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Formulation and Evalution of Herbal Shampoo

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Abstract: *An essential component of human beauty is hair. Human hair has several functions, including sebum production, apocrine sweat, pheromonas production, thermoregulation, and defense against environmental aggressors. The main purpose of hair care products is to clean the hair. Additionally, it changes the texture of the hair, nourishes it, and gives it a healthy appearance..*

Keywords: hair

I. INTRODUCTION

An essential component of human beauty is hair. Human hair has several functions, including sebum production, apocrine sweat, pheromonas production, thermoregulation, and defense against environmental aggressors. The main purpose of hair care products is to clean the hair. Additionally, it changes the texture of the hair, nourishes it, and gives it a healthy appearance.

The most popular hair care product is shampoo. It can be used to clean hair and scalp of grime, leftover hair style product residue, and environmental contaminants. It comes in both viscous liquid and powder form. Shampoos used to just be used to clean the hair and scalp, but modern shampoos are considerably more versatile. It is effortless to use and leaves the hair shiny, manageable, and easy to comb after cleansing. These days, a large variety of shampoos with various purposes are sold in the market, including synthetic, herbal, medicated, and non-medicated shampoos. The most well-liked herbal shampoos are those that seem to have superior purity, safety, and effectiveness.

Similar to ordinary shampoo, herbal shampoos are made with natural components and are intended to clean hair and scalp. These shampoos have good stability, are less damaging than synthetic shampoo, and have no adverse effects because no surfactants are used. Surfactants are present in synthetic shampoo. Serious side effects, such as split ends, eye irritation, hair loss, drying out, and graying of the hair, can result from using these surfactants over an extended period of time. Because of these factors, the general population is becoming more interested in herbal cosmetics because of their low cost and negligible adverse effects.

In our daily lives, shampoos are arguably the most used cosmetic products for cleaning our hair and scalps. In essence, a shampoo is a detergent solution with appropriate chemicals for additional benefits including lubrication, medicine, and improved hair conditioning. There are a lot of synthetic, herbal, medicated, and non medicated shampoos on the market these days, but customers are becoming more and more interested in herbal shampoo because they think that since it comes from natural sources, it is safe and doesn't have any negative effects. Shampoo contains synthetic surfactants mainly for foaming and cleaning purposes; nevertheless, prolonged usage of these surfactants can cause hair loss, scalp discomfort, and eye irritation. Herbal shampoo recipes are thought to be an alternative to synthetic ones, but making cosmetics with just natural ingredients is challenging. Numerous medicinal plants are frequently utilized in shampoo formulations because of their purportedly therapeutic benefitson hair.

These plant components can be utilized in derivative, refined extract, powdered, or crude form. Making a herbal shampoo with just one natural ingredient that is as safe and mild as a synthetic one while still competing well in terms of foaming, detergency, and solid content is really challenging. As a result, we thought about creating a pure herbal shampoo using plants that are widely and historically used in Oman and the Gulf, particularly India, for hair cleaning. For millennia, the Indian folklore

system has employed the pericarp of Spindus mukorossi, also known as soapnut or reetha, the fruits of Phyllanthus emblica, also known as Amla, and the dried pods of Acacia concinna (Sheekakai) to wash hair (Kapoor, 2005). Because Reetha and Sheekakai have a high saponin content, they create a rich lather when shaken with water. Additionally, they have been shown to have positive that make them important ingredients of cosmetic applications.

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Ideal characters of shampoo

- Should effectively and completely remove the dust, excessive sebum.
- Should effectively wash hair. Should produce a good amount of foam.
- The shampoo should be easily removed by rinsing with water.
- Should leave the hair non dry, soft, lustrous with good, manageability.
- Should impart a pleasant fragrance to the hair.
- Should not make the hand rough and chapped. Should not have any side effects or cause irritation to skin or eye.

Composition of shampoo

- Principal surfactant
- Secondary surfactant Antidandruff agents
- Conditioning agents
- Pearlescent agents
- Sequestrants
- Thickening agents
- Colours, perfumes and preservatives.

Types of shampoo

- Liquid shampoo
- Solid cream shampoo
- Jelly shampoo
- Powder shampoo Lotion shampoo
- Aerosol foam shampoo

HISTORY

Hans Schwarzkopf created the original liquid shampoo in 1927, which was still referred to as "soap." Liquid has been the most widely used form factor for hair cleaning since 1927. Hans Schwarzkopf did not develop a soap free liquid until 1933.

