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Development and Evaluation of Herbal Fenugreek Shampoo for Hair Health: A Comprehensive Review

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ABSTRACT
Herbal shampoos have emerged as a popular alternative to synthetic counterparts in the hair care market due to their natural origins, perceived safety, and growing consumer demand. Unlike synthetic shampoos, which can strip hair of essential oils and potentially and cause hair loss, increased scaling, scratching, pain,nausea and headache. In the present study, herbal shampoo has been formulated using plant-derived ingredients such as Pomegranate peel, Amla, Fenugreek, Neem, Reetha, and Aloe vera. These natural components are selected for their ability to cleanse, nourish, and protect both hair and scalp effectively. Formulating herbal shampoos presents challenges in achieving the desired foaming, detergency, and consistency without compromising on mildness and safety.For instance, Fenugreek, a key active ingredient in some herbal shampoos, is noted for its ability to clear dirt and sebum while acting as a conditioning agent. The market for shampoos includes various types such as synthetic, herbal, medicated, and non-medicated options, among which herbal shampoos are favored for their perceived purity and efficacy. The trend towards herbal products underscores a broader consumer preference for natural solutions that offer multipurpose benefits without the potential drawbacks associated with synthetic chemicals. As such, ongoing research and development in herbal shampoo formulations continue to cater to these preferences while addressing the evolving needs of hair care consumers worldwide.
The primary goal of this research is to create and evaluate a herbal shampoo, as well as to Discover its physiochemical function, with a focus on the product's safety, efficacy, and Quality. As a result, an effort is made to create a herbal Shampoo that is devoid of adverse effects.

I. INTRODUCTION

Shampoo is a hair care product, typically in the form of a viscous liquid that is used for cleansing hair. The goal of using shampoo is to remove dirt that is build up on the hair, provide nourishment and give healthy look to the hair without stripping out so much sebum from it [1]. The shampoo sector is probably the largest market for sale amongst the hair care products since shampoos are one of the cosmetic products used in daily life. Many synthetic Shampoos are present in the current market both medicated and non-medicated; however, herbal shampoo are nowadays mostly popularized due to their natural origin, safety, increasing consumer demand, low cost and negligible side effects [2,3].

Herbal shampoo is a cosmetic preparation which uses herbs from plants and it is meant for washing of hair and scalp just like a regular shampoo [4, 5]. Herbal formulations are considered as alternative to synthetic shampoo but formulating cosmetics using completely natural raw material is challenging task [6, 7]. It is extremely difficult to prepare a herbal shampoo using a single natural material that would be milder and safer than the synthetic ones, and at the same time would compete well with its foaming, detergency and solid content. The selection of active ingredients for hair care is based on the ability of the ingredient to prevent skin damage as well as to improve the quality of skin by cleansing, nourishing and protecting the skin [8]. We therefore made an attempt to develop a basic protocol for herbal shampoo formulation for effective hair care. In the present study, herbal shampoo was formulated containing suitable ingredients such as Pomegranate peel (Punica granatum), Amla (Phyllanthus embica),Fenugreek (Trigonella foenum-graecum), Neem (Azadirachta indica), Reetha (Sapindus mukorossi), Aloe vera (Aloe barbadensis) etc. in different proportions and evaluated for its physicochemical properties.

Herbal shampoo is a combination of cosmetic preparation that uses herbs from plants and it is used for washing hair and scalp just like a regular shampoo. Synthetic shampoo causes many harmful effects on hair, skin, and eyes. Therefore,

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people got attracted towards the herbal products, due to low side effects and less cost. [6,7]

The main objective is to formulate and evaluate a herbalshampoo with various herbs for multipurpose benefits to eliminate all traditionally synthetic ingredients. The uniqueness of this herbal Shampoo formulation is due to its active ingredient, Fenugreek. This shampoo clears Dirt, sebum and promotes shine, hair growth, strength, and darkens hair. It also acts as a Conditioning agent. This herbal shampoo powder also performs all these activities without affecting or damaging hairs [8,9].

Nowadays a wide range of shampoos are available in the market like synthetic herbal, medicated, and non-Medicated shampoos with different functions. Among these herbal shampoos are the most popular ones as they bear the impression of having better purity, safety, and efficacy [7].

The functional properties of the ingredients are as follows:

1)FENUGREEK-Fenugreek seeds stimulate hair growth by nourishing the hair follicles and increasing blood circulation to the scalp reducing hair fall and promoting the growth of new hair.

2)AMLA-Amla offers various benefits to hair, it helps in reducing hairball. Indian Gooseberry used for strong, thicker hair regrowth.Amla is renowned for its high vitamin C content and abundant antioxidants, making it a valuable resource for promoting hair health.

3)Pomegranate peel: The polyphenols in Pomegranate peel powder combat hair loss, prevent dandruff and darken hair color. It strengthens hair follicles by stimulating circulation and improves blood flow to the scalp thereby stimulating healthy hair growth.

