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Development and Evaluation Of Anti-Hair Fall Shampoo Containing Marshmallow Root Powder

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ABSTRACT

The objective of research work was to formulate and evaluate Herbal Anti Hair fall shampoo using herbal ingredients such as Acacia concinna (shikakai), Trigonella foenumgraecum (fenugreek), Althea officinal is (marshmallow root), Ocimum sanctum(tulsi),Aloe Barbadensis miller(Aloe vera),Allium Ascalonicum(onion seeds), Centlla asiatica (Brahmi).Rationale for selection of plants in the present study was on the basis of their medicinal importance. All of the selected herbs were collected, dried and powdered. Decoction of these ingredients was prepared by maceration and heating. Herbal shampoo was prepared by mixing method and evaluated for its organoleptic and physic –chemical characteristic. Results of the work reveals that the Herbal shampoo is potential for imparting cleansing of the hair also conditioning , smoothing of the hair surface, reduces the hair fall, good health of hair, hair free of dandruff and safety benefits are expected. The advantage of herbal cosmetics is their nontoxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in present work, we found good properties for the herbal shampoo and further optimization of study benefits herbal shampoo on human use as cosmetic product.

Keywords: Cosmetic, Herbal shampoo, Anti hair fall, Onion seeds, Marshmallow root

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INTRODUCTION

In the process of looking good people have become so conscious of the products they use in their daily life. "Cosmetic is defined as, any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance, and includes any article intended for use as a component of cosmetic." The cosmetic products are classified according to their physical states in three main categories as solids, semi solids and liquids. Now a day's peoples are conscious about hairs due to increase in pollution hairs get damaged. Common hair problems occur are Dandruff, Oily Scalp, Dry Scalp, Hair Loss, Frizzy Hair, Split ends, Hair dye damage, Hair fall due to hormonal imbalance, Heat damaged hair and Androgenetic alopecia. Pollutants badly affects on hair resulted into spilt ends, roughness, retarded growth of hairs, loss of shine of hair and hair falls. These all problems of hair are covered by shampoo but in case of synthetic shampoos they are made from chemical constituents shows side effects on hairs.[1]

A Shampoo can be described as a surfactant preparation;(i.e. Surface active material) in a suitable form-liquid, solid, or powder which when used under the condition specified will remove surface grease, dirt and skin debris from the hair, shaft and scalp without affecting adversely the hair, scalp or the health of the user.[2] Shampoos are probably the most widely used cosmetic products for cleansing hairs and scalp in our daily life (Ishi, 1997). A shampoo is basically a solution of a detergent containing suitable additives for other benefits such as hair conditioning enhancement, lubrication, medication etc. Now-a-days many synthetic, herbal, medicated and non medicated shampoos are available in the market but popularity of herbal shampoo among consumers is on rise because of their belief that these products being of natural origin are safe and free from side effects (Manikar and Jolly, 2001). Synthetic surfactants are added to shampoo primarily for the foaming and cleansing action but their regular use leads to dryness of hairs, hair loss, irritation to scalp and eyes.[3] Hair loss is a natural occurrence that happens every day. However, it cannot be the primary cause of hair loss. Every human hair strand goes through a genetic cycle of growth, stabilization, aging, and shedding. On average, the human scalp sheds 50-125 hairs daily, yet most of them grow back after the resting stage since the follicles are not damaged. A person may experience excessive hair loss as a result of drug exposure, poor clinical health, pregnancy, pollution, stress, inactivity, insufficient sleep, malnutrition, etc.[4] Androgenetic alopecia (AGA) is a type of non-cicatricle or common baldness that affects both men and women at any age, from puberty to senescence. AGA is diagnosed

based on clinical symptoms and family history because it is primarily genetic in origin. The likelihood of having AGA is significantly higher in males with a family history of baldness than it is in men without such a history, according to evidence from family studies. Positive maternal family history may also enhance the likelihood of having AGA.[4]

Marshmallow, commonly known as Althaea and Alcea, belongs to Malvaceae family. Marshmallow is called “Khatmi”,“Panirak” or “Moloukhia” in TPM; other names include “Althea, Moorish Mallow, Cheeses, Mallards, Mortification Root, Sweet Weed, Schloss Tea, and White Maoow ”. The therapeutic effects of Alcea are roughly the same as those of Althaea; In general, none of the Althaea species in Iran are used in the herbal market for marshmallow; instead the flowers of Alcea genus are consumed. This plant has lived more than one thousand years ago, especially in wet areas such as south of Europe, Iran, Iraq, and Turkey. In addition, marshmallow grows in most parts of Iran including Gorgan, Mazandaran, Gilan, Khorasan, Azarbaijan and Kermanshah.[5] The marshmallow has been known since ancient times, and "Pedanius Dioscorides" the author of "Materia Medica" or "Hashayesh", has described it (40-90 AD). Galen believed that the temperament of marshmallow is cold and wet, but Avicenna believed it was mildly warm. According to the view point of TM scholars, marshmallow has cold and wet temperament and reduces inflammation, irritation, eczema, infections and fever. Marshmallow contains mucilage (polysaccharides), flavonoids, phenolic acid, and scopoletin. In this review, applications of marshmallow, the pharmacological properties, adverse events, and toxicity are evaluated based on both classic and traditional medicine among, children and adults.[5] It has been used orally or topically (shampoo, plaster or ointment) on the wound.[5]