'Kneading' or'massaging' is the meaning of the Hindi phrase shampoo (often champi/Champy or champ), which is where the English word'shampoo' originates.

A herbal shampoo is formulated with natural oil, mineral, and Ayurvedic plant extracts. Shampoos that are high in chemicals can damage hair roots and result in a number of scalp-related problems. However, herbal shampoos can gently cleanse the scalp, restore any lost nutrients, and enhance the condition of hair. Many herbs and their extracts have been used as shampoos on the Indian subcontinent from ancient times. The Indus Valley Civilization was the first source of shampoo.

The filtered extract from boiling Sapindus with dried Indian gooseberry (amla) and a few other herbs formed a very efficient early shampoo. The fruit pulp of the tropical sapindus tree, commonly referred to as soapberries or soapnuts and found throughout India, contains saponins, a naturally occurring surfactant. In ancient Indian scriptures, the sapindus tree is known as ksuna. Indian literature refer to the lather produced by soapberry extract as "phenaka." The hair is left manageable, lustrous, and silky after. Shikakai (Acacia concinna), hibiscus flowers, ritha (Sapindus mukorossi), and arappu (Albizzia amara) were additional treatments used for hair cleaning. In the sixteenth century, the founder and first Guru of Sikhism, Guru Nanak, mentioned soap and the soapberry tree.

Early Indian colonial traders indulged in body massages (champu) and hair cleaning during their daily baths. They brought the newly acquired habits, including the hair treatment they termed shampoo, back to Europe when they arrived.

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CONTENT AND ITS QUANTITY REQUIREMENT

Sr. No.	Ingredient	Quantity Given (for 100 gm.)	Quantity Taken (for 10 gm.)
1	Ritha Extract	1%	10 gm
2	Amla Extract	1%	10 gm
3	Shikakai Extract	1%	10 gm
4	Methyle Paraben	1 mL	0.5 %
5	Gelatine Solution	5 % (qs)	Qs
6	Citric Acid	1%	Qs
7	Rose oil	0.1 mL	0.01 mL

LITRATURE REVIEW

1] Sachin Dubey et al. (2004):

Two preparations of herbal shampoo powder were formulated using some common traditional drugs used by folk and traditional people, for hair care. The preparations were formulated using Behera, amla, neem Tulsi, shikakai henna & Brahmi evaluated for organoleptic, powder characteristics, foam test, and physical evaluation. As the selected drugs are being used for a long time as a single drug or in combination, present investigations will further help to establish standard formulation and evaluation parameters, which will certainly help in the standardization of the quality and purity of such types of herbal powder shampoos.

2] Ashok Kumar et.al. (2010):

The formulated shampoos were not only safer than the chemical conditioning agents but also greatly reduce protein loss during combing. The pH of the shampoos was adjusted to 5.5, to retain the acidic mantle of the scalp. Synthetic preservatives have sometimes been the cause of adverse effects among consumers. We have used the physicochemical approach to preservation and by formulating a self-preserving shampoo has avoided this risk posed by chemical preservatives. Even while herbal shampoo performs better and is safer than synthetic ones, it seems unlikely in the current situation that it will be widely used by customers.

3] Richa Madhu Sharma et. al. (2011):

Shampooing is the most typical method of hair care. Shampoos are products that are primarily used to clean the hair and scalp. A more radical approach to popularizing herbal shampoo would be to change the consumer expectations of shampoo, with an emphasis on safety and efficacy. In rare cases, synthetic preservatives have caused negative consumer reactions. We have used the physicochemical approach to preservation and by formulating a self-preserving shampoo, have avoided using chemical preservatives in herbal shampoo.

4] Sarath Chandran et.al. (2013):

Shampoo is a hair care product used for the removal of oils, dirt, skin particles, dandruff, environmental pollutants, and other contaminant particles that gradually build up in hair. It is a cosmetic product, and its main use is to clean the hair of accumulated sebum, scalp impurities, and hair-grooming product residue. The main objective of this study was to eliminate the harmful synthetic ingredient from anti-dandruff shampoo formulations and substitute them with a safe natural ingredient.

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5] Shah A. Khan et.al. (2014):
The study aimed to formulate a pure herbal shampoo and to evaluate and compare its physicochemical properties with the marketed synthetic and herbal shampoos. The herbal shampoo was formulated by adding herbal ingredients. The pH was corrected with citric acid, and a little amount of methylparaben was added as a preservative. To ascertain the physicochemical qualities, a number of tests were carried out, including visual inspection, pH, wetting time, percentage of solid contents, foam volume and stability, surface tension, detergency, dirt dispersion, etc. of both prepared and marketed shampoos. Our prepared shampoo showed comparable results with that of marketed shampoo for quality control tests but further research and development are required to improve its overall quality.