4) Reetha (Soap nut): It is used as foaming agent has been used for hair cleansing property due to high saponin content. It keeps scalp gentle & removes any microorganisms responsible for infection. It is also helpful for removal of dandruff[10].

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5)Aloe vera-It contains proteolytic enzymes which repairs dead skins on the scalp.
It deep cleanses oily hairs.

II. MATERIALS AND METHODS

INGREDIENT	PARTS	USE
FENUGREEK	LEAF	NOURISHING AGENT
NEEM	LEAF	ANTIMICROBIAL PRESERVATIVE
ALOE VERA	LEAF	MOISTURISING AGENT
AMLA	FRUIT	ANTI-OXIDANT
REETHA	NUT	FOAMING AGENT
POMEGRANATE	FRUIT PEEL	HAIR STIMULANT
LEMON JUICE	FRUIT	PH MODIFIER AND PRESERVATIVE

INGREDIENT	QUANTITY	
FENUGREEK POWDER	1.5 gm	
NEEM LEAVES	1 gm	
ALOE VERA GEL	2 gm	
AMLA POWDER	1 gm	
REETHA POWDER	2.5 gm	
POMEGRANATE POWDER	2 gm	

Aloe vera Extraction

The gel extraction from Aloe vera leaves had been carried out by removing of its exudates and its mucilage was scraped out with blunt edged knife. This mucilage was stirred vigorously in a blender to make it uniform and then filtered.

Neem leaves extractions

The Leaves were boiled on a hot water at a temperature ranging from 30-40 degrees Celsius for 15 minutes.
The leaves were then grinded into a fine paste in mortar and pestle using aloe vera gel as a solvent.

PROCEDURE
1.After the extraction of the aloe veral gel and neem paste,the aloe vera and neem paste were thoroughly mixed.
2.The required quantities of fenugreek powder, amlapowder,Reetha powder and pomegranate peel powder were sieved through sieve no. 25seperately.
3.After that the powders were added into the aloe-neem paste prepared and thoroughly mixed.

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4.On the other side, Reetha powder was soaked in water for about 30 minutes.After that some amount of water was added to it and produce foam.

5.The paste prepared was now slowly added to the Reetha foam solution and stirred continuously.

6.The prepared solution was filtered and refiltered 2-3 times through a liquid strainer and then the filtrate was collected in a beaker.

7.A portion of the liquid was collected and then Neem extract residue was added.

EVALUATION OF HERBAL SHAMPOO

1)Physical appearance/visual inspection:

The formulations prepared were evaluated in terms of their color,odor and clarity.

Color-Olive green

Odour-Pleasant

Clarity-Clear

2)Determination of pH:

The pH of 10% shampoo solution in distilled water was determined at room temperature 25°C.

Result-4.5-5

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3)**Wetting time**:

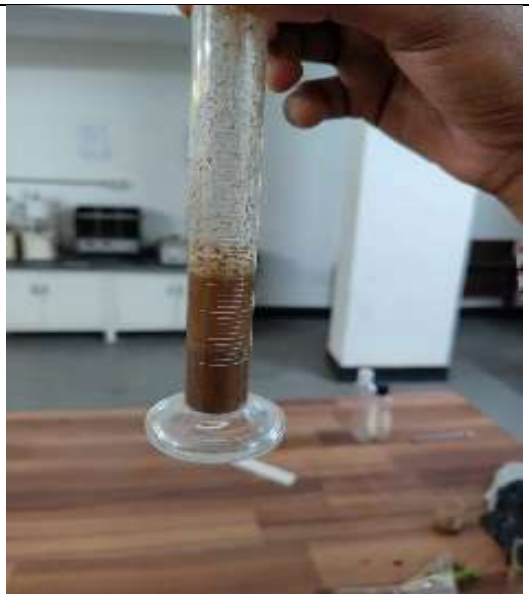
A duck paper was cut into a discshape and floated on the surface of shampoo solution 1%w/v. The time required for the squab piece to begin to sink was measured accurately and noted as wetting time.

Result-55 seconds

4)Skin irritation test-The prepared solution was applied on the skin and kept for 5 minutes.

Results-No irritation observed

5)STABILTY

30 DAYS	60 DAYS
 STABLE	 STABLE

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6)ANGLE OF REPOSE-It is the maximum angle of probable among the horizontal plane and the surface of the pile of powder.