Althaea Officinalis L., sometimes referred to as marshmallow, is a perennial herbaceous plant classified under the Malvaceae family. It flourishes in diverse environments, displaying a specific preference for moist and swampy regions. Althaea officinalis L is typically found on the periphery of marshes, riverbanks, and other wetlands, which serve as its native habitat. Althaea officinalis L is rich in a variety of bioactive components such as polysaccharides, flavonoids, mucilage, tannins, and phenolic acids. Polysaccharides and mucilage enhance the condition and nourishment of the hair, so promoting its health and imparting a glossy appearance. Flavonoids help the process of repairing and regenerating hair follicles. Tannins constrict the hair cuticles, resulting in a more polished and lustrous appearance[4]. Althea officinalis used to prevent hair loss.[6]

MATERIALS AND METHOD

The plant material (Marshmallow Root powder) used in the formulation were purchased from the K. R. Impex Enterprises, Amritsar 143001.The Aloe Vera Gel obtained from the Wellness Forever Medical Store, Satara. Brahmi Powder obtained from Waghdole Ayurvedic, Satara. Tulsi powder, Fenugreek seed powder, Onion seed powder, and Shikkai powder naturally obtained from home. Other ingredients used in the present study used were from laboratory of analytical grade.

Instrument

Instrument used for analysis were pH meter, Brookfield viscometer, Water bath thermostatic and Weighing balance.

Methodology

A. Grinding fenugreek seeds

Add 3 grams of fenugreek seeds to the mixture.

B. Grounding onion seeds

Take one gram of onion seeds and ground them in the mixture.

Formulation of Anti-Hair Fall Shampoo

Procedure

- Decoct fenugreek seeds, onion seeds, Brahmi powder, tulsi powder, Bhringraj powder, and shikakai powder. Take a jar and put 15 grams of sodium lauryl sulfate.
- Added 10 ml of Aloe Vera gel.
- Added 10ml of glycerine. Then, we put one vitamin E container.
- Added the decoction mixture.
- Added suitable amounts of sodium benzoate (0.25), cocoa butter, fragrance, and diethanolamine.
- Added rose oil for aroma.
- Using a mechanical stirrer, thoroughly blend and hold the mixture for a few seconds.[7]

Table 1: Formulation of Herbal Anti-Hair Fall Shampoo

Sr. No	Ingredients	Category	F1	F2	F3
1.	Sodium lauryl sulphate	Oil, dirt remover lathering effect	15 gm	15 gm	15 gm
2.	Distilled water	Solvent	10 ml	10 ml	10 ml
3.	Aloe vera gel	Hydration and conditioning	10 ml	10 ml	10 ml
4.	Fenugreek seeds powder	Revives damaged hair	3 gm	3 gm	3 gm
5.	Onion seeds powder	Strengthen strands and rejuvenate scalp	1 gm	1 gm	1 gm
6.	Shikakai powder	Shine & softness	2 gm	2 gm	2 gm
7.	Marshmallow root powder	Prevent hair fall	1.5 gm	3 gm	5.2 gm
8.	Tulsi powder	Rejuvenation of hair follicles	1.5 gm	1.5 gm	1.5 gm
9.	Brahmi powder	Coats hair naturally & protect from drying	2 gm	2 gm	2 gm

10.	Glycerin	Hydration	10 ml	10 ml	10 ml
11.	Vitamin E	Healthy scalp	1capsule	1capsule	1capsule
12.	Sodium benzoate	Preservative	0.25 gm	0.25 gm	0.25 gm
13.	Rose oil	Fragrance	Q.S	Q.S	Q.S

Evaluation of Formulated Herbal Shampoo

Evaluate herbal shampoo formulations using quality control tests, including visual evaluation and physicochemical parameters including pH, density, surface tension, foam volume, and wetting time.

Physical Appearance/Visual Inspection

The formulation prepared was evaluated for the clarity, colour, odour and foam producing ability[8].

Determination Of pH

The pH of shampoo solution (10% w/v) in distilled water was determined at room temperature.