6] Rhimjhim arrora (2019):
The aim of the present investigation was to formulate and evaluate herbal shampoo containing natural ingredients with an emphasis on safety and efficacy, which will avoid the risk posed by chemical ingredients. The main objective of this study was to eliminate the harmful synthetic ingredients from shampoo formulation and substitute them with safe natural ingredients an attempt has been made to incorporate cutting-edge formulation technology into a recipe using natural ingredients. It clears sebum, dirt, and dandruff, promotes hair growth, strengthens, and darkens the hair.

7] Vijayalakshmi A et al (2018): The present study was carried out with the aim of preparing an herbal shampoo that reduces hair loss during combing, is safer than chemical conditioning agents as well as strengthens hair growth. The main purpose behind this investigation was to develop a stable and functionally by excluding all types of synthetic additives, which are normally incorporated in such formul for good product performance of the prepared shampoo, many tests were performed. The resul study of the developed shampoo revealed a comparable result for the quality control test, bu validation is needed for its overall quality.

AIM : "Formulation and Evaluation of Herbal shampoo"

Objective :
By elucidating the formulation principles and performance characteristics of herbal shampoos, this project aims to address the following objectives:

1. Investigate the efficacy of various herbal ingredients in cleansing and conditioning the hair and scalp.
2. Optimize the formulation parameters to enhance the stability and shelf-life of the herbal shamp??.
3. Evaluate the safety and compatibility of the formulated shampoo through rigorous testing.
4. Assess the consumer acceptability and perceived efficacy of the herbal shampoo through sensory evaluation studies.

NEED OF STUDY
Shampoos are cosmetic preparations designed to clean hair by removing oil and debris from the scalp and hair shaft. There is a large variety of synthetic shampoos with various uses on the market. However, the negative effects of these synthetic shampoos on the hair and scalp include keratin loss and dry hair. Because the chemicals in herbal shampoos are safe and have been used for a long time, they have become a popular substitute for synthetic shampoos. Similar to ordinary shampoo, herbal shampoo is a cosmetic preparation made with herbs that is intended to clean the hair and scalp. Many of the herbs used in herbal shampoos are said to have positive effects on hair. This study's goal is to create and assess a poly-herbal shampoo with herbal components for cosmetic use. The following powders and gels were purchased at the local market: hibiscus powder, neem powder, henna powder, amla powder, shikakai powder, ritha powder, and aloe vera powder. Homemade methods are used to make the soy milk and banyan root powder. These ingredients are then combined and their organoleptic and physico-chemical properties are assessed. In addition to cleaning hair, herbal shampoo also conditions and smoothes the hair's surface, promoting healthy hair that is free of dirt, grease, dandruff, and lice. Most importantly, its safety benefits are anticipated. Herbal cosmetics have the advantage of being non-toxic, reducing allergic reactions, and having many substances that have been shown to be

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effective throughout time. As a result, in the current work, we have discovered that herbal shampoo has good qualities and have further optimized its benefits for use as a cosmetic by humans.

PLAN OF WORK
Literature Review
Selection Of Drug Material
Study Of Monograph And Chemical Constituents
Extraction Of Crude Drugs
Incorporation Of Essential Oil Into Shampoo Base
Preparation Of Shampoo Base
Formulation Of Shampoo
Evaluation Of Shampoo

BENEFITS OF HERBAL SHAMPOO
1. More Shine
2. Less Hair Loss
3. Long Lasting Colour
4. Stronger and More Fortified Hairs
5. All Natural, No Chemicals
6. Wont Irritate Skin or Scalp
7. Keep Healthy Natural Oil

Function of Herbal Shampoo:
1. Conditioning
2. Hair Growth
3. Maintenance of Hair Colour
4. Medication.

Advantages of Herbal Shampoo:
1. Pure and Organic Ingredient
2. Free from Side Effects
3. No Surfactants .

INGREDIENTS OF HERBAL SHAMPOO

Material Required	Quantity to be Weighed
Soap nut extract	0.5 g
Amla extract	0.5 g
Shikakai extract	0.5 g
Hibiscus	0.5 g
Bhingraj extract	0.5 g
Senna extract	0.5 g
Gelatin	q.s
Aloe Vera	q.s.
Lemon Juice	q.s
Rose	q.s.