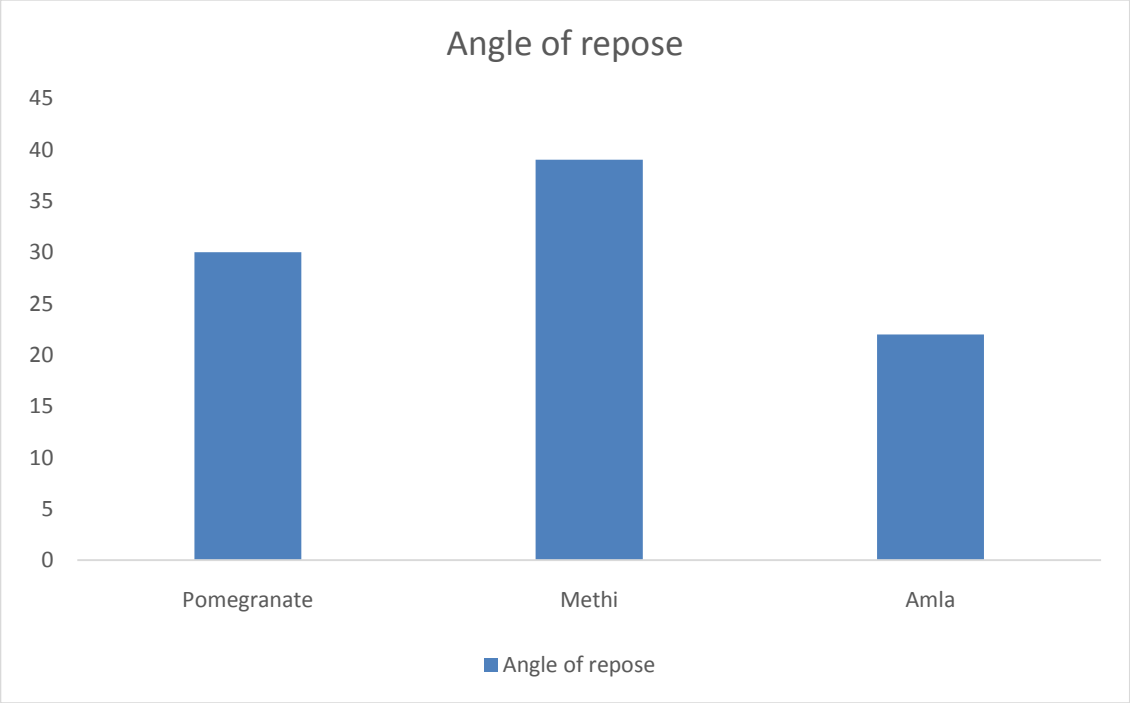
Results were evaluated by the formula Tan 0=h/r
Where h=height of the pile
r=radius of the pile

Measuring the height of the pile

Measuring the radius of the pile

III. RESULTS-

POMEGRANATE-30(Passable)
FENUGREEK POWDER-39(Passable)
AMLAPOWDER-22(Excellent)



Foam Height:15 ml of the 1% shampoo solution was put into a 25 ml graduated cylinder and covered the cylinder with hand and shaken for 1 minutes. Then the foam was allowed to settle down. The height of the foam level was recorded immediately.

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Result-160 mm

DETERGENT ACTION-25ml of the shampoo was mixed in 10 ml of water to evaluate its detergent action. Adequate amount of foam was produced whilst it was rinsed on the hand.

EVALUATION TESTREPORT

PHYSICAL APPEARANCE	Color-Brown Smell-Aromatic Clarity-Transparent and clear Texture-Smooth
pH	4.5-5
FOAM HEIGHT	160 CM
FOAM STABILITY	Stable for more than 15 minutes
SKIN IRRITATION TEST	NON-IRRITATBLE
WASHIBILTY	EASILY WASHABLE
WETTING TIME	60 secs
STABILITY	Found to be stable even after 2 months

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IV. CONCLUSION-

The main objective of this study was to eliminate Harmful synthetic ingredient from shampoo formulation and substitute them with safe natural ingredients.

In the present study, herbal shampoo was formulated containing suitable ingredients such as Pomegranate (Punica granatum), Reetha (Sapindus mukorossi), Aloe vera (Aloe barbadense) etc. in different proportions and evaluated for its physicochemical properties. The uniqueness of this herbal shampoo formulation is due to its active ingredient, Fenugreek.

Herbal shampoos are prepared from natural ingredients and are meant for cleansing hair and scalp just like regular shampoo. These shampoos are totally free from side effects as no surfactants are involved in it.It maintains good stability and are having less harmful effects as compared to synthetic shampoo. Synthetic Shampoo contains surfactants. Long term use of these surfactants can lead to serious effects like scalp Irritation, loss of hair, drying of hair, greying of hair, split ends and eye irritation. Thus, the people are getting Attracted towards herbal cosmetics due to its less side effects and inexpensive nature. The synthetic preservatives have sometimes been the cause of adverse effects among consumers. We have used the physico-chemical approach to preservation and by formulating a self-Preserving shampoo, have avoided this risk posed by chemical preservatives.

Several Physicochemical tests were performed for visual assessment, wetting time, pH, assurance of solid Contents, detergency, conditioning performance, foam stability. The Formulated herbal shampoo is green in color with demonstrable good froth stability, detergency, good Cleansing, optimum pH and conditioning activity. Dirt dispersion of herbal shampoo is light. All these are the ideal characters for good quality of the herbal Shampoo to be used in daily life.

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