Determine the Proportion of a Solid Substance

The solid content of the shampoo was investigated. First, 4 g of the sample was placed in an evaporating dish and the total weight was recorded. The evaporating dish was placed in a water bath to allow evaporation to occur until it was completely evaporated. Then, the evaporating dish was weighed again. The percentage of solid content was then calculated using the follow equation:

$$\% \text{ solid content} = [((A - B)/4) \times 100]$$

Where A was the total weight of the sample and evaporating dish after evaporation and B was the total weight of the sample and evaporating dish before evaporation. The experiment was performed in triplicate [10]

Foam, Volume and Stability

The cylinder shaking method was used to determine foaming ability. Take 50 ml of the 1% shampoo solution was put into a 250ml graduated cylinder and covered the cylinder with hand and shake for 10 minutes. 1 minute shaking was immediately recorded. [9]

Rheological or Viscosity Evaluation

The Brookfield viscometer is used to determine the viscosity of shampoo. Take 10ml of shampoo in a beaker and spindle is dipped in it for about 5 minutes and then reading is taken. [11]

Stability Studies

The stability of the formulation was studied for a period of four weeks by keeping at temperature of 25-30°C.[12]

Consistency

The consistency of the created shampoo was tested by hand. Take a pinch of shampoo and massage it with your finger.[7]

Skin Sensitization test

This is the test, which is used to check the irritation occurred by the formulated product on the skin. It is done by the human volunteers. Prepared herbal shampoo was applied on skin for 5 minutes after that was washed and tested for irritation or inflammation to the skin.[13]

RESULTS AND DISCUSSION

Physical appearance

The formulation was visually inspected and the colour and odour of each formulation was noted and recorded. Table 2 contains the result of the physical appearance of a series of formulation.

Table 2: Evaluation of Formulation for Physical Appearance

Formulation	Colour	Transparency	Odour
F1	Brownish	Turbid	Rose like /pleasant
F2	Brownish	Turbid	Rose like /pleasant
F3	Brownish	Turbid	Rose like /pleasant

Determination of pH

The pH of a 10% shampoo solution in distilled water was measured at room temperature (25 C) and found to be

Table 3: pH Profile for Formulated Shampoo

Sr. No	Formulation	pH
01.	F1	6.05+_0.2
02.	F2	5.96+_0.3
03.	F3	6.02+_0.3

Determination Percent of Solid Content

The weight of shampoo (just solid) after drying was determined for each recipe. The result of percentage of solid content is represent in Table 4 and was found between 20 to 29%.

Table 4: Percentage of Solid Content

Sr. No	Formulation	Solid contents (%)
01.	F1	23.75%
02.	F2	22%
03.	F3	24%

Foaming Ability and Foaming Stability

Foaming ability and foaming stability from the consumer point of view, foam stability is one of the important needs of a shampoo. Important parameter that was considered in the shampoo evaluation was determination of foaming stability. The prepared shampoo generates uniform,

small sized, compact, denser, and stable foam. The foam volume remains same throughout the period of about 5 min showing that the generated foam by the shampoo has good stability and the prepared shampoo exhibits higher foam property which present in shikakai.

Table 5: Foam of Herbal Shampoo Formulation

Sr. No	Formulation	Foam stability
01.	F1	High
02.	F2	Very high
03.	F3	High

Viscosity Evaluation

The viscosity of shampoo was determined by using Brookfield Viscometer .The viscosity ranges from 1.10 to 1.30 poise, which gives high fluidity. Which makes formulation easy to apply or easy to spread on hair. The formulated shampoo did not show any skin irritation because it was fully prepared by natural herbs and viscosity was found between 10to 20mPa.s, which was shown in Table: 7

Table: 6 Viscosity of Herbal Shampoo

Sr. No	Formulation	Viscosity (mPa.s)
01.	F1	16.7
02.	F2	18.2
03.	F3	17.4

Stability study

Stability of formulations during the storage period indicated that they are chemically and physically stable. The formulated Anti hairfall shampoo is chemically and physically stable at standard room temperature of 25-30°C.The results indicate that it possesses good stability within the 4 weeks of stability study.

Skin irritation test

The skin irritation tests revealed that the herbal shampoo shows no harmful effect on the skin. This is due to the absence of harmful synthetic ingredients. Most of the synthetic chemicals produce inflammation and causes irritation to the skin. But in this formulation, almost all ingredients are obtained naturally. So it does not produce any harmful effect on the skin and it is irritation free.

CONCLUSION

In the current study, anti-hairfall shampoo was prepared and evaluated utilizing various combinations of anti-hairfall ingredients, such as fenugreek seeds, marshmallow root powder. Because of its effectiveness against Malassezia spp., fenugreek leaf has the potential to be

developed as an herbal therapy for the treatment of anti-hairfall & other Malassezia spp. related cutaneous infection. The primary goal of developed an herbal anti-hairfall shampoo was to prevent hair fall and its diseases. The main purpose behind this investigation was to develop a stable and functionally effective anti-hairfall shampoo. It was discovered that anti-hairfall shampoo created from natural sources have fewer negative effect than shampoos prepared from synthetic compounds. In addition to the anti-hairfall action for nourishing and conditioning the hair, aloe vera gel & vitamin E. The optimized formulation was examined using a variety of tests, including pH, physical appearance, % solid content, and foaming stability tests. It is concluded that the formulated shampoo was safe and effective to use. Herbal shampoos are generally compatible, very effective in terms of ease of manufacture.

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