Material Required Quantity to be Weighed

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FUNCTION OF HEARBAL SHAMPOO-

1. Lubrication
2. Conditioning
3. Hair Growth
4. Maintenance of Hair Colour
5. Medication

DESIRED PROPERTIES OF HEARBAL SHAMPOO-

1. Ease of Application
2. Removal of More Debris
3. Easy Wet Combing
4. Fragrance
5. Low Level of irritation
6. Well Preserved
7. Good Stability

ADAVANTAGES OF HERBAL SHAMPOO-

1. Pure and Organic Ingredient
2. Free from Side Effects
3. No Surfactants eg:- SLS 4. No Synthetic Additives
5. No Animal Testing
6. Earth And Skin Friendly
7. No Petroleum based Ingredients

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USE OF INGREDIENTS-

1. Soap Nut Extract –

i. Stops Hair Fall

ii. Prevents Dandruff

iii. Fight Against Scalp Infection

2. Amla Extract

i. Strengthen the Scalp and Hair.

ii. Reduce premature pigment loss from hair, or greying.

iii. Stimulate Hair Growth.

iv. Reduce Hair Loss.

v. Prevent or treat dandruff and dry scalp.

vi. Prevent or treat Fungal and Bacterial hair and Scalp infections.

vii. Improve overall appearance of Hairs.

3. Shikakai Extract –

i. Cleanses Hair.

ii. Add more Shine to the Hairs,

iii. Prevents Grays.

iv. Crubs Hair Loss

v. Prevents Lice, Psoriasis, Eczema & Scabies.

vi. Provides Nourishment to the hair and promote healthy and rapid hair growth.

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vii. Prevents Split ends.

4. Hibiscus –

i. Stimulate Hair Growth & Lost hair volume & Luster over the years.

ii. Conditions Hairs

iii. Prevents Baldness (Minoxidil & Finasteride).

iv. Treat Dandruff & Itchy Scalp. v. Prevents premature greying.

5. Bhringraj Extract –

i. Treats baldness and helps in growth of hairs.

ii. Makes Hair Lustrous

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6. Senna Extract –
i. Strong Hairs
ii. Great Conditioner
iii. Combats Hair Loss

7. Aloe Vera –
i. Calms an itchy scalp.
ii. Deep cleans oily hairs.
iii. Strengthens
iv. Aloe vera contains proteolytic enzymes which repairs dead skin cells on scalp.
v. Promote hair growth
vi. Smooth natural curls
vii. Reduce frizziness
viii. Detangle Hairs.

8. Gelatin –
i. Gelatin Can improve hair thickness and growth.
ii. Gelatin supplement or placebo for 50 weeks to 24 people with alopecia.
iii. It gives thickness to hairs.
iv. For strengthening of Hairs

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9. Lemon Juice –
i. Add More shine.
ii. Get rid of dandruff
iii. Split ends
iv. Reduces Hair fall
v. Gives Natural colour to hairs
vi. Detox the scalp
vii. Promotes the growth of hairs
viii. Great hair mask for dry and damage hairs.

10. Rose Oil –
i. It repairs hair damage
ii. Improves Growth of hairs
iii. Reduces the dandruff
iv. Gives fragrance to the shampoo.

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DESCRIPTION OF THE INGREDIENTS –

S. No.	Common name	Pictures	Botanical name	Parts used
1	Hibiscus		*Hibiscus rosa-sinensis*	Flower
2	Amla		*Emblica officinalis*	Fruit
3	Shikakai		*Acacia concinna*	Powder
4	Soapnut		*Sapindus indica*	Fruit
5	Cassia		*Cassia auriculata*	Leaves
6	Bhringraj		*Eclipta prostrata*	Leaves, flower
7	*Aloe vera*		*Aloe barbadensis*	Leaf

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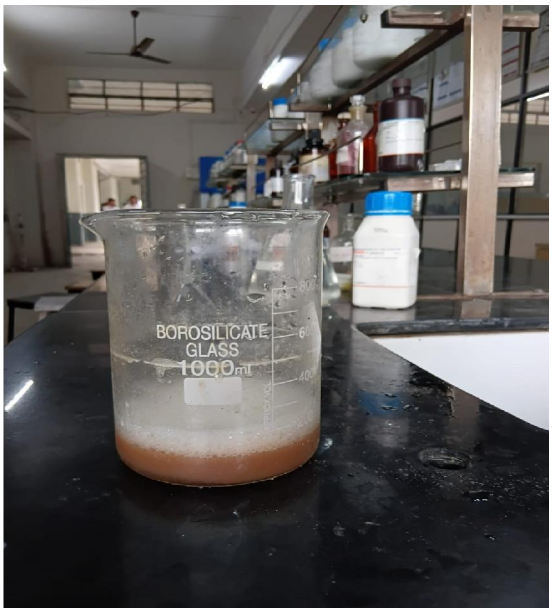
FORMULATION OF SHAMPOO

