha	20 g
Methyl Cellulose	5 g
Sodium Lauryl Sulfate	15 g
Jasmine Oil	2 mL
Menthol	0.5 g
Distilled Water	q.s. to 500 mL

Method of Preparation

Fresh herbal materials were collected, authenticated, washed, and shade-dried. The dried materials were coarsely powdered and passed through sieve no. 40. The powdered herbal drugs were subjected to aqueous extraction by boiling with distilled water for 30–45 minutes. Methyl cellulose was dispersed in warm distilled water and allowed to hydrate. Sodium lauryl sulfate was dissolved separately and slowly incorporated into the gel base. The prepared herbal extract was added gradually with continuous stirring. Jasmine oil and menthol were incorporated to improve fragrance and provide cooling and soothing effects. The pH of the formulation was adjusted to 5.5–6.5 using citric acid solution, and the final product was transferred into amber-colored bottles for storage and evaluation.

Evaluation of Herbal Shampoo

Organoleptic Evaluation

The shampoo was evaluated for color, odor, appearance, texture, and consistency. The formulation exhibited a uniform appearance with pleasant herbal odor and smooth texture.

pH Determination

A 10% v/v shampoo solution was prepared in distilled water and the pH was determined using a calibrated digital pH meter. The pH was found within the ideal range for scalp compatibility.

Foaming Ability and Foam Stability

Foaming studies were performed using the cylinder shake method. A 1% shampoo solution was shaken in

a graduated cylinder and foam volume was recorded initially and at predetermined intervals.

Surface Tension Measurement

Surface tension was determined using a stalagmometer. Reduction in surface tension indicates effective wetting and spreading characteristics of the shampoo.

Cleaning Action

The cleansing efficiency of the shampoo was evaluated by the greasy wool yarn method. Removal of grease and impurities from hair samples indicated satisfactory cleansing performance.

RESULTS AND DISCUSSION

The formulated herbal shampoo showed desirable physicochemical characteristics and good consumer acceptability. Organoleptic evaluation indicated acceptable color, pleasant odor, smooth texture, and absence of phase separation. These findings suggest compatibility among herbal extracts and formulation excipients. The pH of the shampoo was observed within the range of 5.5–6.8, which closely resembles the natural pH of scalp and hair. Maintenance of mildly acidic pH prevents hair cuticle damage, dryness, and irritation and improves hair smoothness and shine. The shampoo exhibited moderate yet stable foam formation. Although herbal shampoos generally produce less foam than synthetic formulations, adequate and stable foam contributes significantly to consumer satisfaction and cleansing performance. Natural saponins present in Reetha and Shikakai likely contributed to the foaming characteristics. Surface tension studies demonstrated significant reduction in comparison to distilled water. Lower surface tension improves wetting properties and enhances removal of dirt, oil, and sebum from hair fibers. Cleaning action studies revealed effective removal of grease and impurities while preserving natural oils present on the scalp and hair. The balanced cleansing action may be attributed to the synergistic activity of the herbal ingredients, which provide detergent, conditioning, antimicrobial, and nourishing effects simultaneously. Overall, the results indicate that the formulated herbal shampoo possesses acceptable physicochemical characteristics and can

serve as an effective natural alternative to conventional synthetic shampoos.

CONCLUSION

The present investigation successfully formulated and evaluated a herbal shampoo containing Peepal leaves, Hibiscus, Shikakai, Reetha, and suitable pharmaceutical excipients. The formulation demonstrated desirable organoleptic properties, acceptable pH, satisfactory foaming characteristics, effective cleansing action, and good stability. The herbal shampoo effectively cleansed hair and scalp without causing excessive dryness or irritation and maintained the natural moisture balance of hair. The synergistic action of herbal ingredients provided cleansing, conditioning, and scalp-protective effects. Therefore, the formulated herbal shampoo may be considered a safe, economical, and environmentally friendly alternative to synthetic shampoos and holds considerable potential for commercial development.

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