Formulation of the herbal shampoo was done as per the formula given in Table 1. To the gelatin solution (10%), added the herbal extract and mixed by shaking continuously at the time interval of 20 min. 1 ml of lemon juice was also added with constant stirring. To improve aroma in the formulation, sufficient quantity of essential oil (rose oil) was added and made up the volume to 100 ml with gelatin.



EVALUTION OF HERBAL SHAMPOO

The prepared formulation was evaluated for product performance which includes organoleptic characters, pH, physicochemical characterization, and for solid content. To guarantee the nature of the items, particular tests were performed for surface tension, foam volume, foam stability, and wetting time using standard protocol.

Visual assessment:- The prepared formulation was assessed for color, clarity, odor, and froth content.

pH determination :– The pH of the prepared herbal shampoo in distilled water (10% v/v) was evaluated by means of pH analyzer at room temperature .

Surface tension measurement :– The prepared shampoo in distilled water (10% w/v) was evaluated for surface tension using stalagmometer in room temperature .

Testing of wetting :– Wetting time was calculated by noting the time required by the canvas paper to sink completely [3]. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch

Foam stability test: – The stability of the foam was determined using cylinder shake method. About 50 ml of formulated shampoo (1%) solution was taken in a graduated cylinder of 250 ml capacity and shaken for 10 times vigorously. Foam stability was measured by recording the foam volume of shake test after 1 min and 4 min, respectively . The total foam volume was measured after 1 min of shaking.

Dirt dispersion test: – To 10 ml of refined water two drops of cleanser were included and taken in a wide-mouthed test tube. To the formulated shampoo, added one drop of Indian ink and shaken for 10 min after closing the test tube with a stopper. The volume of ink in the froth was measured and the result was graded in terms of none, slight, medium, or heavy.

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Conditioning performance evaluation: – An artificial hair tress of Indian women was received from a salon and divided into two swatches of length 10 cm approximately, weighing 5 g. The control swatch was the one without washing and the test swatch using the formulated shampoo was washed with. Each tress was added for 2 min to the combination of shampoo in water in the proportion 10:15 taken in a conical flask and washed using 50 ml of distilled water.

PHYSICOCHEMICAL PROPERTIES OF HERBAL SHAMPOO

Evaluation test	Formulated Shampoo
Colour	Brown
Transparency	Clear
Odour	Good
pH of 10% solution	7
Solid contents (%)	23.25
Foam volume (ml)	25
Foam type	Dense, small
Surface tension (dynes/cm)	35.18
Wetting time (s)	120 s

MATERIALS AND METHODS MATERIAL USED

- Ritha Extract
- Amla Extract
- Shikakai Extract
- Methyle Paraben
- Gelatine Solution
- Citric Acid
- Rose oil

RESULT

The shampoo was formulated by admixing the equal amount of the aqueous extracts of all the ingredients with soapnut . The above plant extract contains phytoconstituents like saponins which is a natural surfactant having detergent property and foaming property. An ideal shampoo must have adequate viscosity and many natural substances possess good viscosity. The gelatin solution (10%) behaves as a pseudoplastic forming clear solutions. Lemon juice (1 ml) added to the shampoo serves as anti-dandruff agent, natural antioxidant, and chelating agent and maintains the acidic pH in the formulation.

II. CONCLUSION

The present study was carried out with the aim of preparing the herbal shampoo that reduces hair loss during combing, safer than the chemical conditioning agents as well as to strengthen the hair growth. Herbal shampoo was formulated with the aqueous extract of medicinal plants that are commonly used for cleansing hair traditionally. Use of conditioning agents (synthetic) reduces the protein or hair loss. To provide the effective conditioning effects, the present study involves the use of shikakai, amla, and other plant extracts instead of synthetic cationic conditioners. The main purpose behind this investigation was to develop a stable and functionally effective shampoo by excluding all types of synthetic additives, which are normally incorporated in such formulations. To evaluate for good product performance of the prepared shampoo, many tests were performed. The results of the evaluation study of the developed shampoo revealed a comparable result for quality control test, but further scientific validation is needed for its overall quality.

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